

**Indiana State Department of Health (ISDH) Indiana Violent Death Reporting System
(INVDRS)**

Advisory Board Worksheet – March 24th 2015

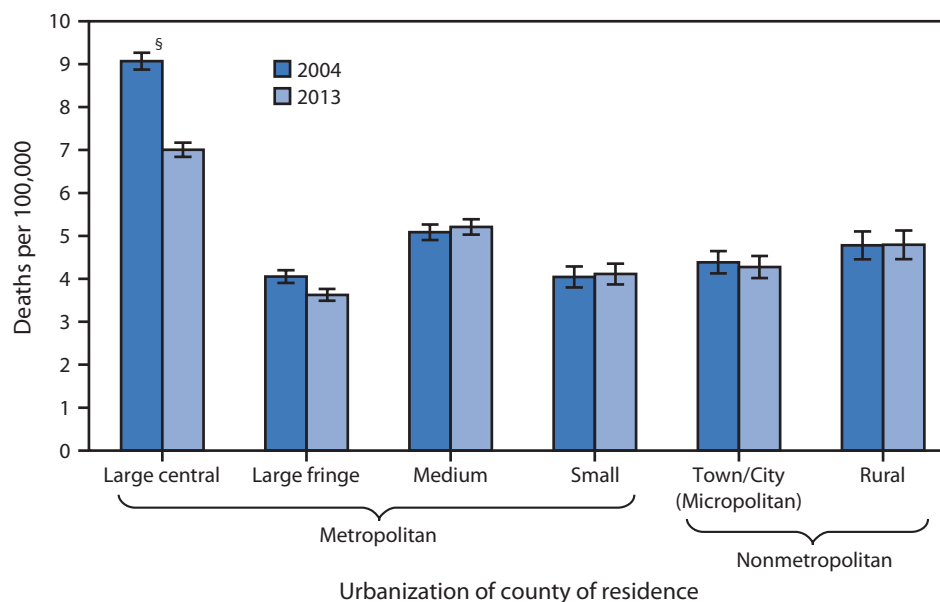
Advisory Board Member Questions/concerns/roadblocks

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QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Age-Adjusted Homicide Rates,* by Urbanization of County of Residence† — United States, 2004 and 2013



* Age-adjusted rates per 100,000, based on the 2000 U.S. standard population. Deaths from homicide are coded *U01–*U02, X85–Y09, and Y87.1 in the *International Classification of Diseases, 10th Revision*.

† Counties were classified into urbanization levels based on a classification scheme that considers metropolitan/nonmetropolitan status, population, and other factors.

§ 95% confidence interval.

From 2004 to 2013 in the United States, the age-adjusted homicide rate in large central metropolitan counties decreased 23% (from 9.1 to 7.0 deaths per 100,000 population), and the rate in large fringe metropolitan counties (suburbs of large cities) decreased by 10% (from 4.1 to 3.6). For four other county urbanization types (medium and small metropolitan and town/city [micropolitan] and rural nonmetropolitan), rates in 2004 and 2013 were similar. For both years, the homicide rates in large central metropolitan counties were higher than the rates for all other county types, and the rates for medium metropolitan counties were higher than the rates for large fringe and small metropolitan counties, and town/city (micropolitan) nonmetropolitan counties. Overall, in the United States, the 2004 age-adjusted homicide rate was 5.9 deaths per 100,000 population, and the 2013 rate was 5.2.

Source: National Vital Statistics System. Available at <http://wonder.cdc.gov>.

Ingram DD, Franco SJ. NCHS urban-rural classification scheme for counties. National Center for Health Statistics. Vital Health Stat 2 2012(154).

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Can We Rely on Suicide Mortality Data?

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Accuracy in suicide statistics is expected to influence research results, policy-making in public health and mental health, and planning and funding of prevention strategies. In turn, community awareness and support services also depend on reliable reporting. Profiling the size of the suicide phenomenon and the related costs is extremely important for addressing the needs of those bereaved and fighting the stigma attached to suicidal behavior. Despite the clear need for reliable mortality data related to it, suicide possibly remains one of the most under-reported causes of death worldwide (it is rarely over-enumerated).

This peculiarity has been known for more than two centuries. As reported by Goldney and associates (Goldney, Schioldann, & Dunn, 2008), specific reference to undercounting of suicide is present in books as early as 1790 (Charles Moore, *A Full Inquiry Into the Subject of Suicide*) and 1840 (Forbes Winslow, *The Anatomy of Suicide*). Interestingly, one of the reasons for under-reporting indicated by Moore was the deliberate concealment of suicide cases due to the strong stigma existing around this cause of death.

The probable under-reporting of suicide cases in the statistics available from the US was also addressed by Amariah Brigham (1845), the editor-in-chief of the *American Journal of Insanity* (later destined to become the *American Journal of Psychiatry*). The Italian suicidologist Enrico Morselli underlined the magnitude of the problem of under-counting suicide cases in his book *Suicide: An Essay on Comparative Moral Statistics*, considered to represent the first illustrious example of the epidemiology of suicide (1882).

In the second half of the 20th century, attention toward the issue of suicide data quality grew remarkably. For example, in the US, Louis Dublin estimated under-recognition of suicide cases to be around 30% (1963). Erwin Stengel proposed a similar figure for England (1964). Sainsbury and Barraclough (1968), Ross and Kreitman (1975), and Ruzicka (1976) all produced papers on the problem of suicide under-enumeration that then became classic quotations. In Ireland, McCarthy and Walsh (1975) thought that a figure of 100% would best describe the amount of suicide under-reporting in their country.

In "Validity and Reliability of Trends in Suicide Statistics" (1983), Peter Sainsbury wrote:

The accuracy and hence the value of official suicide statistics has been questioned in recent years to an extent that has led some authorities to dismiss their usefulness in epidemiological research. [...] Nevertheless, the evidence ... indicates that the sources of error are of a random nature, at least to an extent that allows epidemiologists to compare rates between countries and districts within them, between demographic groups, and over periods of time. (p. 340).

However, a WHO Working Group on Mortality Data Quality (1986), chaired by Walter Gulbinat and inclusive of the same Peter Sainsbury, concluded by cautioning against the validity of direct comparisons of suicide rates from different countries. Acknowledging a probable degree of consistency in the under-reporting of each country, the Working Group agreed that comparisons could eventually be performed only on suicide trend analyses. But at the foundation meeting of the International Academy for Suicide Research in Padua (Italy, 1990), Gulbinat admitted that "...while the World Health Organization firmly discourages the practice of straight data comparisons between countries, nobody actually seems to care."

Data Recording

To be registered as caused by suicide, a death first needs to be reported. There may be circumstances that occasionally hinder this process, such as communication difficulties (the death cannot be timely referred to relevant authorities) or the remoteness of the location where the death occurred. However, there are also issues in recording suicide deaths that are common to most (if not all) countries. Some are represented by cases in which the intention to die is equivocal or in which there are reasons to disguise the suicide in the form of accident or other cause of death. These situations can be summarized in the following points:

- Stigma avoidance.
- Legal, religious, and political pressures.
- Life-sustaining medication not assumed.
- Self-starvation.
- Voluntary euthanasia/assisted suicide.

- Particular suicide methods (e.g., motor vehicle accident, opiate overdose).
- Dubious circumstances of the act (e.g., falls, drowning).
- Missing person.
- Financial conditions (gains from life insurance).
- Social position of the deceased.
- Changes in coding (e.g., from ICD-9 to ICD-10).
- Lack of standardized certification procedures.

Quality of Coding

“Reliable estimates of the burden of death due to injury are essential for shaping national and global health priorities” (Bhalla, Harrison, Shahraz, Fingerhut, & the Global Burden of Disease Injury Expert Group, 2010, p. 831).

As a general rule, the quality of mortality data for a given country is inversely related to the proportion of causes of death recorded as *unknown* (ICD codes: R95-R99, *other ill-defined and unspecified causes of mortality*). That is, the higher the number of unknown deaths, the lower the quality of data in that country (De Leo, 2010). Other ICD-10 codes that may involve cases of suicide are Y10-Y34 (*event of undetermined intent*: When there is not enough evidence to distinguish between a death due to assault, homicide, accident, or suicide) and V01-X59 (*accidents*: When there are uncertainties about the self-inflicted nature of the act).

The number of partially specified causes of death also remarkably affects data quality. In a clear example provided by Bhalla et al. (2010), the death of a car occupant killed in a road accident could be coded using any of the following categories, with decreasing specificity toward the end of the list:

- Unspecified road injury not including a pedestrian or bicyclist (V87-V88).
- Unspecified unintentional road injury (V89, Y85.0).
- Unspecified unintentional transport injury (V99, Y85.9).
- Unspecified unintentional injury (X59).
- Unspecified injury mechanism (Y89.9).
- Unknown cause of death (R95-R99).

There is remarkable variability between countries in the use of both unspecified and partially specified codes. Differences are appreciable also among Anglo-Saxon countries (Mathers, Perrin, & Watt, 2008), with gaps particularly evident in deaths due to undetermined intent (Bhalla et al., 2010; Bhalla, Shahraz, Naghavi, Lozano, & Murray, 2008). For example, 12% of all injury deaths were coded as due to undetermined intent in the UK, while the proportion was four times smaller in the US (Bhalla et al., 2010).

There are also marked disparities between countries regarding who is responsible for investigation procedures and death certification. While police officers are mostly in charge of preliminary investigations, in many countries there are no magistrates/coroners to express formal judgments over the cause of death. Often, forensic doctors,

general practitioners, and other professionals (not always belonging to the health domain) have authority to register the cause of death.

However, even in high-income countries mortality data quality can be hindered by issues such as: differences in data validation procedures; disparities in determination of intent by the certifying authority; lack of common training of deputies or shared procedures (a frequent occurrence in countries that are federation of different states); changes in policies or legislations; financial difficulties or inadequate resourcing (e.g., this might influence the quantity and quality of autopsy examinations; see Kapusta et al., 2011); delays in investigative procedures or delays in uploading of results into electronic databases; differences in timing of data compilation (e.g., fiscal year vs. calendar year); etc.

Multiple causes of death represent a traditional challenge to death certification; in fact, it is often problematic to establish the injury or the disease that has initiated the train of morbid events eventually leading to death. In addition – particularly in hospital environments – the longer the time from the initial mechanism, the higher the probability the latest organ failure be named as the final motive of death (e.g., kidney failure after deliberate self-poisoning weeks earlier; generalized sepsis after self-provoked wound, etc.).

How to Improve Data Recording

Identifying gaps, priorities, and practical solutions within and across different domains through the widest possible consultation is the necessary premise to any change in existing recording systems. This requires the establishment of multidisciplinary working groups able to develop, pilot, and eventually implement projects by choosing the most cost-effective ones (the adequate identification of available resources is an essential step of any successful change). Once decided, the project needs to be accompanied by an appropriate communication strategy, with emphasis on the gains derivable from the knowledge of realistic baselines of mortality data.

The improvement of suicide statistics starts by the adoption of standardized definitions. In this direction, the World Health Organization has recently published in its blue series on suicide prevention two resource booklets on how to record fatal (2011) and nonfatal suicidal behavior (2014a). Well-defined sets of procedures should also be in operation. For example, it is crucial that all individuals potentially in charge of death certification share equal training and use identical forms, which in turn make reference to accepted definitions. The International Association for Suicide Prevention has recently established a task force to investigate opportunities to build an internationally applicable nomenclature on suicide-related phenomena. This would eventually favor combination of efforts and use of meta-analytic procedures, and avoid undue duplications.

Once obtained, data should be timely collected and stored in a centralized databank. Linkages with databanks

related to other environments of public health interest (e.g., health records, schools, corrective services, drug and alcohol services etc.) should then be encouraged for public health and research purposes. These latter recommendations have been strongly underlined by the recent World Health Organization's report on suicide (*Suicide Prevention: A Global Imperative*, 2014b) and represent fundamental steps for effective antisuicide interventions (Fleischman & De Leo, 2014).

Acknowledgments

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Indiana Violent Death Reporting System

Reporting Child Violent Death

The Indiana Violent Death Reporting System will capture 100% of violent death incidents among children in Indiana beginning January 1, 2015 by utilizing and enhancing the work done through Child Fatality Review (CFR).

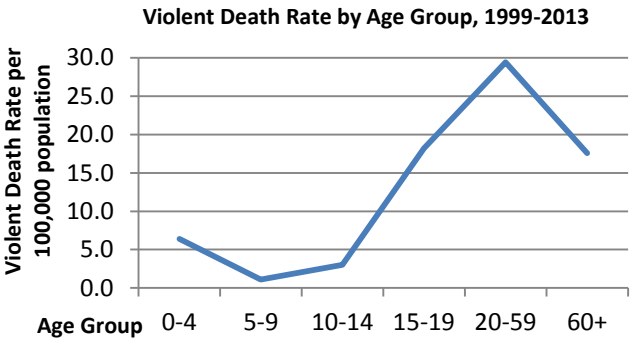
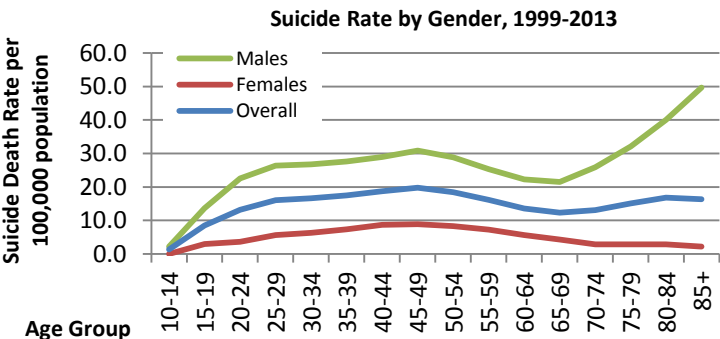
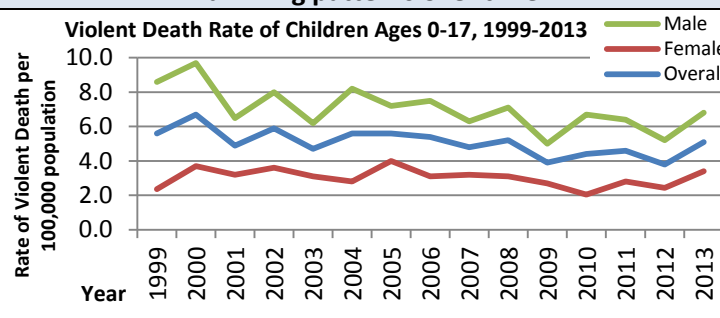
Overview: INVDRS

- Collect comprehensive, objective, and accurate population-based information on victims, suspects, weapons, and circumstances related to homicides, suicides, unintentional firearm injury deaths, legal intervention deaths, deaths of undetermined intent, and deaths due to terrorism.
- Combine data from multiple sources, including death certificates, coroner records, law enforcement reports, to increase scientific understanding of violent injury to be translated into prevention strategies for state, local and national efforts
- Contribute de-identified data to the National Violent Death Reporting System (NVDRS) funded by the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control

Overlap: INVDRS and Child Fatality Review

INVDRS	INVDRS & CFR	CFR
<ul style="list-style-type: none"> • Focuses on state-based data collection and dissemination • Captures death certificate data from 100% of Indiana counties • Contributes data to NVDRS in conjunction with 31 other states 	<ul style="list-style-type: none"> • Use confidential reporting system to collect data for analysis • Examine extensive background and circumstance information on victims, suspects, relationships, weapons, and life events related to the incident to identify examining associated risk factors and warning signs to prevent future death • Shared common data providers, users, and stakeholders for increased utility and completeness 	<ul style="list-style-type: none"> • Focuses on local community and statewide action • Local teams are mandatory in all counties • Contributes data to National CDR Case Reporting System on a team by team basis

Data: Violent Deaths in Indiana

Detecting trends spanning from infancy to adulthood	Examining violent death by intent
<p>Violent Death Rate by Age Group, 1999-2013</p> 	<p>Suicide Rate by Gender, 1999-2013</p> 
<p>Highlights key characteristics of child violent death</p> <ul style="list-style-type: none"> • From 1999-2013 in Indiana, there were 1,212 violent deaths among children ages 0-17 years. • Rates of violent deaths decline from infancy to early childhood, rise during childhood and teen years, peak during adulthood, and decline after age 59. • The rate of violent deaths for males was more than double that of females. • Males were four times more likely to die by suicide and nearly two times more likely to die by homicide compared to females. 	<p>Examining patterns over time</p> <p>Violent Death Rate of Children Ages 0-17, 1999-2013</p> 

INVDRS Advisory Board:

The success of the implementation and utilization of INVDRS relies upon its partners and Advisory Board (AB) members. The AB will:

- Focus on the technical aspects of developing and implementing the reporting system
- Provide access to data (if applicable) and help develop solutions to identified barriers
- Advise on the publication of useful and actionable reports and fact sheets

For more information about INVDRS, please contact the Principal Investigator, Katie Hokanson, at KHokanson@isdh.in.gov
 For more information about Child Fatality Review, please contact Program Coordinator Gretchen Martin, at GMartin1@isdh.in.gov

Violent Deaths by County of Residence in Indiana, 2010- 2013

2010:

County of Residence:	Violent Death Counts:	Rank in State:
Marion County*	258	1
Lake County*	138	2
Allen County*	75	3
Vanderburgh County*	53	4
St. Joseph County*	52	5
Madison County*	38	6
Indiana Total:	1,361	

2011:

County of Residence:	Violent Death Counts:	Rank in State:
Marion County*	250	1
Lake County*	126	2
Allen County*	58	3
St. Joseph County*	54	4
Vanderburgh County*	54	5
Howard County	35	6
Madison County*	32	7
Indiana Total:	1,371	

2012:

County of Residence:	Violent Death Counts:	Rank in State:
Marion County*	264	1
Lake County*	140	2
Allen County*	83	3
St. Joseph County*	56	4
Vanderburgh County*	47	5
Porter County	38	6
Hamilton County	37	7
Madison County*	35	8
Indiana Total:	1,456	

2013:

County of Residence:	Violent Death Counts:	Rank in State:
Marion County*	313	1
Lake County*	146	2
Allen County*	90	3
St. Joseph County*	50	4
Johnson County	41	5
Vigo County	40	6
Vanderburgh County*	39	7
Madison County*	35	8
Indiana Total:	1,526	

* Indicates Pilot County for Indiana Violent Death Reporting System (INVDRS) in 2015

Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2013 on CDC WONDER Online Database, released 2014. Data are from the Multiple Cause of Death Files, 1999-2013, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/ucd-icd10.html>.