



International Society for CNS Clinical Trials and Methodology

# **Research in suicide ideation and behavior: Problems faced. What we have learned. Directions for the future.**

Jill Harkavy-Friedman, PhD

American Foundation for Suicide Prevention

# Disclosures & Conflicts

Jill Harkavy-Friedman, PhD

Senior Vice President of Research

American Foundation for Suicide Prevention

New York, NY

Associate Professor of Clinical Psychology, in Psychiatry, Columbia University

No bias, conflict of interest or payments from industry

# Plan

- Model for understanding suicide and framing research
- Problems faced with studying suicide
- What we have learned about suicide and the brain and biomarkers
- Treatments
- What needs to come next

# Language Do's and Don'ts

## Avoid

"Committed suicide"

"Failed" or "successful"  
attempt

## Say

"Died by suicide"

"Ended his/her life"

"Killed himself/herself"

"Suicide attempt" or  
"death by suicide"

# Scope of the Problem of Suicidal Ideation and Behavior

Many people think of suicide: 12.2 million

Some people attempt suicide: 1.2 million

Few people die by suicide: 45,979

60% of people who die by suicide die on their first attempt

90% of people who make a suicide attempt do not die by suicide

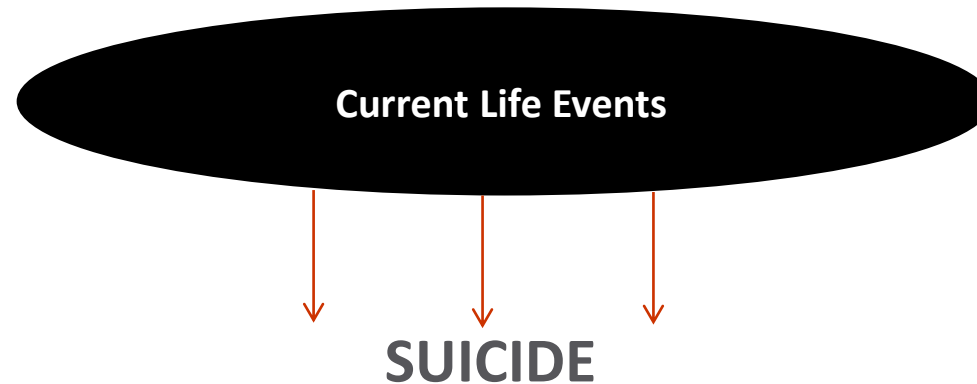
Different people have different patterns of SI

Though related, suicide is not equal to ideation and attempts

Knowing these differences will help us prevent suicide

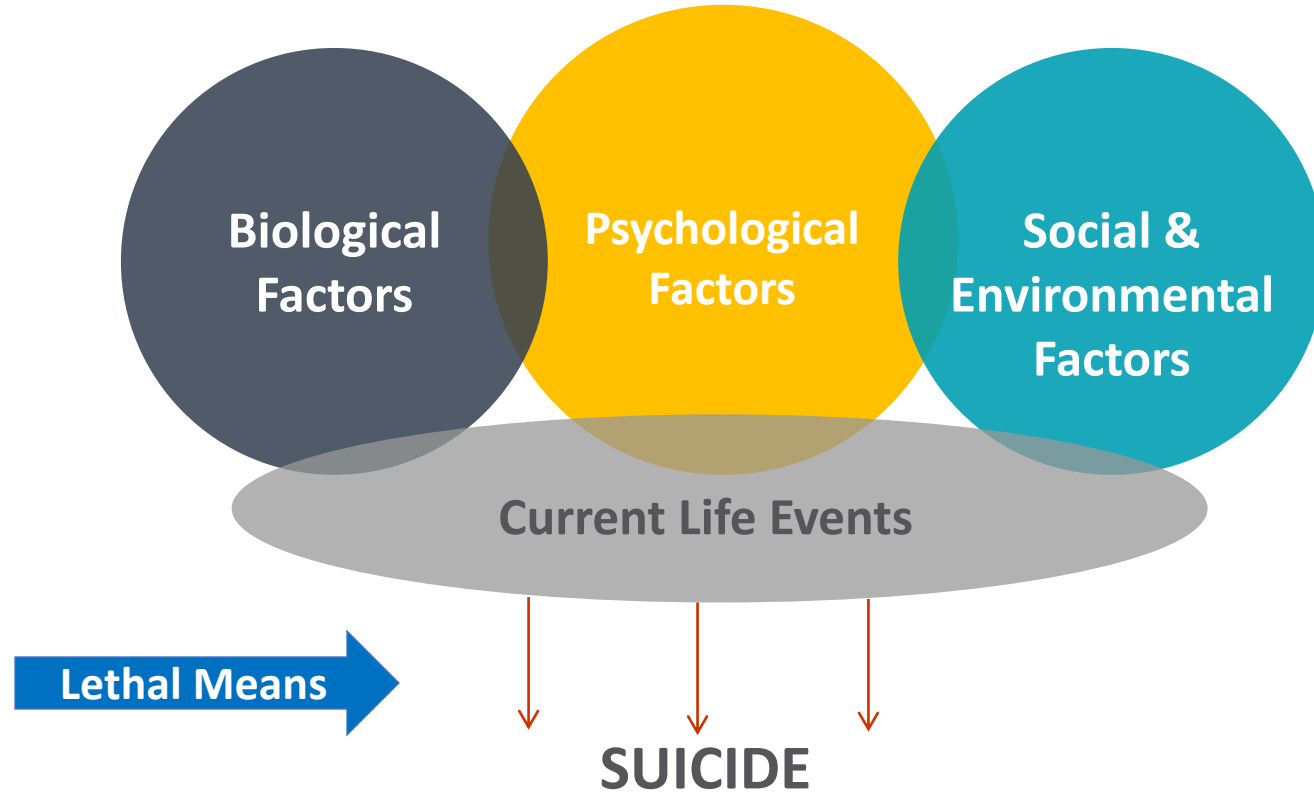
<https://www.cdc.gov/suicide/facts/index.html> Substance Abuse and Mental Health Services Administration, accessed 9/1/2022. National Survey on Drug Use and Health. 2016. Owens D, et al. *Br J Psychiatry*. 2002;181:193-199. Bostwick JM, et al. *Am J Psychiatry*. 2016;173(11): 1094-1100.

# Interacting Risk and Protective Factors



Moutier and  
Harkavy-  
Friedman,  
AFSP, 2014

# Interacting Risk & Protective Factors



AFSP, 2014

# Problems Faced

- Low base rate
- Moving target
- Multidetermined
- Lifetime vs. Short-term risk
- Comorbidity
- Immediate reduction vs. near term reduction vs. long-term reduction



# Research Finding

Ninety percent of people who die by suicide have an underlying — and potentially treatable — mental health condition

Most people with mental health conditions do not think of suicide or engage in suicidal behavior

Need to treat accompanying mental health conditions

# Findings from Genetic Research

- Many genes involved
  - Specific to mental health disorder
  - Stress reactivity
  - Stress responsivity
  - Suicide
- Epigenetics
  - Stress reactive
  - Impact of stress reduction

van Heeringen K, et al. *Lancet Psychiatry*. 2014;1(1):63-72.

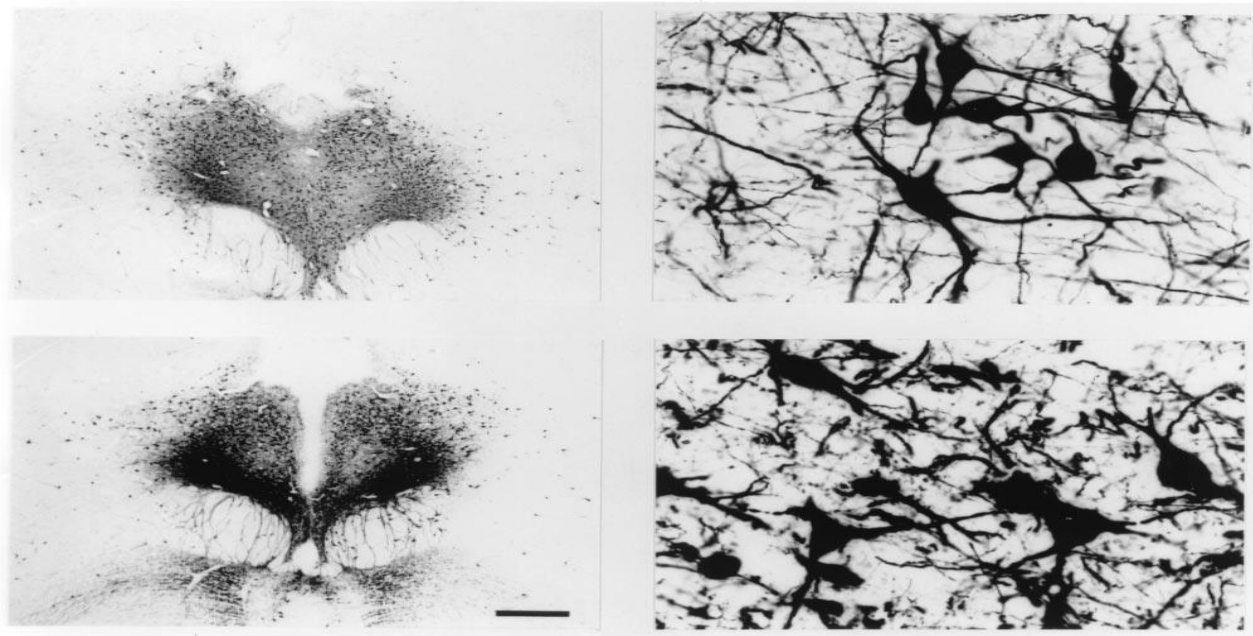
# Research Finding

Suicide is related to brain functions that affect decision-making and behavioral control, making it difficult for people to find positive solutions

Differences on cellular, genetic and neurotransmitter levels  
Can be measured, in part, through brain imaging and cognitive testing

# Do these brains look the same?

Neurons in the raphe nucleus where serotonin is released



Control

Case

# Prefrontal Cortex of the Brain

- Executive Function
  - Directs behavior
- Behavioral Inhibition
  - Impulse control
- Decision making
  - Flexibility



# Research Finding

Limiting a person's access to methods of killing themselves dramatically decreases suicide rates in communities

U.S. Department of Health and Human Services (HHS) Office of the Surgeon General and National Action Alliance for Suicide Prevention. 2012 National Strategy for Suicide Prevention: Goals and Objectives for Action. Washington, DC: HHS, September 2012. [www.surgeongeneral.gov/library/reports/national-strategy-suicide-prevention/full-report.pdf](http://www.surgeongeneral.gov/library/reports/national-strategy-suicide-prevention/full-report.pdf). Accessed March 5, 2019.

# Research Finding

Specific treatments used by mental health professionals have some evidence that to help people manage their suicidal ideation and behavior

# Interventions Focus on Decision Making

- Safety Planning (SPI) <http://suicidesafetyplan.com/>
- Cognitive Behavior Therapy-Suicide Prevention (CBT-SP)
  - **Brown GK, et al. *Am J Prev Med.* 2014;47(3 Suppl 2):S186-S194.**
- Dialectical Behavior Therapy (DBT) <https://depts.washington.edu/uwbrtc/about-us/dialectical-behavior-therapy/>
- Collaborative Assessment and Management of Suicidality (CAMS)
  - <https://cams-care.com/>
- Attachment Based Family Therapy (ABFT) <https://drexel.edu/familyintervention/attachment-based-family-therapy/overview/>



# Medication and Somatic Treatment

- Antidepressants can be used with antipsychotics
- Medications that have been found to be effective in reducing suicidal behavior
  - Lithium
  - Clozapine
- Electroconvulsive therapy (ECT)
- Maybe transcranial magnetic stimulation (TMS)
- Maybe ketamine

# Brain function can change with treatment

- People with less activation of the frontal lobes benefited most from DBT
- Brain activity increased with DBT for those who had low functioning before treatment
- Those with greater frontal lobe activity at baseline benefited more slowly from DBT

Ruocco, A. C., Rodrigo, A. H., McMain, S. F., Page-Gould, E., Ayaz, H., & Links, P. S. (2016). Predicting Treatment Outcomes from Prefrontal Cortex Activation for Self-Harming Patients with Borderline Personality Disorder: A Preliminary Study. *Frontiers in Human Neuroscience*, 10, 220. doi: <https://doi.org/10.3389/fnhum.2016.00220>

# What to measure?

- Thoughts, feelings, behaviors
  - Self-report, observation, EMA
- Brain Function
  - PET, MRI, fMRI, Optical, EEG,
  - Cognition
- Biomarkers
  - TSST, cytokines and inflammation, medication levels, HRV, GSR
- Electronic and Documented Data
  - EHR, Death Records, insurance records
  
- Timing: immediate, lifetime, short-term, long-term

We have learned a lot

We have a lot to learn

Assessment needs to be multimodal,  
multifaceted, multiple assessments,  
timely