

Understanding Teenage Suicide

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- Every 40 seconds someone in the world commits suicide

- 90 people worldwide will die of suicide during the time of this discussion

- Some of those deaths will be among people 20 years old or younger



3—Tales from Shakespeare

Suicide is an abnormal
response to the pain,
loss, and frustration of
ordinary existence

II. Epidemiology



According to
the CDC, in
2014 there
were...

11.4

Suicides per 100,000 worldwide

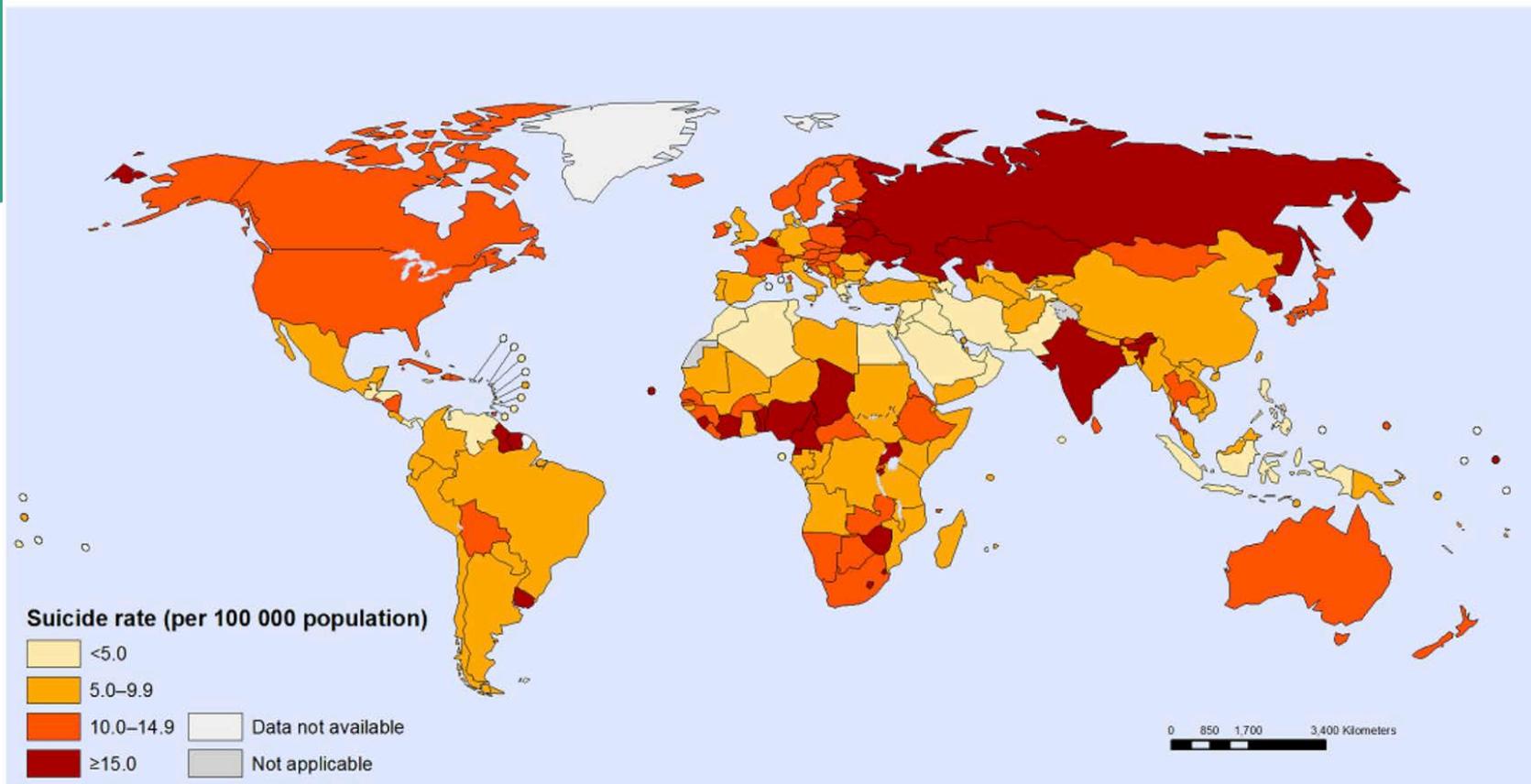
13.0

Suicides per 100,000 in the U.S.

1.4

Worldwide, percentage of all deaths

Age-standardized suicide rates (per 100 000 population), both sexes, 2016



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Information Evidence and Research (IER)
World Health Organization



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Suicide accounts for...

56

Percent of violent deaths worldwide

50

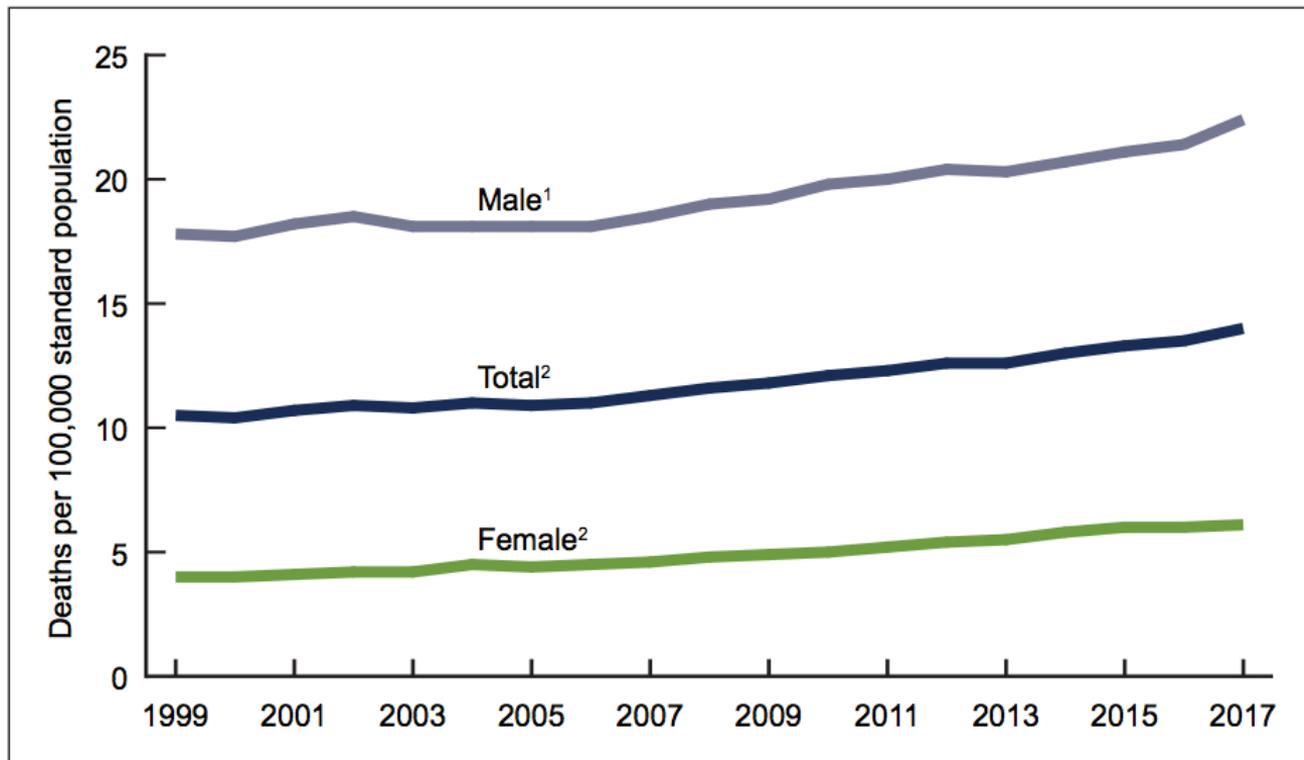
Percent of violent deaths among men

71

Percent of violent deaths among women

Among those 15 -29 years old, suicide accounts for 8.5 percent of all deaths and is the 2nd leading cause of death

Figure 1. Age-adjusted suicide rates, by sex: United States, 1999–2017



¹Stable trend from 1999 through 2006; significant increasing trend from 2006 through 2017, $p < 0.001$.

²Significant increasing trend from 1999 through 2017 with different rates of change over time, $p < 0.001$.

NOTES: Suicides are identified using *International Classification of Diseases, Tenth Revision* underlying cause-of-death codes U03, X60–X84, and Y87.0. Age-adjusted death rates were calculated using the direct method and the 2000 U.S. standard population. Access data table for Figure 1 at: https://www.cdc.gov/nchs/data/databriefs/db330_tables-508.pdf#1.

SOURCE: NCHS, National Vital Statistics System, Mortality.

III. Risk Factors



Risk Factors: Age, Gender, Race

**Risk increases with
age greater than 14
years**

**Male to female
completed suicide
ratio is 3:1...**

**Attempted ratio is
1:5**

**Native American >
Caucasian > African
American**

Risk Factors: Family

Risk increases with family history of suicide

Parental pathology (affective disorder, schizophrenia, personality disorders, substance abuse)

Family environment (violence, drug use, familial discord)

Risk Factors: Abuse

- Verbal
- Emotional,
- Physical
- Sexual
- Peer group bullying

Risk Factors: Psychiatric Diagnoses

- Major depression
- Bipolar disorder
- Conduct or Personality Disorder
- Substance abuse
- Gender Dysphoria
- Schizophrenia

Risk Factors: Violence

- **Personal history of violent behavior**
- **Previous suicide attempts (risk increases 30x in boys and 3x in girls)**

Brent 1999

Risk Factors: Lethality

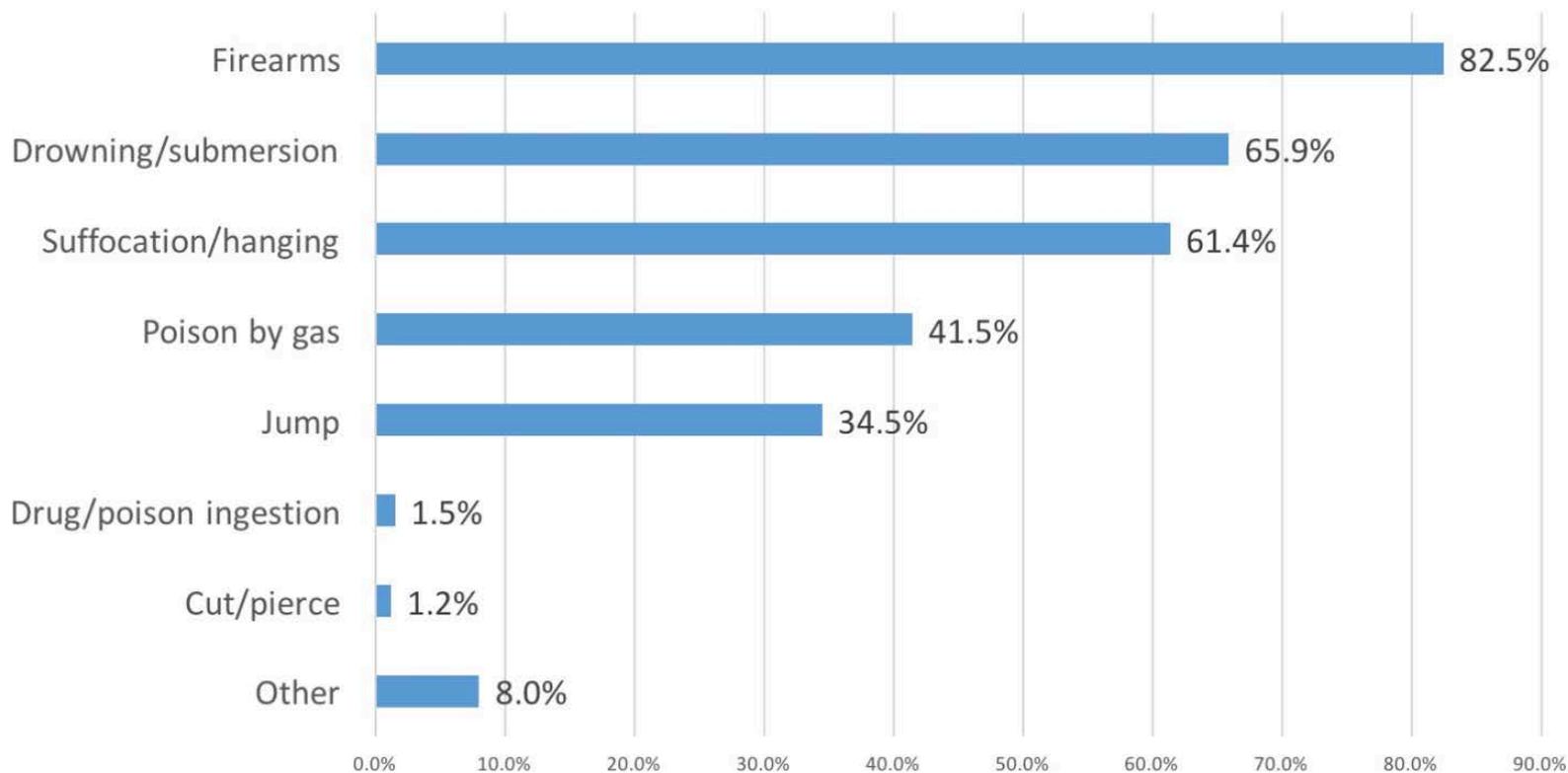
■ Means

- Firearms (quadruples the risk of completed suicide)
- Prescription medications
- Pesticides

■ Seriousness

- Intent
- Concealment
- Leaving a note
- Giving away property

Case Fatality Rates (%) By Suicide Method



(Spicer, R.S. and Miller, T.R. Suicide acts in 8 states: incidence and case fatality rates by demographics and method. American Journal of Public Health. 2000:90(12);1885.)

Risk Factors: Non-suicidal self injury

- Shared diathesis with suicide
- Gateway behavior
- Up to 1/3rd of adolescents are “rolling the dice”
- Present in 16 -18% of adolescents worldwide

Risk Factors: Models

- Personal contact with a suicide victim

- Exposure to dramatic media coverage of a suicide

- Contagion effect
 - Correlates inversely with age

Holinger 1990

IV. Neurobiology



Genetics

- Twin/adoption studies suggest 30 -50% heritability of suicidal behavior
- Factoring out heritability of psychiatric disorders, there remains 17% heritability of suicidal behavior

Epigenetics

- Epigenetics is a process that allows the genome to adapt to environmental influences
- Methylation of DNA to influence expression of genes in response to environmental effects
- One mechanism of ELA mediating brain changes

Environmental Factors

- Depletion of fatty acids
- Correlation with amount of lithium in drinking water
- Altitude
- Seasonal variation

Environmental Factors, cont'd...

- Exposure to sunshine
- Circadian rhythm vulnerability via the pineal gland
- Air pollution: nitrous oxide and particulate matter, ozone, especially in China and Japan

Neuroendocrine Studies

- Central serotonergic function and the effects on hormone production: prolactin, ACTH, and cortisol
- Dexamethasone suppression test: measure of the reactivity of the stress response system

Structural brain imaging

- Periventricular white matter changes
- Volumes of prefrontal cortex gray matter reduced
- Increased volume of subcortical nuclei



Pompilli 2008

Link between ELA and Suicide

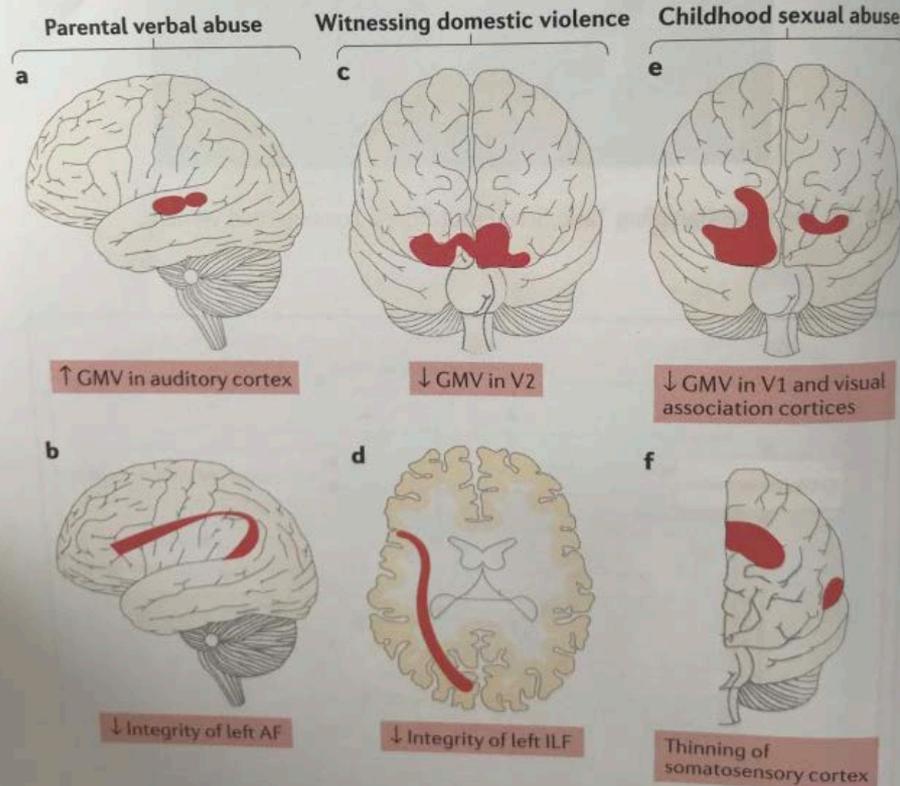


Plate 14 The effects of childhood maltreatment on brain structures and connectivity (Teicher et al., 2016).

Van Heeringen *The Neuroscience of Suicidal Behavior*, 2018, 114

V. Prevention





Strengthen economic supports

- Strengthen household financial security
- Housing stabilization policies



Strengthen access and delivery of suicide care

- Coverage of mental health conditions in health insurance policies
- Reduce provider shortages in underserved areas
- Safer suicide care through system change



Create protective environments

- Reduce access to lethal means among persons at risk of suicide
- Organizational policies and culture
- Community-based policies to reduce excessive alcohol use



Promote connectedness

- Peer norm programs
- Community engagement activities



Teach coping and problem-solving skills

- Social-emotional learning programs
- Parenting skill and family relationship programs



Identify and support people at risk

- Gatekeeper training
- Crisis intervention
- Treatment for people at risk of suicide
- Treatment to prevent re-attempts



Lessen harms and prevent future risk

- Postvention
- Safe reporting and messaging about suicide

<https://www.cdc.gov/violenceprevention/suicide/fastfact.html>

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Credits