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# Youth Suicide:
# Epidemiology and Prevention Strategies

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# Scope of the Problem

# Scope of the Problem:
# Youth Suicide Deaths, U.S.

In 2009, suicide ranked as the ***third leading*** cause of death for young people (ages 15-19 and 20-24); only accidents and homicides occurred more frequently. 4,371 people between the ages of 15 and 24 died by suicide.

Suicide rates among American Indian/Alaska Native adolescents and young adults are **1.8 times** higher than the national average for that age group.

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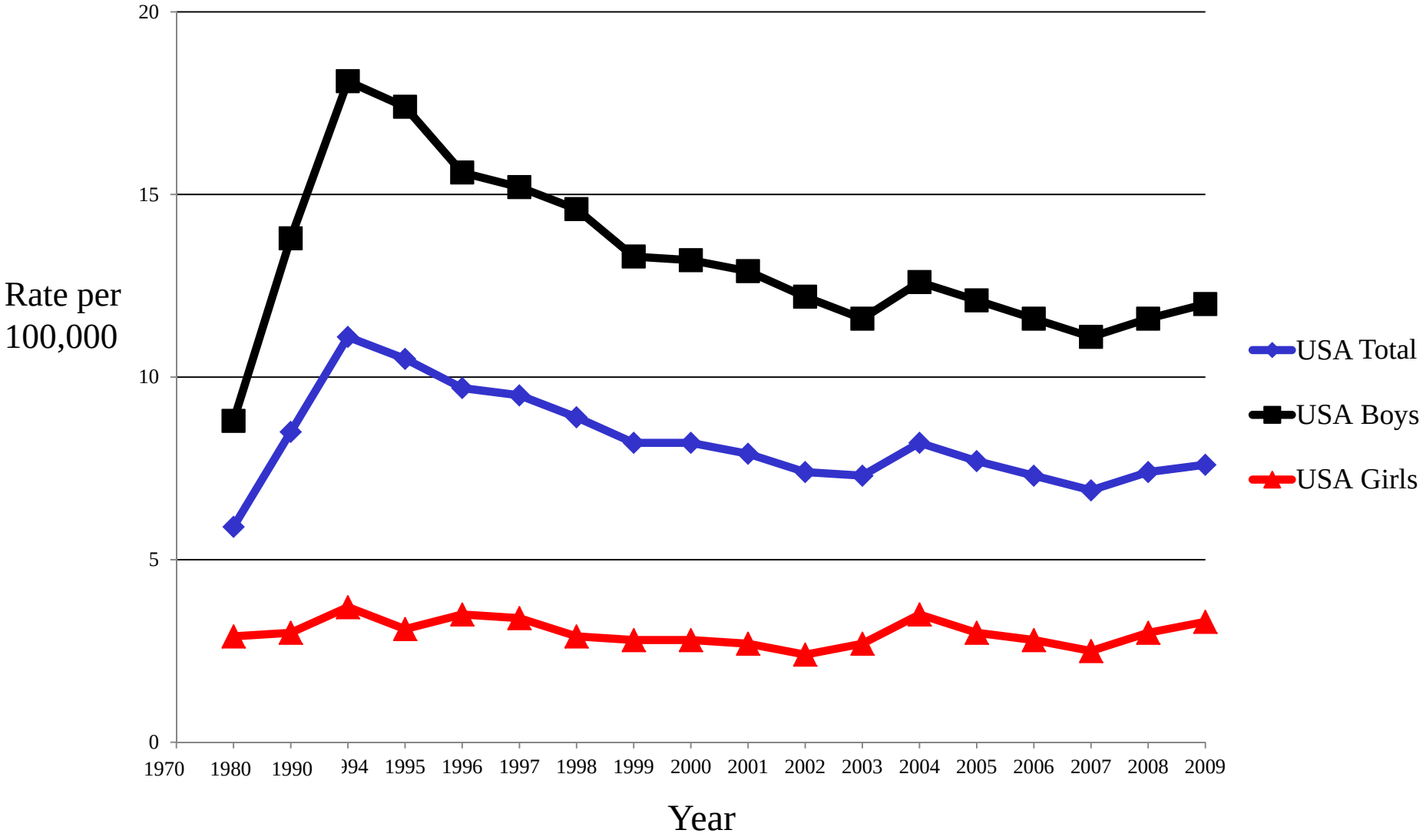
# U.S.A. Suicide Deaths Among Youth Ages 15-19 (1970-2009)



# Scope of the Problem: Suicide Ideation/Behavior

13.8% of U.S. high school students seriously consider attempting suicide and 6.3% attempt suicide during a 12-month period (YRBS, 2009).

U.S. Latina girls have the **highest rates** of feeling sad and hopeless, seriously considering suicide, making a suicide plan AND attempting suicide when compared to whites and blacks.

# Youth Suicide Risk Factors

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# HOW DOES A SUICIDE OCCUR?

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## UNDERLYING VULNERABILTY

*e.g.: Mood Disorder / Substance Abuse / Aggression / Anxiety / Impulsivity/ Sexual Orientation/ Abnormal Serotonin Metabolism/ Family Characteristics, including history of suicidality/ Sexual Abuse/Physical Abuse/Social adversity*

↓

## STRESS EVENT

(often caused by underlying condition)

*e.g.: In Trouble With Law or School / Loss/ Bullied*

↓

## ACUTE MOOD CHANGE

*e.g.: Anxiety – Dread / Hopelessness / Anger*

### INHIBITION

*e.g.: Family cohesion/ Available Support Religiosity*

↓

SURVIVAL

### FACILITATION

*e.g.: Method/Weapon available / Recent example / Media displays*

↓

SUICIDE

Table 2
*Mental Disorders in Cases of Suicide in Young People*

| Disorder | No. diagnoses | % cases |
|---|---|---|
| Mood disorders | 376 | 42.1 |
| Substance-related disorders | 365 | 40.8 |
| Disruptive behavior disorders | 186 | 20.8 |
| Personality disorders | 104 | 11.6 |
| Adjustment disorder | 97 | 10.9 |
| Anxiety/somatoform disorder | 68 | 7.6 |
| Schizophrenia | 44 | 4.9 |
| Other *DSM* Axis I diagnoses | 42 | 4.7 |
| Other psychotic disorders | 21 | 2.3 |
| Organic mental disorders | 4 | 0.4 |
| No diagnosis | 102 | 11.4 |

Fleischmann et al. Completed Suicide and Psychiatric Diagnoses in Young People: A critical Examination of the Evidence. American Journal of Orthopsychiatry. Vol 75 (4):676-683 2005

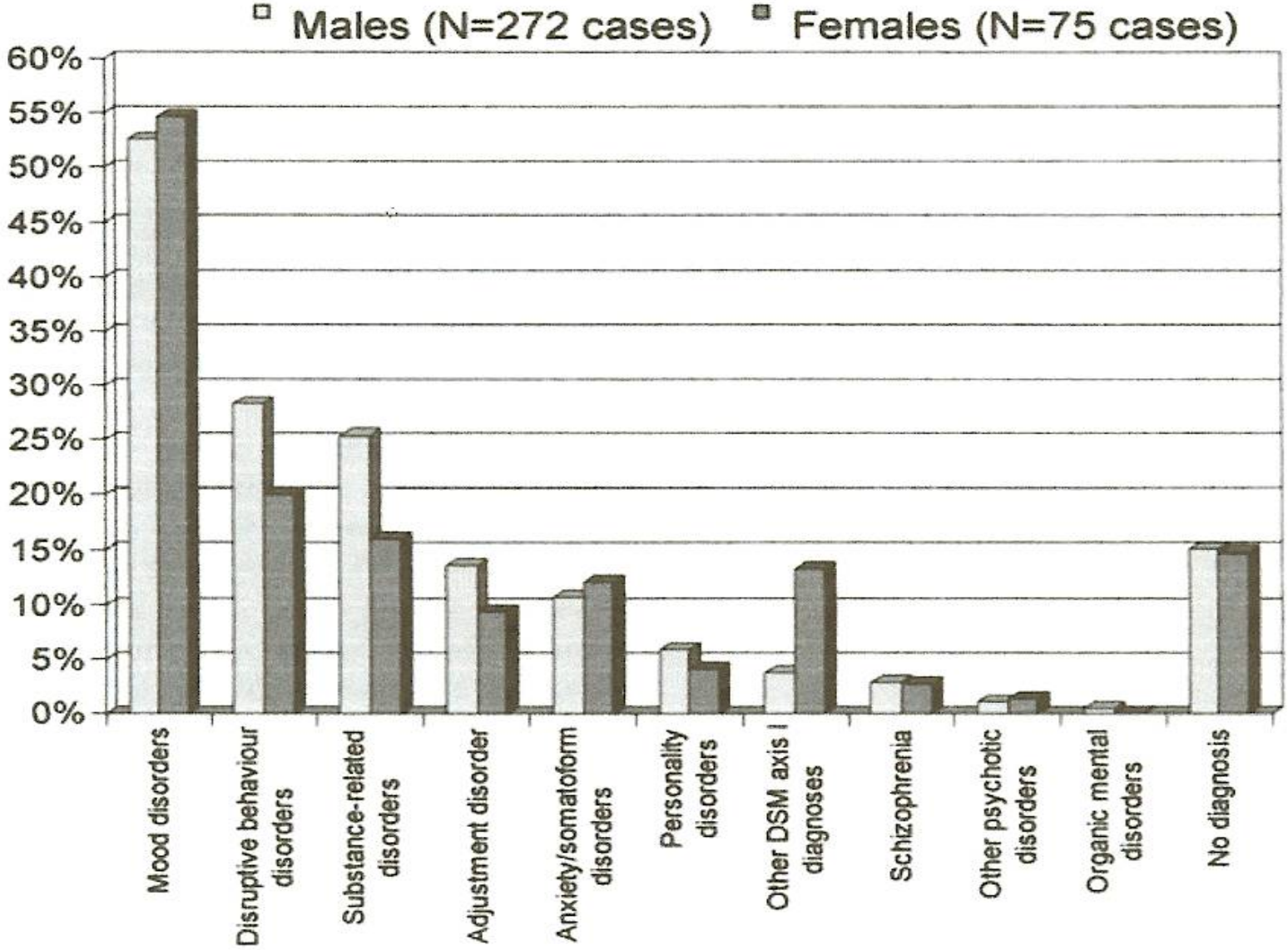



*Figure 1.* Psychiatric diagnoses in cases of suicide by sex, younger than 30 years. *DSM = Diagnostic and Statistical Manual of Mental Disorders.*

Fleischmann et al. Completed Suicide and Psychiatric Diagnoses in Young People: A critical Examination of the Evidence. American Journal of Orthopsychiatry. Vol 75 (4):676-683 2005

# Suicide & Substance Abuse

- Between 40-60% of those who die by suicide are intoxicated at the time of death.
- Alcoholics are at higher risk if they also suffer from depression – at the time of death by suicide, 50-75% of alcohol-dependent individuals are suffering from depression.
- 20% of those who die by suicide have used cocaine in the days prior to death.

•Source: Substance Abuse & Mental Health Service Administration, 2004. *From Herrmann & Lang*

# Suicide & Bipolar Disorder

- Approximately 1 in 5 people with bipolar disorder eventually commit suicide.
- This is **30 times** greater than the general population.
- 20-50% of people with bipolar disorder attempt suicide at least once.

•Source: Goodwin & Jamison, 1990. *From Herrmann & Lang*

# Suicide & Schizophrenia

Among those diagnosed with schizophrenia:

- Suicide is the leading cause of premature death.
- Suicide rate is up to **50 times** greater than the general population.
- 10-15% (especially young males) will suicide within the first 10 years of their illness.

•Sources: Caldwell & Gottesman, 1990; Centers for Disease Control, 1992; National Institute of Mental Health, 1999; Substance Abuse and Mental Health Service Administration, 2004.

*From Herrmann & Lang*

# PRIOR SUICIDAL BEHAVIOR

- Between 1/4 to 1/3 of suicides have made a prior attempt completed

- 30 fold increased risk for boys

  3 fold increased risk for girls

# INTERRELATIONSHIP BETWEEN SUICIDE AND OTHER RISK BEHAVIORS

| | Flisher et al (2000) MECA (N = 1,285) | King et al* (2001) MECA (N = 1,285) | Garrison et al (1993) SC YRBS (N = 3,764) |
|---|---|---|---|
| **Physical fights** | 2.8 | 1.9 | 1.7 |
| **Alcohol** | 4.3 | 2.1 | 1.3 |
| **Cigarettes** | 6.6 | 2.3 | 1.2 |
| **Marijuana** | 4.4 | 1.9 | 1.6 |
| **Intercourse** | 3.4 | 2.1 | — |

*OR's adjusted for demographic and psychiatric Dx.

# PERSONALITY/COGNITIVE FACTORS

- Hopelessness
- Poor interpersonal problem-solving ability
- Aggression/Impulsivity

# SUICIDE ATTEMPTS AND SAME-SEX SEXUAL ORIENTATION

| AUTHOR | N | CONTROLS | AGE | OR ATTEMPT |
|---|---|---|---|---|
| Garafalo et al. 1998 | 3,365 | MA '95 YRBS | HS | 2.28 *** |
| Faulkner & Cranston 1998 | 3,054 | MA '93 YRBS | HS | 2.5*** |
| Fergusson et al. 1999 | 1,265 | Christ Church Cohort | 21 | 6.2 *** |
| Remafedi et al. 1998 | 653 | MN Ad Hlth | MS & HS | 7.1*** male |
| van Heeringen & Vincke 2000 | 396 | Belgian School | 15–27 (m=20) | 6.2 *** females |
| Russell & Joyner, 2001 | 11,940 | Add Health | grades 7- 12 | 1.7* (adjusted for other suicide risk factors |

(Compiled by Greenberg and Gould, 2002)

# SEROTONIN DYSREGULATION

1. **Many studies showing decreased serotinergic activity in suicides**
2. **Low serotonin associated with excitable, impulsive, and violent behavior**
3. **Serotonin lower**
   - ***– in males,***
   - ***– after alcohol intake***
   - ***– in the elderly***

# GENETIC FACTORS

- Focus has been on genes that play important roles in the regulation of serotonin.

# MOST COMMON FAMILY RISKS

| | Cases | Controls |
|---|---|---|
| •Family history of suicidal behavior | 17% | 5% [2] |
| •Parental psychopathology | 68% | 32% [1] |
| •Parent-child relationships – *conflict* | 39% | 20% [1] |
| • *poor communication* | 30% | 12% [2] |
| •Parental divorce | 48% | 33% [2] |

*([1] Brent et al., 1994; [2] Gould et al., 1996)*

# MOST COMMON STRESSFUL LIFE EVENTS

| | Cases | Controls |
|---|---|---|
| •Interpersonal losses | 46% | 29% |
| •Legal/disciplinary crises | 42% | 13% |

*(averaged Brent et al., 1999 and Gould et al., 1996)*

# SUICIDE AND PHYSICAL ABUSE

- **Association between physical abuse and suicide completion *(Brent et al., 1994)***
- **Childhood physical abuse associated with increased risk of suicide attempts in late adolescence or early adulthood, even after adjusting for demographic, child psychiatric and parental characteristics.**
  ***(Johnson et al., 2002)***

# SUICIDE AND SEXUAL ABUSE

- **No evidence of association between sexual abuse and suicide completion *(Brent et al., 1994)***
- **33% of sexually abused children are suicidal at ages 16 to 18**
  ***(Fergusson et al. 1996)***
- **Individuals with history of sexual assault are 6 times more likely to report a suicide attempt, controlling for demographic characteristics, PTSD and depression**
  ***(Davidson et al., 1996)***
  ***(Compiled by Greenberg and Gould, 2002)***

People
PHOEBE PRINCE HER FINAL DAYS
BULLIED TO DEATH?
• THE TEENAGER'S CRY FOR HELP
• NEW DETAILS ABOUT THE ACCUSED 'MEAN GIRLS'
• EXCLUSIVE INTERVIEWS WITH PHOEBE'S FRIENDS
FAREWELL DIXIE CARTER
JENNY & JIM INSIDE THEIR SPLIT
KATE GOSSELIN 'I WON'T LOSE MY KIDS'

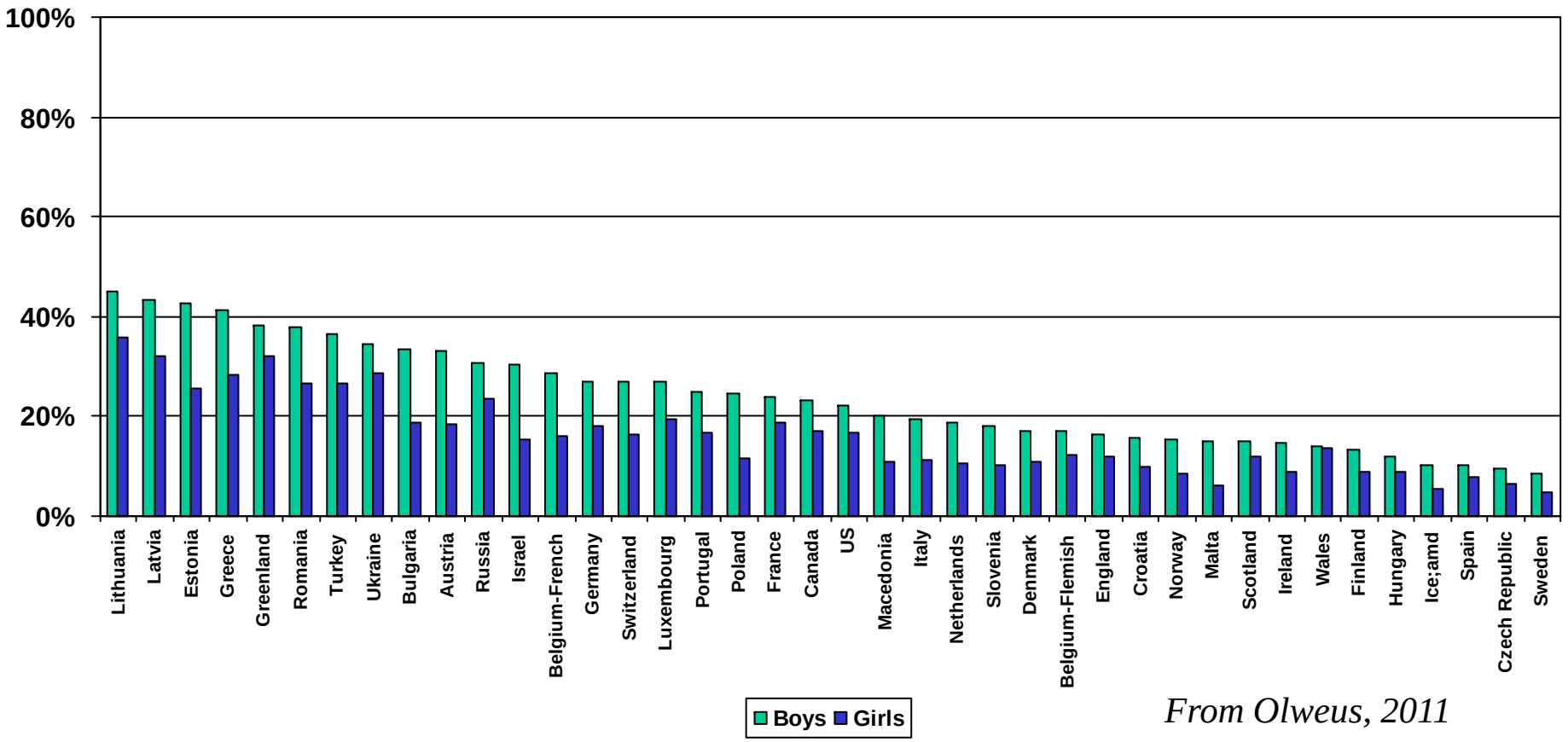
# Bullying Media Messages

- Typical media message: bullying causes suicide.
- This does not tell the full story.
- Suicide risk may be substantially mediated by other factors.

(Gould et al. 2003, Shaffer et al., 1996; Brent et al., 1993).

# Percentage of Students Being Involved in Bullying as Victims only, Bullies only or Bully-Victims

41 Nation Study of 11, 13 & 15-Year-Old School Children (Craig et al., 2009)




*From Olweus, 2011*

# Prevalence of Cyberbullying

- 15.8% of high school students reported cyberbullying in past 12 months.
- A majority (59.7%) of cyberbullying victims were also school bullying victims.
- Victimization was higher among nonheterosexual identified youths.

*Schneider et al.*

# Associated Risks

The past decade has witnessed a surge in research on association between bullying behaviors and depression, suicidal ideation and behavior.

- Cross-sectional Studies:

  Kaltiala-Heino et al., 1999 Finland; Kim et al., 2005 Korea; Rigby & Slee, 1999 Australia; Cleary, 2000 USA; Van der Wal et al., 2003 Netherlands; Eisenberg et al., 2003 USA; Roland, 2002 Norway; **Brunstein Klomek et al., 2007 USA; Brunstein Klomek, 2008 USA**; Kaminski & Fang, 2009.

- Longitudinal Studies:

  Kim et al., 2009 Korea; **Brunstein Klomek et al., 2008 Finland; Brunstein Klomek et al., 2009 Finland; Brunstein Klomek et al., 2011 USA.**

# Summary of US cross-sectional studies

- Most bullying behavior occurred in school but bullying behavior away from school was still prevalent
- Bullying behavior was more prevalent among males than females
- Males were more likely to be belittled because of religion or race and to be physically bullied. Females were more likely to be the subject of rumors, sexual gestures and meanness by use of the Internet
- Bullies, and not only victims, were at higher risk for depression, SI and attempts
- The threshold was lower for females compared to males
- Those who are frequently both bullies and victims were at the highest risk

# Summary of Longitudinal Study

- Students who *only* reported frequent bullying behaviors (as bullies, victims or both) *did not develop later depression or suicidality* and continued to have fewer psychiatric problems than students identified as at-risk for suicide
- Students who experienced bullying behaviors AND depression or suicidality were more impaired four years later than those who had only reported depression or suicidality

# Access to lethal means

- Agricultural chemicals
- Sri Lanka, rural India, Samoa, China
- China – Self-poisoning accounts for 80% of completed suicides
- Sri Lanka and Samoa, banning of toxic pesticides coincided with a decline in suicide rates (Gunnell et al 2007, Bowles et al 1995)

# Firearm Availability as a Suicide Promoter in U.S.

- Parallel ↑ in firearm ownership and suicide rates (ecological)
- Case control studies show greater prevalence of guns and less securely stored guns in suicide than control homes

# SUICIDE CONTAGION

Process by which knowledge of one suicide facilitates the occurrence of a subsequent suicide.

Viewed within the larger context of behavioral contagion or social learning theory

# SUICIDE CONTAGION/ MODELING

## *- Sources of evidence -*

- Impact of media
- Suicide clusters
- Impact of exposure to suicidal peer

# Magnitude of the Effect of Suicide Contagion/Imitation

## *Media*

- **12% increase in suicides following Marilyn Monroe's death**
- **~75% decrease in subway-suicides following implementation of media guidelines in Vienna**

## *Exposure to Suicidal Peer*

- **OR's range from 2.8 - 11.0 (attempted suicide)**

## *Suicide Clusters*

- **1 - 5% of teen suicides occur in clusters**

*(Cerel et al., 2005; Gould et al., 1990; Grossman et al., 1991; Harkavy Friedman et al., 1987; Phillips, 1974; Shafii et al., 1985; Sonneck et al., 1994)*

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SUICIDE

# School-based Prevention Strategies

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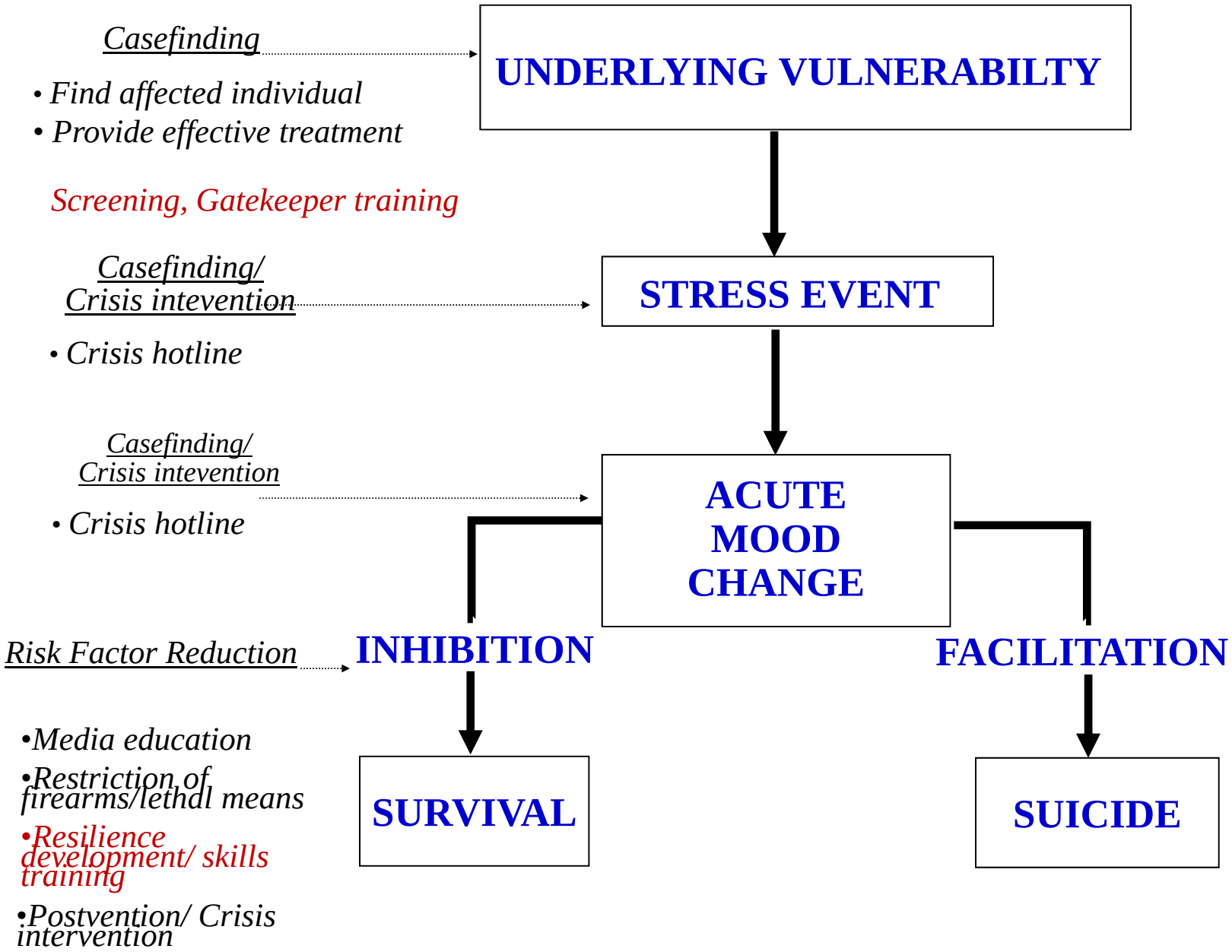
# PREVENTION STRATEGIES



# A comprehensive plan for suicide prevention in schools involves a continuum of activities:

- Prevention*
- Intervention
- Postvention

# Promising School-Based Prevention Strategies

- Resilience development/skills training
  ("upstream" strategies)

- Casefinding
  ("downstream" strategies)

# Resilience development/skills training

## Major Aims

- Prevent suicide through the enhancement of problem-solving, coping, cognitive skills, and help-seeking behaviors.
- Enhance protective factors to “immunize” students against suicidal feelings.
- These skills may prevent suicide risk factors such as depression, hopelessness and drug abuse.

# Resilience development/skills training Example (I)

## Good Behavior Game

- Not designed as suicide prevention program; rather behavior management technique for reducing disruptive behavior
- Universal implementation in elementary schools (for students aged six through 12 years)
- Competitive teams – losing points or privileges for rule-breaking or disruptive behavior

# Resilience development/skills training Example (I)

## Good Behavior Game

- Short-term efficacy trials have shown reduced aggressive and disruptive behavior, a potential risk factor for suicide

  *(Ialongo et al., 1999; Kellam et al., 1994)*

- Epidemiologically-based randomized trial involving 41 classrooms in 19 schools in a U.S. inner city showed long-term effect (15 years) on ↓ young adult ***suicide ideation***.

  *(Wilcox et al., 2008)*

# Resilience development/skills training Example (II)

Sources of Strength
Connecting peers and caring adults...

- Designed to enhance social-ecological protective factors
- Aims to increase connectedness between "trusted adults" and students, transform school climate using peer influence and positive messaging.
- Peer leadership training

# Resilience development/skills training Example (II)

Sources of Strength
Connecting peers and caring adults...

- Randomized controlled trial in 18 high schools in three U.S. states. *(Wyman et al., 2010)*
- Improved peer leaders' adaptive norms re suicide, their connectedness to adults, and their school engagement, with the largest gains for those entering with the least adaptive norms.
- Larger randomized controlled trial focusing on suicide outcomes is in progress (funded by U.S. NIMH)

# Casefinding I: Screening



## Underlying rationale

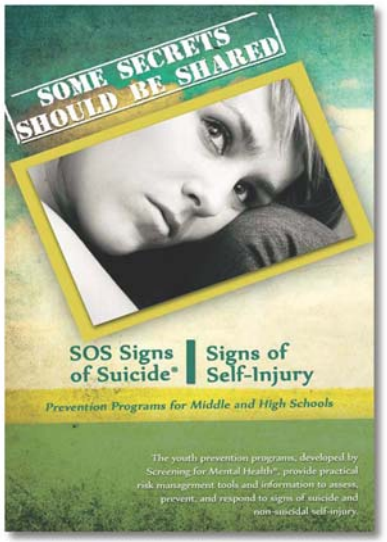
- Suicidal adolescents are under-identified
- Potent risk factors can identify at-risk youth
- Youth suicide occurs in the context of an active, often treatable mental illness

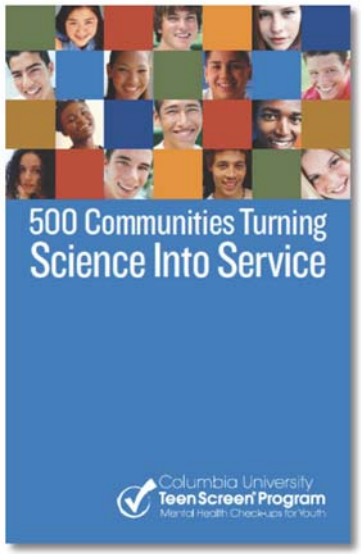
## Major Aims

- Screen for mood disorders, suicidal ideation, suicide attempt, substance and alcohol abuse
- Case manage and treat those identified at risk

# Casefinding I: Screening

## Examples of Programs



# Casefinding I: Screening

- Clinical validity and reliability findings of school-based screening procedures are encouraging *(Aseltine,2003;Aseltine & DeMartino,2004; Thompson & Eggert, 1999; Reynolds, 1991; Shaffer & Craft, 999; Shaffer, 2004).*
- Shown to identify high risk students - very good to excellent sensitivity 75% - 100% few false negatives. Valid thresholds established. *(Scott et al., 2010)*
- Many high risk teens were not otherwise known *(Scott et al., 2009)*
- "SOS" found short-term decrease in attempts *(Aseltine et al., 2007)*
- Facility-level risk of serious suicide attempts reduced by screening in *juvenile justice* facilities *(Scherff et al., 2005)*
- Cost effective
- Safe *(Gould et al., 2005)*
- Screening effective in enhancing the likelihood that students at risk for suicidal behavior will get into treatment. *(Gould et al., 2009; Husky et al., 2011)*

# Casefinding II: Gatekeeper Training

## Underlying rationale

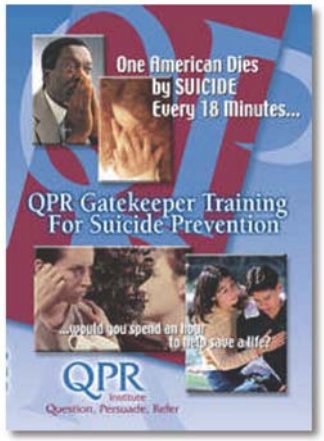
- Suicidal adolescents are under-identified
- Even professionals are reluctant to ask about suicide
- Community helpers can be among the first to detect signs of suicidality

## Major Aims

- Develop knowledge, attitudes and skills to inquire directly about distress, persuade suicidal youth to accept help, and provide referrals

# Gatekeeper Training

## Example of programs




LivingWorks

# Gatekeeper Training



- Group-based randomized trial with 32 schools examined impact of Question, Persuade, Refer (QPR) training on a stratified random sample of 249 staff with 1-year average follow-up. *(Wyman et al., 2008)*

- Increase in knowledge, *SELF-RATINGS* of preparation to intervene and refer to treatment services; however the increases in asking about suicide occurred primarily among school staff who reported they inquired about suicide *prior* to gatekeeper training (14%).

- Behavioral rehearsal with **role play** practice results in higher gatekeeper skills in RCT of QPR. *(Cross et al., 2011)*

# School-based Suicide Prevention Strategies

Effectiveness data mounting – particularly from randomized trials and longitudinal studies

But, need to overcome challenges of :

- Winning support from school personnel
- Competing for time with academic programing
- Ensuring no iatrogenic effects
- Maintaining skills and effects over time