Divergence in Contributing Factors for Suicide Among Men and Women in Kentucky: Recommendations to Raise Public Awareness

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SYNOPSIS

Objectives. The primary purpose of this study was to compile demographic information from 1999 to 2005 on suicides and examine specifically toxicology differences between men and women dying by suicide and differences in what type of intimate partner problems (IPPs) were cited as a precipitating circumstance.

Methods. In addition to death certificate data, coroner investigation reports were available for more than three-quarters of cases in 2005 detailing precipitating factors leading up to suicide. We linked toxicology results to death certificates and coroner investigation reports in the Kentucky Violent Death Reporting System database for statewide analysis.

Results. In 2005, IPP was documented as a contributing factor in 128 (29%) of all suicide cases where the circumstances were known. In 54 (42%) of the 128 cases, the coroner noted that the decedent's intimate was in the process of leaving, breaking up, had recently left, had recently separated, had recently filed for divorce, was awaiting divorce, or had a divorce recently finalized. Of those 54 cases involving IPPs, most (87%) of the suicide victims were men and were significantly different from the women.

Conclusions. As a result of this study, we have two recommendations: (*1*) partnering with the media and community-based programs and services to systematically disseminate information on issues such as male IPPs and suicide, and (*2*) continuing and expanding the use of violent death surveillance to improve risk factor identification. With improved data gathering, targeted interventions can better address the various dynamics influencing the decision to take one's own life.

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Nationally, suicides outnumbered homicides by nearly two to one between 1999 and 2004. The Commonwealth of Kentucky exceeded the national rate of suicides by a mean of 18% during those same years and, in 2005, suicides outnumbered homicides by almost three to one.[1] Although suicides are a crushing blow to families and communities, these tragedies go largely unreported to the public. The media are understandably reticent to publish suicide information, fearing copycatting and out of respect to the family suffering a loss still frequently viewed as shameful. The downside to the media position on suicide is an uninformed public.

At its best, homicide reporting honors the memory of the decedent, enlightens citizens about the compromising of safety, and exposes perpetrators of violent offenses. Conversely, the failure to uniformly report suicides prevents the public from learning about the seriousness of a health crisis that is devastating communities nationwide.[2,3] Systematically informing the public means moving beyond anecdotal stories and convenience sampling to comprehensive, population-based reporting of suicides. With limited resources, it is especially important to identify populations at risk and develop gender, age, and/or racial/ethnic-specific interventions.[4] As with most dissemination, whether media-driven or community-based, the most effective interjections are those designed and tailored for specific groups identified through population-based data.

There is increasing consensus that males use more lethal means when attempting suicide, putting them at a higher risk for completion.[5–7] Numerous studies reveal associations between alcohol consumption and males dying by suicide.[6,8–12] Data from the National Violent Death Reporting System (NVDRS) are now available, and published studies from these data provide a more detailed picture of suicide than previously available.[5,13] A 2008 study, using 2005 NVDRS data from 16 states, found the rate of male suicide to be nearly four times that of female suicide. Intimate partner problems (IPPs) were noted as a precipitating factor in 33% of male suicides and 26% of female suicides.[13] This is relevant to prevention efforts because of the high rate of male suicides, under potentially behaviorally modifiable circumstantial factors, and the need for gender-specific initiatives.[5] Current practices might not be effective in targeting males.[5,14]

The Kentucky Violent Death Reporting System (KVDRS) collects information from multiple investigative sources statewide, as part of the NVDRS. In this study, we used state-based data to move beyond what has previously been reported. The primary purpose of this study was to not only compile demographic information on suicides from 1999 to 2005, but to look specifically at toxicology differences between men and women dying by suicide and differences in what types of IPPs were cited as a precipitating circumstance.

BACKGROUND

Suicide prevention efforts across the United States are hampered by the inherent limitations of death certificate data. The National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC) provides information initially recorded on death certificates (completed by funeral directors, attending physicians, medical examiners, and coroners). Death certificate information proves useful but remains incomplete. NCHS collects information on the underlying and contributing cause of death; the place of occurrence; and the decedent's demographics, residence, and education level. Deaths are enumerated for the U.S. by state, county, metropolitan statistical area, and areas with a population of 10,000 or more.

A primary purpose of the NCHS is to collect, analyze, and publish data obtained from all death certificates filed in vital statistics offices in the U.S. and its territories. For all its benefits, the death certificate data system contains limited information on the circumstances of the injury incident and factors contributing to death. Additionally, public access to these data is usually not available until two years after the calendar year of death.[15]

Compiling additional population-based data, which are integral to a comprehensive understanding of suicide, has until recently been nearly impossible on a statewide, let alone national basis. In response, CDC aspires to build a national system to merge uniform violent death data (defined as all homicides, suicides, and firearm-related fatalities) from all states for both individual-level and collective analysis.[15,16] The NVDRS provides timely and detailed information to "inform decision makers about the magnitude, trends, and characteristics of violent deaths."[17] The NVDRS has become a tool for the evaluation and continuous improvement of state-based violence prevention policies and programs. CDC modeled the NVDRS after the Fatality Analysis Reporting System, which combines data with the goal of reducing the rate of motor vehicle-related deaths by improving road safety policies, child restraint use, safety belt use, rear restraint use, and vehicle safety standards.[18]

Since the launch of the NVDRS in 2002, 17 states currently benefit from additional data-gathering capabilities provided by affiliation with NVDRS. Data

gathered from 2005 represent KVDRS's first year of full reporting within the NVDRS. A component detailing key elements of suicide is uniformly recorded from coroners' reports, including a narrative describing the circumstances surrounding an entire suicide event.

METHODS

We obtained suicide mortality data for the years 1990–2005 from CDC's Web-based Injury Statistics Query and Reporting System (WISQARS). Overall crude and age-adjusted rates were calculated through WISQARS for the U.S. and Kentucky and subgrouped for gender, race/ethnicity, and age.[1]

The Office of Vital Statistics provided a monthly electronic death certificate file to the KVDRS beginning in March 2005. A subset was then generated using International Classification of Diseases, 10th Revision codes meeting CDC's definition of suicide. Additionally, we requested information from coroners and the state toxicology laboratory in Frankfort, Kentucky.

Although Kentucky Vital Statistics tracks the deaths of all Kentucky residents, this article includes only those deaths in which an investigation occurred within Kentucky, thereby making primary investigation and toxicology reports available to the KVDRS. Coroner and toxicology death investigation documents are only available when the death investigation occurs in Kentucky, even if the injury occurred within Kentucky but the resulting death occurred outside of the state.

Coroners in Kentucky, having the full power and authority of peace officers, investigate the cause and manner of deaths defined as coroners' cases by Kentucky Revised Statute (KRS) 72.025.[19] The coroner/medical examiner system in Kentucky is a cooperative effort between forensic specialists and, under KRS 72.405, a coroner may request that an autopsy be performed by a pathologist to ascertain the cause and manner of death in a coroner's case. Each of Kentucky's 120 county coroners uses a standard set of procedures and adheres to the same protocol during a death investigation, although not all record the investigation in the same manner. Approximately 86 of the 120 counties use a standardized reporting form when documenting the investigation.[15]

The rollout of a statewide coroner reporting system continues with plans to encourage the remaining counties to incorporate uniform documentation into their death investigations. Similar to death scene investigations in other states, Kentucky's Coroner Investigation Report (CIR) includes information concerning the circumstances surrounding a suicide based on interviews with family or friends of the decedent. The circumstance section of the CIR includes a suicide incident section and lists contributing suicide factors, where the investigator can check all factors that apply to the incident. For instance, the coroner would check the circumstance "depressed mood" if a family or friend, during an interview, stated that the decedent was suffering from a "depressed mood," or was "down," "blue," "despondent," "sad," "low," or "unhappy" at the time of death. There is also a narrative component in which the investigator can elaborate on the case history and tell the story of the event. In most cases, Kentucky coroners provide a detailed summary of the story within the narrative portion of the CIR. If upon entering a suicide event a coroner—without further investigation—determines the manner of death to be suicide, the coroner may enter the suicide incident, carry out requisite procedures, and exit the scene without contact from another professional. Even if law enforcement is called to the death scene and the case is ruled a suicide without further investigation, the coroner will not file a formal report in most cases.

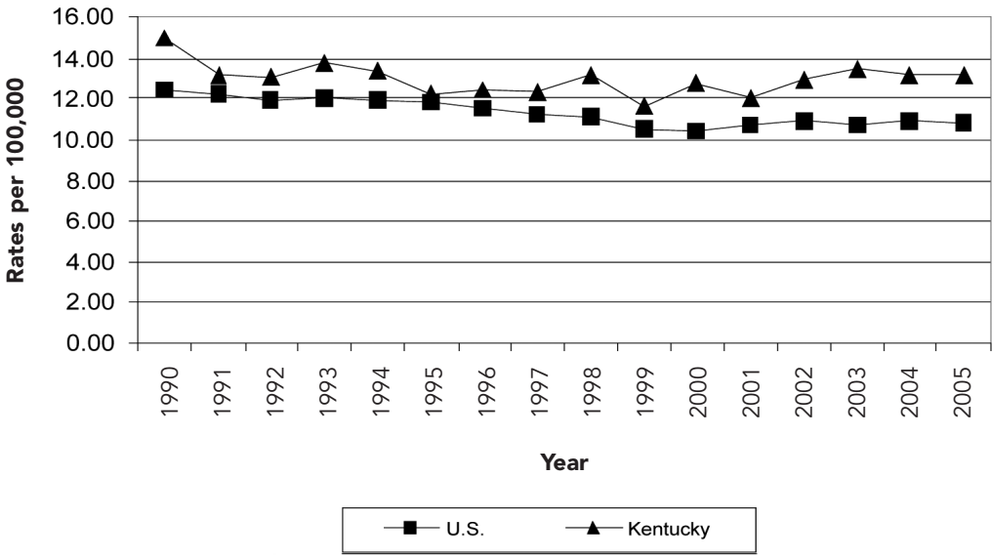
Each of Kentucky's 120 counties uses a standard set of procedures and adheres to the same protocol to determine whether a superficial postmortem examination is to be performed by the coroner or an autopsy is to be performed by the medical examiner. Specimens are collected for toxicology analyses by the medical examiner during autopsy or the coroner during postmortem examination. Toxicology screening includes alcohol and other volatiles, a large number of prescription medications, over-the-counter medications, and illicit drugs.[12] Toxicology results are based on substances found in the victims; however, suspect toxicology results are not included in this article. If toxicology analysis reveals that there is more than one substance found, there is overlap between substance categories. For instance, if alcohol and cocaine both test positive, then those results are added to both categories although reporting on only one decedent.

We performed toxicology analyses on 75% of the 2005 cases ruled as suicide. Toxicology results for all suicide cases occurring in 2005 were provided to the KVDRS by the state toxicology laboratory. Cases were linked to electronic death certificate data and coroners' reports by name, date of death, and county of death, and then combined in the NVDRS database for statewide analysis.

RESULTS

Kentucky exceeded the national rate of overall suicide deaths from 1999 to 2005 (Figure 1), when male suicide deaths were subgrouped for those same years

Figure 1. Suicide rates: U.S. and Kentucky, 1990–2005

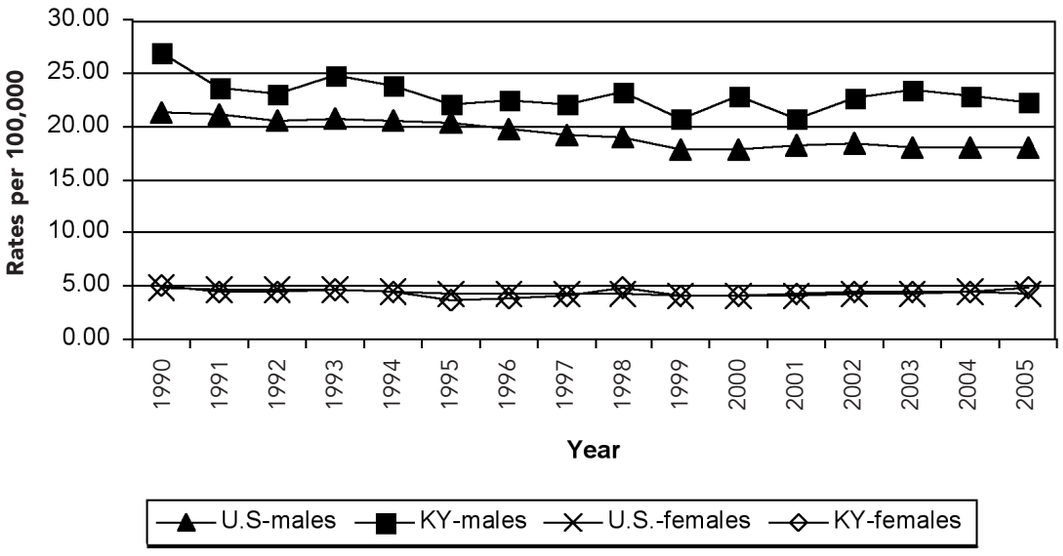


and, to a lesser degree, when female suicide deaths were subgrouped (Figure 2).

In 2005, Kentucky recorded 810 violent deaths, of which 557 (69%) were suicides. Of the 557 suicides, 451 (81%) were men, although males represent slightly less than half (49%) of Kentucky's population. Decedents were between the ages of 35 and 59 in more than half of the suicides, although this age group represents only 35% of Kentucky's population. Of the 375 (68%) firearm-related suicides, 320 (85%) were men and 363 (97%) were white.

More than 78% of the suicide investigation reports for 2005 were submitted to the KVDRS with complete information regarding the circumstances surrounding the suicides. Coroners might have found that decedents had several contributing factors (they noted all

Figure 2. Rates of suicide by gender: U.S. and Kentucky, 1990–2005[a]



[a]Reported rates are age-adjusted. Rates were calculated using the Web-based Injury Statistics Query and Reporting System, Centers for Disease Control and Prevention, 2006.

that applied on the CIR), and might have taken more than one drug with or without alcohol. In such cases, overlap exists.

Consistent with previously published reports, depression was the most frequently documented contributing factor for suicide (56%).[12,14,20–24] In addition to depression, Table 1 shows the most frequent circumstances recorded on the coroners' reports that lead up to a suicide event: current mental health problem (53%), current treatment for mental health (53%), IPP (29%), crisis in the past two weeks (23%), physical health problem (21%), history of suicide attempts (18%), alcohol problem (14%), other substance abuse problem (14%), and recent criminal/legal problem (12%). Notably, not in the top 10 were job problem (7%), financial problem (5%), and death of friend or family (7%).

We applied Chi-square statistics to determine statistically significant differences between men and women, and the two-sided Fisher's exact test in cases where cell size was less than 7. Table 1 shows *p*-values for testing the null hypothesis that males and females dying by suicide are homogenous with respect to certain characteristics.

We rejected the null hypothesis in four variables that were significant at the $p<0.05$ level, and two variables that were significant at the $p<0.001$ level. Women were significantly more often depressed, suffering from another mental health problem, and in treatment for their mental health prior to committing suicide; women were also more often found to have a history of suicide attempts.

Several observations warrant comment. Women had odds 1.67 times as great as men for leaving a suicide note, but men more often, although not significantly, disclosed their intent to commit suicide to a friend or family member prior to taking their lives. The odds of men suffering a crisis within the past two weeks prior to the suicide were nearly two times that of women. Men more often suffered from job problems, and significantly more often experienced recent criminal or legal problems.

Toxicology testing was conducted in 75% of the decedents classified as suicides; 39% of male decedents tested positive for alcohol compared with 22% of women. Women tested positive for antidepressants in 41% of the cases and men in 24% of the cases. Opiates were found in 16% of suicides: 25% in females and 14% in males. Amphetamines were documented in less than 3% of suicide cases.

In 2005, IPP was documented as a contributing factor on the coroners' investigation report in 128 (29%) of all suicide cases where the circumstances were known. In 54 (42%) of the 128 cases, the coroner noted that the decedent's intimate partner was in the process of leaving, had recently broken up, had recently left, had recently separated, had recently filed for divorce, was awaiting an impending divorce, or had a divorce recently finalized (Table 2). Of those 54 cases involving IPPs, most (87%) of the suicide victims were men and were significantly different from the women.

DISCUSSION

Prevention efforts hinge on the quality of data gathered at the site of a suicide event. Improving data-gathering capabilities among first responders must represent

Table 1. Most frequent suicide circumstances in Kentucky, 2005

Circumstance	*Yes* N *(percent)* (n=*435*)	*Males* (n=*348*)	*Percent of males*	*Females* (n=*87*)	*Percent of females*	P-*value*
Top 10 circumstances						
Current depressed mood	243 (55.9)	185	53.2	58	66.7	0.027
Current mental health problem	231 (53.1)	167	48.0	64	73.6	<0.0001
Current treatment for mental health	231 (53.1)	167	48.0	64	73.6	<0.0001
Intimate partner problem	128 (29.4)	105	30.2	23	26.4	0.487
Crisis in the past two weeks	100 (23.0)	87	25.0	13	15.0	0.046
Physical health problem	91 (20.9)	75	21.6	16	18.4	0.511
History of suicide attempts	76 (17.5)	51	14.7	25	28.7	0.002
Alcohol problem	59 (13.6)	48	13.8	11	12.6	0.773
Other substance abuse problem	59 (13.6)	45	12.9	14	16.1	0.448
Recent criminal/legal problem	50 (11.5)	46	13.2	4	4.6	0.024
Additional circumstances						
Person left a suicide note	93 (21.4)	68	19.5	25	28.7	0.064
Person disclosed intent to commit suicide	121 (27.8)	99	28.4	22	25.3	0.548

Table 2. Suicide and intimate partner problems: Kentucky, 2005

	Number of suicides[a] *(n=128)*	*Males (n=105)*	*Percent of males*	*Females (n=23)*	*Percent of females*	*P-value*
Suicide over intimate partner leaving/ending relationship	54	47	87	7	13	<0.0001

[a]Number of suicides with intimate partner problem noted as a precipitating circumstance, based on information available to the Kentucky Violent Death Reporting System project

the foremost priority across the nation. As Kentucky coroners—encouraged by the KVDRS but through their own initiative—move increasingly toward a detailed, uniform reporting system, comprehensive analysis on factors relevant to suicide are readily compiled and disseminated. Increased accuracy and detail in reporting by coroners at the scene of a suicide, or soon after leaving the scene, elevates Kentucky's suicide prevention efforts.[16,25]

Decedents disclosed their intent to commit suicide in 121 (27%) of Kentucky's 2005 suicide cases. This variable is included in the NVDRS database to identify the subset of suicides for which opportunities to intervene and prevent the death may have been present, and also to further understand contributing factors of suicide. This variable has not been coded in cases in which the intent to commit suicide was expressed at the moment of the suicide, where there was no opportunity for an intervention, or if there was disclosure in the past but no disclosure regarding the current incident.[25] These cases represent instances in which there was time to intervene and, with the right message to those close to this at-risk population, lives might have been saved.

IPP is one of the top 10 reasons for committing suicide, especially considering the top three could be combined into a single mental health category. IPPs are generally linked to violence acted out against a partner, possibly leading to homicide; not as readily considered is violence against oneself because of domestic issues. This study raises three important issues regarding gender differences. The first shows the importance of examining IPPs in all cases of violent death, not only in cases of homicide. Prevention efforts in suicide would look entirely different from protecting populations against domestic homicidal threat. Second, data for Kentucky women and national women almost overlap, while the data for men are substantially different. This reveals that Kentucky's consistently higher suicide rate was almost entirely due to men. Third, there are differences between men and women regarding the circumstances surrounding suicide, thereby necessitating different prevention approaches. This study illustrates the need for more evidence-based primary prevention programs tailored specifically for men at risk for suicide.

Limitations

Our study had several limitations. First, the study was retrospective and relied solely on information provided on death forms completed by the coroners. Documented circumstances are subjective, representing the opinion of survivors of the decedent in regard to depressed mood, with or without a formal clinical diagnosis, regardless of whether they were currently in treatment, or whether there was a record of IPPs or violence (e.g., emergency protective order). This information is compiled through investigator interviews with survivors and is subject to recall bias. There also might be differential recall between family and friends depending on their motivations. Furthermore, a friend or family member might wish to deny the possibility of a suicide and, therefore, either not disclose information or downplay information.

CONCLUSIONS

Increased awareness remains the first step toward suicide prevention, as current prevention efforts struggle to gain a voice in the community. Unfortunately, the need to address the threat of suicide for the health of the community is not likely to diminish. Effective prevention efforts begin when the entire community is made aware of this largely silent crisis. Men are consistently more averse to receiving professional help and respond differently than women in this regard.[26] This notion certainly rings true in the arena of relational or mental health issues. The suicidal male is difficult to reach and, according to the National Institute of Mental Health, improving outreach to men at risk for suicide is a major challenge that requires further investigation.[27,28] Unlike their female counterparts, males often suffer without the knowledge of those closest to them, making the need for friends and family to take statements of intent to commit suicide more seriously. The

break-up of an intimate relationship often leaves men vulnerable to explosive behavior, and known interventions to de-escalate vulnerable men are limited.

As a result of this study, we offer the following recommendations. One, it is important to partner with the media and community-based programs and services to systematically disseminate information on issues such as male IPPs in suicide. With limited resources, it is especially important to monitor this at-risk population and develop specific interventions—whether media-driven or community-based—that can assist men in the midst of a crisis. We also echo recommendations to continue the use of violent death surveillance to improve risk factor identification and treatment of potential victims.[15,22] With improved data gathering, targeted interventions can better address the various dynamics influencing the decisions leading up to the taking of one's own life.

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REFERENCES

1. Centers for Disease Control and Prevention (US). Web-based Injury Statistics Query and Reporting System [cited 2006 Oct 10]. Available from: URL: http://www.cdc.gov/ncipc/wisqars
2. Pirkis J, Blood RW, Beautrais A, Burgess P, Skehan J. Media guidelines on the reporting of suicide. Crisis 2006;27:82-7.
3. Alao AO, Soderberg M, Pohl EL, Alao AL. Cybersuicide: review of the role of the Internet on suicide. Cyberpsychol Behav 2006;9:489-93.
4. Karch DL, Barker L, Strine TW. Race/ethnicity, substance abuse, and mental illness among suicide victims in 13 US states: 2004 data from the National Violent Death Reporting System. Inj Prev 2006;12(Suppl 2):ii22-7.
5. Sanford C, Marshall SW, Martin SL, Coyne-Beasley T, Waller AE, Cook PJ, et al. Deaths from violence in North Carolina, 2004: how deaths differ in females and males. Inj Prev 2006;12(Suppl 2):ii10-6.
6. McGirr A, Seguin M, Renaud J, Benkelfat C, Alda M, Turecki G. Gender and risk factors for suicide: evidence for heterogeneity in predisposing mechanisms in a psychological autopsy study. J Clin Psychiatry 2006;67:1612-7.
7. Spicer RS, Miller TR. Suicide acts in 8 states: incidence and case fatality rates by demographics and method. Am J Public Health 2000;90:1885-91.
8. Cho H, Guo G, Iritani BJ, Hallfors DD. Genetic contribution to suicidal behaviors and associated risk factors among adolescents in the U.S. Prev Sci 2006;7:303-11.
9. Cho H, Hallfors DD, Iritani BJ. Early initiation of substance use and subsequent risk factors related to suicide among urban high school students. Addict Behav 2007;32:1628-39.
10. Mukamal KJ, Kawachi I, Miller M, Rimm EB. Drinking frequency and quantity and risk of suicide among men. Soc Psychiatry Psychiatr Epidemiol 2007;42:153-60.
11. Kolves K, Varnik A, Tooding L-M, Wasserman D. The role of alcohol in suicide: a case-control psychological autopsy study. Psychol Med 2006;36:923-30.
12. Shields LBE, Hunsaker DM, Hunsaker JC, Ward MK. Toxicologic findings in suicide: a 10-year retrospective review of Kentucky medical examiner cases. Am J Forensic Med Pathol 2006;27:106-12.
13. Karch DL, Lubell KM, Friday J, Patel N, Williams DD. Surveillance for violent deaths—National Violent Death Reporting System, 16 states, 2005. MMWR Surveill Summ 2008;57(SS-3):1-43, 45.
14. Sher L. Alcohol and suicide: neurobiological and clinical aspects. ScientificWorldJournal 2006;6:700-6.
15. Walsh S, Dignan M, Caldwell G. The PAPM, diffusion theory, and violent death surveillance. Am J Health Behav 2007;31:451-61.
16. Steenkamp M, Frazier L, Lipskiy N, DeBerry M, Thomas S, Barker L, et al. The National Violent Death Reporting System: an exciting new tool for public health surveillance. Inj Prev 2006;12(Suppl 2):ii3-5.
17. Effectiveness in disease and injury prevention child passenger restraint use and motor-vehicle-related fatalities among children—United States, 1982–1990. MMWR Morb Mortal Wkly Rep 1991;40(34):600-2.
18. Evans L. The effectiveness of safety belts in preventing fatalities. Accid Anal Prev 1986;18:229-41.
19. Kentucky Coroners. Commonwealth of Kentucky: Kentucky Justice and Public Safety Cabinet; 2005 [cited 2006 Oct 17]. Available from: URL: http://www.coroners.ky.gov
20. Abe K, Mertz KJ, Powell KE, Hanzlick RL. Characteristics of black and white suicide decedents in Fulton County, Georgia, 1988–2002. Am J Public Health 2006;96:1794-8.
21. Rosenbaum M. The role of depression in couples involved in murder-suicide and homicide. Am J Psychiatry 1990;147:1036-9.
22. Stockwell J. Va. violent deaths are mostly suicides; study finds high rate for older men. The Washington Post 2005 Oct 12; Sect. B1.
23. Kohlmeier RE, McMahan CA, DiMaio VJM. Suicide by firearms: a 15-year experience. Am J Forensic Med Pathol 2001;22:337-40.
24. Bennewith O, Hawton K, Simkin S, Sutton L, Kapur N, Turnbull P, et al. The usefulness of coroners' data on suicides for providing information relevant to prevention. Suicide Life Threat Behav 2005;35:607-14.
25. Centers for Disease Control and Prevention (US). National Violent Death Reporting System (NVDRS) coding manual, revised: version 3. Atlanta: National Center for Injury Prevention and Control, CDC; 2008.
26. Mayo Foundation for Medical Education and Research. Male depression: understanding the issues [cited 2009 Jan 12]. Available from: URL: http://www.mayoclinic.com/health/male-depression/MC00041
27. Bjerkeset O, Romundstad P, Gunnell D. Gender differences in the association of mixed anxiety and depression with suicide. Br J Psychiatry 2008;192:474-5.
28. National Institute of Mental Health. Suicide in the U.S.: statistics and prevention [cited 2009 Jan 12]. Available from: URL: http://www.nimh.nih.gov/health/publications/suicide-in-the-us-statistics-and-prevention.shtml#risk