

SUICIDE AND SUICIDALITY ACROSS THE LIFESPAN

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DISCLOSURES

NIMH, NIAAA, CHADS

KTGF CHILD DEPRESSION AND ADHD

FELLOWSHIP SELECTION COMMITTEE

NO CONSULTATION TO PHARMACEUTICAL OR
OTHER COMPANIES

NO SPEAKER'S BUREAUS

NO EQUITY HOLDINGS



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SLU

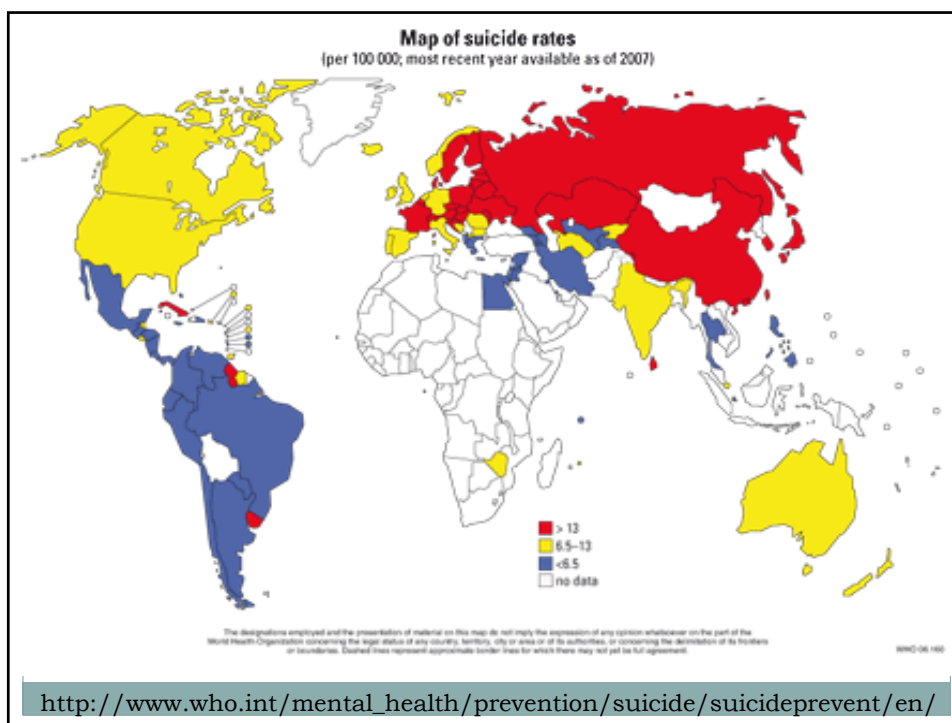
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OUTLINE

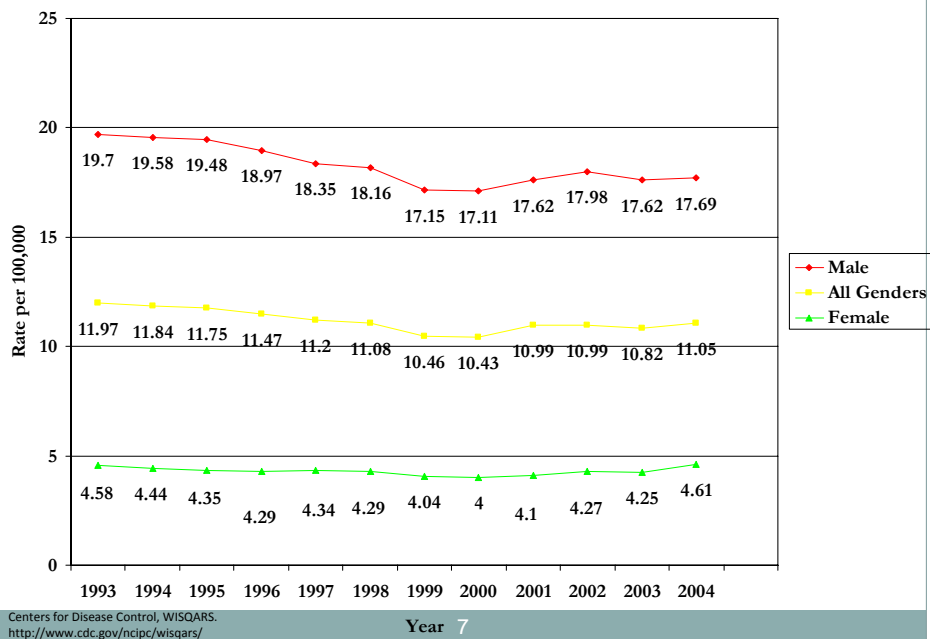
- THE BURDEN OF SUICIDE AND SUICIDALITY
- EPIDEMIOLOGY OF SUICIDE AND SUICIDALITY ACROSS THE LIFESPAN
- GENETIC EPIDEMIOLOGY: TWIN STUDIES



ARGENTINA 96	9.9	3.0
AUSTRALIA 99	21.2	5.1
AUSTRIA 01	27.3	9.8
BELARUS 00	63.6	9.5
BELGIUM 96	29.4	10.7
BULGARIA 00	25.2	9.1
CANADA 98	19.5	5.1
CHILE 94	10.2	1.4
CHINA 99 (Selected rural & urban areas)	13.0	14.8
CHINA 99 (Hong Kong SAR)	16.7	9.8
CROATIA 00	32.9	10.3
DENMARK 98	20.9	8.1
FINLAND 00	34.6	10.9
FRANCE 99	26.1	9.4
INDIA 98	12.2	9.1
ISRAEL 97	10.5	2.6
JAPAN 99	36.5	14.1
RUSSIAN FEDERATION 00	70.6	11.9
SPAIN 99	12.4	4.0
UNITED KINGDOM 99	11.8*	3.3
UNITED STATES OF AMERICA 99	17.6	4.1

Adapted from WHO data

U.S. Suicide Rates by Gender and Year - All Ages



MISSOURI: DEATHS BEFORE 65 DURING YEAR 2005

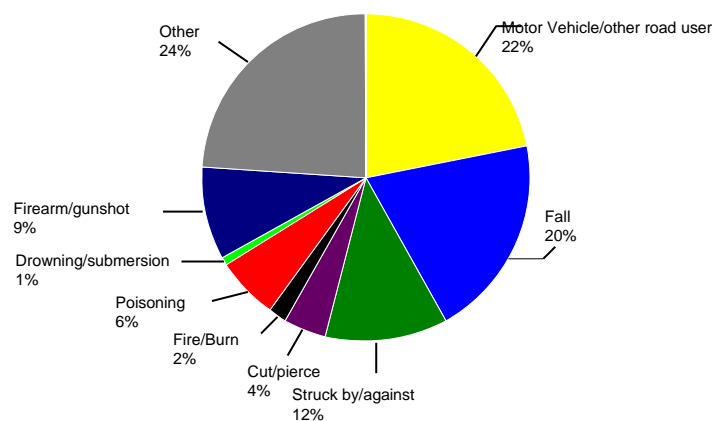
Cause of Death	Deaths	YPLL	Age-adjusted Rate	Population
All Causes	14320	256845	5056.483	5024740
Unintentional Injury	1936	55619	1115.858	5024740
Malignant Neoplasms	3789	41559	780.7347	5024740
Heart Disease	2837	34711	663.8911	5024740
Perinatal Period	282	18324	378.6123	5024740
Suicide	628	15568	315.5876	5024740
Homicide	399	13494	270.8723	5024740
Congenital Anomalies	203	10352	213.0137	5024740
Cerebrovascular	449	5313	100.8203	5024740
Diabetes Mellitus	380	4532	87.69503	5024740
Chronic Low. Respiratory Disease	431	3787	69.18213	5024740
All Others	2986	53586	69.18213	5024740

Adapted from CDC data

BURDEN OF SUICIDE ATTEMPTS

- 30,000 SUICIDES PER YEAR
- 300,000* SUICIDE ATTEMPTS PER YEAR
- ABOUT ONE THIRD OF SUICIDE ATTEMPTERS RECEIVE MEDICAL ATTENTION*
- ABOUT 20% OF INDIVIDUALS HOSPITALIZED FOR SUICIDE ATTEMPTS SUFFER FROM SERIOUS DIRECT SEQUELAE

Total Cost of Injury by Mechanism \$406 Billion (Finkelstein, et al 2006)



http://www.cdc.gov/ncipc/factsheets/CostBook/Economic_Burden_of_Injury.htm

SUICIDE ACROSS LIFESPAN

- A leading cause of death in youth (4th from 10-14 and 3rd from 15-19 and 20-24)
- Suicide rates raise substantially after mid-adolescence: ~1/100,000 from 10-14, 8/100,000 from 15-19 and 12/100,000 from 20-24
- Rates were then usually steady throughout adulthood until elderly age where rates increase again for men: ~30/100,000 for men over 65
- ~1% US population dies by suicide over a lifespan of 70 years

SUICIDE EPIDEMIOLOGY IN US

- Geography: ~East vs. West
- Peaks during spring/summer, not Christmas
- Gender: Men>Women
- Age: Mature>Young
- Ethnicity: Asian women over 65, Caucasian men over 65, Native American and Alaskan Native Youth, Filipino-Americans, Multi-racial individuals
- Evolving cohort trends
- Well known risk factors (we'll return to them)

A Peril of the Middle Years

From 1999 to 2004, the suicide rate rose the most among middle-age people while decreasing for the elderly, a group that had been at a higher risk in the past.

Suicide rate, per 100,000 people

AGE GROUP	RATE IN 1999	RATE IN 2004	PERCENTAGE CHANGE FROM 1999 TO 2004
5 to 14	0.6	0.7	+16.7 %
15 to 24	10.1	10.3	+ 2
25 to 34	12.7	12.7	0
35 to 44	14.3	15.0	+ 4.9
45 to 54	13.9	16.6	+19.4 %
55 to 64	12.2	13.8	+13.1 %
65 to 74	13.4	12.3	- 8.2
75 to 84	18.1	16.3	- 9.9
85 and over	19.3	16.4	- 15

Source: Centers for Disease Control and Prevention

THE NEW YORK TIMES

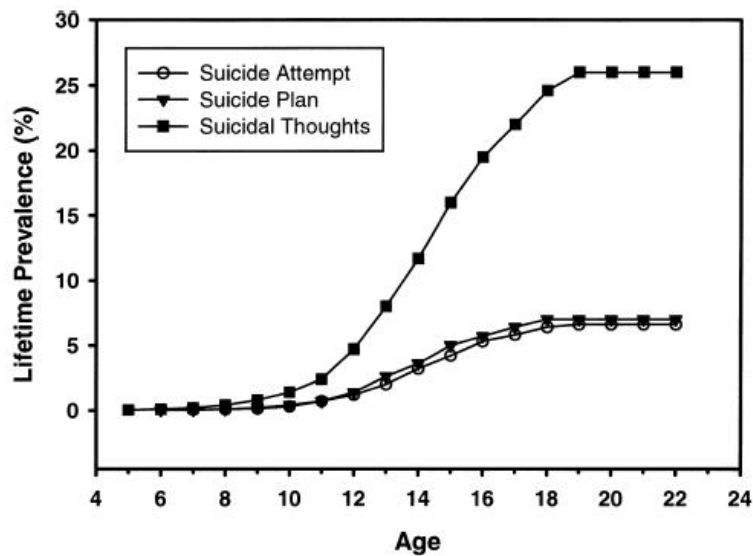
From the New York Times 2-19-08

SUICIDALITY ACROSS LIFESPAN

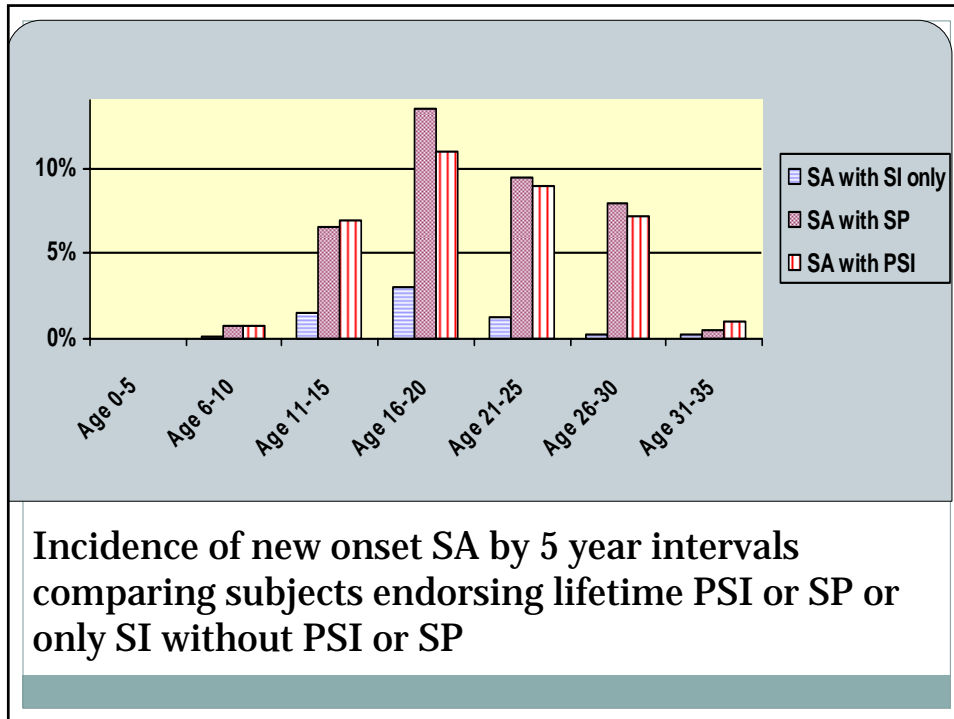
- Definitional variations continue to hinder research
- Absence of comprehensive epidemiological data especially longitudinally
- Youth onset behaviors and thoughts
- Much more common in youth than adults including reports of lifetime thoughts and behaviors*
- Ratio of suicide attempt/suicide changes with age: not certain this is true for lifetime ratio
- Range of poor outcomes associated with serious suicide attempts

SUICIDE ATTEMPTS EPIDEMIOLOGY

- Geography
- Gender: Women>Men
- Age: Young>Mature
- Ethnicity: Multi-racial individuals*, Hispanic youth
- Other: youth sexual orientation
- Evolving cohort trends
- Well known risk factors (we'll return to them)



Glowinski et al. jaacap, 2001 (PMCID: PMC1474069)



**YRBSS: High School Age
US vs. MO 2005 Suicide Attempts**

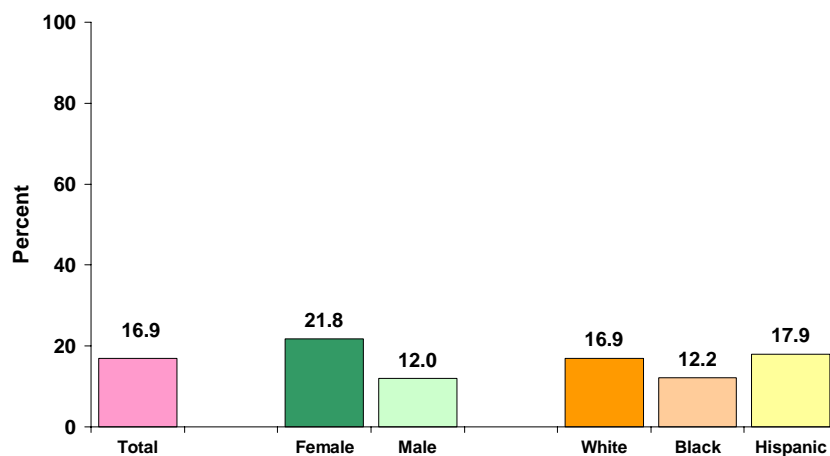
	C	AA	H	O	All Racial categories
US Females	9.3 (±1.5)	9.8 (±2.4)	14.9 (±2.2)	16.3 (±3.5)	10.8 (±1.1)
US Males	5.2 (±1.3)	5.2 (±2.8)	7.8 (±2.4)	8.8 (±3.8)	6.0 (±1.2)
MO Females	8.7 (±2.1)				9.3 (±1.9)
MO Males	4.6 (±1.9)				4.9 (±1.4)

Adapted from CDC/Youth Risk Behavior Survey 2005 data

Epidemiology of suicidal thoughts

- Definitional variations
- Not well known except middle/high school age youth (see next slides for high school)
- Apparently inversely correlated to age, including lifetime thoughts of suicide
- Clinical and epidemiological evidence for severity gradient

Percentage of High School Students Who Seriously Considered Attempting Suicide,* by Sex** and Race/Ethnicity,*** 2005



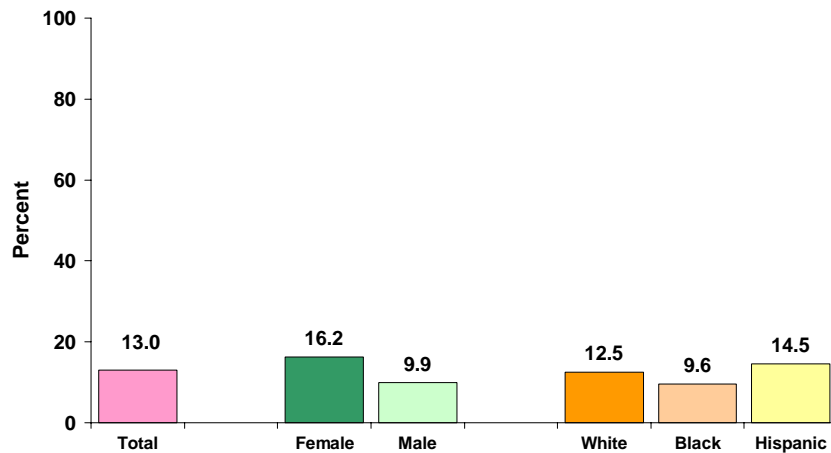
* During the 12 months preceding the survey

** F > M

*** W, H > B

National Youth Risk Behavior Survey, 2005

Percentage of High School Students Who Made a Plan about How They Would Attempt Suicide,* by Sex** and Race/Ethnicity,*** 2005



* During the 12 months preceding the survey

** F > M

*** H > W > B

National Youth Risk Behavior Survey, 2005

USA Self Reported Lifetime Suicidality

	Suicide Ideation	Suicide Plan	Suicide Attempt	Suicide Attempt /Suicide ratio
Youth	17%	13%	8.5%	1/100
Adult	13.5%	4%	4.5%	1/10
Elderly	1%-?	<1%	<1%	1/4

Unique aspects of young child suicide

- Rare ~1-2/100,000
- However, 10-14 year old suicide rate has increased about 100% overall in last 3 decades
- Under-treatment of mental illness
- Risk factors are the same as for older adolescents*
- In fact, earlier age of exposure to such risk factors as misuse of alcohol and other drugs postulated as critically involved in cohort trend

Unique aspects of adolescent suicide

- Still rare but a disproportionate cause of mortality in that age group
- Unevaluated and untreated mental illness*
- Precipitating factors, which may appear less understandable to adults
- Contagion

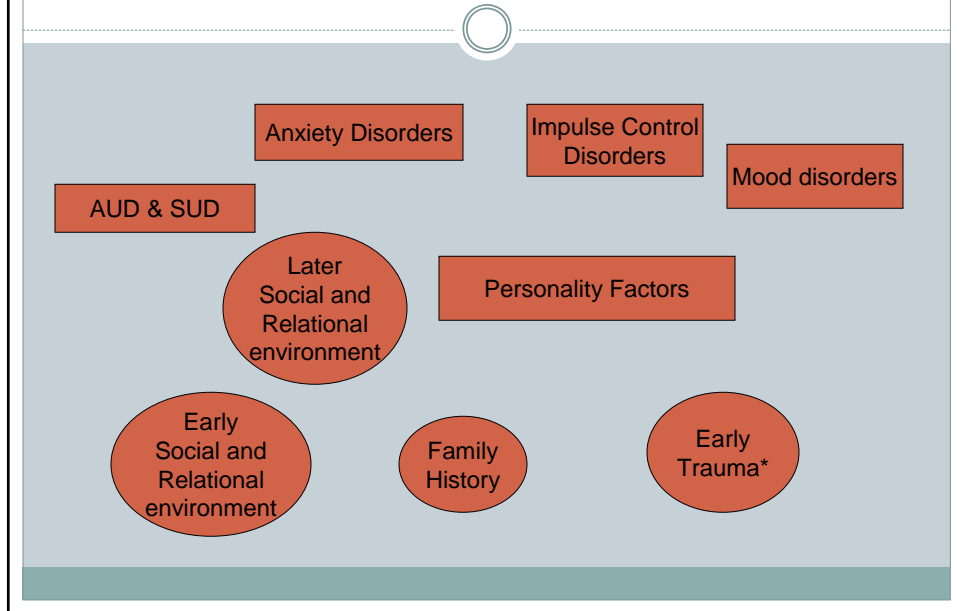
Characteristics of adult suicide

- More warning than adolescents/elderly?

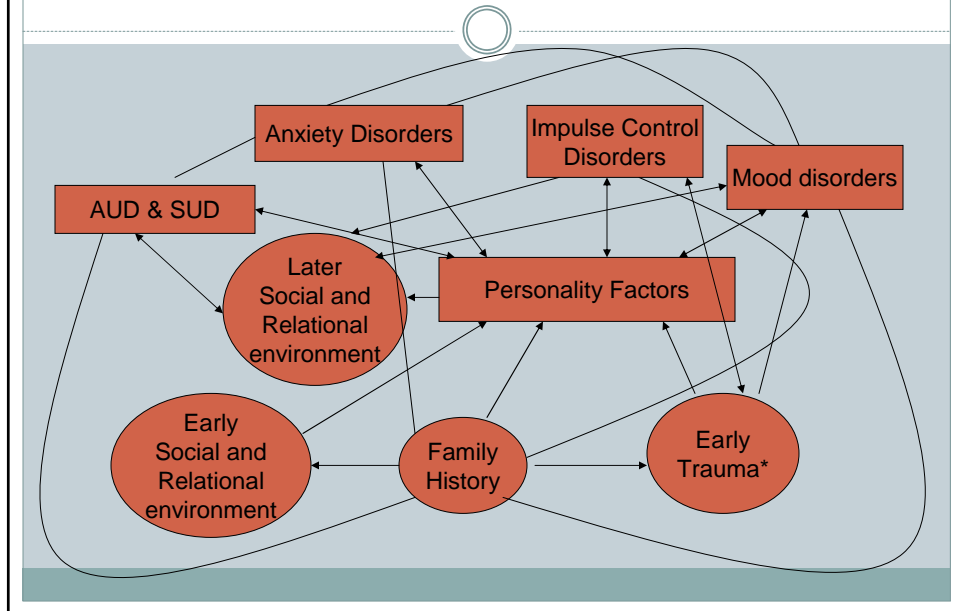
Characteristics of Elderly Suicide

- Lethality>adult>adolescent
- Relational, social and physical isolation
- Physical disability
- Less likely to survive suicide attempts*
- Males particularly vulnerable, even more than baseline differential risk

Chronic suicide & suicidality risk factors across lifespan



How often is there *just* one risk factor?



Family Studies

- Suicide is familial even after controlling for other potentially familial factors (e.g., psychopathology)
- Multiple studies have shown higher rates (OR ~4) of suicide attempts in first degree relatives of suicides compared to relatives of controls
- Aggressive behavior and suicide may share familial transmission (e.g., Brent)
- Maternal suicide attempt predicts offspring suicide attempt but not offspring suicide ideation

TWIN STUDIES	DESIGN	SAMPLE	RESULTS
Roy (1995)	Surviving co-twins of suicides	26 MZ co-twins 9 DZ co-twins	50% MZ cotwins and no DZ cotwins made suicide attempts
Statham (1998)	Classical	Adult men and women	Serious SI/Suicide Attempt about 45% heritable
Glowinski (2001)	Classical	3416 Adolescent females	Suicide attempt familial 35%-75%
Segal (2001)	Surviving co-twins of non-suicides	289 MZ co-twins 150 MZ co-twins	No MZ/DZ differences for suicidal ideation or suicide attempt after twin death
Fu (2002)	Classical	Middle aged men	Serious SI and SA share much but not all genetic risk
Glowinski (2003)	Children of Twins	Adolescent-Young Adult offspring of male twins	Genetic factors insufficient to account for Relationship of parental alcoholism to offspring suicide attempt
Glowinski	Classical	Young adult men and women	SI and SA on same dimension 45% heritable

Summary of Key Twin Findings

- Genetic factors underlie familial transmission of suicidality
- These findings are not due to MZ twins being on average closer to one another than DZ twins*
- In diverse large samples (US male and female adolescent twins, US middle aged male twins, Australian male and female young adult twins), twin suicidality confers a suicidality risk to cotwin even after controlling for common psychiatric and substance use disorders*
- Genetic/environmental interplay is likely

Summary and Some Outstanding Questions

- ~1% rate of suicide over lifespan; much higher for individuals with known risk factors, though exact risk specifically conferred by common mental illness such as major depression is unclear
- Suicide attempts are common, costly and predict a range of poor outcomes
- Risk factors for suicide/suicidality are often correlated and cumulative risks are more predictive of suicide/suicidality than single risk
- Unclear whether youth suicide attempt confers lifelong risk for suicide, but baseline associated risks are usually chronic and enduring
- Is there a substrate unique to suicide?

SOURCES

- Center for Diseases Control
- World Health Organization
- American Foundation for Suicide Prevention
- Reducing Suicide: A National Imperative (IOM, 2002)
- Suicide in Children and Adolescents (King & Apter, 2003)
- New York Times

"The best thing for being sad", replied -----, beginning to puff and blow, "is to learn something. That is the only thing that never fails. You may grow old and trembling in your anatomies, you may lie awake at night listening to the disorder of your veins, you may miss your only love, you may see the world about you devastated by evil lunatics, or know your honour trampled in the sewers of lesser minds. There is only one thing for it then-to learn."