Measurement Systems to Assess Individual and Population Level Change: Youth Suicide Outcomes

Jane Pearson, PhD

Presentation for the IOM meeting: Innovations in Design and Utilization of Measurement Systems to Promote Children's Cognitive, Affective, and Behavioral Health

November 5, 2014

National Institute of Mental Health

Presenter Disclosure

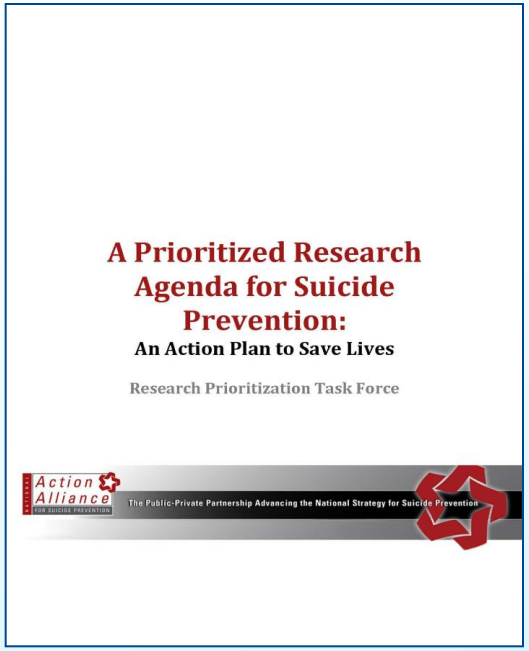
Jane Pearson

The following personal financial relationships with commercial interests relevant to this presentation:

No relationships to disclose

Many Data Gaps Noted - Particularly Linkages Between Systems; Risk Trajectories

www.suicide-research-agenda.org



Released February 2014

Goal was to prioritize research objectives that if implemented, could reduce suicides by 20% in five years.

Sought to identify places of suicide 'burden'; where at-risk individuals could be currently reached (health care systems, justice systems, schools, etc.)

Identified research gaps across 6 key questions—many gaps were related to limitations in understanding risk trajectories within systems, across systems, and individual patterns of (repeated) attempts

Measurement Systems to Assess Individual and Population Level Change: Youth Suicide Outcomes

Presentation overview

- Accessible youth suicide death and attempt statistics (national and state level)
- Recently funded study to characterize risk among youth seen in emergency care using new measurement approaches
- Example of how state vital statistics shaped prevention efforts within a state agency
- Impact of Garrett Lee Smith federal grants on youth suicide mortality
- Examples of youth ‘system relevant’ measures
- Social media example and ‘Big Data’

2012 National Statistics: Youth Suicide Deaths

Suicide accounted for 40,600 deaths in the U.S.

Among these are 5,178 youth aged 10-24. (13% of suicides)

Suicide is the second leading cause of death for youth aged 10–24 in the U.S.

The suicide rate nationally is 12.54 per 100,000

…..for American Indian/Alaska Native youth is 4.4/100,000

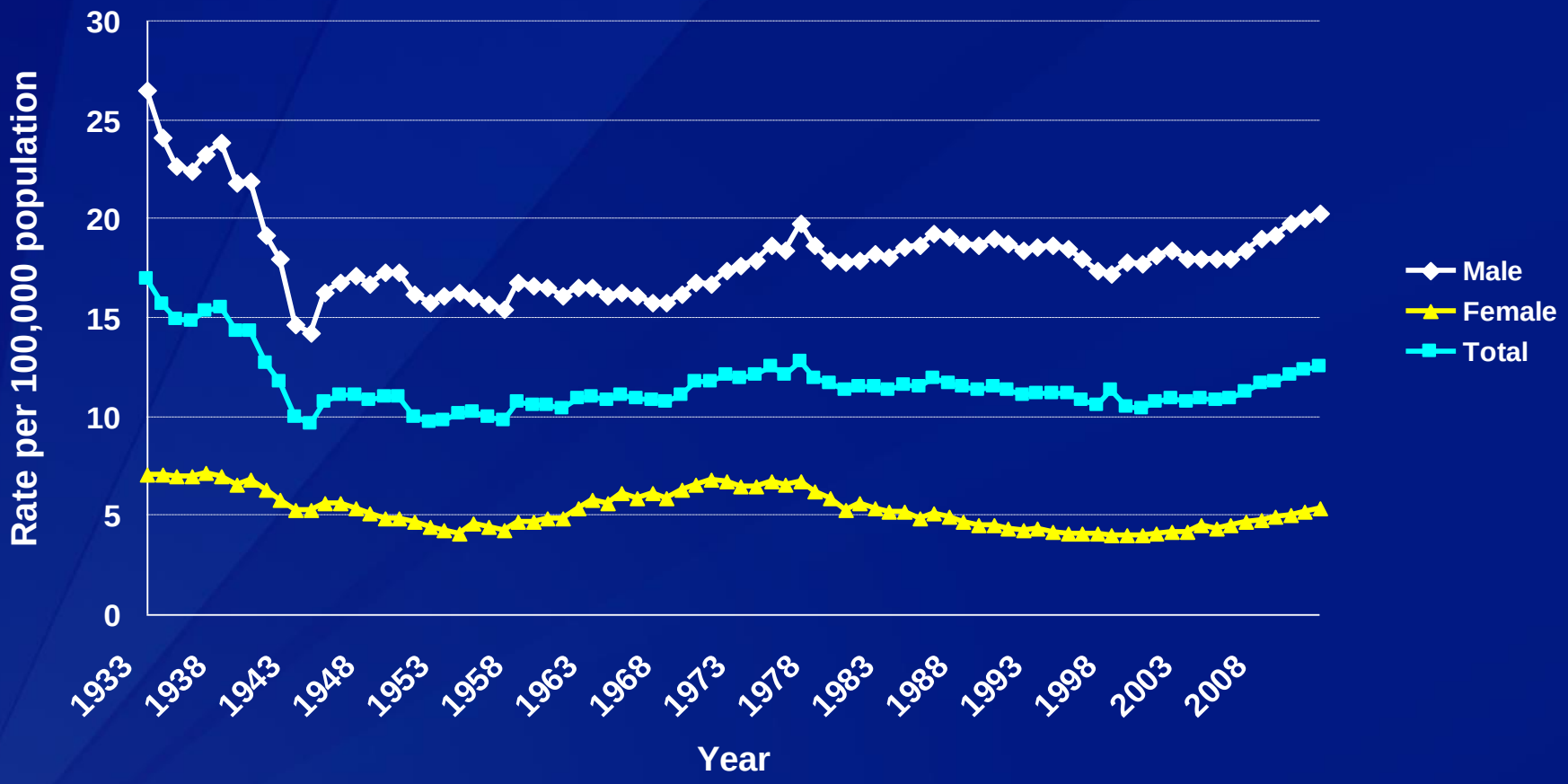
…..for white youth is 2.7/100,000

http://www.cdc.gov/injury/wisqars/fatal_injury_reports.html

CDC Vital Statistics: Internet Access to Mortality, Morbidity Statistics

- **National Center for Injury Prevention and Control**
  - **Division of Violence Prevention**
  - **www.cdc.gov/ncipc**
- www.cdc.gov/ncipc/wisqars/default.htm
- Injury mortality and leading cause of death statistics available by:
  - Intent, Method
  - Year
  - State
  - Demographics
    - Age, Sex, Race
- Injury morbidity
  - Hospital emergency department events
- National Violent Death reporting System

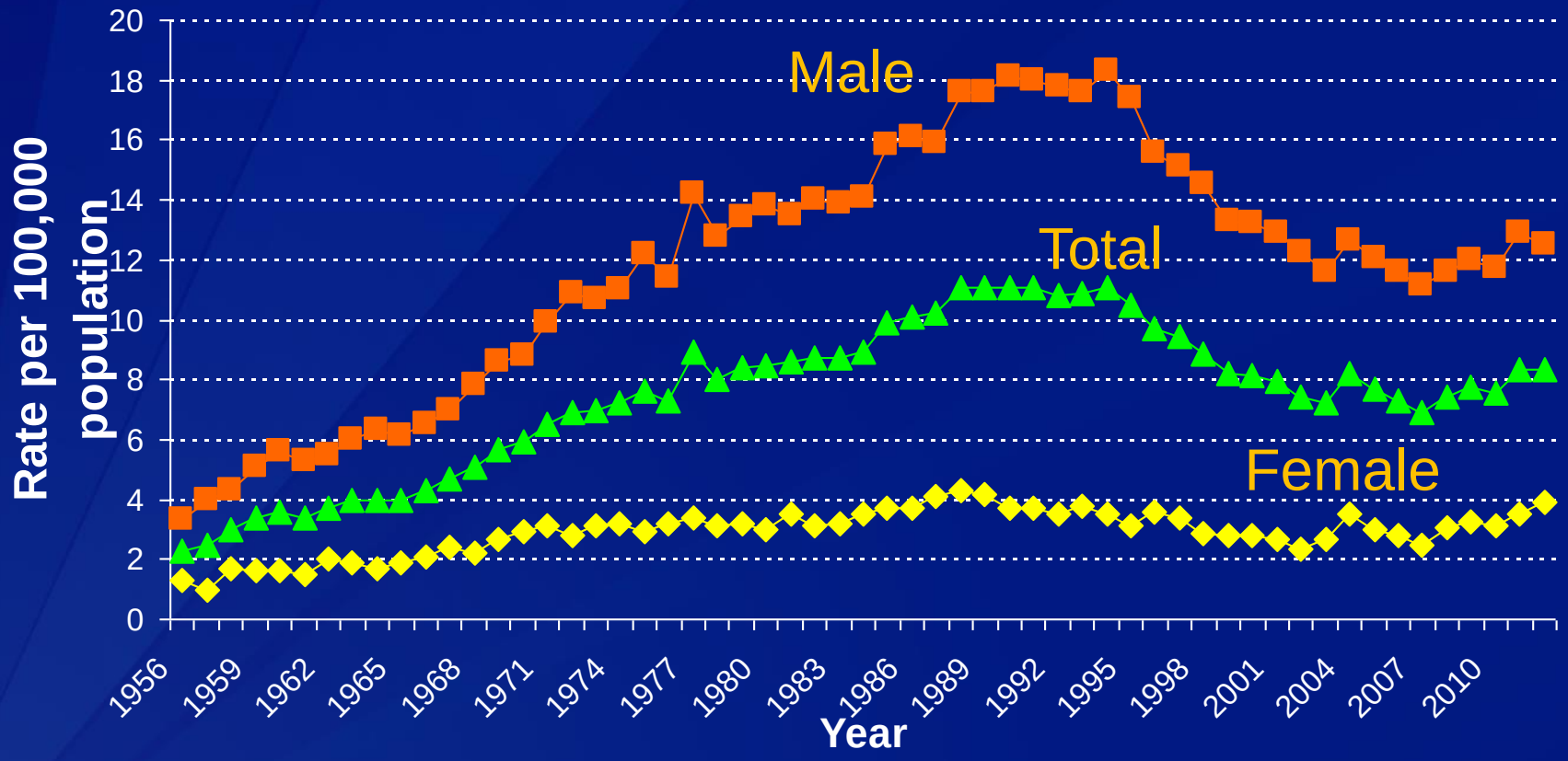
Suicide Among all Persons by Sex -- United States, 1933-2012



Courtesy Alex Crosby

Source: CDC vital statistics

Suicide Rates Among Persons Aged 15-19 years -- United States, 1956-2012



Courtesy Alex Crosby

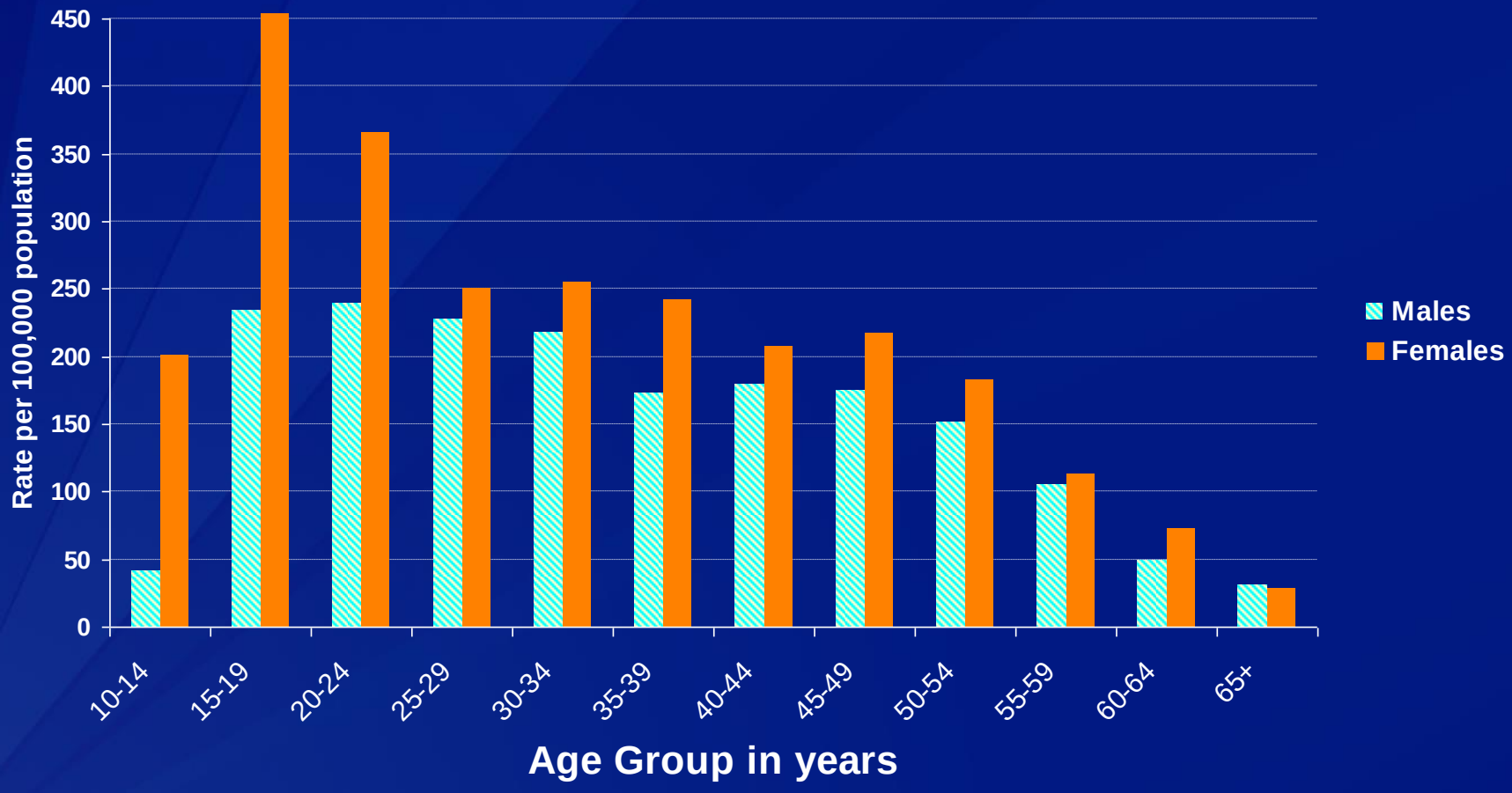
Source: CDC vital statistics

Leading Causes of Death for Selected Age Groups – United States, 2012

Rank	10-14 years	15-19 years	20-29 years	30-39 years	40-49 years	50-59 years
1	Unintentional Injuries	Unintentional Injuries	Unintentional Injuries	Unintentional Injuries	Malignant Neoplasms	Malignant Neoplasms
2	Malignant Neoplasms	**Suicide**	**Suicide**	**Suicide**	Heart Disease	Heart Disease
3	**Suicide**	**Homicide**	**Homicide**	Malignant Neoplasms	Unintentional Injuries	Unintentional Injuries
4	Homicide	Malignant Neoplasms	Malignant Neoplasms	Heart Disease	**Suicide**	Liver Disease
5	Congenital Malformations	Heart Disease	Heart Disease	**Homicide**	Liver Disease	Chronic Lower Respiratory Ds
6	Heart Disease	Congenital Malformations	Congenital Malformations	Liver Disease	Diabetes Mellitus	Diabetes Mellitus
7	Chronic Lower Respiratory Ds	Cerebro-Vascular	Diabetes Mellitus	Diabetes Mellitus	Cerebro-Vascular	**Suicide**
8	Cerebro-Vascular	Chronic Lower Respiratory Ds	HIV	Cerebro-Vascular	Homicide	**Cerebro-Vascular**

Courtesy Alex Crosby **Source: CDC vital statistics**

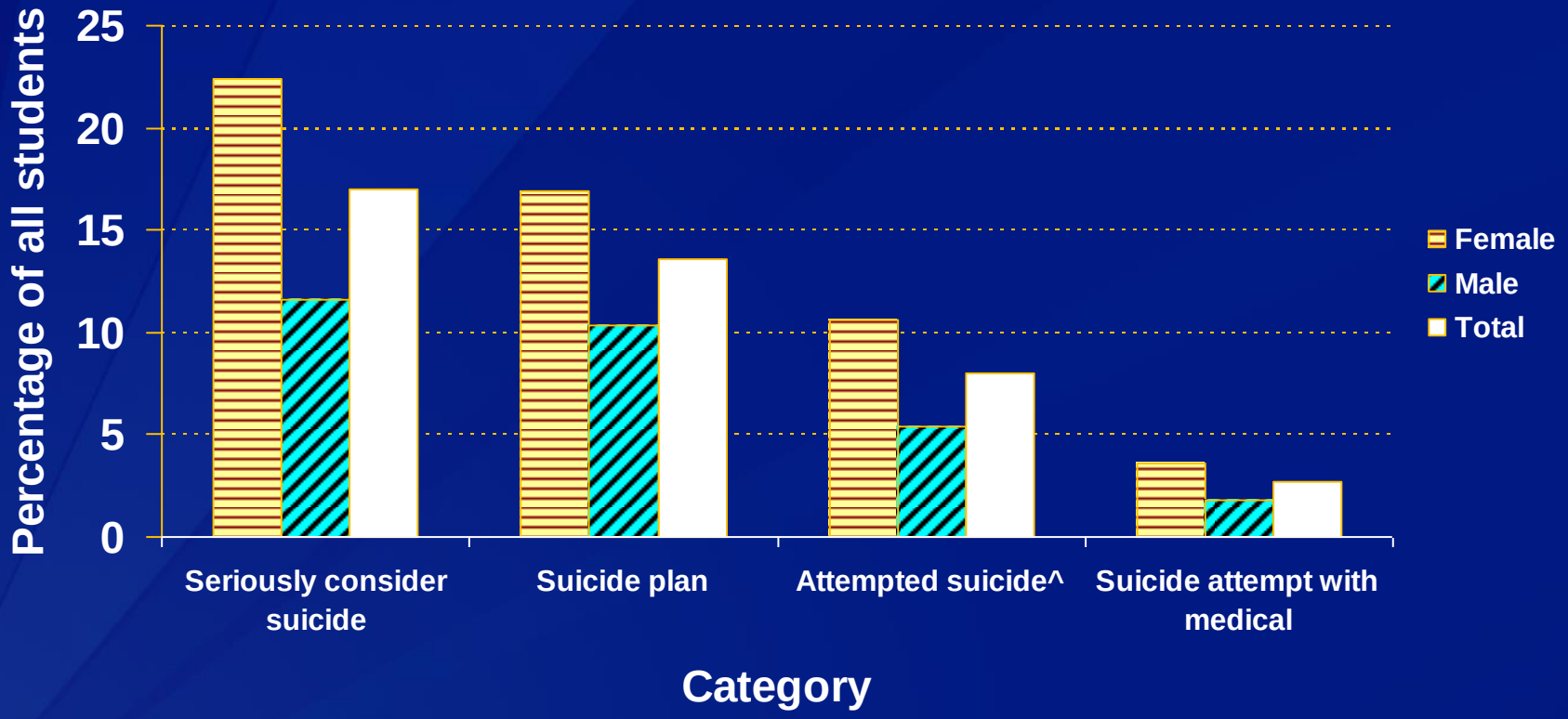
Emergency Department Self-inflicted Injury Among All Persons by Age and Sex--United States, 2012



Courtesy Alex Crosby Source: CDC WISQARS NEISS

Suicidal Ideation and Behavior among High School Students by Category and Sex*

Youth Risk Behavior Survey (YRBS) United States, 2013



Courtesy Alex Crosby. Source: CDC Youth Risk Behavior Survey

* During the 12 months preceding the survey

^One or more times

How to Reach Youth at Risk for Suicidal Behavior? Emergency Care

2009 Healthcare Cost and Utilization Project (HCUP) Nationwide Emergency Department Sample (NEDS) [http://www.hcup-us.ahrq.gov/nedsoverview.jsp] youth ages 10 -17.

9.8 million ED visits

700,755 visits involved a psychiatric concern, and

128,456 visits were for intentional self-harm

NIMH Funded Emergency Department Screen For Teens at Risk for Suicide (ED-STARS) http://www.nimh.nih.gov/news/science-news/2014/personalized-screen-to-id-suicidal-teens-in-14-ers.shtml

Will include innovative assessments such as:

- Approach similar to the Computerized Adaptive Screen (Gibbons et al. The Computerized Adaptive Diagnostic Test for Major Depressive Disorder (CAD-MDD): a screening tool for depression. J. Clin.Psychiatry. Jul 2013;74(7):669-674.)
- Implicit Association Task (Cha et al., J Abnorm Psychol. 2010 Aug;119(3):616-22.)

Example: Addressing Youth Suicide in Utah Linking Mortality Statistics with Agency Contacts

- Western Mountain States have highest suicide rates in the US; Utah is consistently in the top 10
- UT is one of the few states with centralized Medical Examiner
- Studied consecutive youth suicides (n = 151) between August 1, 1996, and June 6, 1999, aged 13-21 years.
- Decedent contact with government agencies examined: Juvenile Justice, Department of Human Services, and the Department of Education.
- 63% had contact with the Juvenile Justice System.

Gray et al J Am Acad Child Adolesc Psychiatry. 2002 Apr;41(4):427-34.

Utah Intervention Examples:

Because decedents had high frequency of contact with Juvenile Justice:

1- A one month screen of all youth coming to the juvenile court system demonstrated high rates of mental illness, and severe mental illness.

2- Development of an in-home and outpatient preventative treatment program for juvenile offenders:

- Based on data from a small controlled study (N=44)
- In home treatment model ("Families First") provided a behavior specialist for 80-100 hours of in-home treatment over a three-month period. Free psychiatric outpatient visits and case management for one year.
- Intervention youth had improved mental health, fewer had new offenses, and they had fewer costs over time. Recommendation that screening an intervention begin early in the juvenile justice process

Moskos et al., 2007. Journal of Law and Family Studies, 10, 127-145

These efforts led to Utah's application for Garrett Lee Smith Youth Suicide (GLS) prevention application.

Evaluation of SAMHSA's Garrett Lee Smith Grants (GLS)

Most GLS grantees train gatekeepers- school personnel, juvenile justice, etc. As an assessment of implementation of programs, counties with measures of training were compared to counties without training, matched through propensity scoring.

The analysis compares the change in the suicide mortality rates between 2006 and 2010 among the population aged 10 to 24 years in counties implementing GLS trainings, with mortality observed in similar counties that did not implement these trainings.

SAMHSA, 2013. Report to Congress: Garrett Lee Smith Youth Suicide Prevention Program

Garrett Lee Smith Evaluation, cont.

ESTIMATED AVERAGE EFFECTS*

	ESTIMATE	STANDARD ERROR	PR>|T|**
Suicide rate for population aged 10-24 years	-1.07	0.48	0.03
Suicide rate for population aged 25 and over	0.42	0.50	0.40
Nonsuicide mortality for population aged 10-24 years	-3.08	1.92	0.12

* Truncated and subclass findings are located in Appendix A.

**Probability of obtaining a test statistic at least as extreme as the one observed if the null hypothesis were true (i.e., the average effect were truly zero).

Reduction of 1 suicide death per 100,000, or the prevention of 237 deaths between 2007 and 2010

SAMHSA, 2013. Report to Congress: Garrett Lee Smith Youth Suicide Prevention Program

System Relevant Measures of Youths' Help-seeking Norms and Context

Challenge: suicide ideation is almost 'normative'

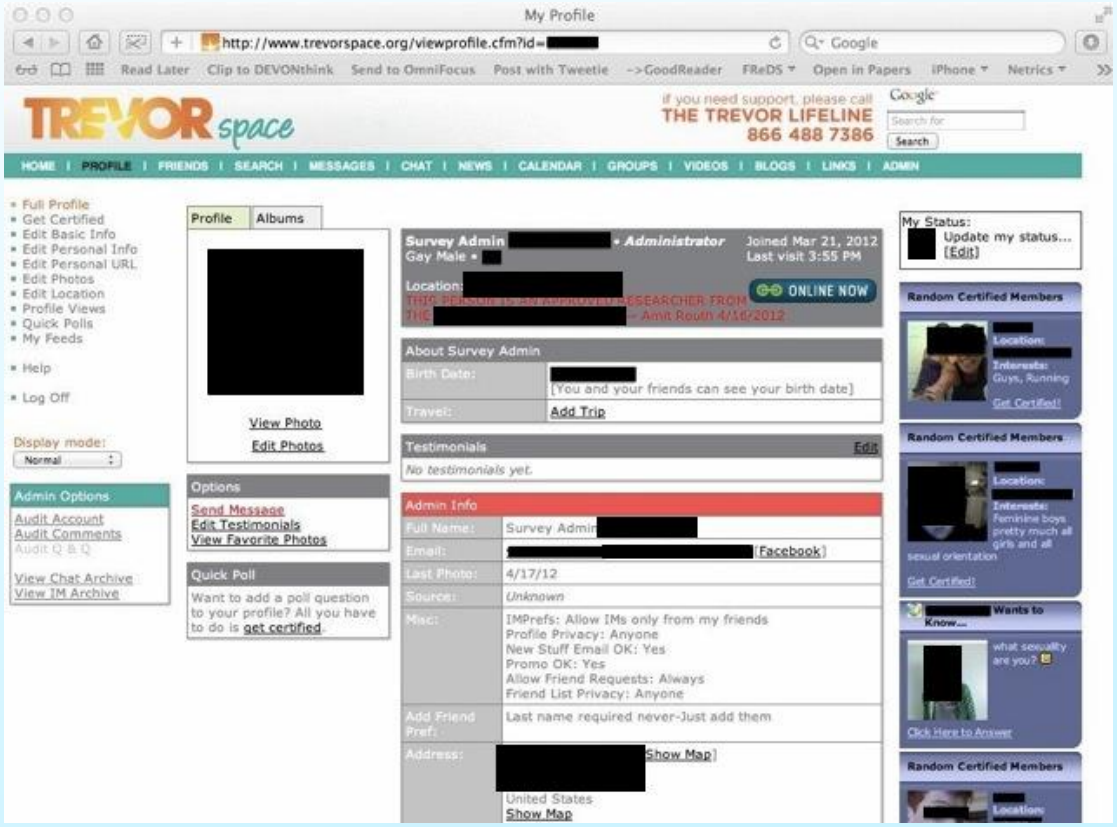
20% + *ideation* rates per YRBS high school youth;

- Suicidal youth have detrimental coping/help-seeking strategies (Gould, et al 2004. JAACAP, 43(9)1124)
- High school youth more likely to disclose their suicide ideation to peers (about half) compared to adults (about 25%) (Pisani et al 2012, J Youth Adolescence, 41:1312)
- Measures of social systems/environment that reflect social network quality. Examples (from Schmeelk-Cone et al 2012, SLTB)
  - Help-seeking acceptability
  - Adult help for suicidal youth
  - Reject codes of silence

Example: Difficult to Reach Youth

Trevor Project's "TREVORSpace" online social network for LGBTQ youth & allies

'safe' place to network: user profiles, testimonials, traversable lists of friends, monitored to provide support for those at risk for self harm



Homan CM, Lu N, Tu X, Lytle MC, Silenzio VMB. Social structure and depression in TrevorSpace. New York, New York, USA; 2014. pp. 615–25. http://dl.acm.org/citation.cfm?id=2531704

Example: Difficult to Reach Youth, cont.

Trevor Project's online social network for LGBTQ youth & allies

- NSF supported research on social 'structure' and depression in TrevorSpace
- Network measures were developed to detect mental health features of individual users within TrevorSpace
- If replicated, suggests that network structural features [low density] could point to individuals with higher rates of psychological symptoms.

Homan CM, Lu N, Tu X, Lytle MC, Silenzio VMB. Social structure and depression in TrevorSpace. New York, New York, USA; 2014. pp. 615–25. http://dl.acm.org/citation.cfm?id=2531704

Big Data Science for Behavioral Health is Here

National Institutes of Health
Turning Discovery Into Health

FOR IMMEDIATE RELEASE
Contact: NIDA Press Office
Thursday, October 16, 2014 301-443-6245
3 p.m. EDT

Using social media to better understand, prevent, and treat substance use, NIH announces 11 awards funded across three Institutes…

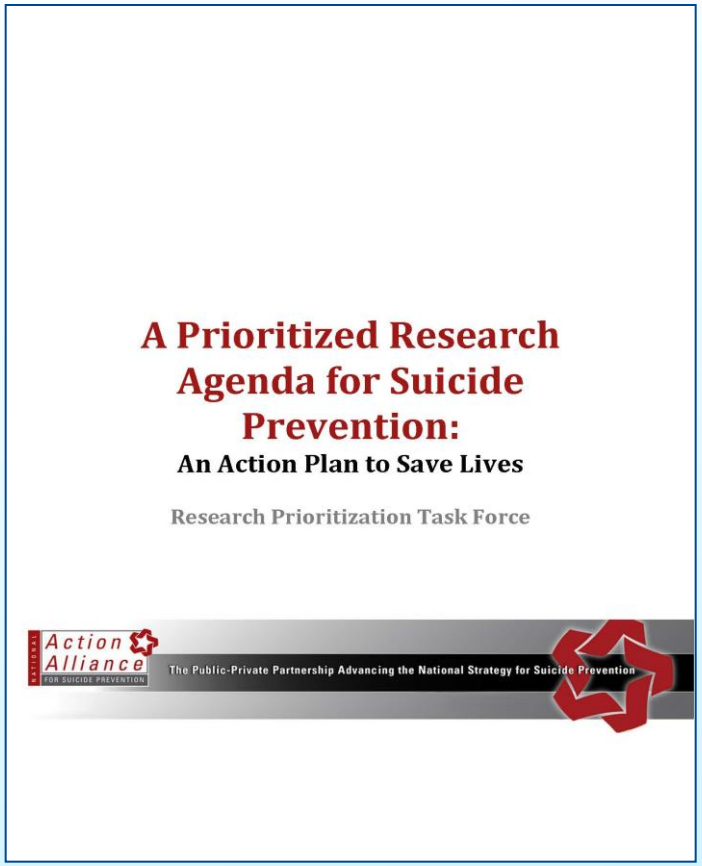
More than $11 million over three years will be used to support research exploring the use of social media to advance the scientific understanding, prevention, and treatment of substance use and addition…NIDA..NIAAA…NCI

http://www.nih.gov/news/health/oct2014/nida-17.htm

National Institute of Mental Health

Thank you

www.suicide-research-agenda.org



jpearson@nih.gov