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Injury Control Research Center for Suicide Prevention

Rethinking Suicide Prevention

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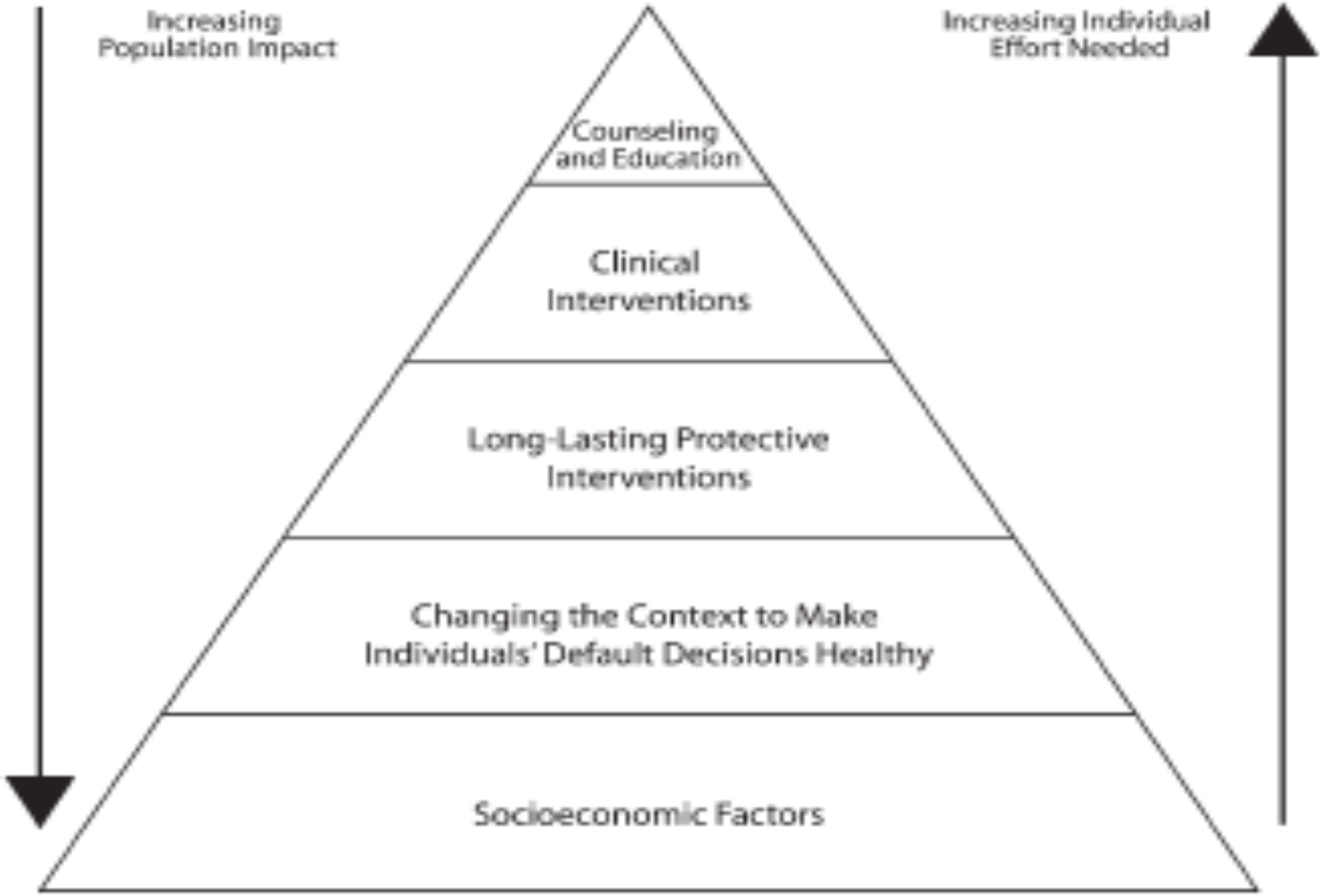
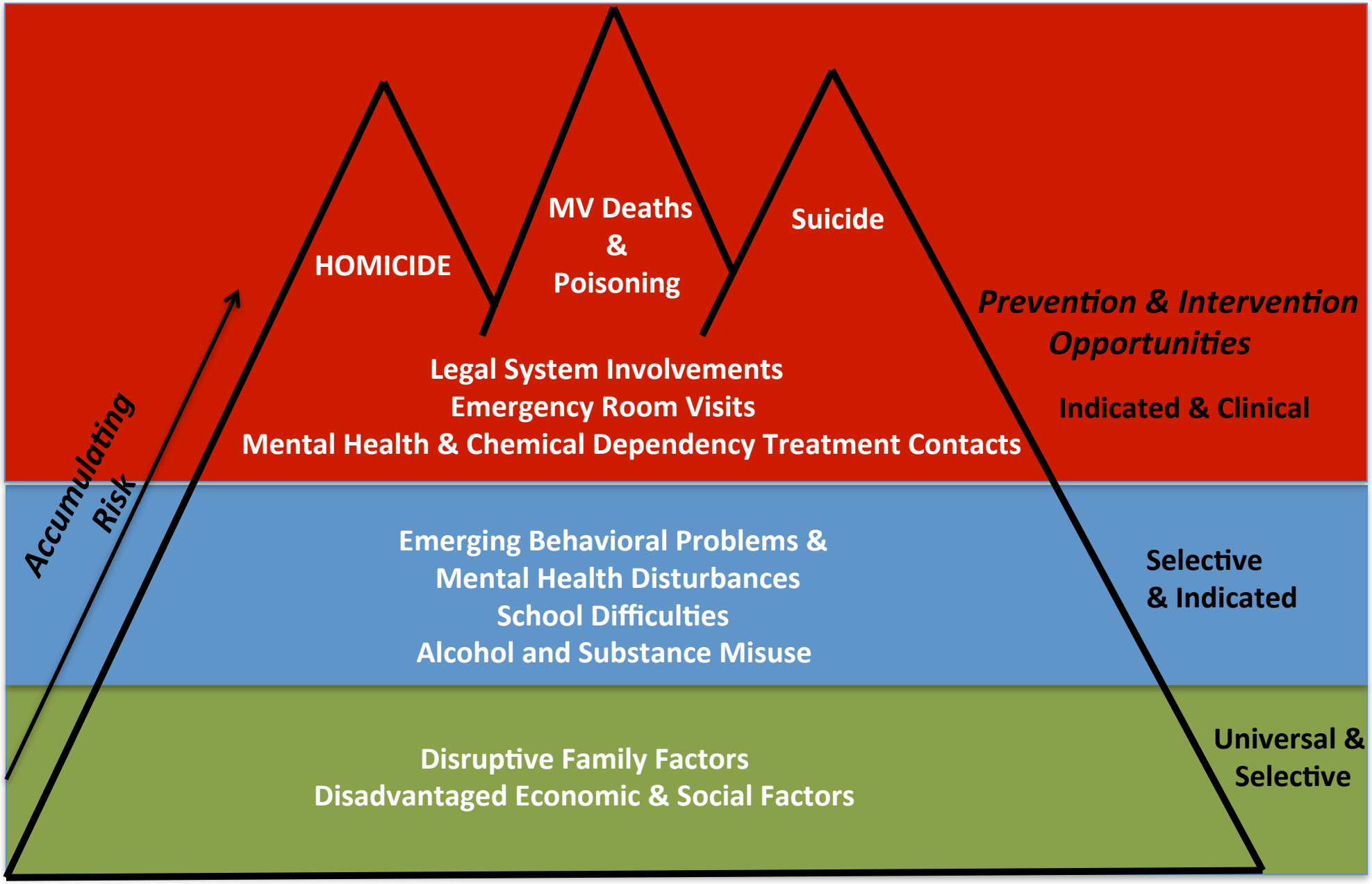
The Health Impact Pyramid

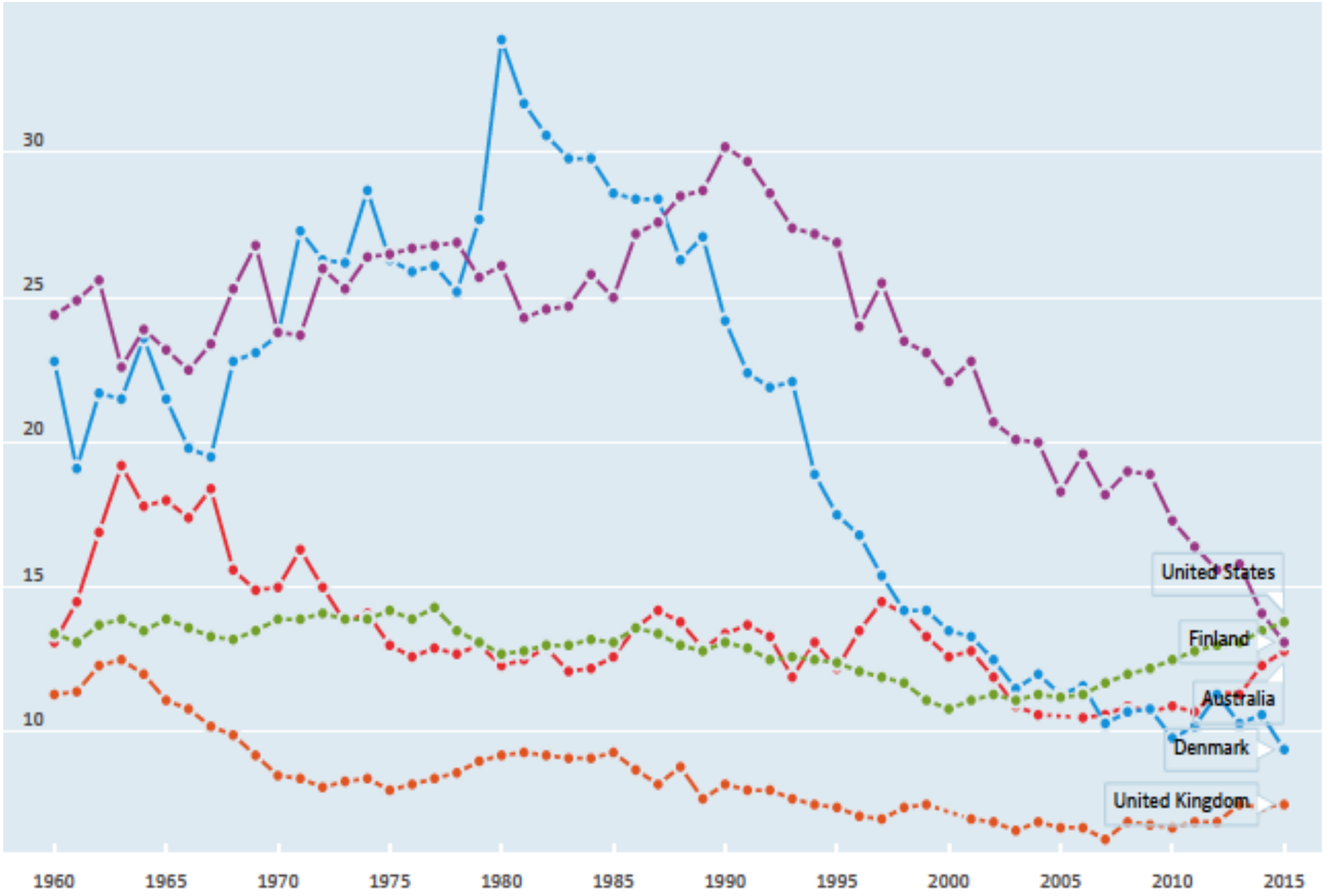


Frieden TH: A Framework for Public Health—The Health Impact Pyramid.
***Am J Public Health* 2010; *100*:590-595.**

Premature Death in Early Adulthood

Common Developmental Contexts for Different Adverse Outcomes





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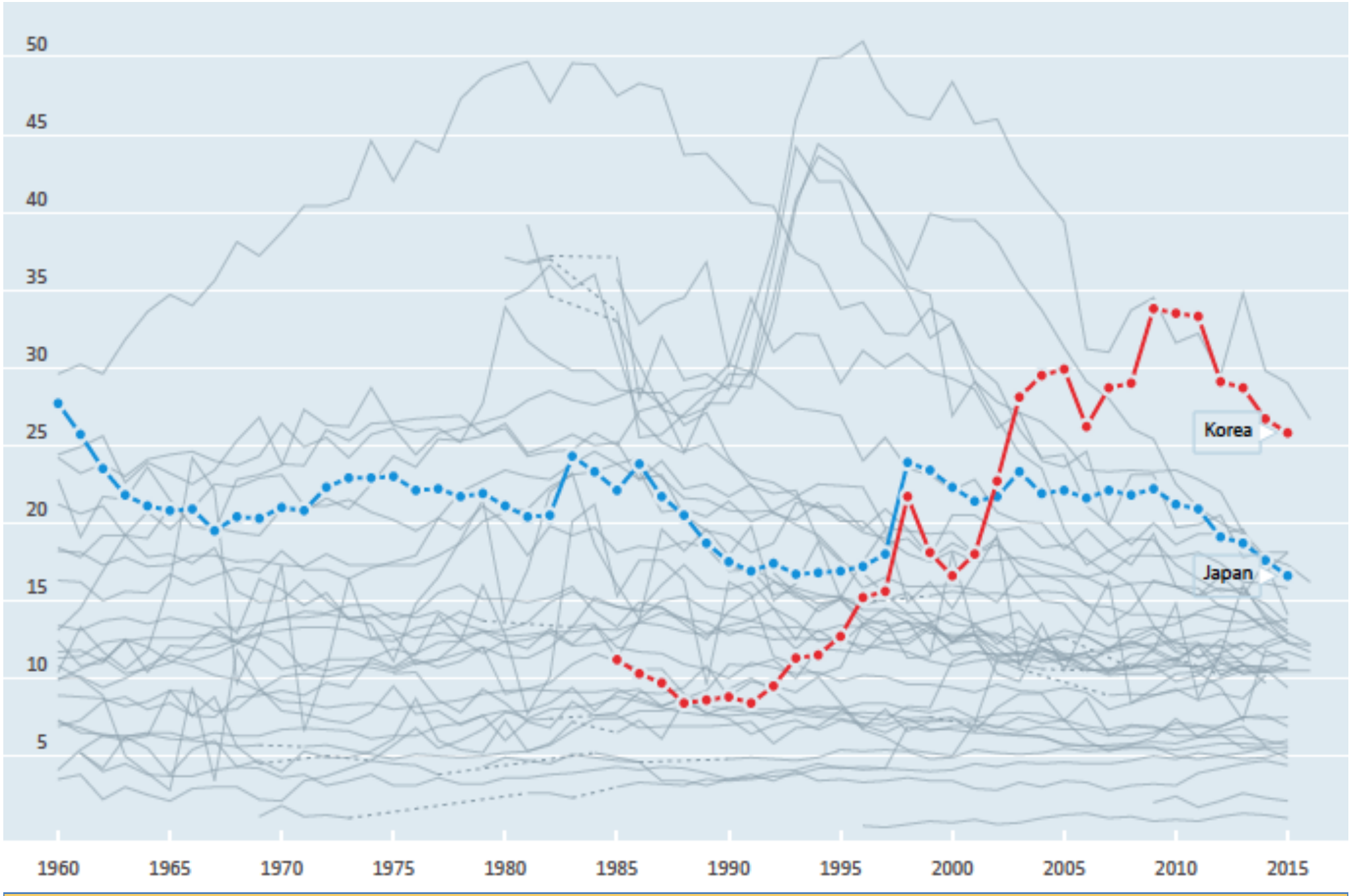
Suicide rates, 1960-2016; OECD; downloaded 02.02.19;
https://data.oecd.org/healthstat/suicide-rates.htm



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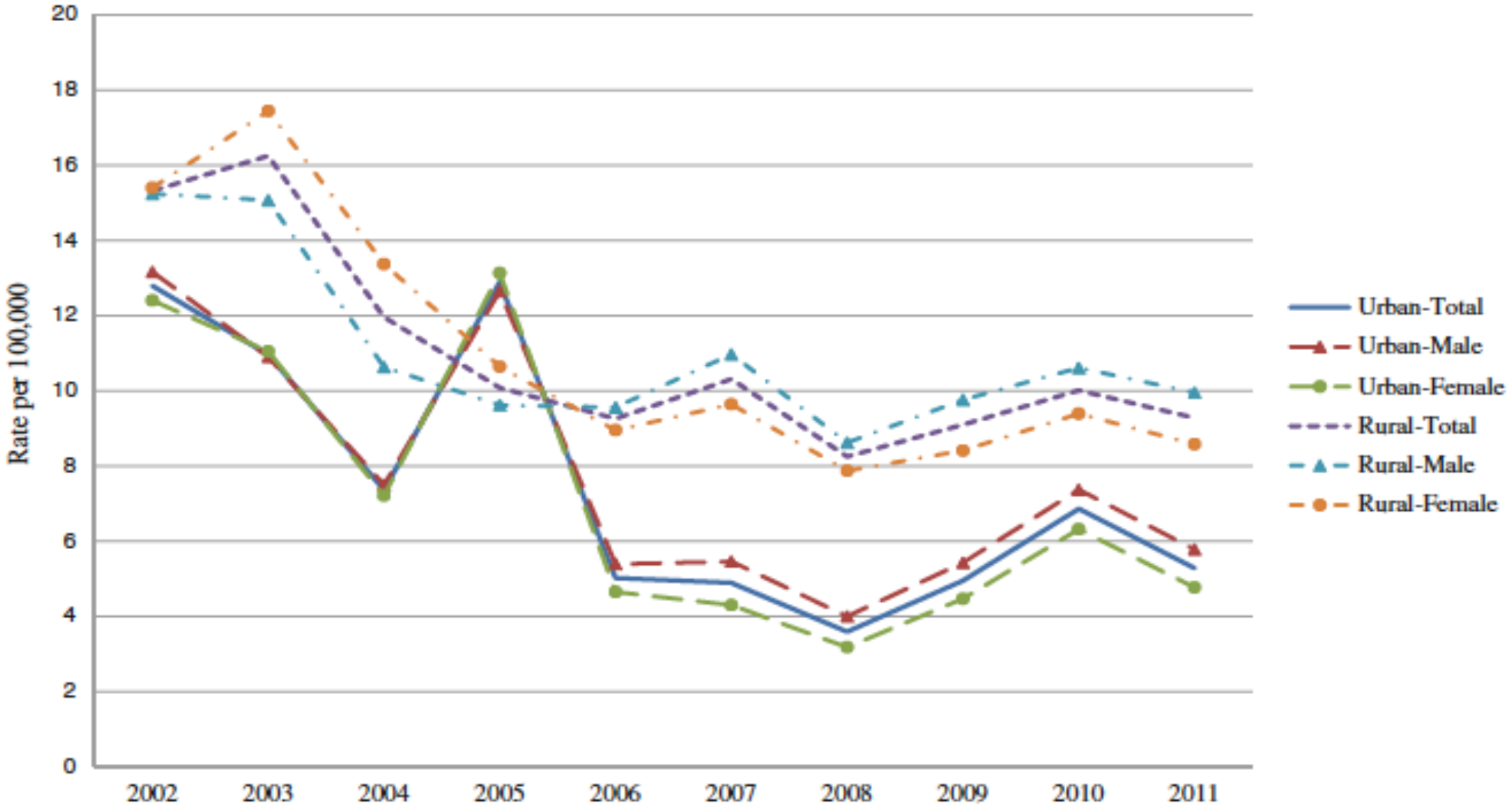
OECD; downloaded 10.23.18;
https://data.oecd.org/healthstat/suicide-rates.htm

China Suicide Rates (crude)
Region & Gender Specific, 2002-2011



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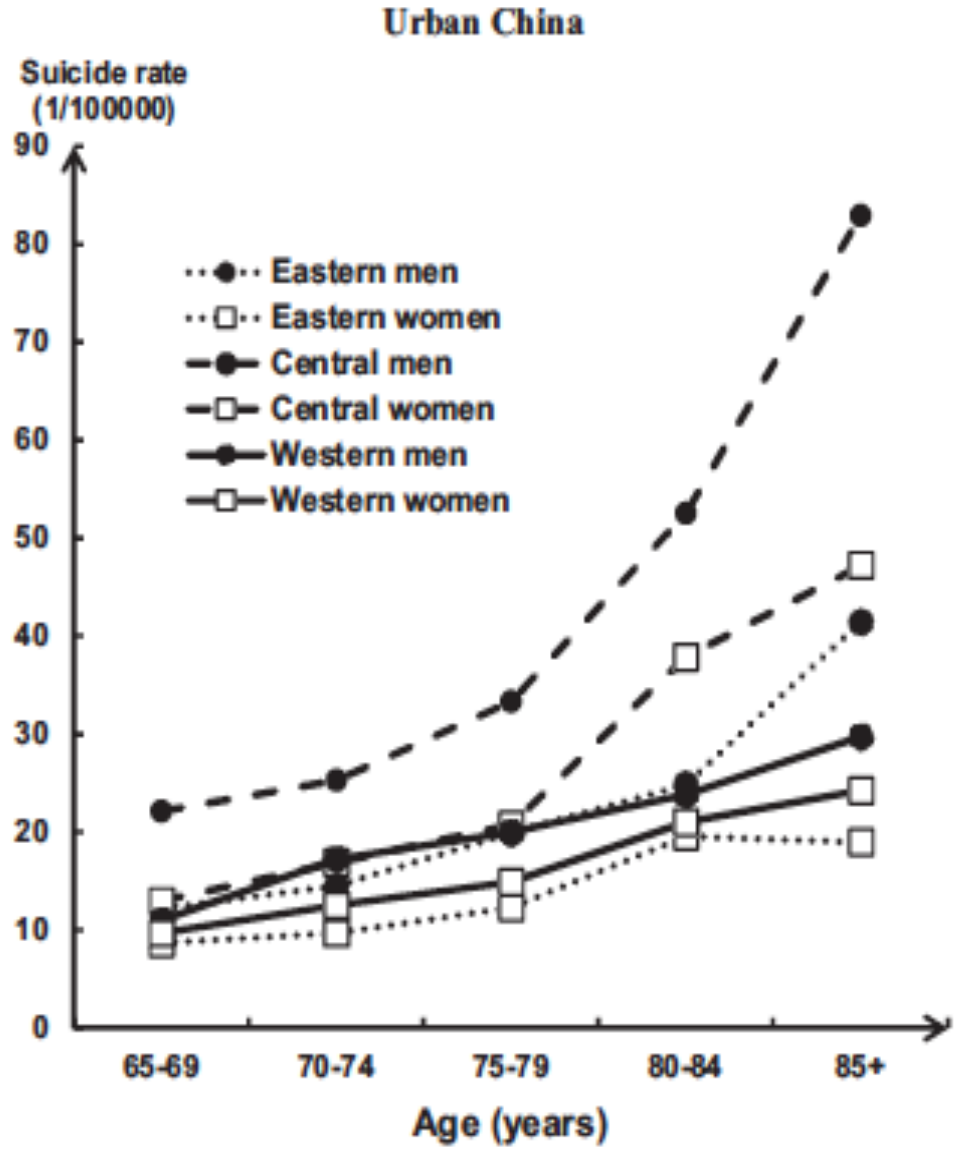
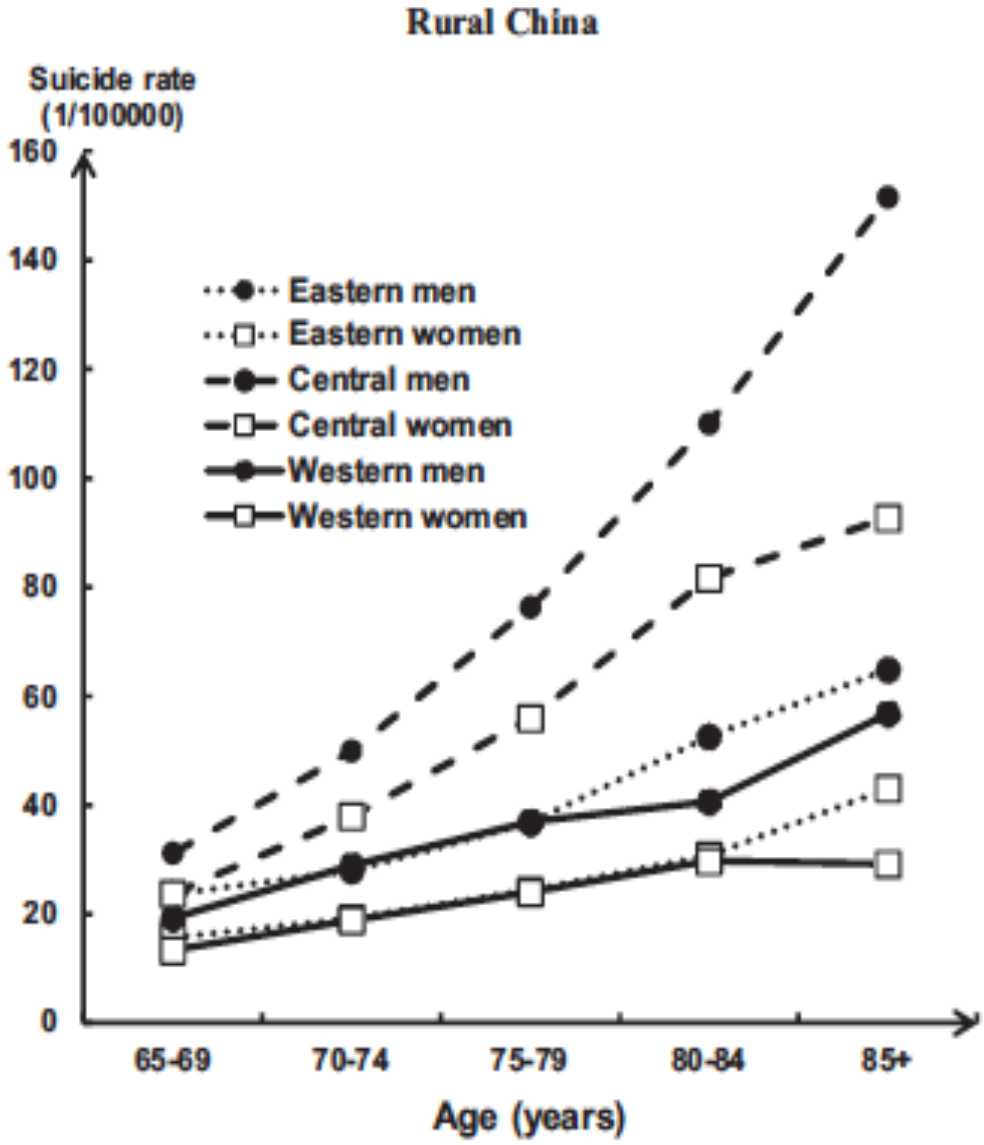
Wang, Chan, Yip. SPPE, 2016

China: Elder Suicide Rates, 2013-2014





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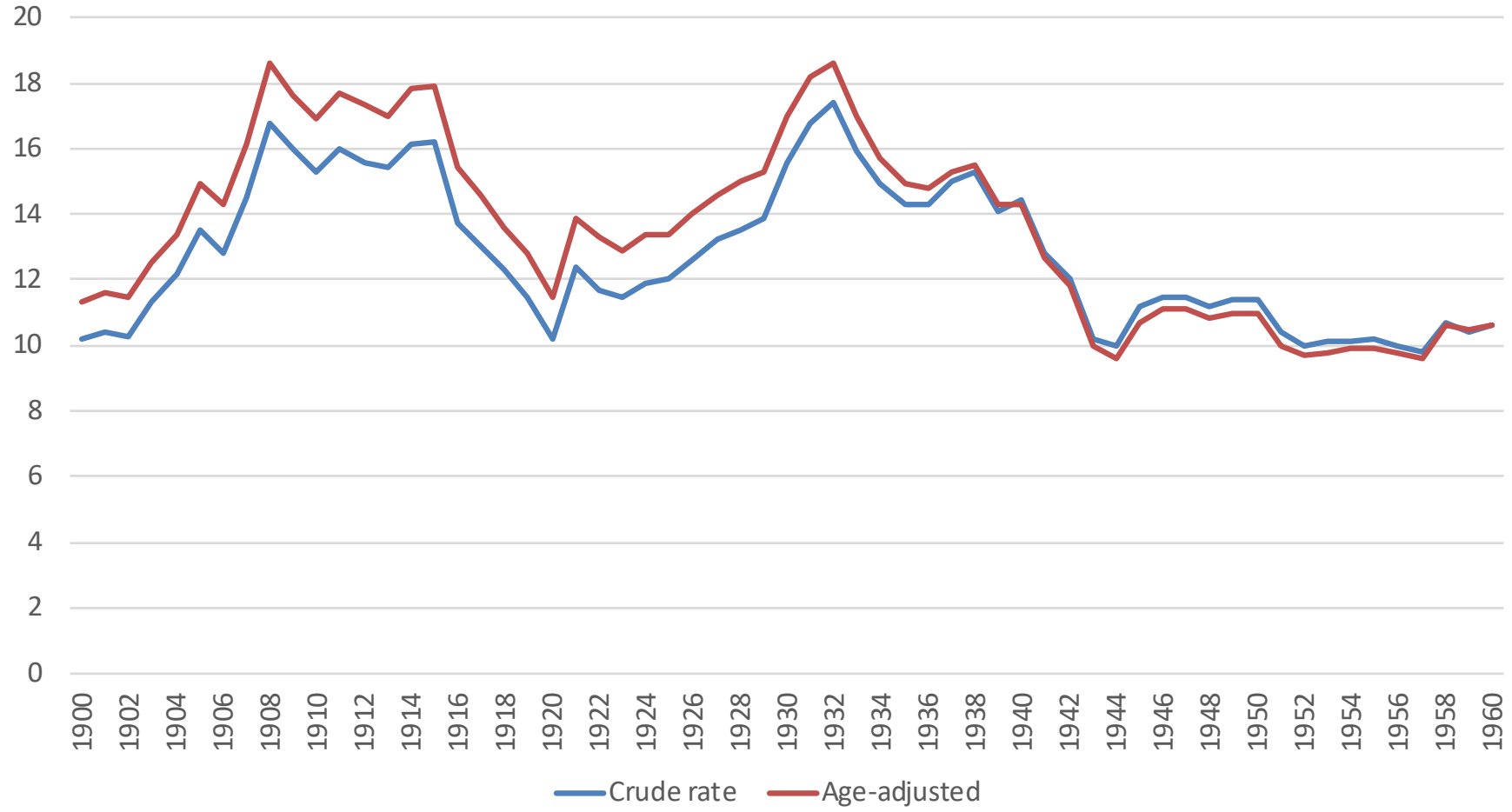
Zhong, Chiu, Conwell. JAD 2016; 206:273-279

U.S. Suicide Rates – 1900-1960

(crude & age-adjusted rates per 100,000)



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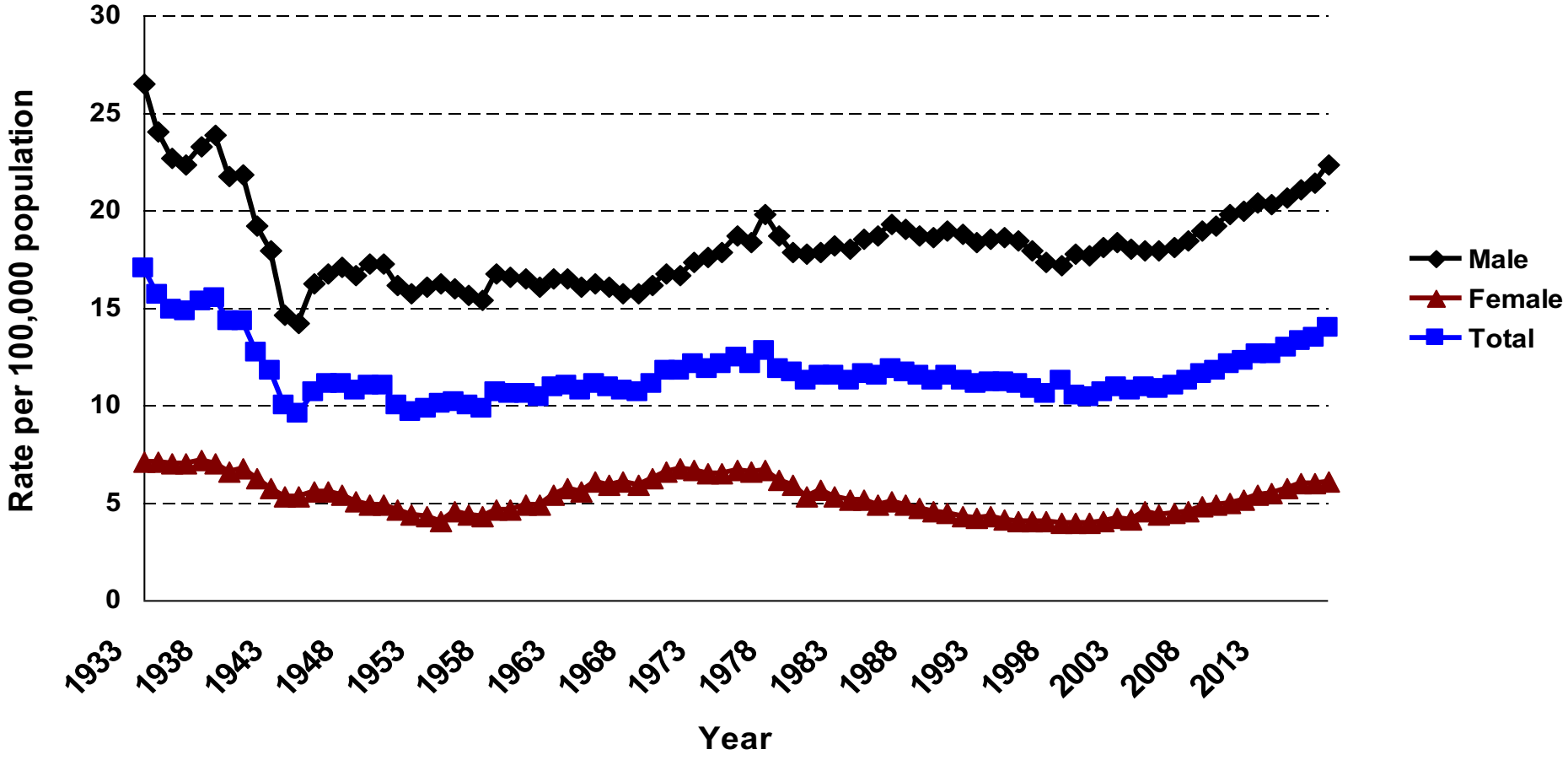
L.I. Dublin: *Suicide – A Sociological and Statistical Study*. 1963
National Office of Vital Statistics

Suicide among all persons by sex—United States 1933-2017



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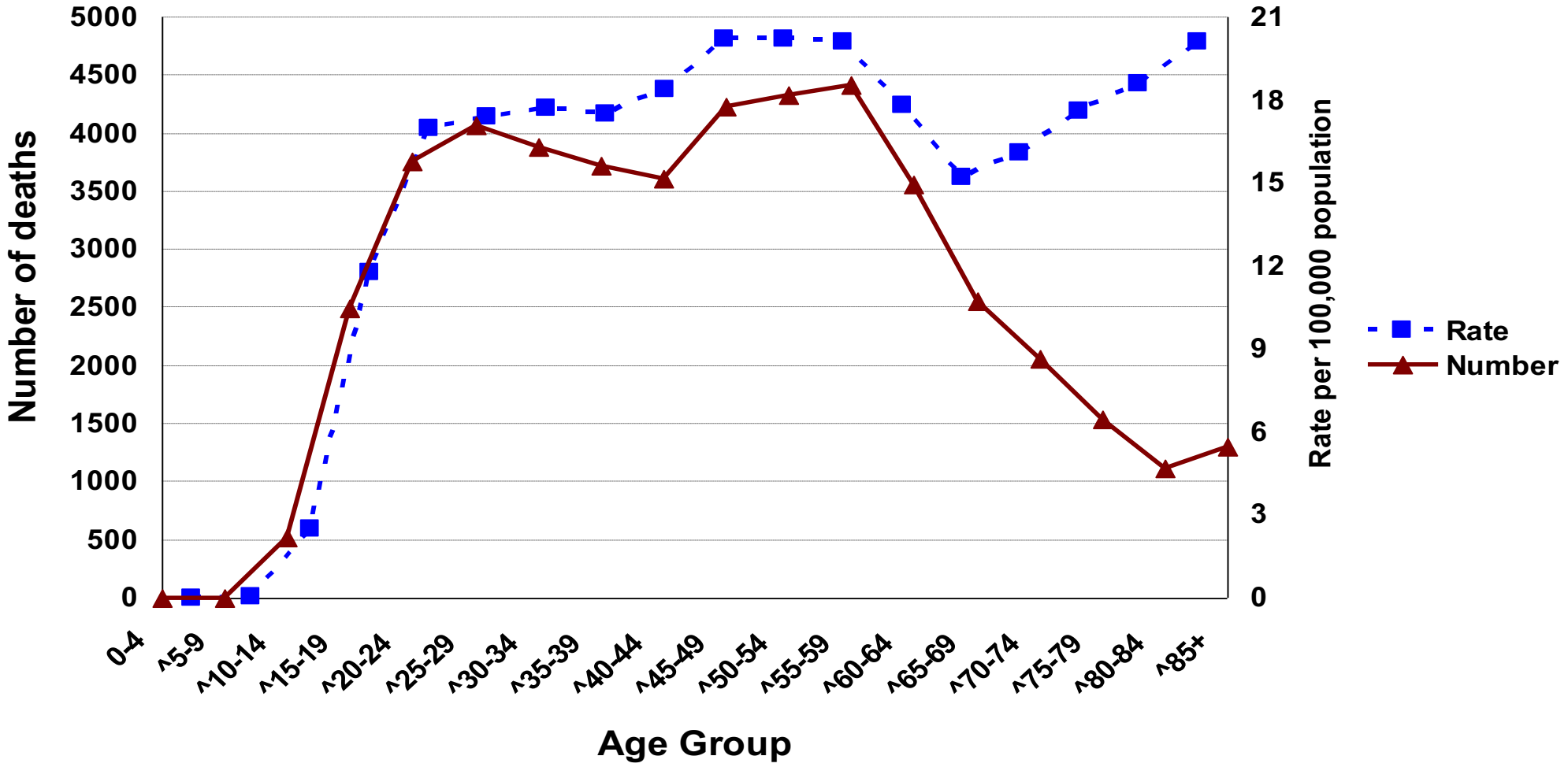
Crosby: www.cdc.gov/injury/wisqars/leading_causes_death.html

Suicides and suicide rates among all persons – United States, 2017



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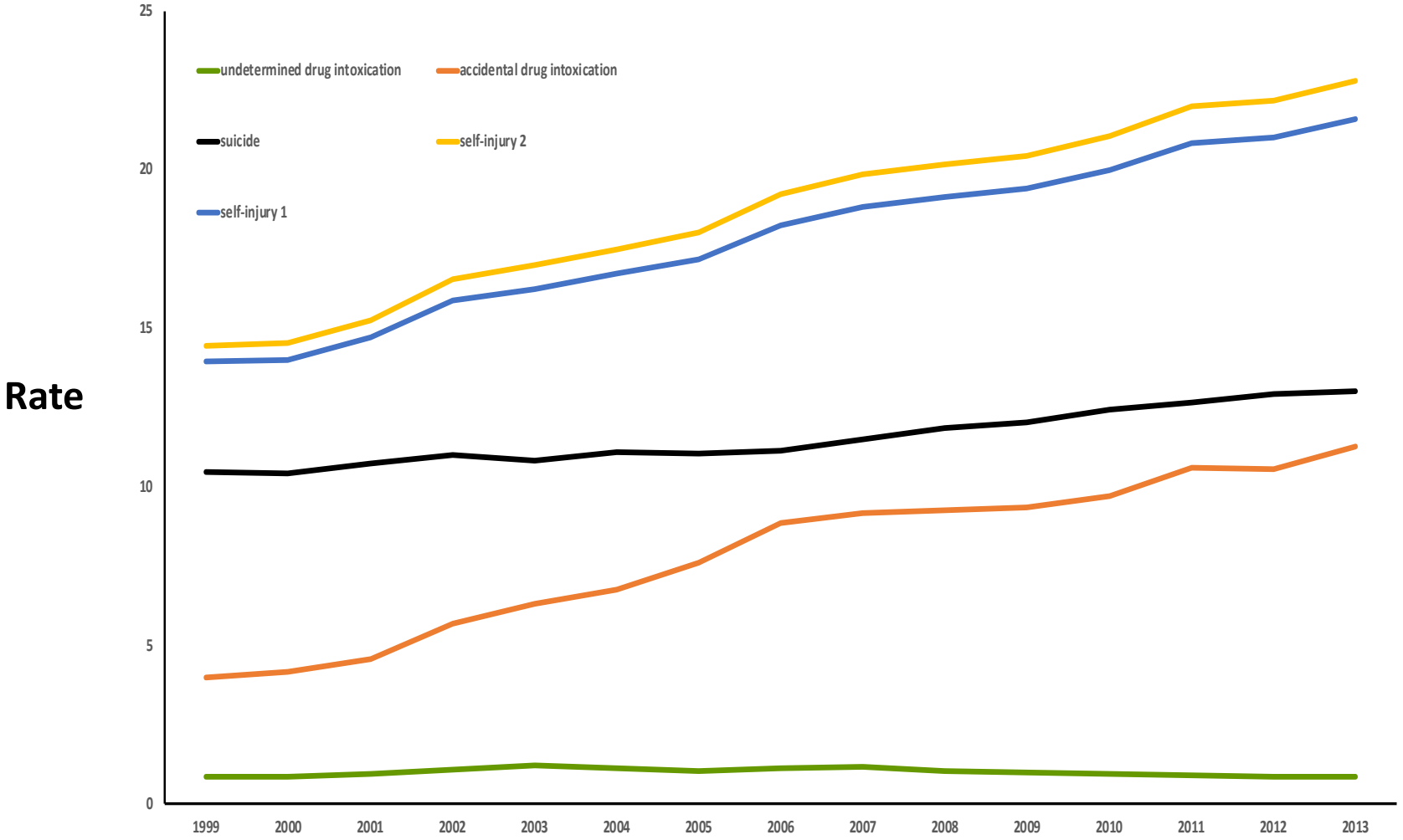
Crosby: www.cdc.gov/injury/wisqars/leading_causes_death.html

Self-Injury Mortality – Suicide & Drug Intoxication Death Rates per 100,000 population, US, 1999-2013



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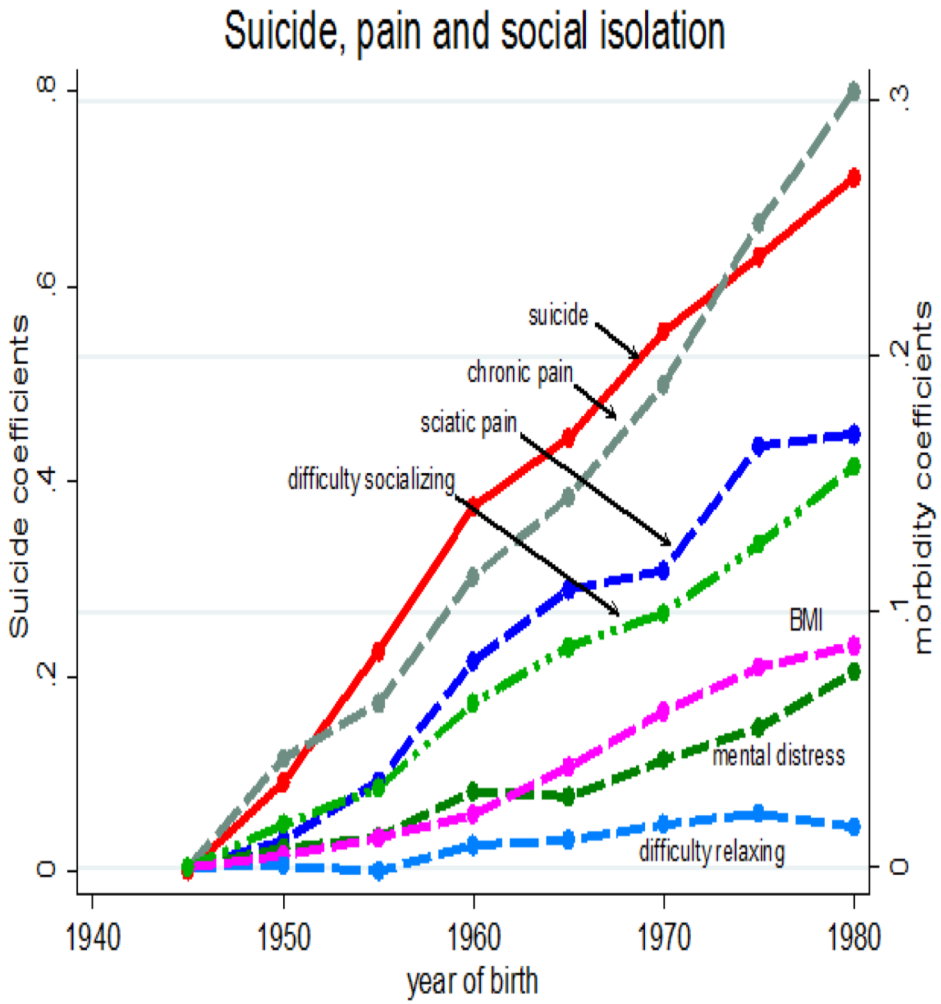
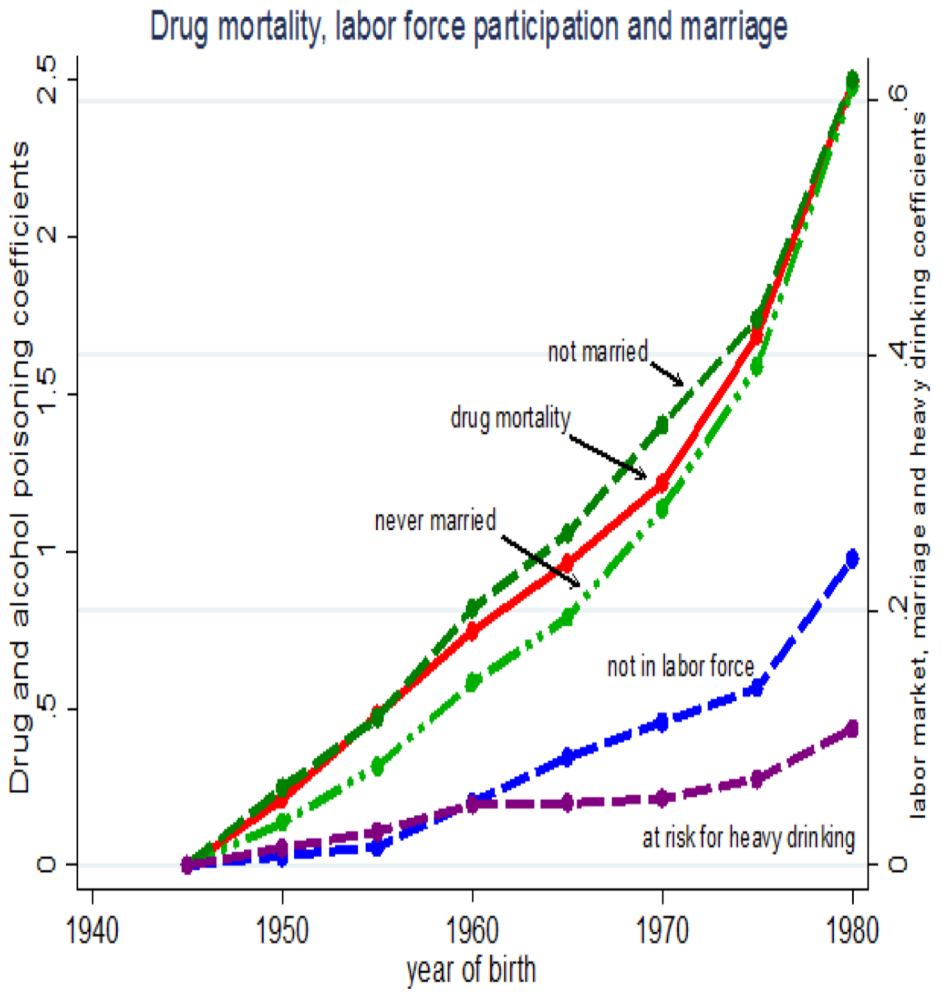
Rockett & Caine. JAMA Psychiatry 2015, Nov;*72*:1069-70.
doi: 10.1001/jamapsychiatry.2015.1418.

Estimates of *cumulative deprivation*, white non-Hispanics without Bachelor's degree, ages 25-64





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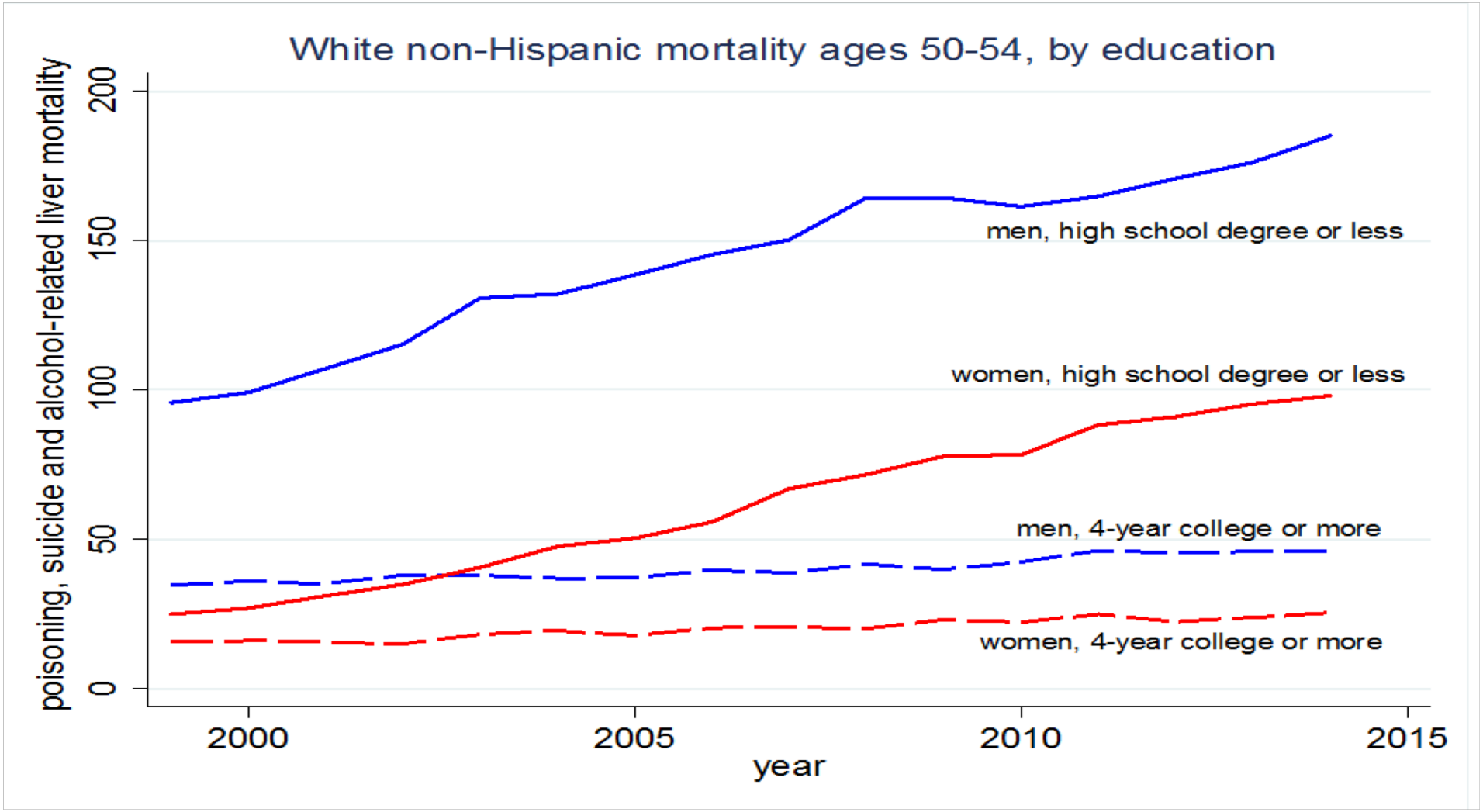
Case & Deaton: *Mortality & morbidity in the 21st century.*
Brookings Papers on Economic Activity. Draft, 03/17/17

Drug, alcohol, suicide mortality



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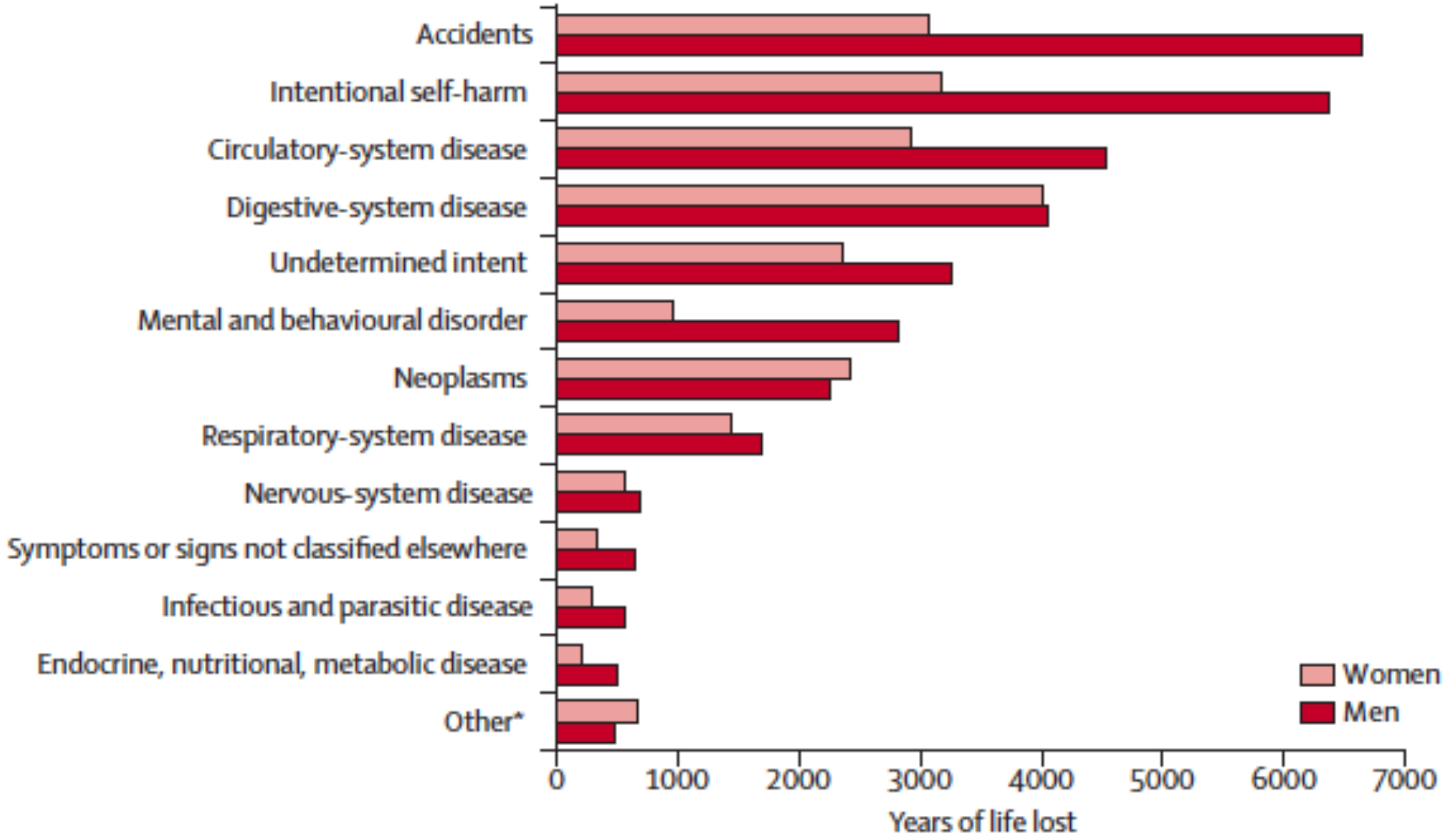
Case & Deaton: *Mortality & morbidity in the 21st century.*
Brookings Papers on Economic Activity. Draft, 03/17/17

Total years of life lost among men and women who had "self-harmed" (England)



*Assault and other external or unknown causes, musculoskeletal-system disease, other neoplasms, genitourinary-system disease, or diseases of the blood or immune systems.

Bergen, Hawton et al. Lancet 2012

Circumstances Preceding Suicide for Adults

NVDRS 2003-2011 Sample (n=630, m=w; ages 35-64 y/o)

Circumstances	Males (%)	Females (%)	Total	Chi-Square
Intimate Partner Prob.	35.2	32.7	34.0	0.45
Job/Financial	37.1	21.6	29.4	18.4***
Any job	24.8	11.4	18.1	18.9***
Any financial	21.9	15.9	18.9	3.7*
Health	22.5	33.9	28.3	10.1**
Family	13.3	23.2	18.3	10.2**
Criminal/Legal	19.4	11.8	15.6	7.0**
MH/SA	67.9	82.2	75.1	17.2***
Tx for MH/SA	25.4	44.4	34.9	25.1***
Prior SI/SA	36.8	59.7	48.3	33.0***

*p<.05; **p<.01; ***p<.001

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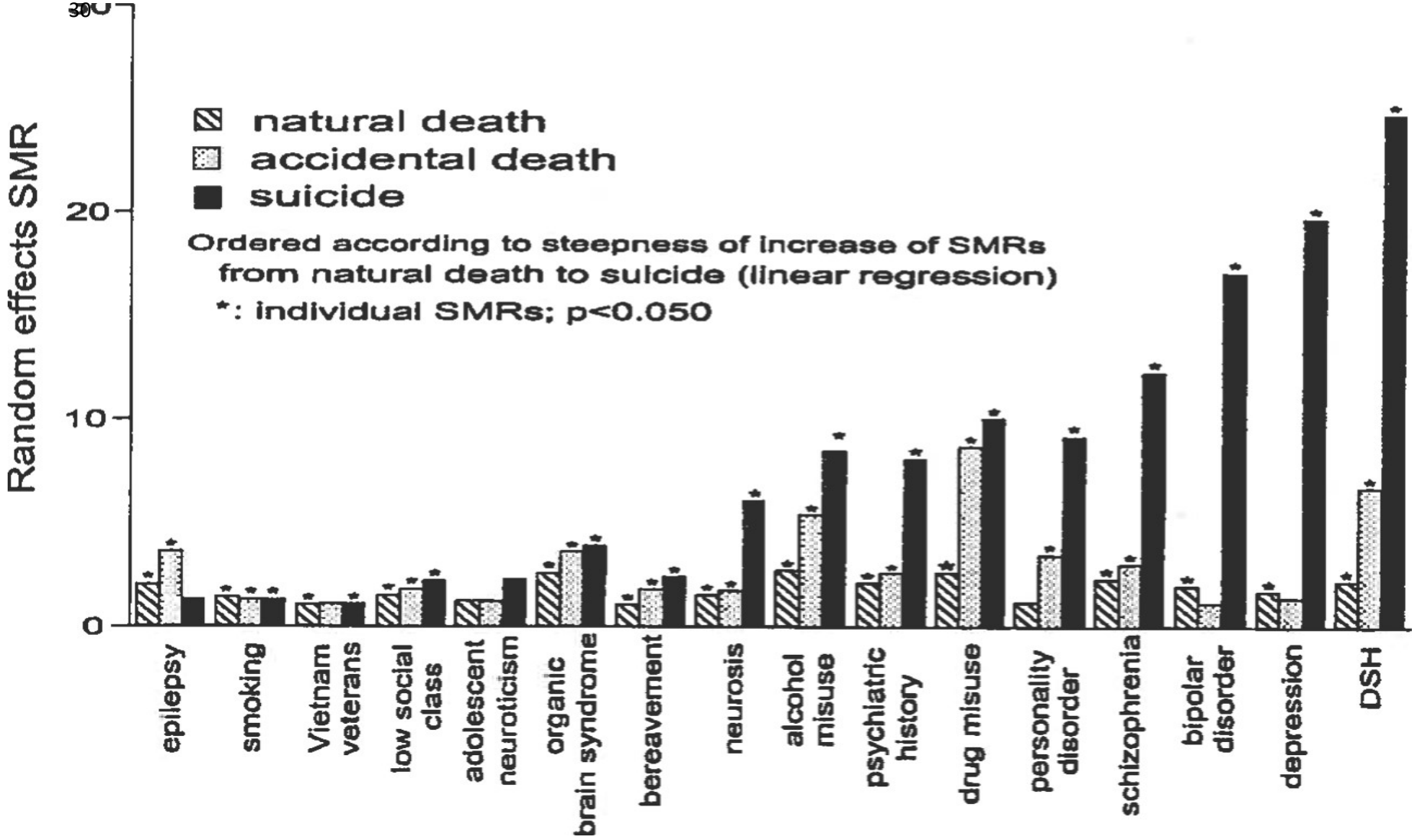
Stone, Holland, Schiff, McIntosh. Am J Prev Med 2016.

SMRs for Alternative Deaths in 16 Risk Groups



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Neeleman. Int J Epidemiology 2001

Common Barriers to Suicide Prevention *among Suicidal Persons*
The Public Health Rationale

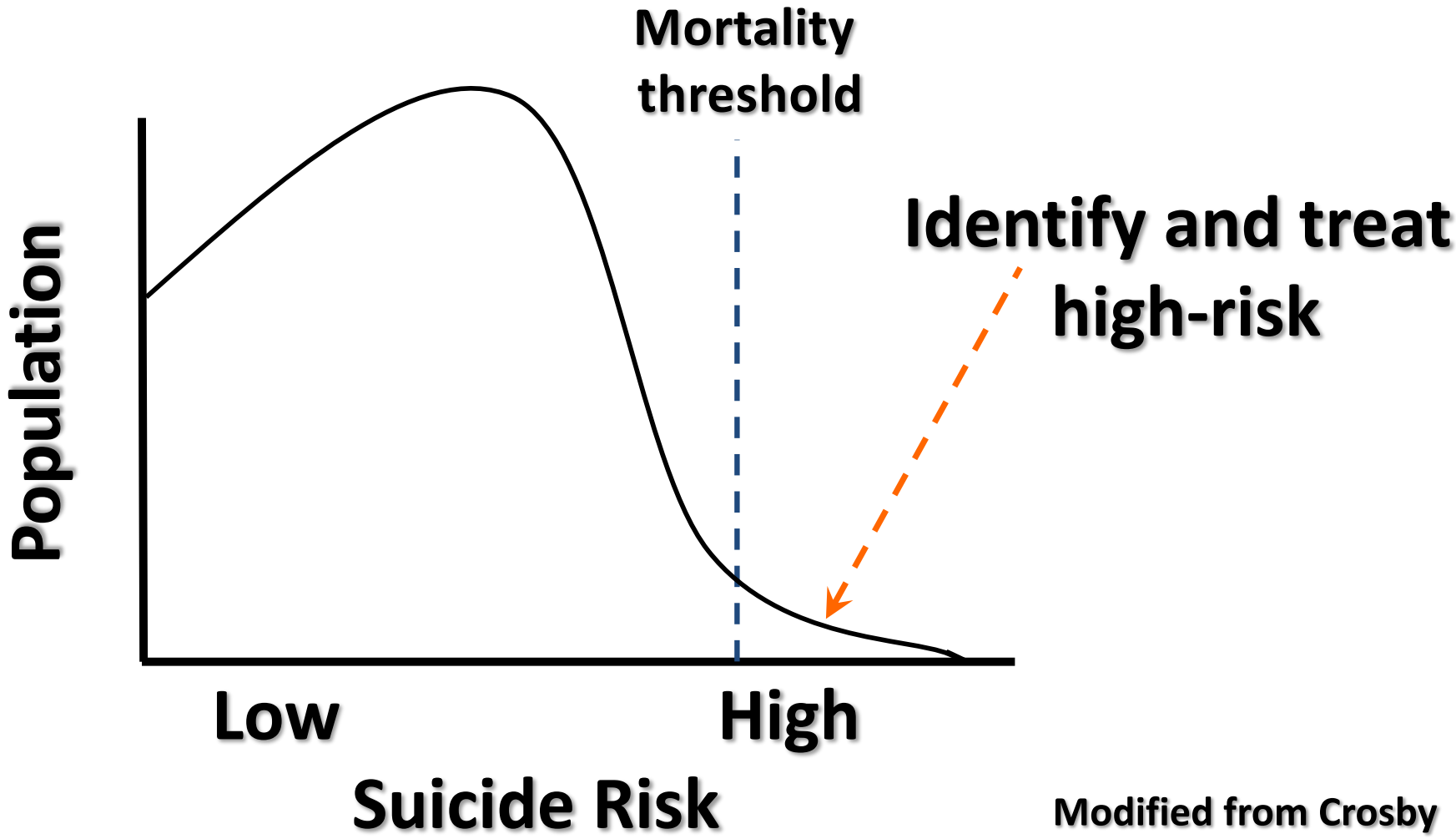
- **People intent on suicide often do not seek help.**
- **Seemingly "normal" people kill themselves.**
- **Fatal attempts often are first attempts.**
- **So-called "risk factors" are common; suicide is uncommon, such that *risk factors are NOT predictive for individuals* (i.e., they fail as warning signs of an attempt).**

The high-risk conundrum…
…finding THE NEEDLE in a stack of needles!

- **The U.S. suicide rate is nearly *14 per 100,000 per year* in the general population, or 0.14 per 1000, or 0.013 per 100. That means *probabilistically* you can say with ~99.9% likelihood that any person from the general population will *not* kill him/herself in the coming year.**

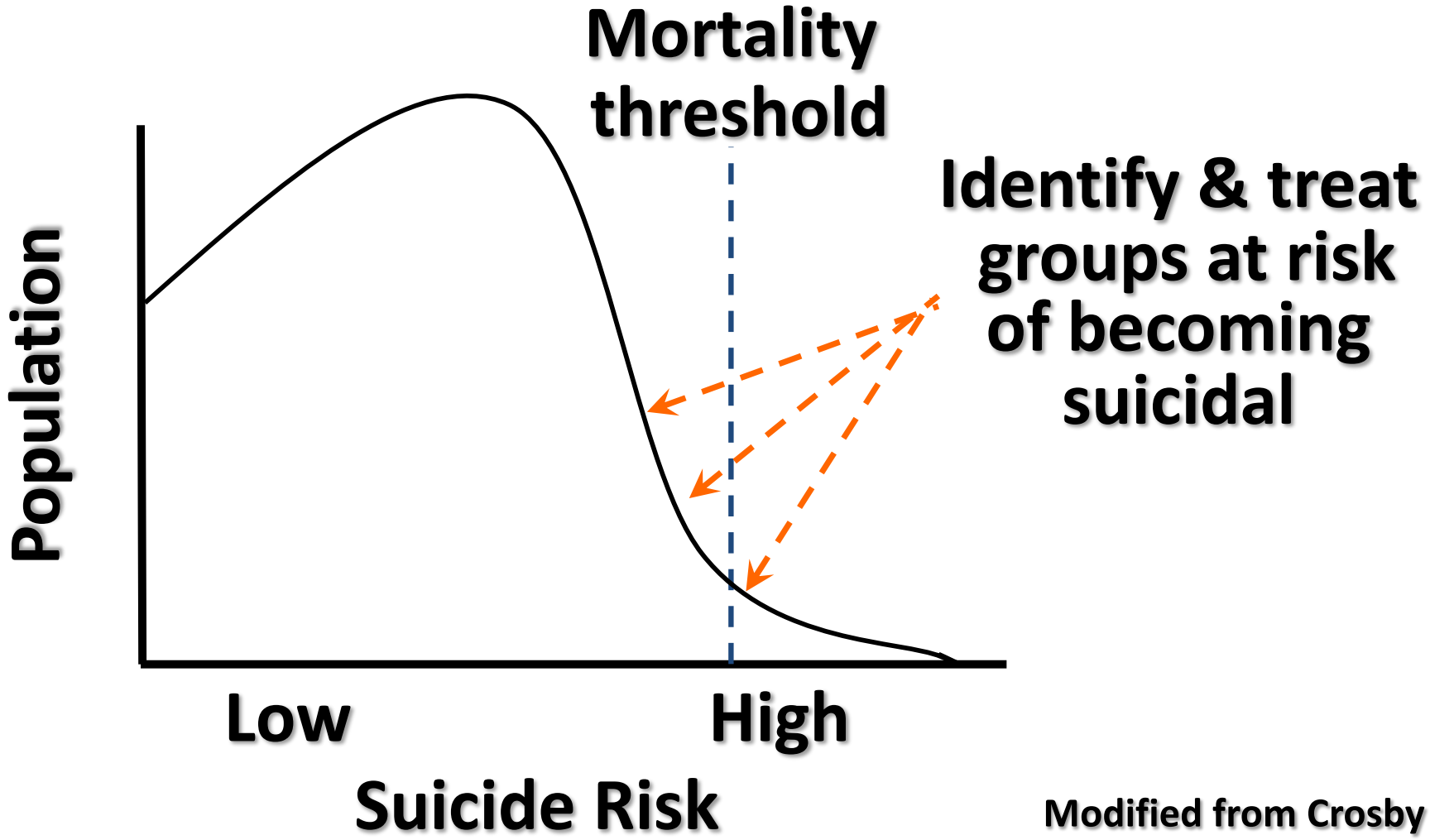
- **If the suicide rate is 50x times higher, *~700 per 100,000* among clinically depressed people discharged after a suicide attempt, it is ~7 per 1000, or ~0.7 per 100 depressed individuals. *Probabilistically* you can say with ~99.3% likelihood that any such depressed person will *not* kill him/herself in the coming year—*despite the need for treatment!***

"Indicated" Approach to Prevention



Modified from Crosby

"Selective" Approach to Prevention



Modified from Crosby

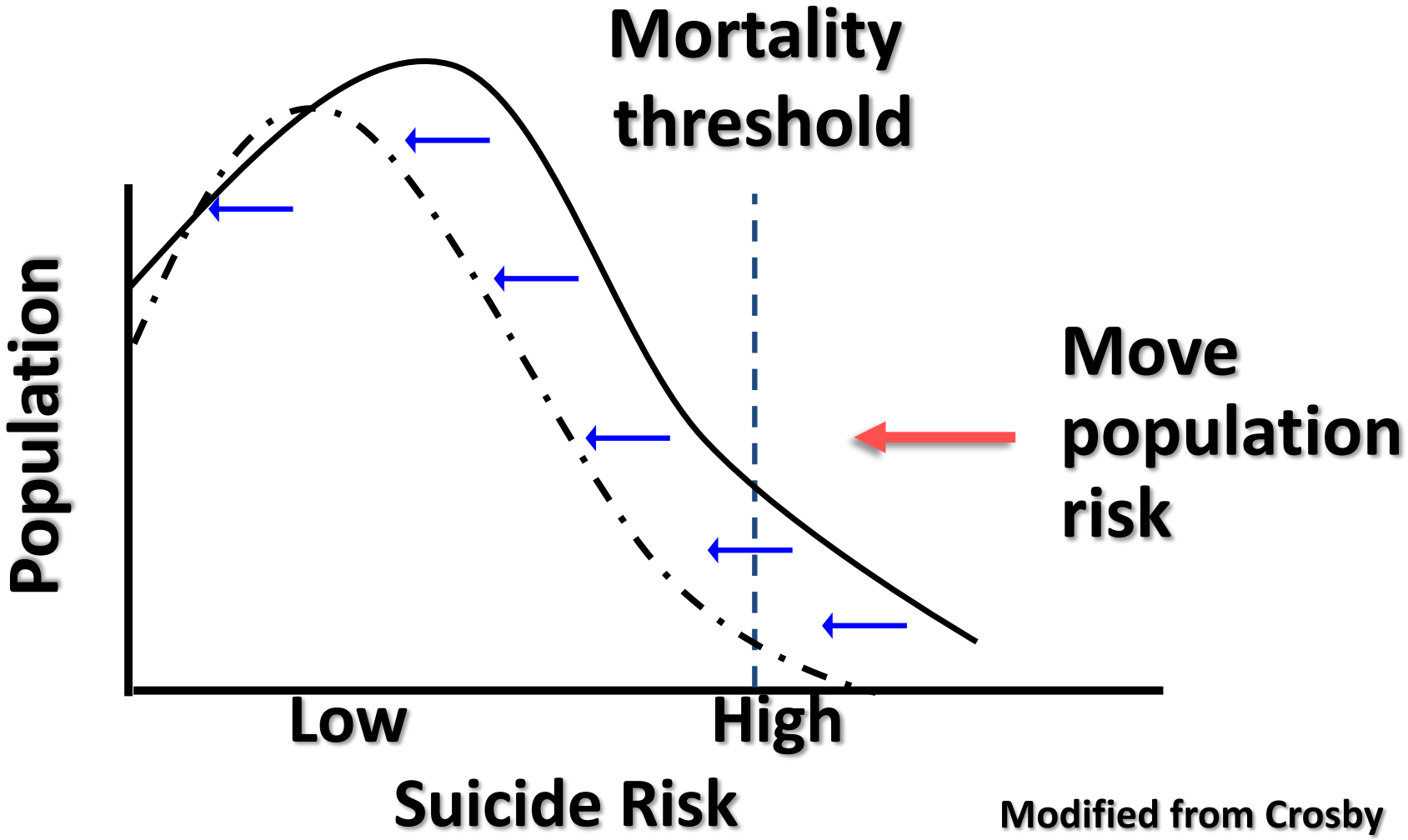
Two fundamental differences between *selective & indicated* public health preventive interventions and "clinical treatments"

1. Public health preventive interventions *reach into communities* to find and engage those who require treatment. They *do not wait* for patients to come in the door of the clinic.
2. To be most effective, public health approaches should involve *co-owning community partners.*

Universal Prevention

Focused on the *entire population* as the target. Prevention through promoting health and mental health, and broadly reducing risk. *Interventions may not depend on individual actions (e.g., means safety; tax codes) & may target cultural values and norms.*

Universal Approach to Prevention



Modified from Crosby

USAF Suicide Prevention Program
1996 ➔ ~2007

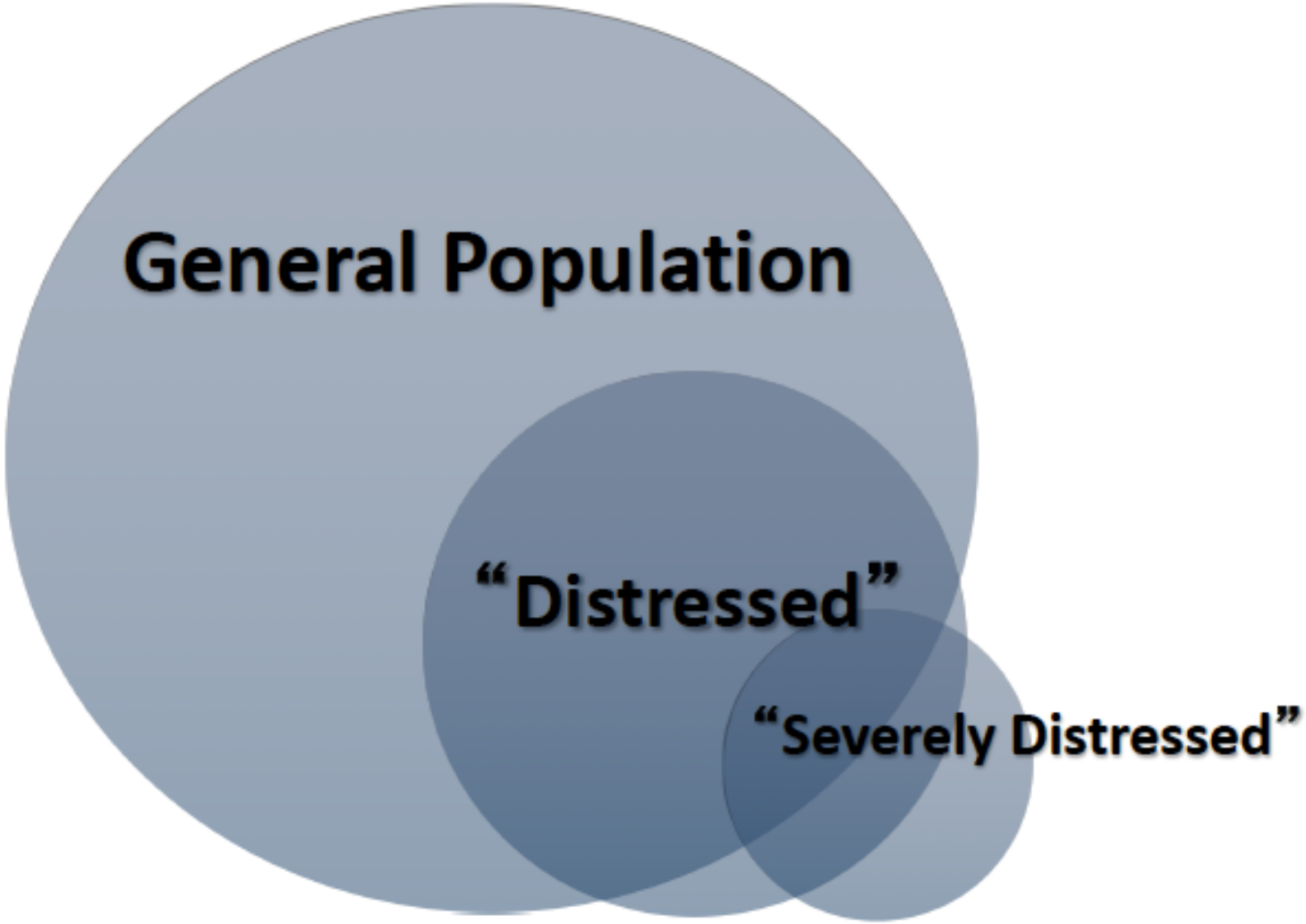
- Public health-community orientation: "The Air Force Family"
- Broad involvement of key leaders: Medics-Mental Health, Public Health, Personnel, Command, Law Enforcement, Legal, Family Advocacy, Child & Youth, Chaplains, CIS; Walter-Reed Army Inst. Of Research; CDC
- Consistent leadership involvement
- 11 initiatives clustering in four areas
  - Increase awareness and knowledge
  - Increase early help seeking
  - Change social norms
  - Change selected policies
- *Common Risk Model*

Table 3 Comparison of effects of risk for suicide and related adverse outcomes in US Air Force population before (1990-6) and after implementation of programme (1997-2002)

Outcome	Relative risk (95% CI)	Risk reduction (1–relative risk)	Excess risk (relative risk–1)
Suicide	0.67 (0.57 to 0.80)	33%	—
Homicide	0.48 (0.33 to 0.74)	51%	—
Accidental death	0.82 (0.73 to 0.93)	18%	—
Severe family violence	0.46 (0.43 to 0.51)	54%	—
Moderate family violence	0.70 (0.69 to 0.73)	30%	—
Mild family violence	1.18 (1.16 to 1.20)	—	18%

Knox et al., BMJ 2003

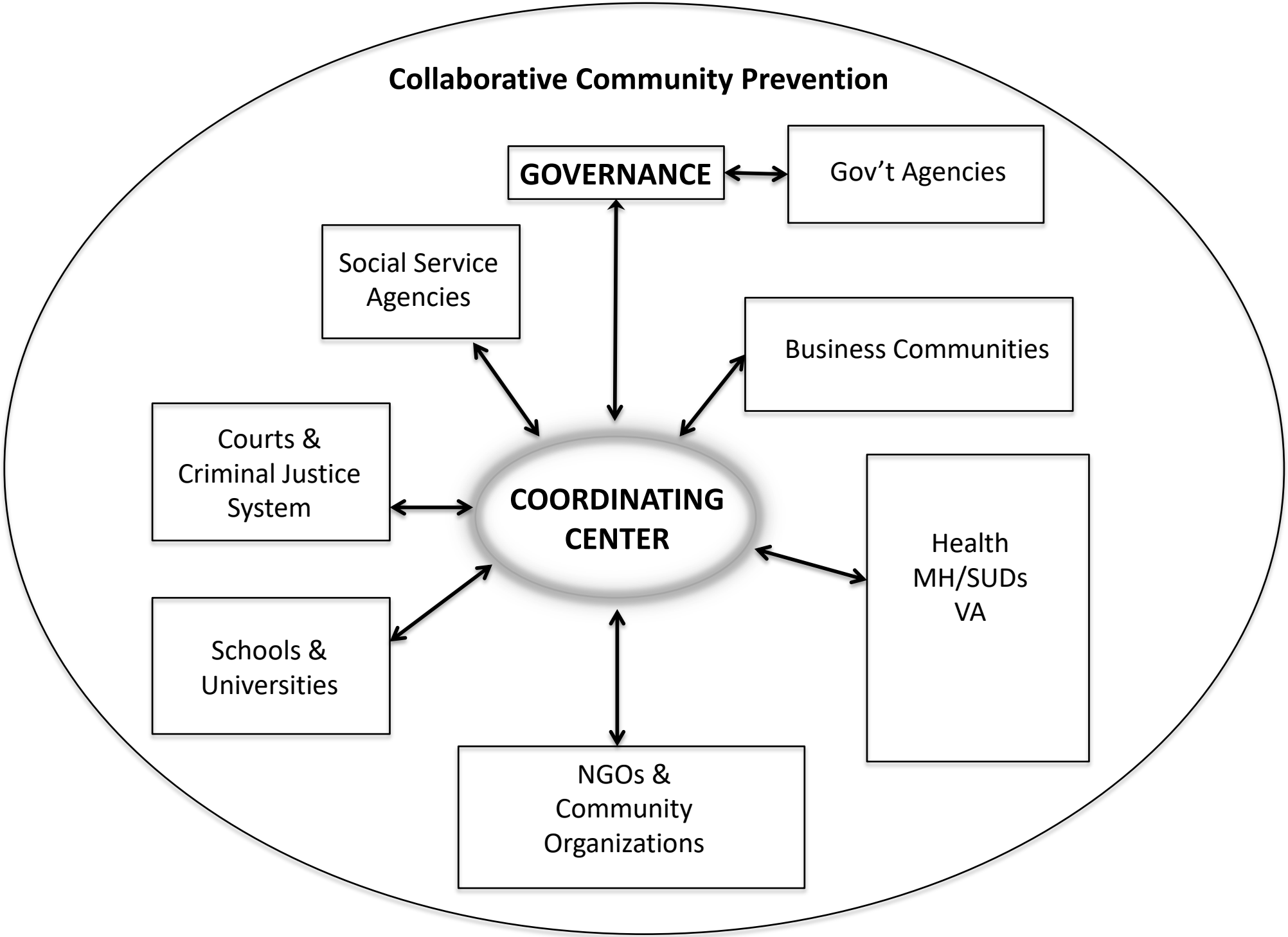
The focus for preventing premature death from self-injury is not the same as the focus for 'clinical' mental health care!



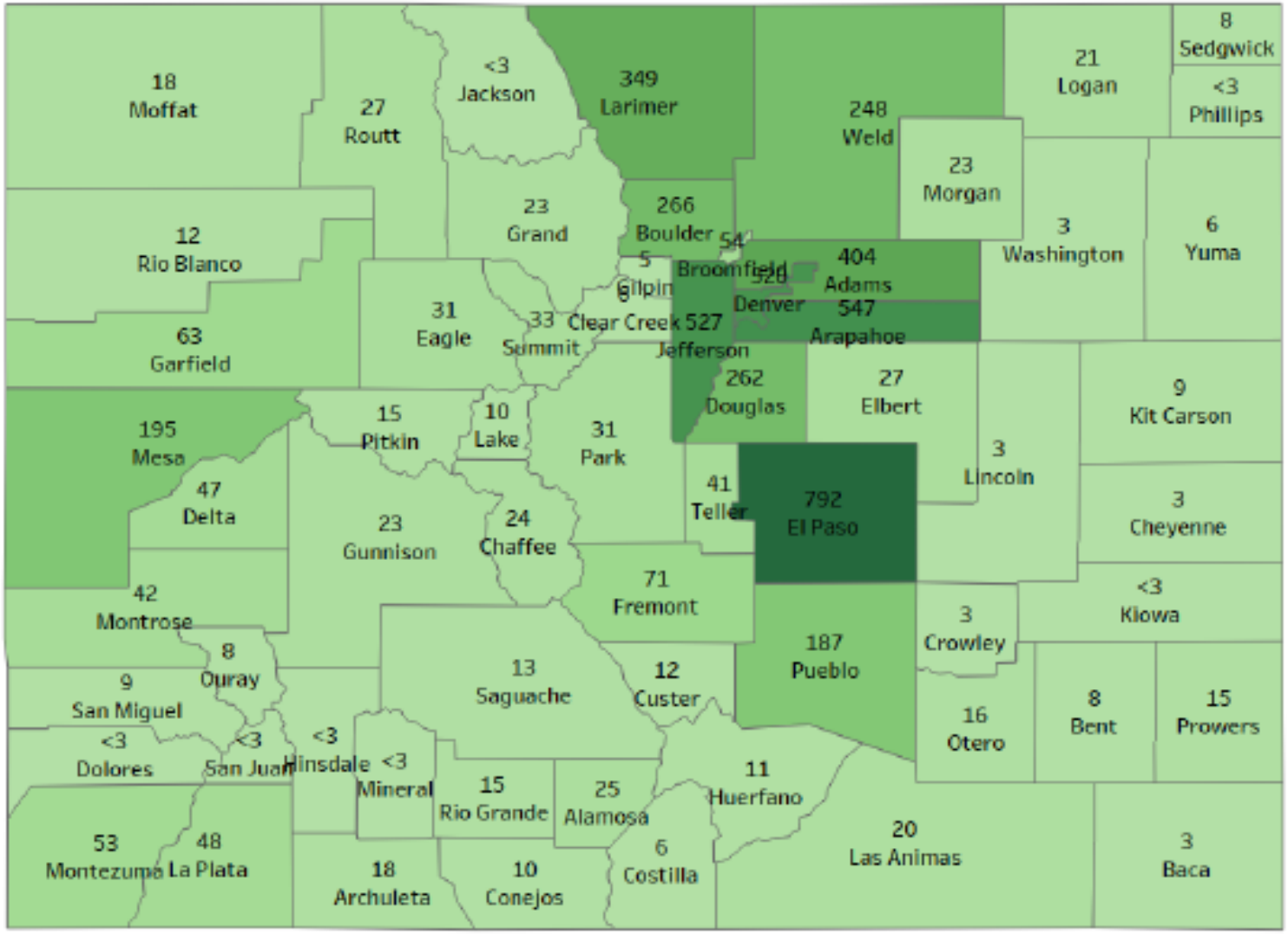
Illustrative Examples of Prevention & Dealing with *Stigma* in the U.S.

- Cardiac & vascular diseases – stimulated during the 1940s in the US by the hidden illness of President Franklin Roosevelt – emergence in the 1960s/70s of distal risk factor reduction to prevent acute events occurring decades later
- Cancers
  - 1964 in the US: Surgeon General's report on smoking
  - 1974: Betty Ford, wife of US President, discussed her mastectomy
- HIV/AIDS – 1980s; change in gay culture and social activism to promote research
- Alcohol – 1980s-present; Mothers Against Drunk Driving (MADD) leading efforts to change culture & laws

Building Comprehensive, Integrated Approaches to Prevention (Colorado)


Collaborative Community Prevention
GOVERNANCE
Gov't Agencies
Social Service Agencies
Business Communities
Courts & Criminal Justice System
COORDINATING CENTER
Health MH/SUDs VA
Schools & Universities
NGOs & Community Organizations

Frequency of Colorado suicides by county of residence, 2012-2016



Map based on Longitude (generated) and Latitude (generated). Color shows sum of D. The marks are labeled by sum of D and Cntyname. Details are shown for Cntyname. The data is filtered on state, whi Colorado. The view is filtered on Cntyname, which keeps 64 members.

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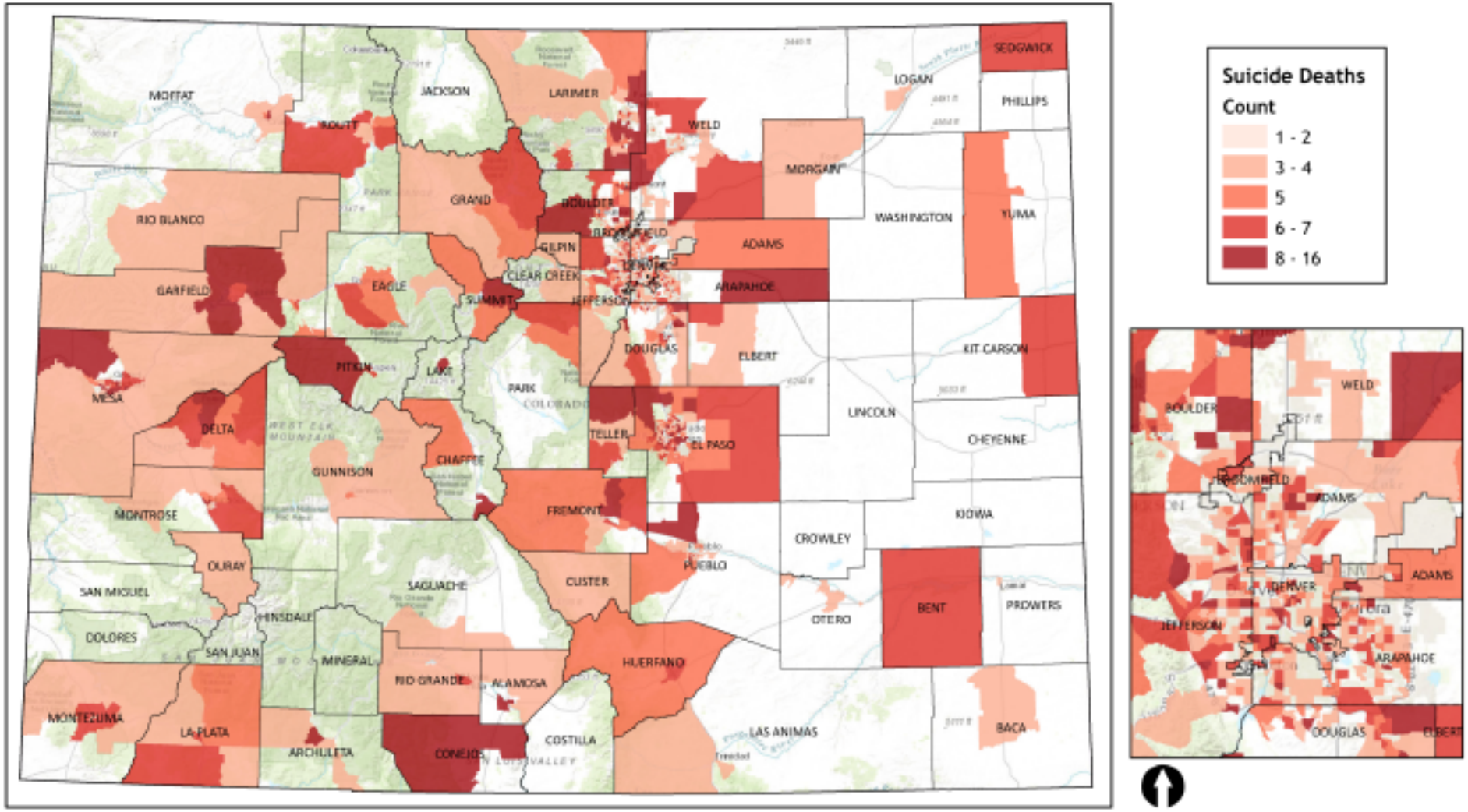
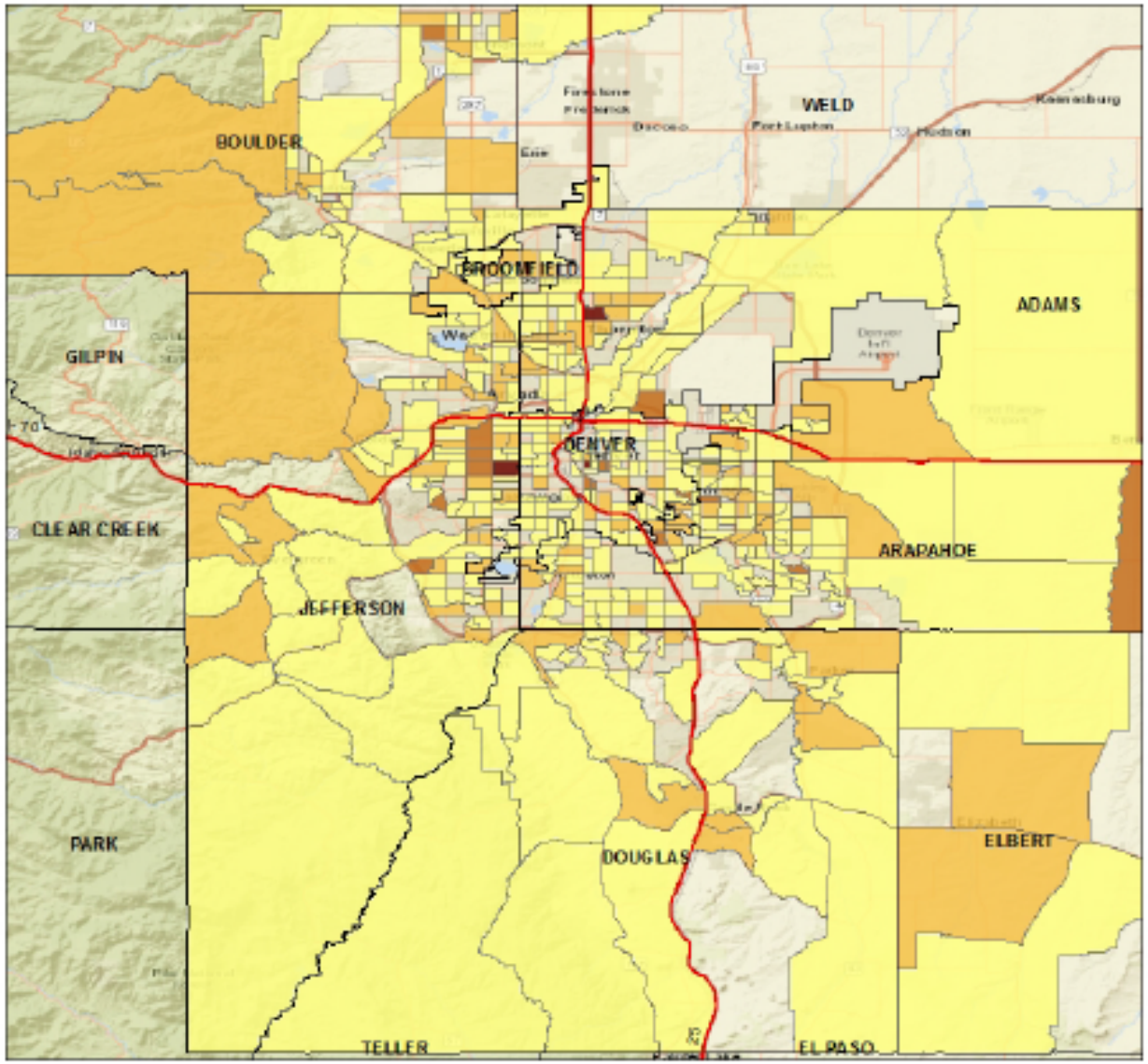
Number of Suicides by Census Tract



Source: CDPHE Vital Records Death Dataset (2010-2014)

COLORADO
Center for Health & Environmental Data
Department of Public Health & Environment

Veteran Suicide in Colorado by Residence (Census Tract) 2004-2015

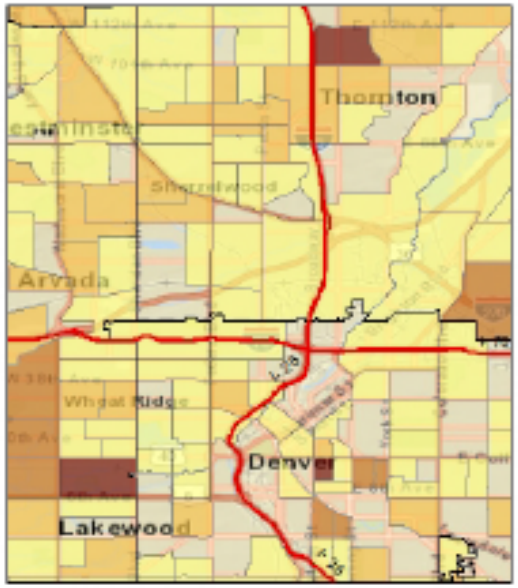


Legend

Number of vet suicides

- 1 - 2 (335)
- 3 - 4 (114)
- 5 - 6 (17)
- 7 - 12 (3)

Denver metro area



Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment (2004-2015)

COLORADO
Center for Health & Environmental Data
Department of Public Health & Environment

Site – Population Approaches (social geography)

Sites	Populations potentially captured	*Populations likely to be missed*
Middle and High Schools	Adolescents attending school	School dropouts; youth in legal trouble
Universities	Vulnerable individuals with new onset or recurrent mental disorders	Young adults not pursuing further education, or unemployed
Organized Work Sites	Those employed in organized work sites, men and women in the middle years	Workers in small businesses, union/hiring halls, day labor, unemployed workers, immigrant/migrant labor, underground workers
Medical Settings	Those with health insurance; those that are willing to access traditional medical settings	Un/under insured; low "utilizers" of health care (men); utilizers of nontraditional health care
Community NGOs (e.g., United Way)	Those targeted for service by the NGO funding source; those in private homeless shelters	Anyone outside perceived scope of agency
Religious/Faith Organizations	Regular attendees	Non-participants & drop outs

Site – Population Approaches (social geography)

Sites	Populations potentially captured	*Populations likely to be missed*
Governmental Agencies, VA. *including Courts & CJ Settings* (gov'tal agencies as PH venues)	Recipients of county level social support and Medicaid services, including those with SMI; shelter populations; state paid unemployment insurance; Medicare; Veterans Perpetrators & victims of IPV; probationers; groups with psychiatric and CD conditions	Chronically unemployed; persons outside traditional workforce; persons not eligible for benefits Failure to gain access to clinical MH and CD treatment settings
Social Media	Youth and young adults; *hidden populations*	People who do not use the Internet – elders, persons with lower education or financial disadvantage

High-risk Groups and Sites to Contact Them

(tracking social ecology)

High-risk groups	Sites	Potential interventions	Comments
High Risk Youth—"drop outs," violent youth, & foster care youth	Community centers, police, jails, foster services	Comprehensive family and youth services, integrated across community and gov't systems	Missed in schools; requires careful integration and coordination not evident in most communities; funding issues central: INSURANCE BARRIERS
People with severe, persisting mental disorders	Mental health treatment settings; courts, jails, prisons	Fostering of early interventions; assertive community treatments; linkages among courts, clinics, and other agencies	Comprehensive systems of care and assertive community follow-up; coordination of housing, courts, and mental health settings critical to success
Men & women with alcohol and substance disorders; perpetrators of domestic violence; victims of DV	CD treatment settings; courts & jails	Integration of mental health and prevention services into CD programs; *court integrated mental health services*	Dependent on development of integrated MICA services; rapid access to care for those in need crucial; INSURANCE BARRIERS

High-risk Groups and Sites to Contact Them
(tracking social ecology)

	Sites	Potential interventions	Comments
Depressed women and men	Primary care settings	Enhanced detection, treatment, and follow up of emerging symptoms	Requires education of patients & providers *re* recognition and treatment; subsyndromal conditions important
Elders with pain, disability, despair (& depression)	Primary care offices, residential settings; Agency on Aging outreach programs	Pre-emptive treatment of pain and increasing medically related disability	Can miss socially isolated elders and elders who do not express their needs openly
Suicidal people, including patients with personality d/o, varying mood disturbances, and CD problems	ERs, ICUs, inpatient psych. and medical services – *need for novel approaches to case identification and follow-up*	High-risk groups	Those high in ideation and attempts in the context of personality disorders often are 'frequent fliers' to ERs who fail to use standard systems of care; major ethical questions; INSURANCE BARRIERS

Prevention of death from self-injury – suicide, drug deaths, alcohol related diseases – must form a mosaic…

…built within the contexts of local geography (community settings) and the social ecology of populations – and of individuals, as well as families. Effective prevention will involve multiple complementary components. This mosaic cannot be built or effectively sustained outside the domains of people's lives!

Practical Steps for Prevention Programming – 1

- Nurture, initiate, build, maintain ***political will***
- Define who, where, & which method – assess changing epidemiology across space & time
- Inventory current efforts & resources
  - Government
  - Health systems
  - Communities
- Define the gaps: Which populations are covered and which are missed?
- Assess capacity & infrastructure to support diverse prevention efforts
- Determine who is needed to develop strategic plan and implement future efforts—team building
- *Community-integrated strategic planning*

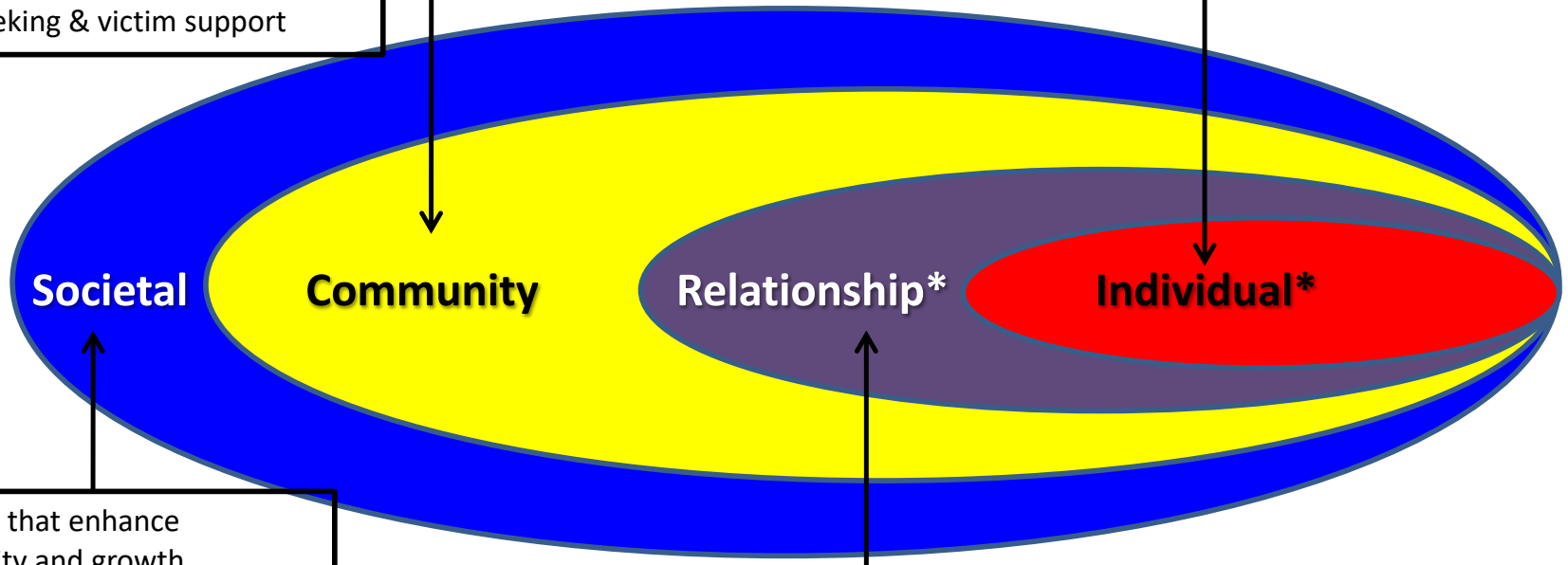
Practical Steps for Prevention Programming – 2

- **Organization & governance**
  - Accountability
  - Coordinating center (operations & data)
  - Coalitions and collective ownership
- **Geospatially distributed, age-specific, inclusive prevention 'mosaics' based on strategic plan & local mapping**
  - **"Placement" of evidence-based & 'best bet' prevention initiatives within the context of community settings, social media, and health systems**
- **Evaluation Paradigms**
  - ***Pre-defined parameters for evaluation*** **built into the planning and design of the program components**
  - **Upstream indicators of activities and outcomes – common risk markers – and downstream indicators of activities and outcomes**
  - **Anticipated extent of change, power analyses predetermine dimensions of program component size to attain meaningful/measurable outcomes**
- **Implementation**
  - **Stepped development – site-specific initiation and spread**
  - **Integration of research processes – coordinated staff and functional activities**

Ecological model: Protective factors (P) and interventions to prevent violence to self and others

(P) Coordinated community support systems
(P) Robust local faith & service organizations
Strengthen educational systems, vocational training programs—for youth & adults
Enhance neighborhoods & home ownership, & community safety
Promote "culture of safety": Reduce access to lethal means and illicit drugs; promote safe firearm storage
Combat "culture of violence"
Promote help-seeking & victim support

(P) Robust coping & resilience; (P) sense of belonging & self-worth
Identify & treat persons suffering severe psychiatric & substance/alcohol related disorders; interventions with suicidal individuals
Prevent alcohol & substance misuse
Prevent child abuse and victimization
Rehabilitate violent persons
Reduce access to lethal means



Support policies that enhance economic stability and growth
Assure economic safety nets for food, housing, health, & education
Reduce all forms of institutional discrimination; reduce stigma regarding mental distress and disorders
Promote cultural norms that discourage violence; promote help-seeking
Reduce access to lethal methods

(P) Family-communal coping; (P) interpersonal connectedness; (P) intergenerational support
Support high-risk parents; intervene in fractured families
Use community, health system, & court-based screening to detect intimate & family violence
Support families to enhance health, food security, economic opportunities, & access to education & vocational skills
Promote safe storage of lethal means

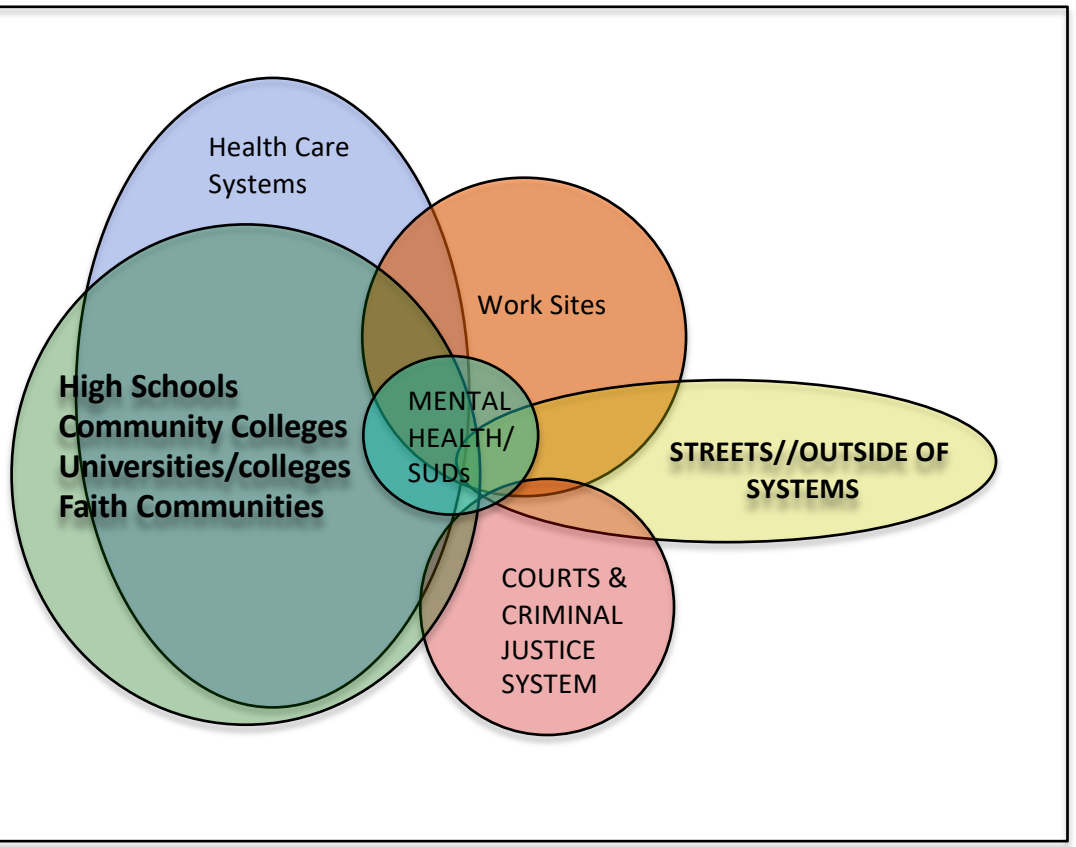
***Protective factors & interventions depend on age, sex & gender, and developmental challenges**

Settings for Collaborative Community Prevention: *Youth & Young Adults*

Culture of Safety & Caring

Universal Prevention: Global & Niche Messaging; Means Safety

State Agencies, Communities, & NGOs



Social Media

Data Systems & Surveillance

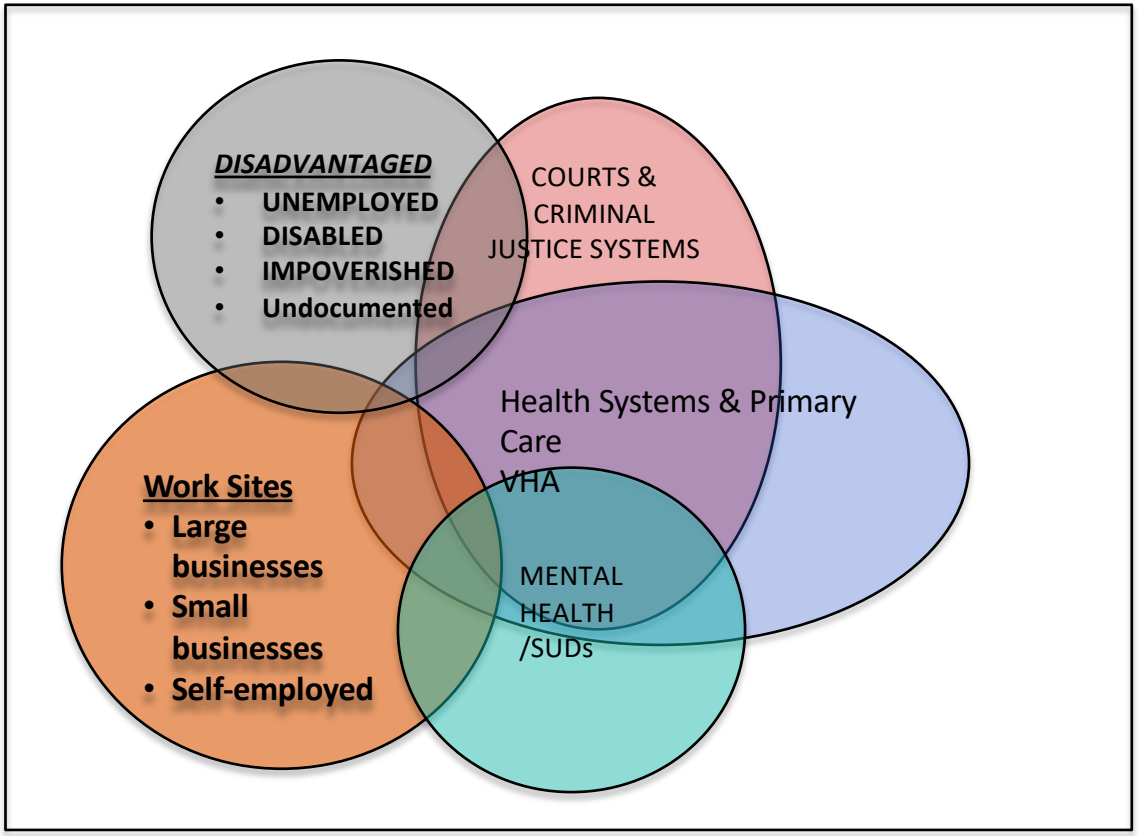
CAPs = *setting to encounter higher risk persons*

Settings for Collaborative Community Prevention: *Adults*

Culture of Safety & Caring

Universal Prevention: Global & Niche Messaging; Means Safety

State Agencies, Communities, & NGOs



Social Media

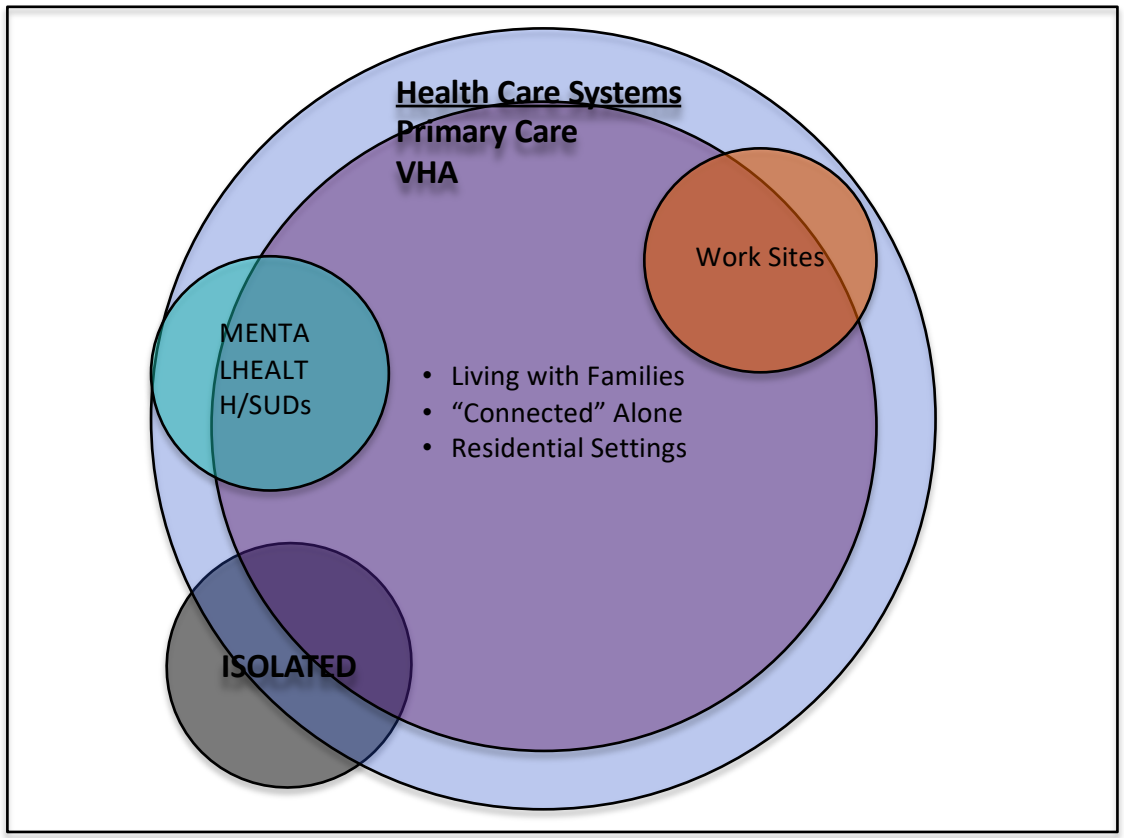
Data Systems & Surveillance

CAPs = *setting to encounter higher risk persons & higher risk groups*

Settings for Collaborative Community Prevention: *Elders*

Culture of Safety & Caring

Universal Prevention: Global & Niche Messaging; Means Safety



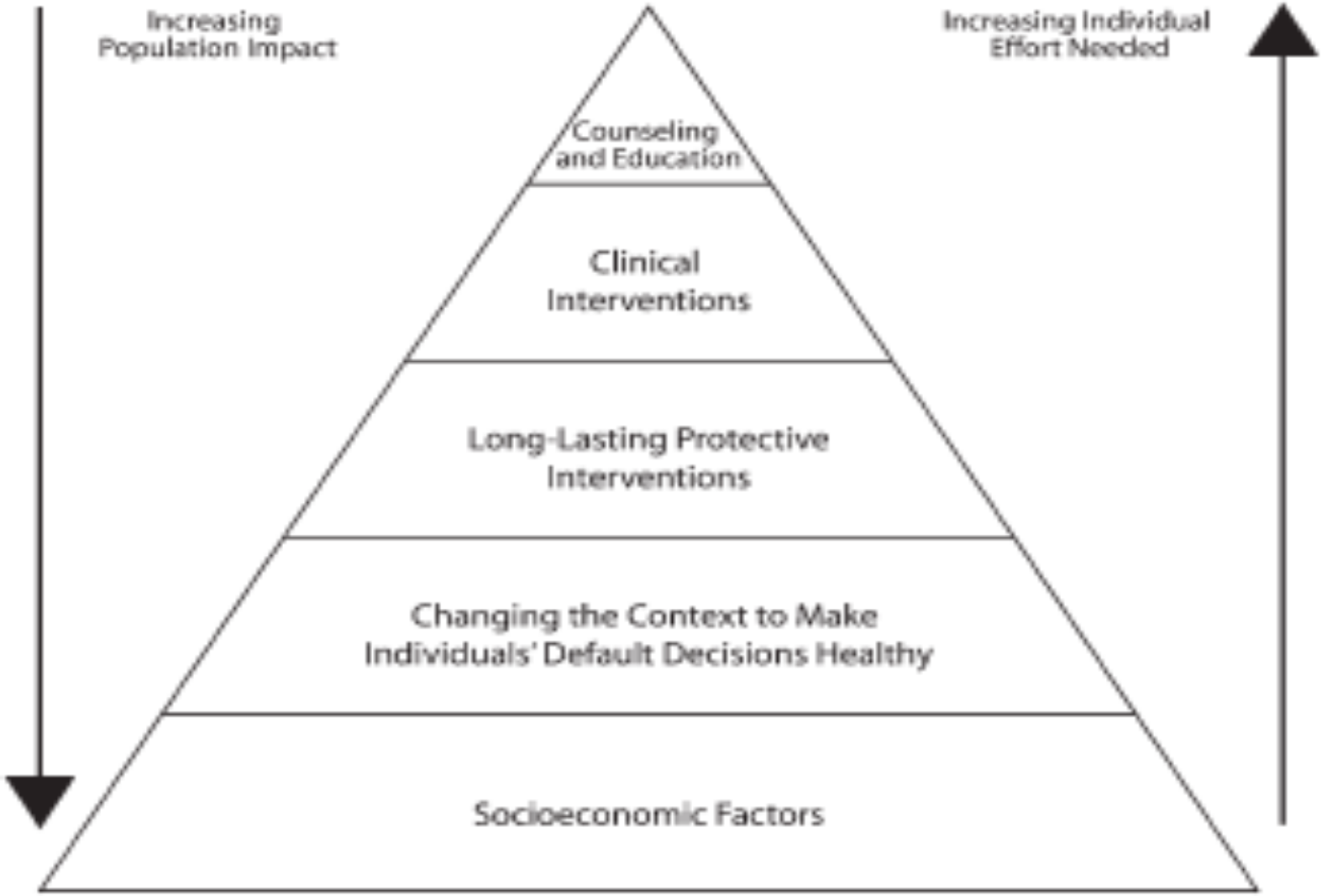
State Agencies, Communities, & NGOs

Social Media

Data Systems & Surveillance

CAPs = *setting to encounter higher risk persons & higher risk group*

The Health Impact Pyramid



Frieden TH: A Framework for Public Health—The Health Impact Pyramid.
***Am J Public Health* 2010; *100*:590-595.**

Framing Questions for Designers of Suicide Prevention Programs

- What are the broad goals & specific intervention and the proposed program?
- Where does this program fit in the overall framework (strategy, model) of suicide prevention and clinical interventions?
- Who do you expect to reach with this effort?
- Who will you miss?
- What will you be changing?
- How will you measure these changes?
- Can the program and its results be exported widely?
- Can the program be sustained after its ardent founders have moved on?

Outcomes!

- **Without scientifically collected and scrutinized *data*, policy implementation will be limited to "intuition," which is subject to multiple observer and interpreter biases.**
- **Without well-designed trials and *rigorous evaluation studies*, it will be impossible to assess whether *intuitively appealing "face valid" interventions* save lives and warrant broad dissemination across communities.**

ICRC-S

Injury Control Research Center for Suicide Prevention

University of Rochester Medical Center

EDC Learning transforms lives.

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