

Suicide in Oklahoma

Suicide Prevention Conference
June 4, 2015

Cox Business Center – Tulsa Conference Center

Injury Prevention Service
Oklahoma State Department of Health



Background

◆ National Violent Death Reporting System

- CDC Grant since 2003 – Oklahoma began in 2004
- 32 States
 - ◆ 14 states added in 2014
- Data sources
 - ◆ Required – Medical Examiner reports, death certificates, law enforcement reports
 - ◆ Optional
 - Supplementary homicide reports, newspapers, hospital, crime lab report, EMS report
 - ◆ Optional data collection modules
 - Child fatality review
 - Intimate Partner Violence
 - Overdose



NVDRS Data Collection

- ◆ Document based
- ◆ Web-based Data Collection System
 - Death certificate data electronically imported
 - ME, PR, CFR data entered by hand
- ◆ NVDRS Coding Guidelines
 - Case definitions
 - Variables
 - Document specific



OVDRS Data Collection

- ◆ Data collected from each data source
 - *Victims and suspects*
 - ◆ Demographics
 - ◆ Drug/alcohol
 - *Relationships*
 - *Event narratives*
 - *Circumstances*
 - ◆ Suicide - Mental health, physical health problem, history
 - ◆ Homicide - Intimate partner violence, drugs, gang-related
 - ◆ Unintentional firearm – context and mechanism of injury
 - *Weapons*
 - ◆ Type, caliber, gauge, owner, etc.



Examples of Unique Elements of Each Data Source

| Law Enforcement | Vital Statistics | Medical Examiner | OVDRS |
|--|---|--|--|
| Suspect data | Work-related injuries/ Occupation and industry | Toxicology testing (drug and alcohol information) | Combine unique elements from all data sources for a comprehensive picture of violent deaths statewide. |
| Weapon information | Education level | Premise and type of injury | |
| Risk factors/ Past criminal history | Demographics including birth information | Medical history and manner of death | |



Cases Included in OKVDRS

- ◆ Homicides
- ◆ Suicides
- ◆ Undetermined Manner Deaths
- ◆ Unintentional Firearm Injury Deaths
- ◆ Legal Interventions
- ◆ Terrorism Deaths



Data Dissemination

- ◆ Annual Summary of Violent Deaths
- ◆ *Injury Updates* - very detailed special topic report
- ◆ *OKVDRS Brief Report* – more reader friendly than *Injury Update*
- ◆ Quarterly updates to data contributors
- ◆ Journal publications
- ◆ CDC Success Stories
- ◆ Special data requests
- ◆ News releases



OKVDRS Suicide Case Definition

- ◆ Manner of death ruled as *suicide*
- ◆ ICD-10 Underlying cause of death
 - Intentional self harm, X60-X84, Y87.0 (more than one year after injury)
- ◆ “A death resulting from the intentional use of force against oneself. A preponderance of evidence should indicate that the use of force was intentional.”



Suicide Data

- ◆ Vital Records (death certificates)
 - ◆ OK2Share (Oklahoma Statistics on Health Available for Everyone)
 - ◆ WISQARS (Web-based Injury Statistics Query and Reporting System)
- ◆ Medical Examiner reports (ME)
- ◆ Hospital Discharge Data – OK2Share



Suicide Data

- ◆ Oklahoma Violent Death Reporting System
 - Combines Vital Records, ME, and law enforcement reports into one comprehensive database
 - ◆ Demographics
 - ◆ Injury and death
 - ◆ Circumstances
 - ◆ Weapons
 - ◆ Suspects
 - ◆ Toxicology

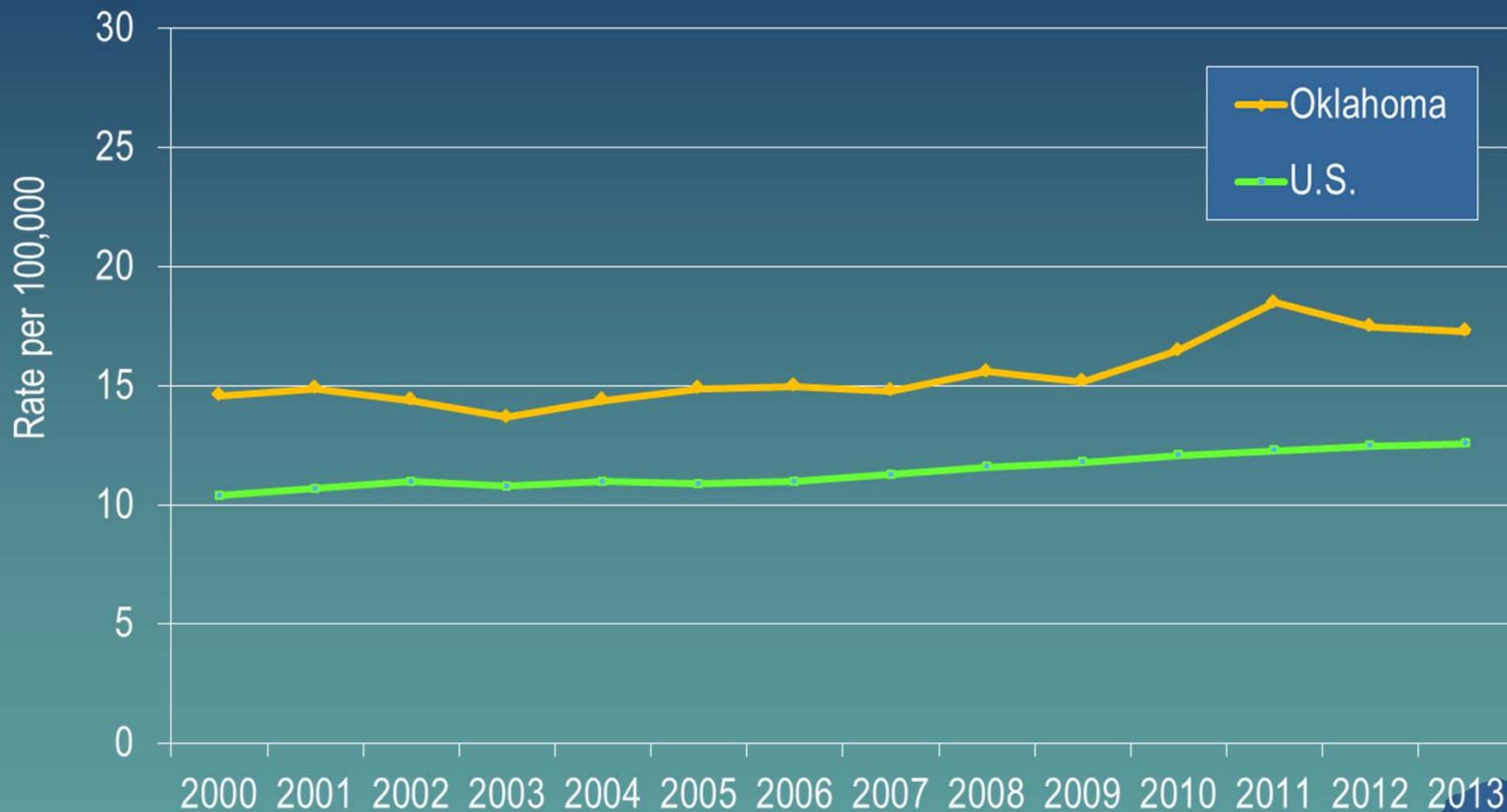


Suicide in the United States

- ◆ In the U.S., suicide is the 10th leading overall cause of death with 41,149 deaths in 2013.
- ◆ In the U.S., an average suicide costs nearly \$1.2 million a year in medical and work lost (CDC, 2010 U.S. Prices)
 - This amounts to \$44.7 billion annually nationally
 - ◆ \$778 million in medical and work loss cost in Oklahoma



Age-Adjusted Suicide Death Rates in Oklahoma and the U.S., 2000-2013



*WISQARS



Suicide in Oklahoma

- ◆ Most common type of violent death
- ◆ From 2004-2013, 5,873 suicide deaths
 - Annual rate = 23.1 per 100,000 population
 - Estimated 599 deaths per year
 - Average age = 45.1 years (range, 9 – 101)
 - 79% male, 21% female

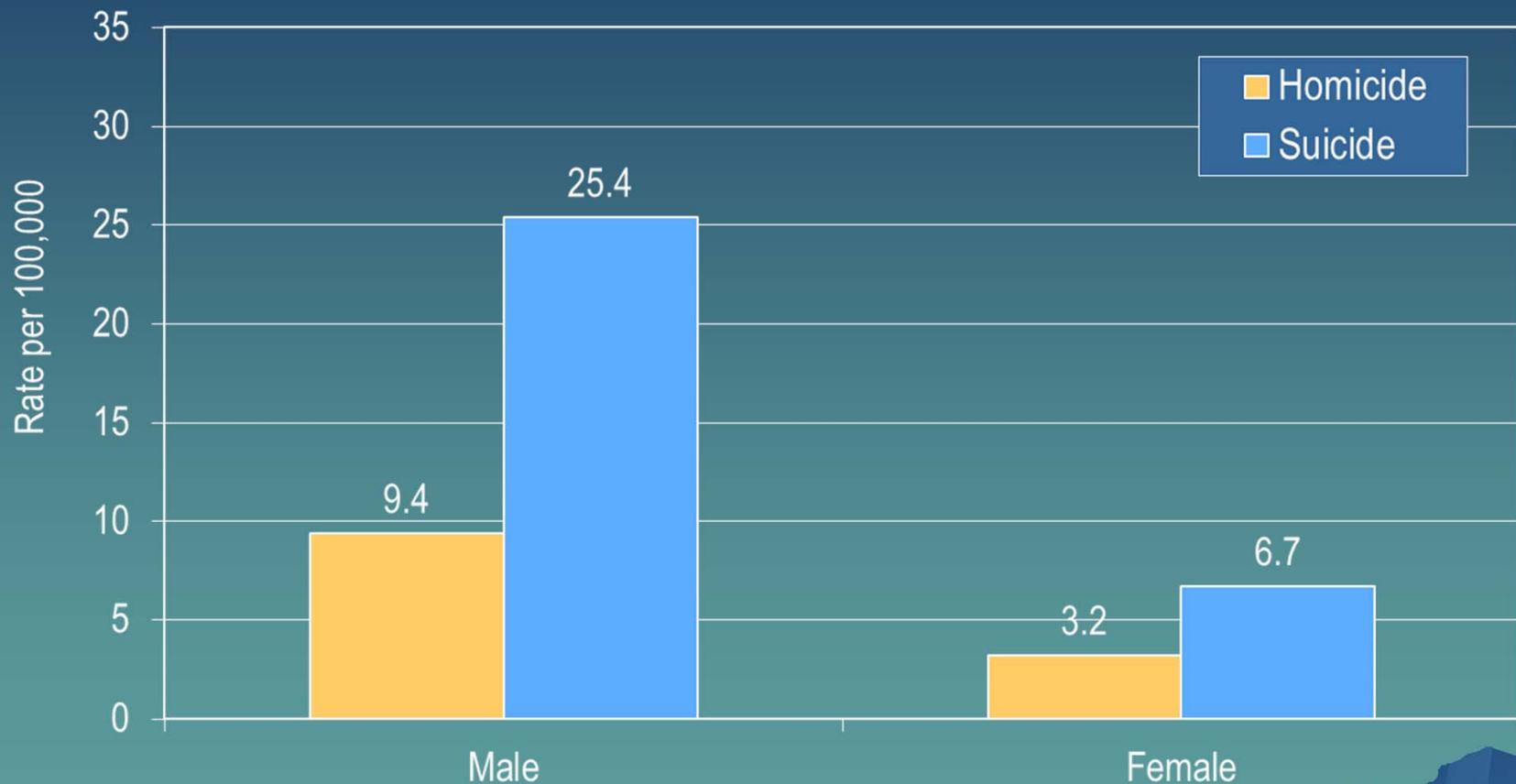
Oklahoma Violent Death Reporting System



10 Leading Causes of Death by Age, Oklahoma, 2004-2013

| Rank | Age Groups | | | | | | | | | | All Ages |
|------|------------------------------------|------------------------------------|--|--|--|--------------------------------------|--------------------------------------|---|---|--|--|
| | <1 | 1-4 | 5-9 | 10-14 | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65+ | |
| 1 | Congenital Anomalies 943 | Unintentional Injury 327 | Unintentional Injury 240 | Unintentional Injury 200 | Unintentional Injury 2,522 | Unintentional Injury 2,754 | Unintentional Injury 3,030 | Malignant Neoplasms 6,946 | Malignant Neoplasms 15,360 | Heart Disease 74,687 | Heart Disease 96,491 |
| 2 | Short Gestation 630 | Congenital Anomalies 94 | Malignant Neoplasms 46 | Malignant Neoplasms 59 | Suicide 765 | Suicide 1,027 | Heart Disease 2,018 | Heart Disease 6,793 | Heart Disease 12,213 | Malignant Neoplasms 52,308 | Malignant Neoplasms --- |
| 3 | SIDS 325 | Homicide 78 | Homicide 27 | Suicide 52 | Homicide 592 | Homicide 558 | Malignant Neoplasms 1,671 | Unintentional Injury 3,781 | Chronic Low. Respiratory Disease 3,278 | Chronic Low. Respiratory Disease 20,262 | Chronic Low. Respiratory Disease 24,842 |
| 4 | Maternal Pregnancy Comp. 139 | Malignant Neoplasms 61 | Congenital Anomalies 26 | Homicide 30 | Malignant Neoplasms 207 | Heart Disease 525 | Suicide 1,109 | Liver Disease 1,407 | Unintentional Injury 2,514 | Cerebro-vascular 17,092 | Unintentional Injury 21,954 |
| 5 | Unintentional Injury 129 | Influenza & Pneumonia 30 | Chronic Low. Respiratory Disease 12 | Congenital Anomalies 26 | Heart Disease 145 | Malignant Neoplasms 470 | Liver Disease 467 | Suicide 1,248 | Diabetes Mellitus 2,026 | Alzheimer's Disease 10,021 | Cerebro-vascular 20,286 |
| 6 | Bacterial Sepsis 120 | Heart Disease 24 | Cerebro-vascular --- | Heart Disease 16 | Congenital Anomalies 54 | Diabetes Mellitus 123 | Homicide 403 | Chronic Low. Respiratory Disease 1,017 | Cerebro-vascular 1,779 | Diabetes Mellitus 8,168 | Diabetes Mellitus 11,699 |
| 7 | Placenta Cord Membranes 108 | Septicemia 13 | Heart Disease --- | Influenza & Pneumonia 14 | Complicated Pregnancy 44 | Cerebro-vascular 93 | Diabetes Mellitus 354 | Diabetes Mellitus 989 | Liver Disease 1,507 | Influenza & Pneumonia 6,744 | Alzheimer's Disease 10,147 |
| 8 | Respiratory Distress 103 | Benign Neoplasms 11 | Influenza & Pneumonia --- | Chronic Low. Respiratory Disease 11 | Influenza & Pneumonia 37 | Liver Disease 91 | Cerebro-vascular 284 | Cerebro-vascular 966 | Suicide 800 | Unintentional Injury 6,457 | Influenza & Pneumonia 8,228 |
| 9 | Circulatory System Disease 82 | Cerebro-vascular 10 | Benign Neoplasms --- | Cerebro-vascular --- | Diabetes Mellitus 34 | Influenza & Pneumonia 79 | HIV 236 | Viral Hepatitis 609 | Influenza & Pneumonia 733 | Nephritis 4,877 | Nephritis 5,952 |
| 10 | Necrotizing Enterocolitis 72 | Perinatal Period --- | Septicemia --- | Septicemia --- | Chronic Low. Respiratory Disease 21 | HIV 72 | Influenza & Pneumonia 185 | Influenza & Pneumonia 372 | Septicemia 656 | Septicemia 3,107 | Suicide 5,884 |

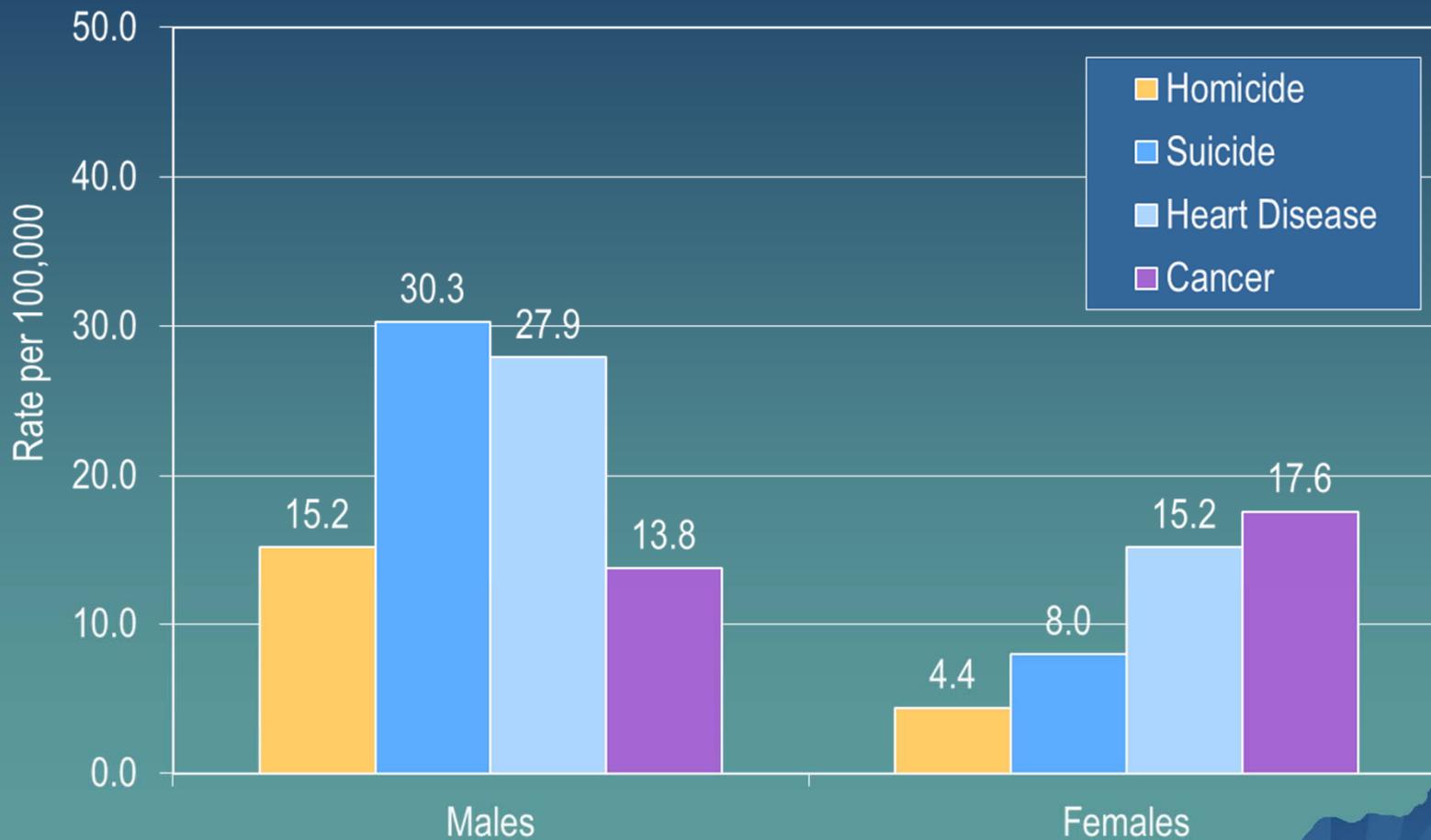
Gender-Specific Suicide and Homicide Rates, Oklahoma, 2004-2013



Oklahoma Violent Death Reporting System



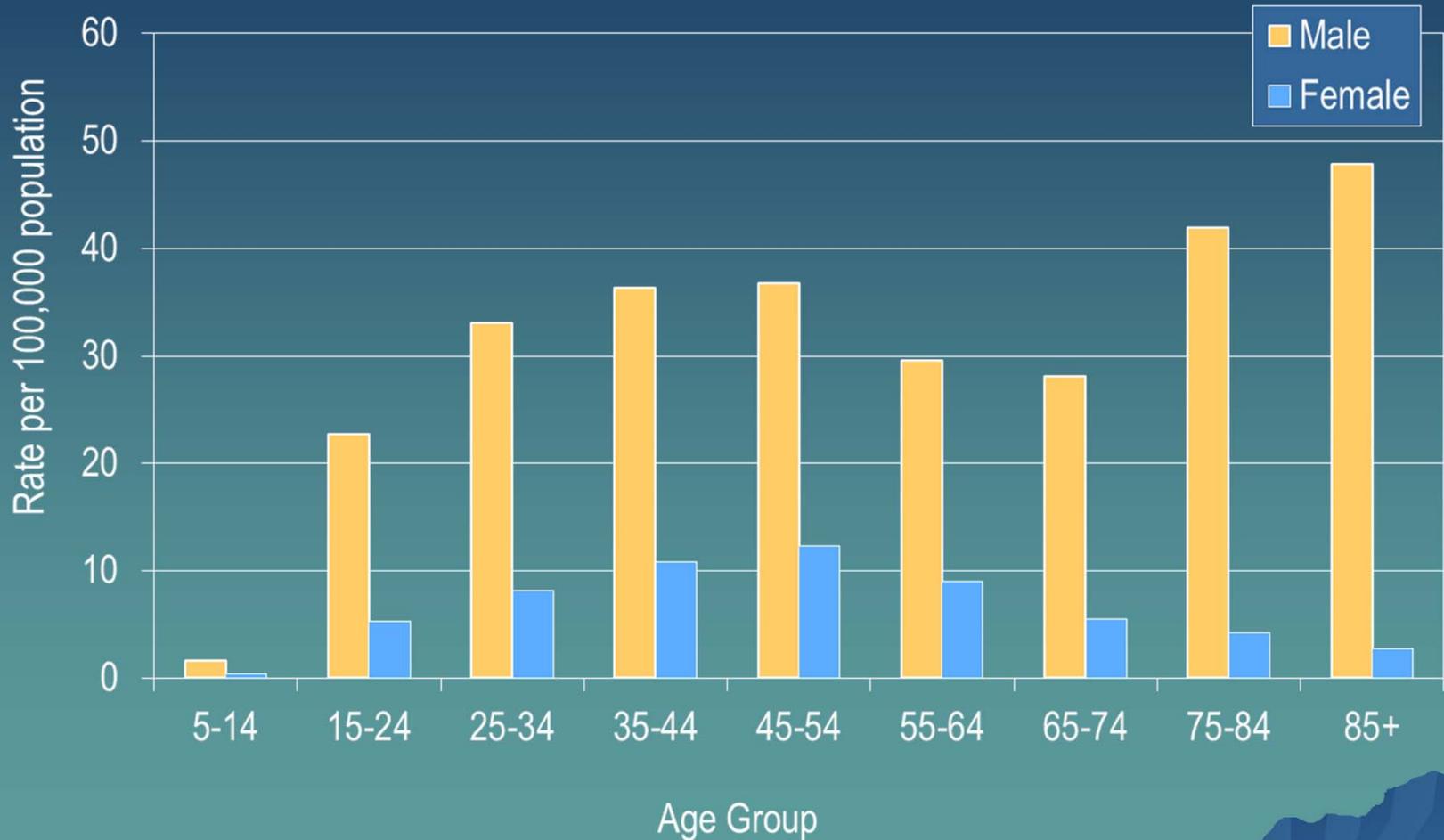
Gender-Specific Death Rates of Persons 15-44 Years of Age, Oklahoma, 2004-2013 (Selected Causes)



*Oklahoma Violent Death Reporting System and OK2Share



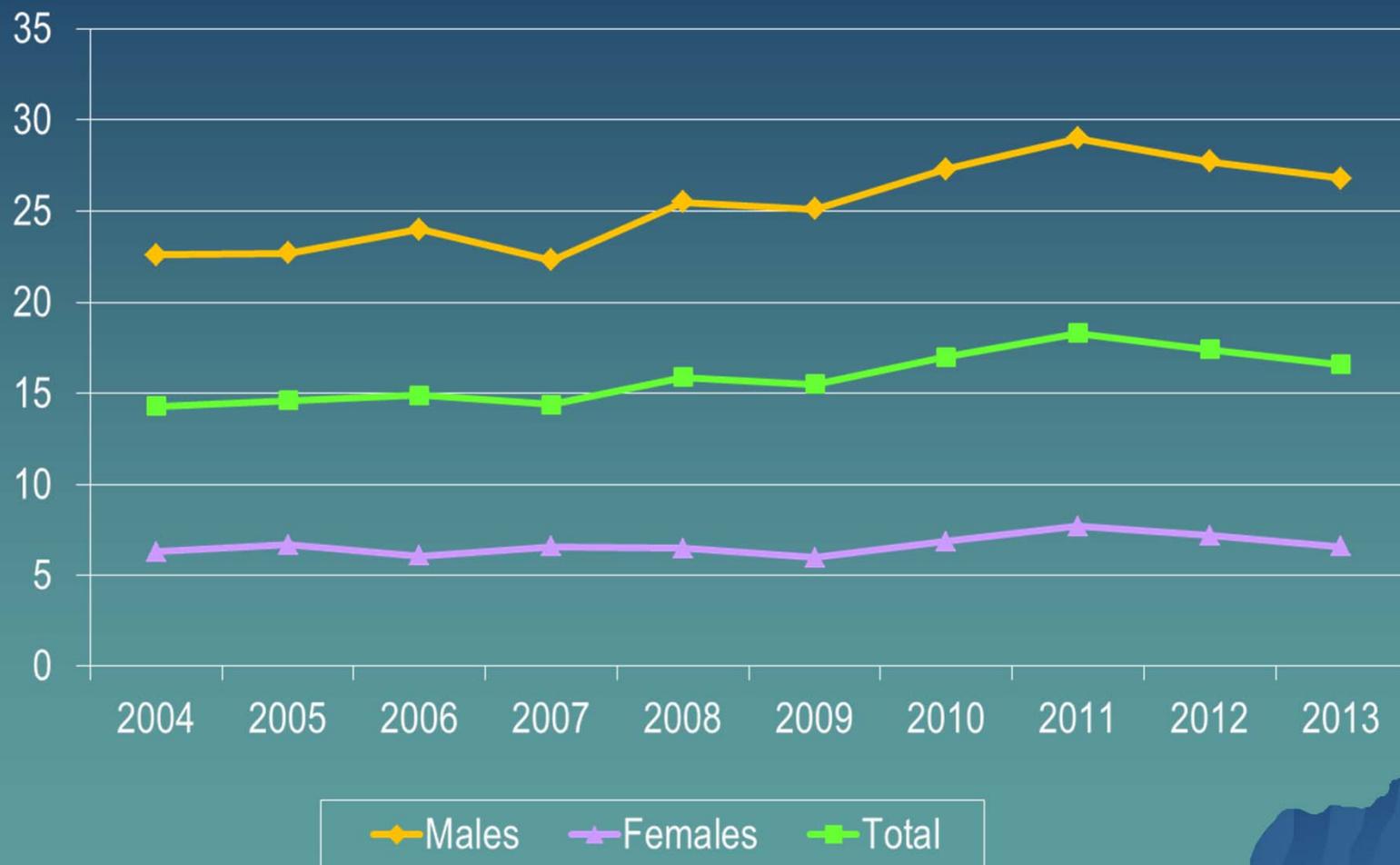
Age and Gender Specific Rates of Suicide, Oklahoma, 2004-2013



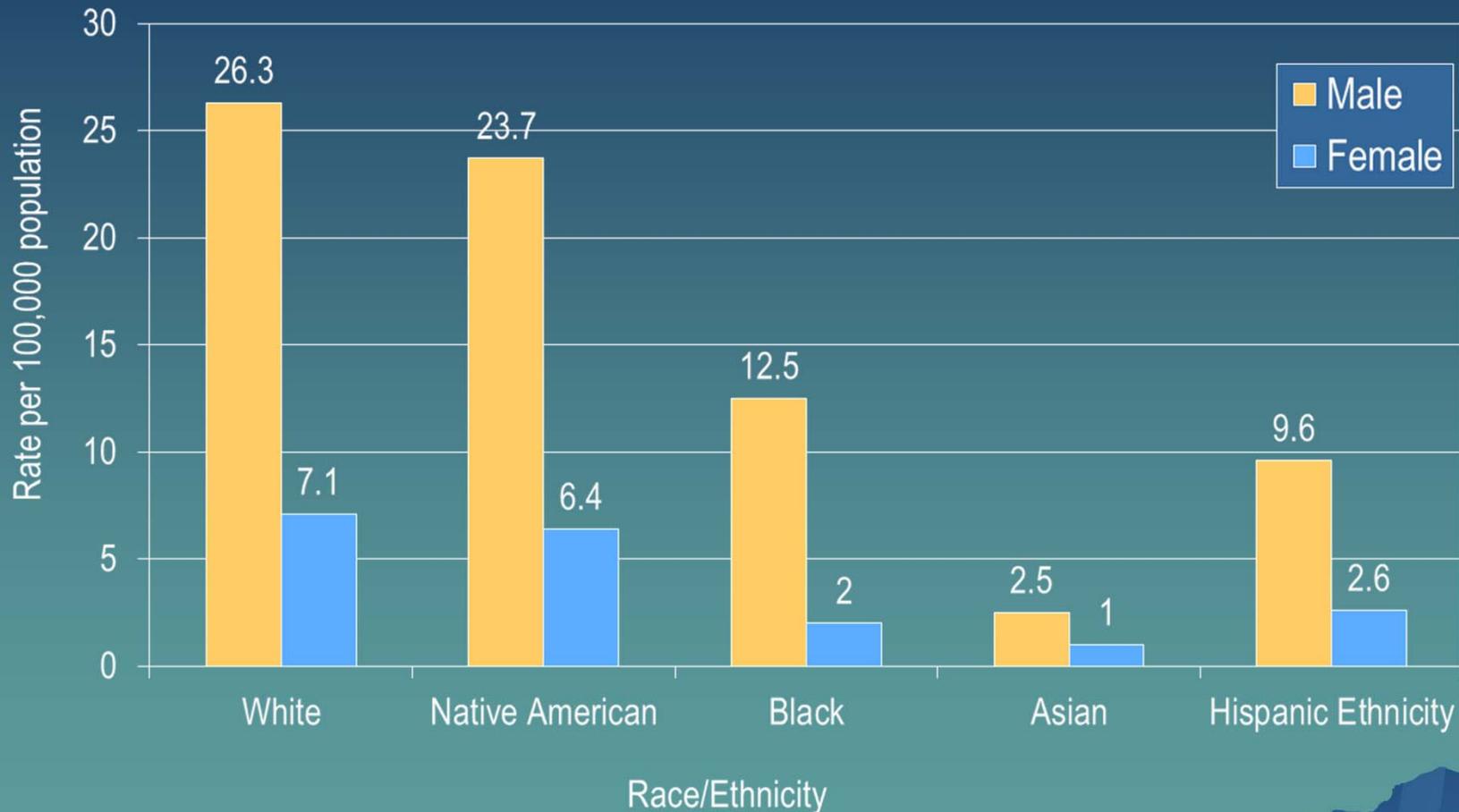
Oklahoma Violent Death Reporting System



Suicide Rates by Year of Death Oklahoma, 2004-2013



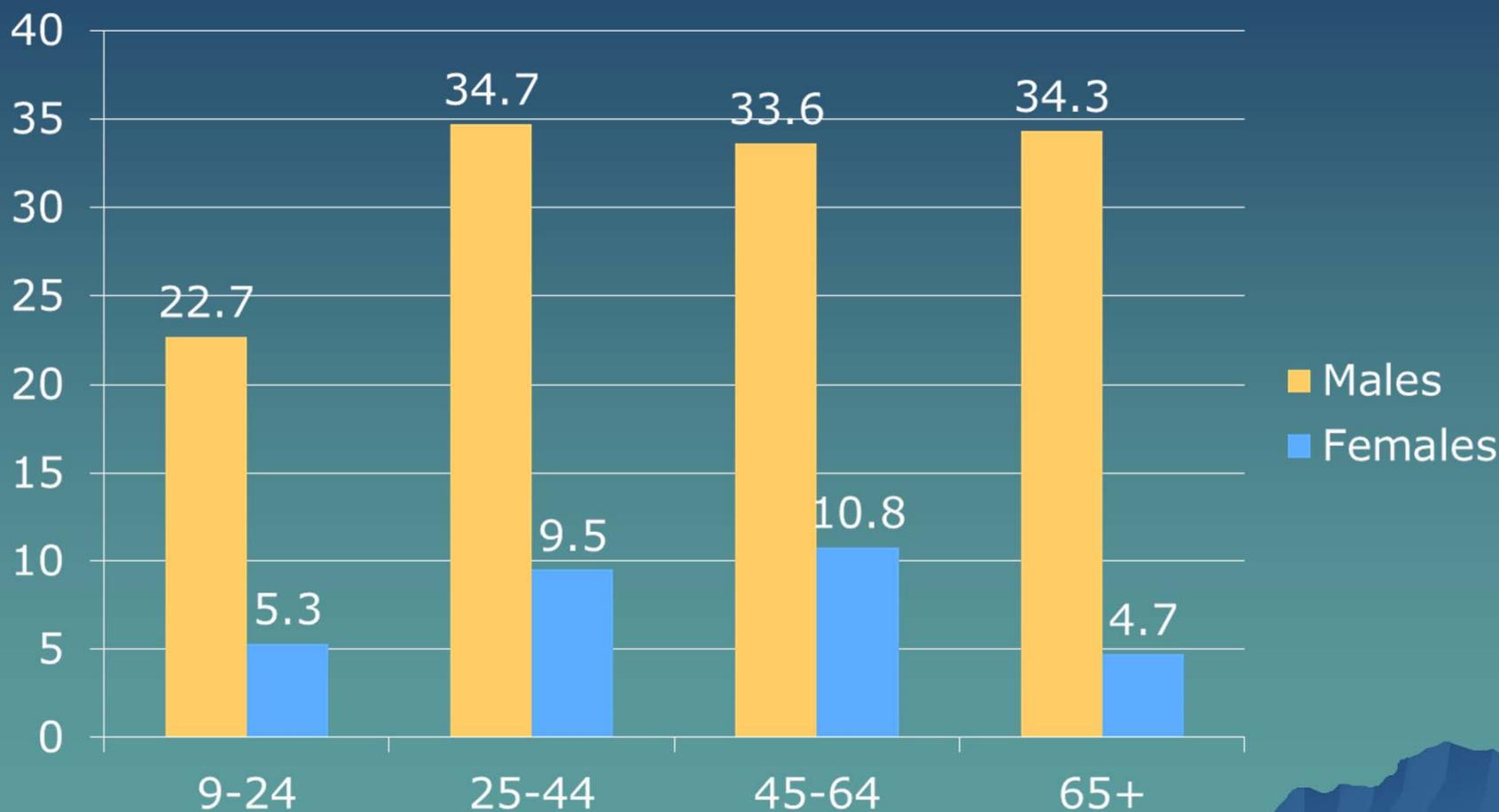
Gender, Race, and Ethnicity Specific Rates of Suicide, Oklahoma, 2004-2013



Oklahoma Violent Death Reporting System



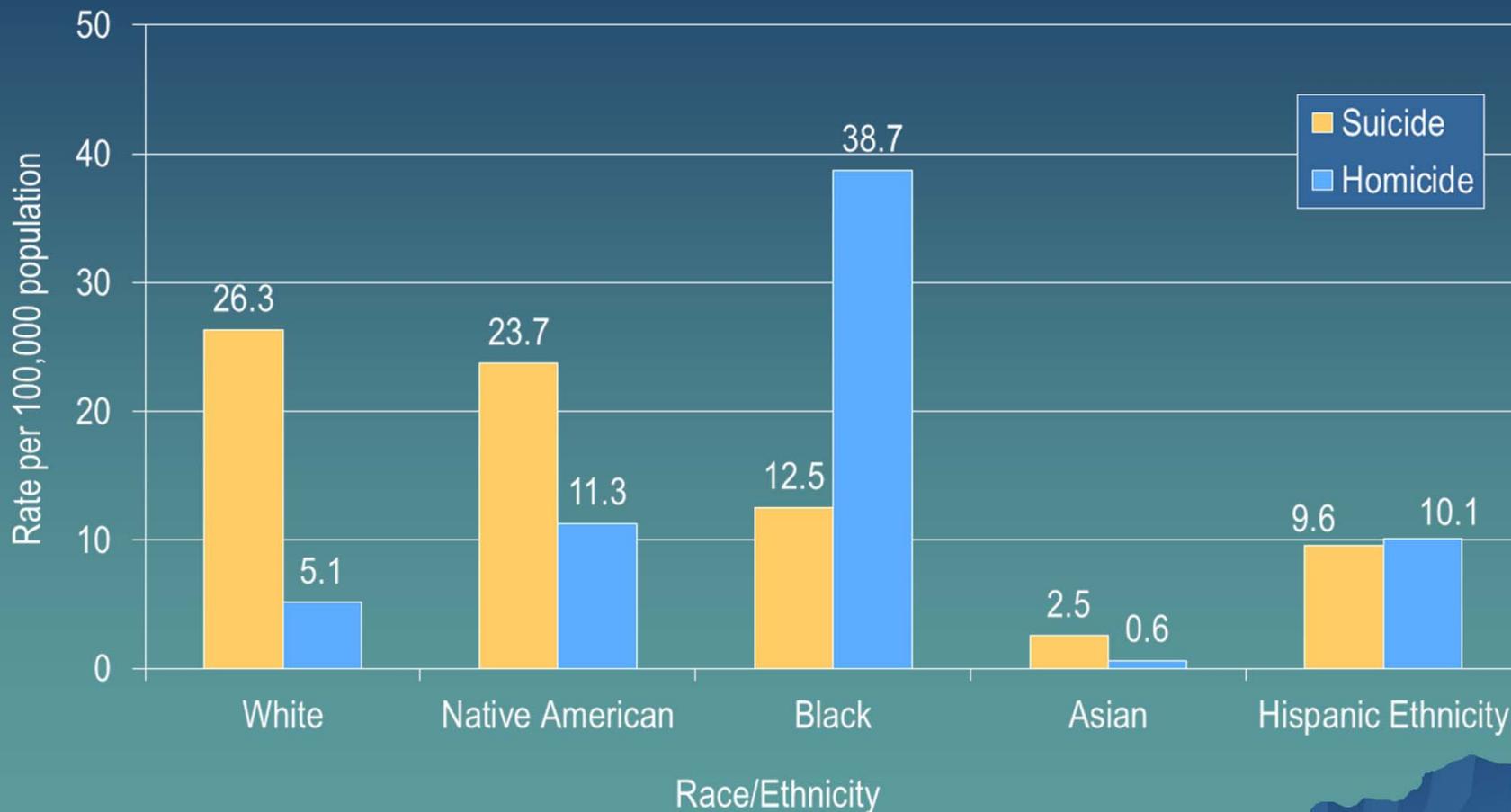
Age Group and Gender Rates of Suicide, Oklahoma, 2004-2013



Oklahoma Violent Death Reporting System



Male Homicide and Suicide Rates by Race, and Ethnicity, Oklahoma, 2004-2013



Oklahoma Violent Death Reporting System



Leading Suicide Methods/Mean

- ◆ Firearms (61% of suicides)
 - 72% handguns
 - 12% rifles
 - 15% shotguns
- ◆ Hanging/strangulation (21%)
- ◆ Poisoning (14%)
 - 57% prescription drugs
 - 15% carbon monoxide/gas vapor
 - 4% OTC
 - 2% recreational drugs or alcohol
 - 2% household products

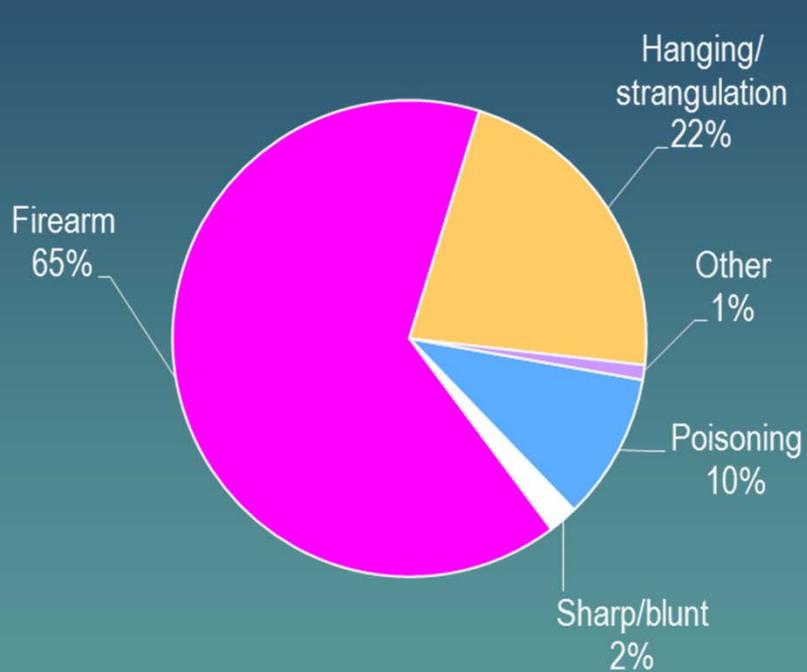


Other Suicide Methods/Mean

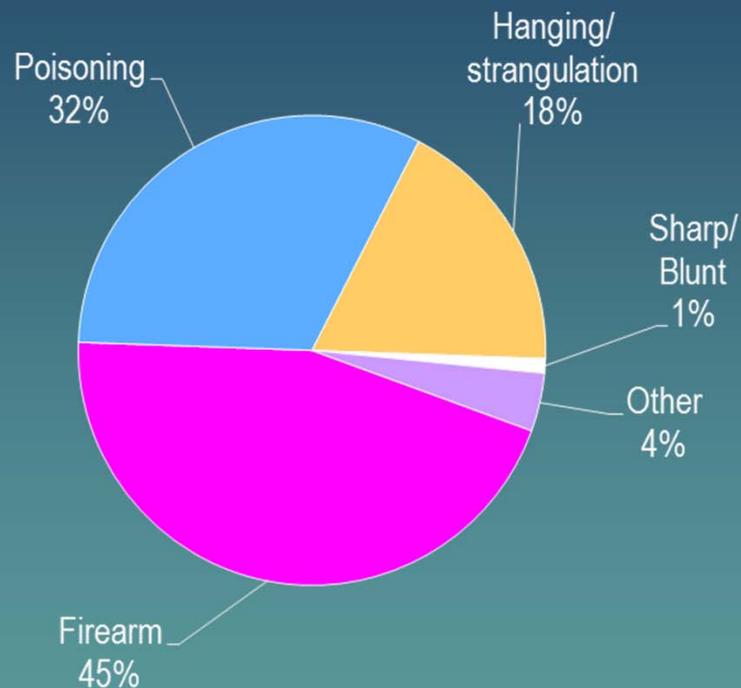
- ◆ Sharp/blunt instruments
- ◆ Motor vehicles/transportation
- ◆ Drowning
- ◆ Fire
- ◆ Fall/jump



Methods of Suicide by Gender Oklahoma, 2004-2013



Males



Females

Oklahoma Violent Death Reporting System



Circumstances

◆ Mental Health, Substance Abuse, and other Addictions

- Current depressed mood
- Current diagnosed mental health problem
- Mental illness diagnosis
- Current mental health treatment
- Ever treated for mental health or substance abuse
- Alcohol problem
- Other substance abuse problem
- Other addiction

◆ Relationship & Life Stressor

- Intimate partner problem
- Family relationship problem
- Other relationship problem
- Abuse or neglect led to death
- History of abuse or neglect as a child
- Previous perpetrator of violence in the past month
- Previous victim of violence in the past month
- Physical fight (2people)
- Argument
 - ◆ Timing of argument



Circumstances

◆ Crime & Criminal Activity

- Precipitated by another crime
- First crime in progress
- Terrorist attack

◆ Suicide Specific Circumstances

- History of suicide attempts
- Recently disclosed suicidal thoughts/plan to suicide
 - ◆ To whom
- Left a suicide note
- History of expressed suicidal thoughts or plans

◆ Crisis in past 2 weeks or upcoming 2 weeks

◆ Life Stressors

- Contributing criminal legal problem
- Civil legal problems
- Physical health problem
- Job problem
- Financial problem
- School problem
- Eviction/loss of home
- Suicide of friend or family
- Non-suicide death of friend or family
- Anniversary of traumatic event
- Disaster exposure



Leading Circumstances Associated with Suicide Oklahoma, 2004-2013

- ◆ 36% current depressed mood
- ◆ 34% intimate partner problem
- ◆ 35% one or more diagnosed or treated mental health problems
 - Depression (78%), bipolar illness (17%), anxiety disorder (8%), schizophrenia (7%), PTSD (3%)

Oklahoma Violent Death Reporting System



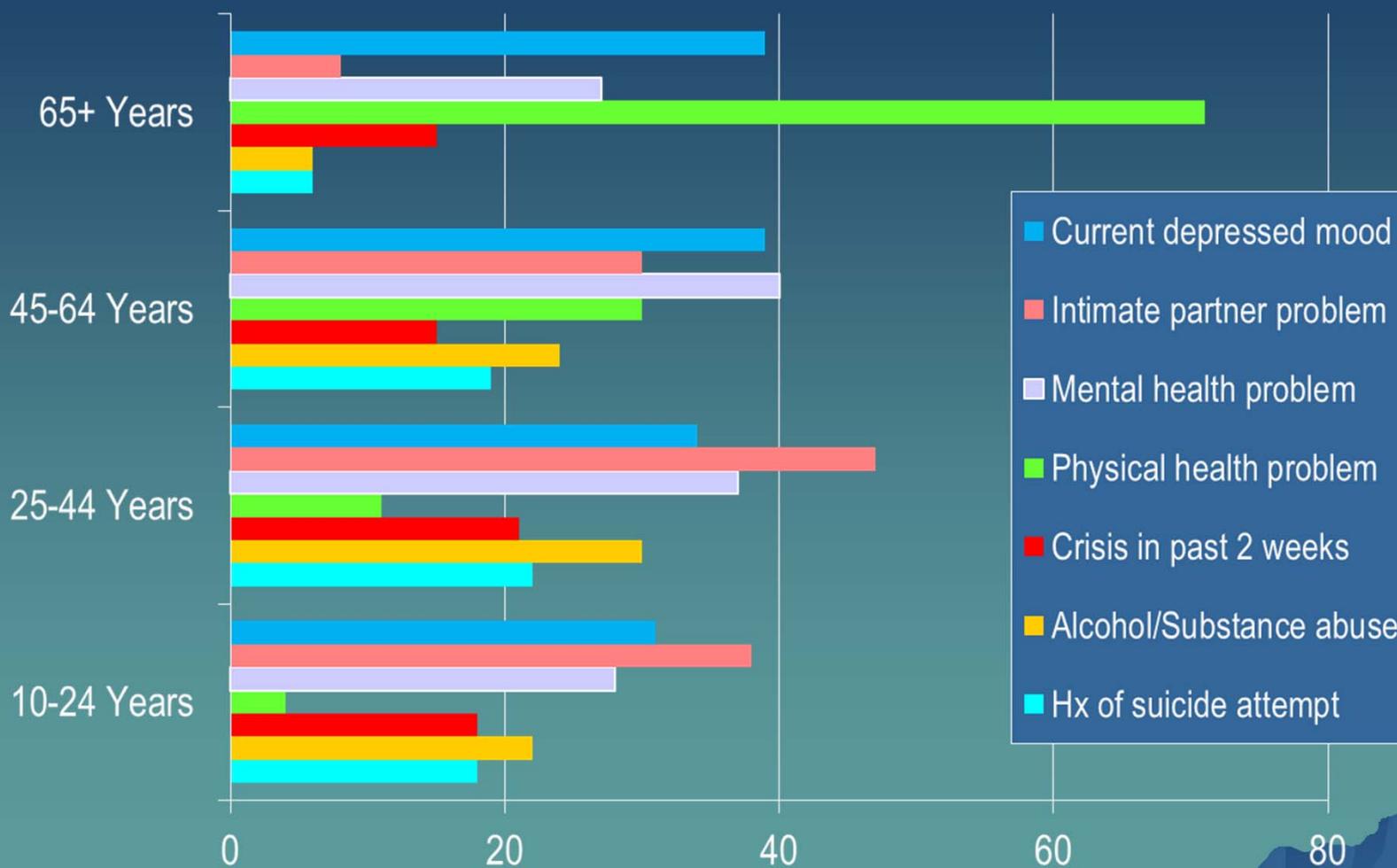
Suicide Circumstances Oklahoma, 2004-2013

- ◆ 25% physical health problem
- ◆ 18% crisis in past two weeks
- ◆ 14% substance abuse problem
- ◆ 14% alcohol problem
- ◆ 10% financial problem
- ◆ 10% job problem
- ◆ 10% Recent criminal legal problem

Oklahoma Violent Death Reporting System



Suicide Circumstances by Life Stage Oklahoma, 2004-2013



Oklahoma Violent Death Reporting System



Suicide Circumstances Oklahoma, 2004-2013

- ◆ 28% previously stated intent to kill themselves or suicidal feelings to another person
- ◆ 32% of persons tested were positive for alcohol
- ◆ 44% of persons tested were positive for drugs

Oklahoma Violent Death Reporting System

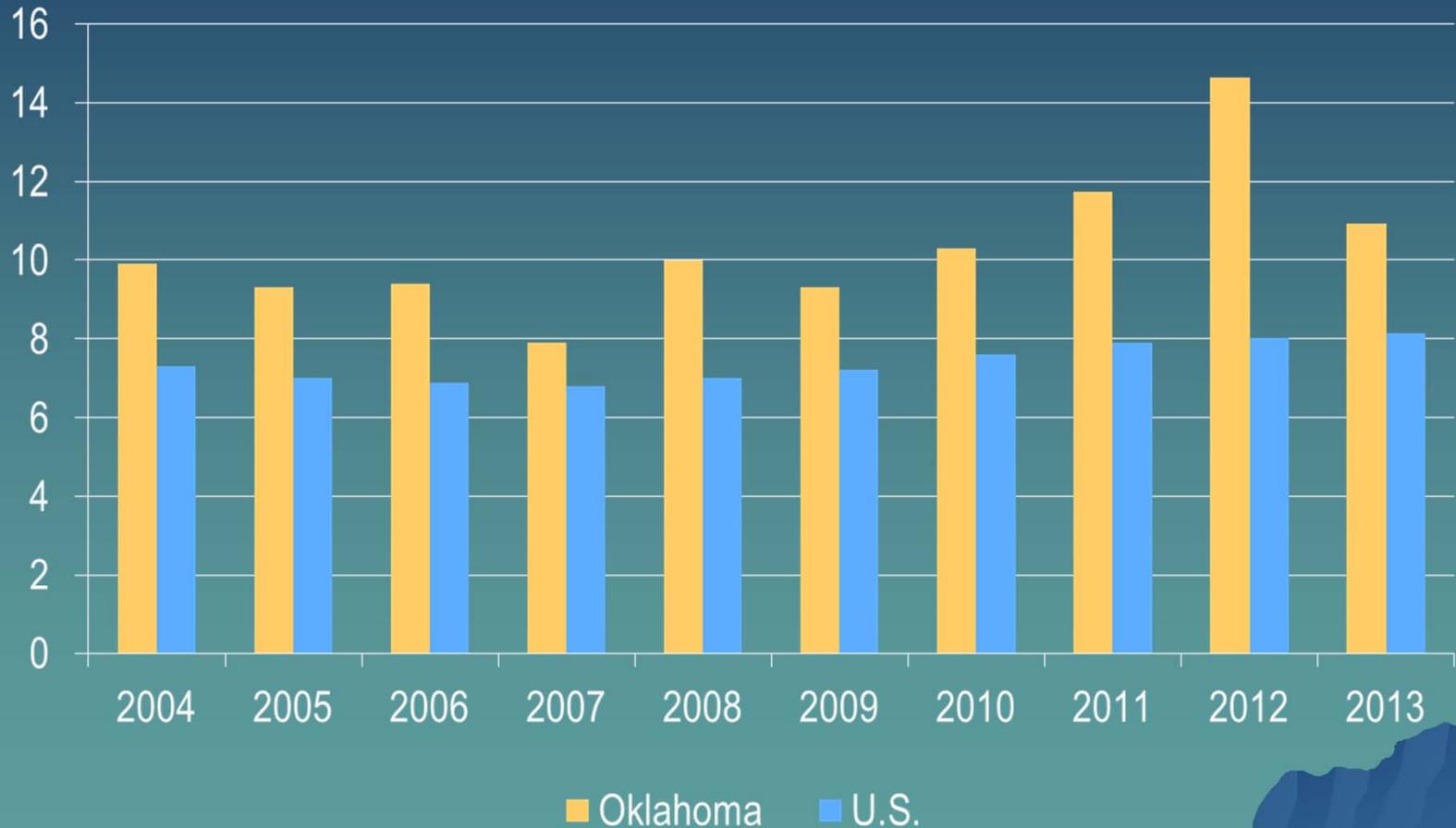


Top Circumstances by Gender, Oklahoma, 2004-2013

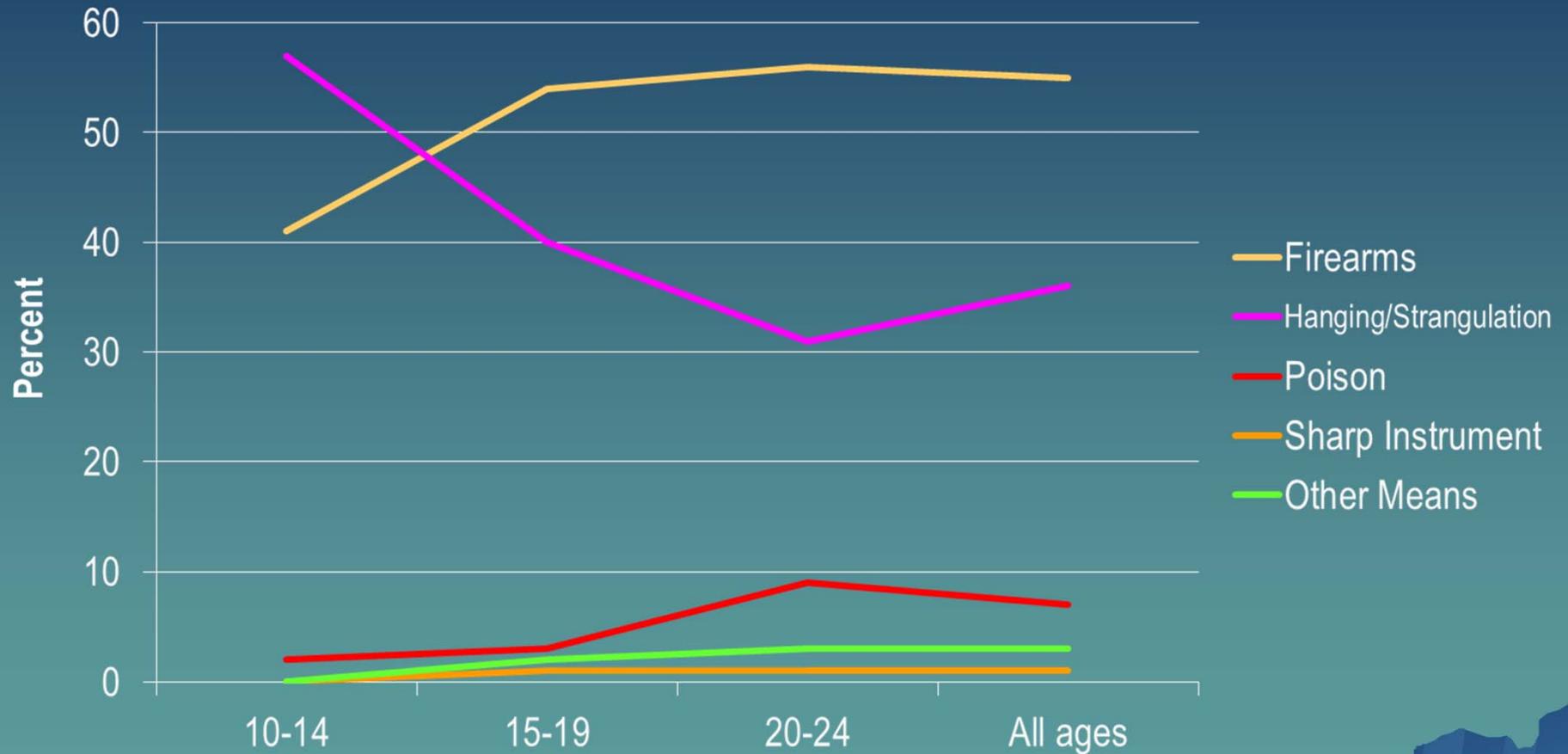
| Rank | Males | Females |
|------|---------------------------------------|---------------------------------------|
| 1 | Current Depressed Mood 36% | Current Mental Health Problems 50% |
| 2 | Intimate Partner Problems 35% | Current Depressed Mood 37% |
| 3 | Current Mental Health Problems 31% | History of Suicide Attempts 31% |
| 4 | Physical Health Problems 25% | Intimate Partner Problems 29% |
| 5 | Crisis in past 2 weeks 19% | Physical Health Problems 29% |
| 6 | Alcohol Problem 15% | Substance Abuse 17% |
| 7 | History of Suicide Attempts 14% | Crisis in past 2 weeks 14% |
| 8 | Substance Abuse Problem 13% | Alcohol Problem 11% |



Suicide Rates among Persons 10-24 Years of Age, Oklahoma and U.S.



Method of Suicide Among Persons 10-24 Years of Age, Oklahoma, 2004-2013

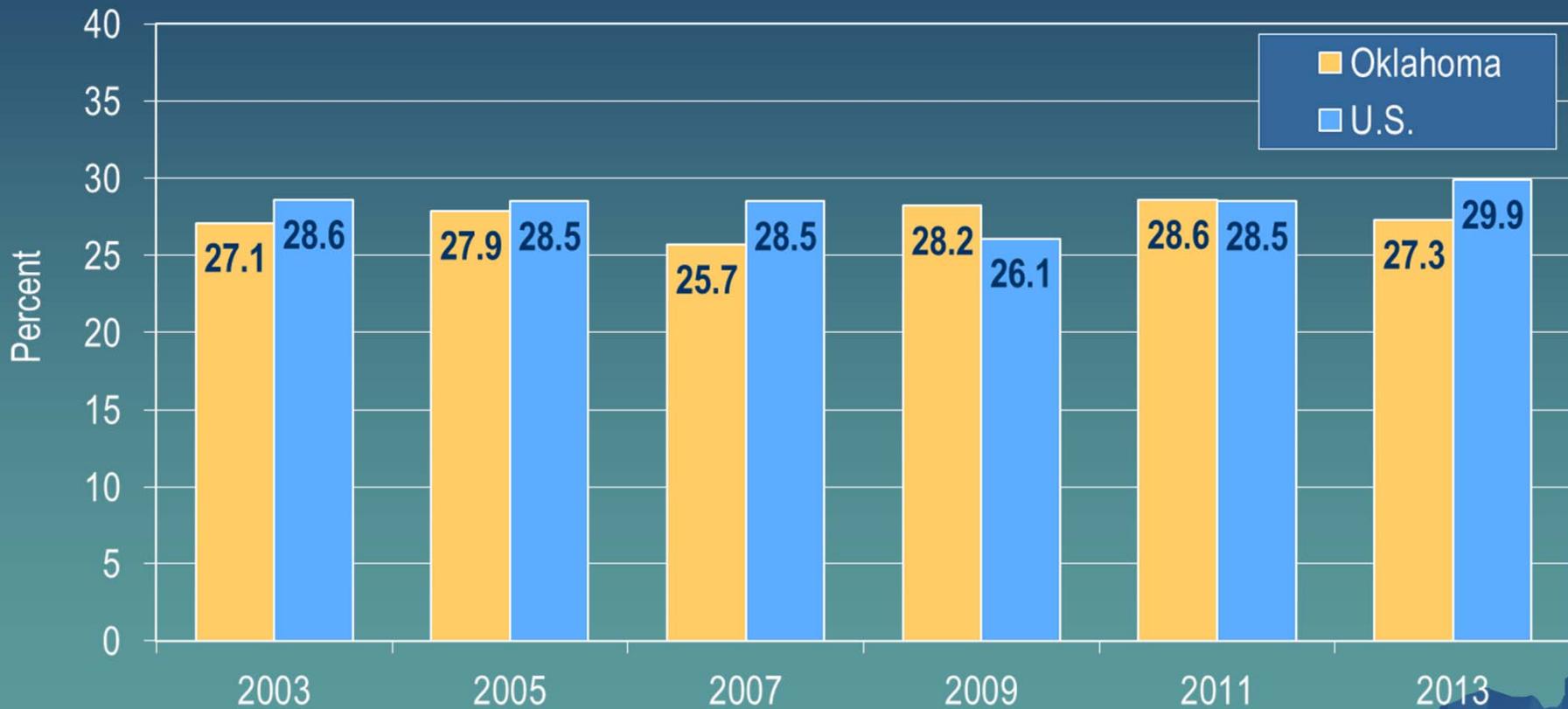


Oklahoma Violent Death Reporting System



U.S. and Oklahoma YRBS Students in Grades 9 – 12

*Who Felt Sad and Hopeless the Previous 12 Months**



*Youth Risk Behavior Survey



U.S. and Oklahoma YRBS Students in Grades 9 – 12

*Who Seriously Considered Suicide the Previous 12 Months**



*Youth Risk Behavior Survey



U.S. and Oklahoma YRBS Students in Grades 9 – 12

*Made a Plan About How They Would Attempt Suicide**



*Youth Risk Behavior Survey



U.S. and Oklahoma YRBS Students in Grades 9 – 12

*Who Attempted Suicide During the Previous 12 Months**



*Youth Risk Behavior Survey



U.S. and Oklahoma YRBS Students in Grades 9 – 12

*Suicide Attempt Resulted in an Injury, Poisoning, or Overdose that had to be Treated by a Doctor or Nurse**



*Youth Risk Behavior Survey



[HTTP://OKVDRS.HEALTH.OK.GOV](http://OKVDRS.HEALTH.OK.GOV)

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Reports

- ◆ Alcohol-Related Suicides in Oklahoma
- ◆ Suicide among Veterans in Oklahoma



ALCOHOL-RELATED SUICIDES IN OKLAHOMA, 2004-2011



Outline

- ◆ Objectives
- ◆ Methods
- ◆ Results
 - Alcohol-Related Suicides
- ◆ Discussion
 - Strength/Limitations
 - Prevention



Objectives

1. Determine the prevalence of intoxication of suicide victims from 2004-2011
2. Examine socio-demographic and circumstance factors associated with alcohol-related suicides



Methods

- ◆ Data obtained from Oklahoma Violent Death Reporting System (OKVDRS)
- ◆ Rates calculated using CDC bridged-race population estimates
- ◆ Multiple regression analyses conducted
 - SAS V9.3
 - Alpha 0.05

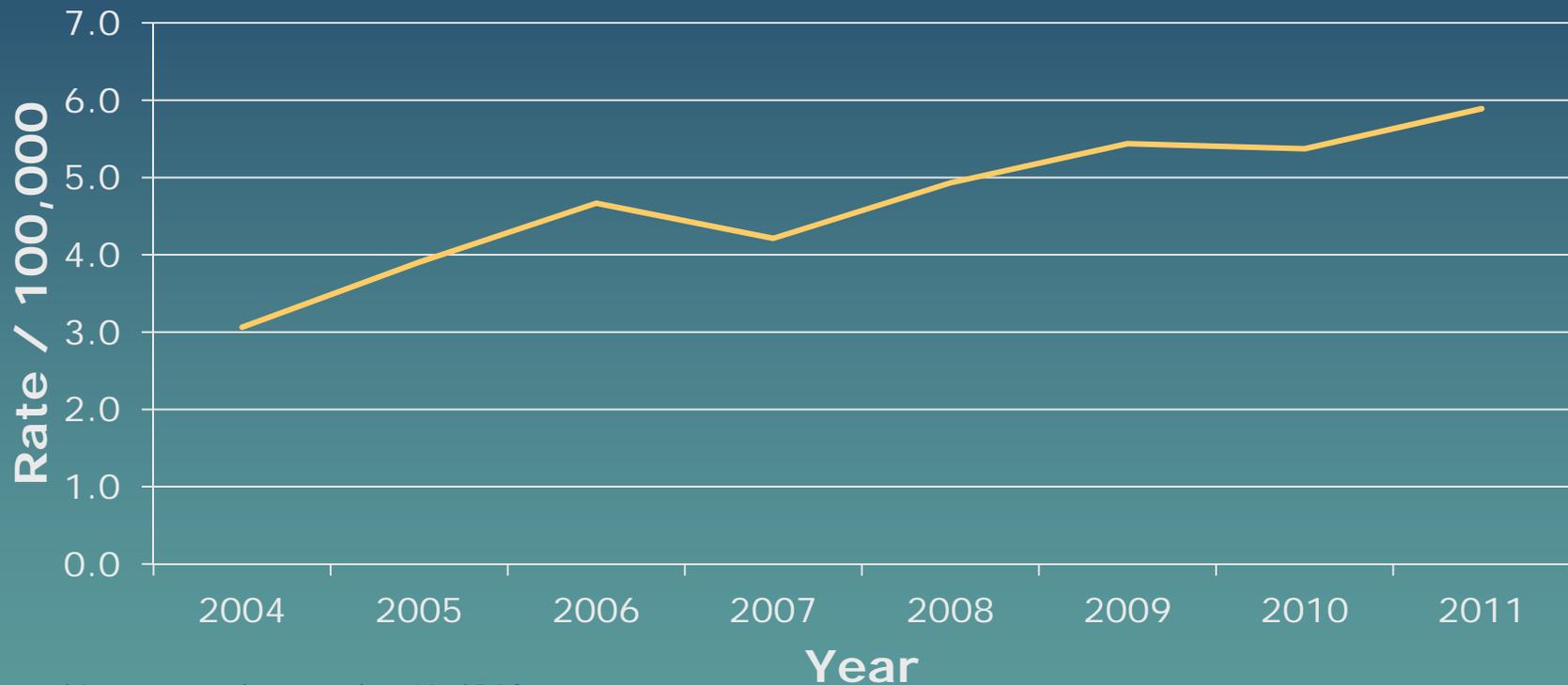


Methods

Inclusion Criteria:



Alcohol-Related Suicide Rate, Oklahoma, 2004-2011

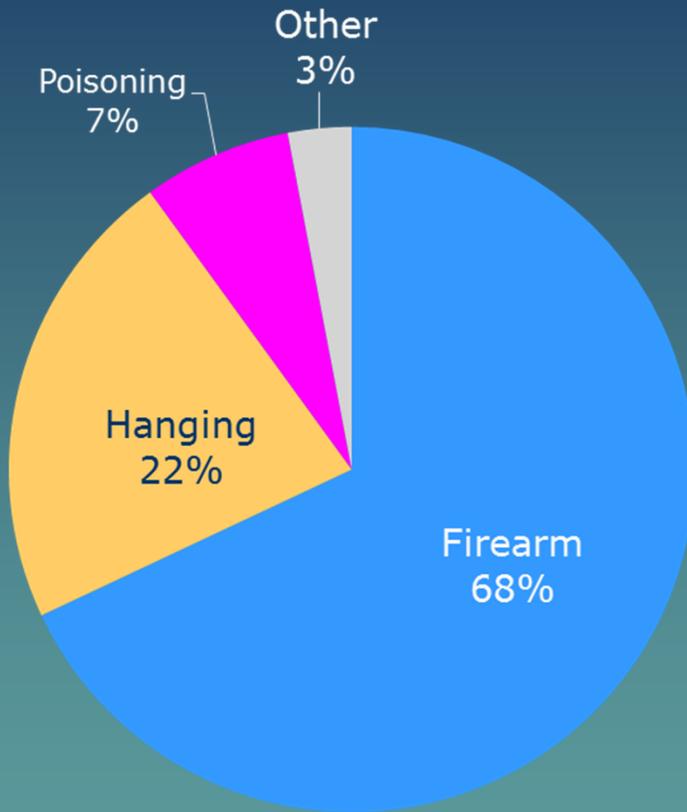


*Age greater than equal to 18. *BAC ≥ 0.08

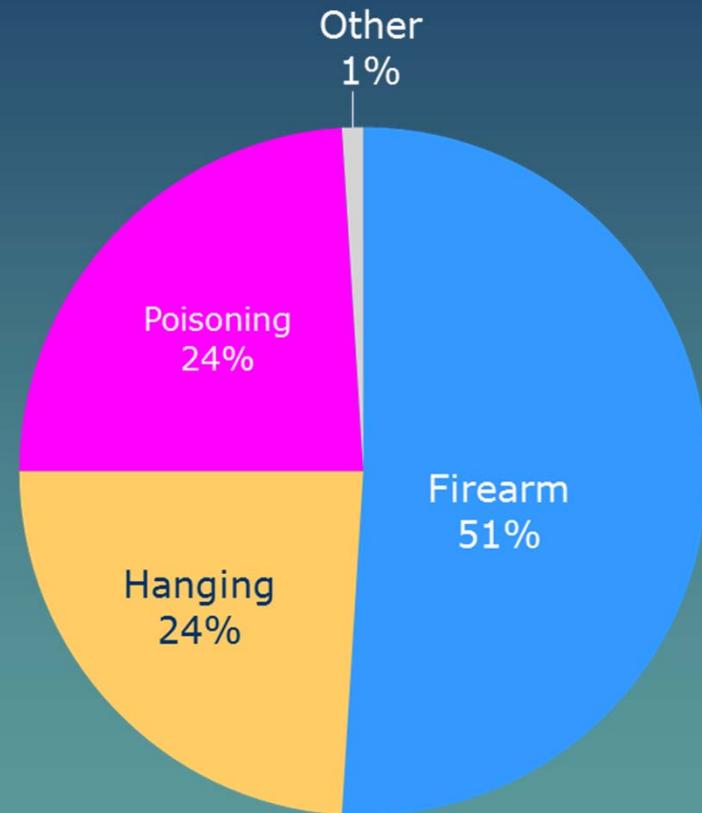
United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Bridged-Race Population Estimates. Accessed at <http://wonder.cdc.gov/bridged-race-v2012.html> on Mar 13, 2014 3:46:32 PM



Alcohol-Related Method of Suicide by Gender, Oklahoma, 2004-2011



Males

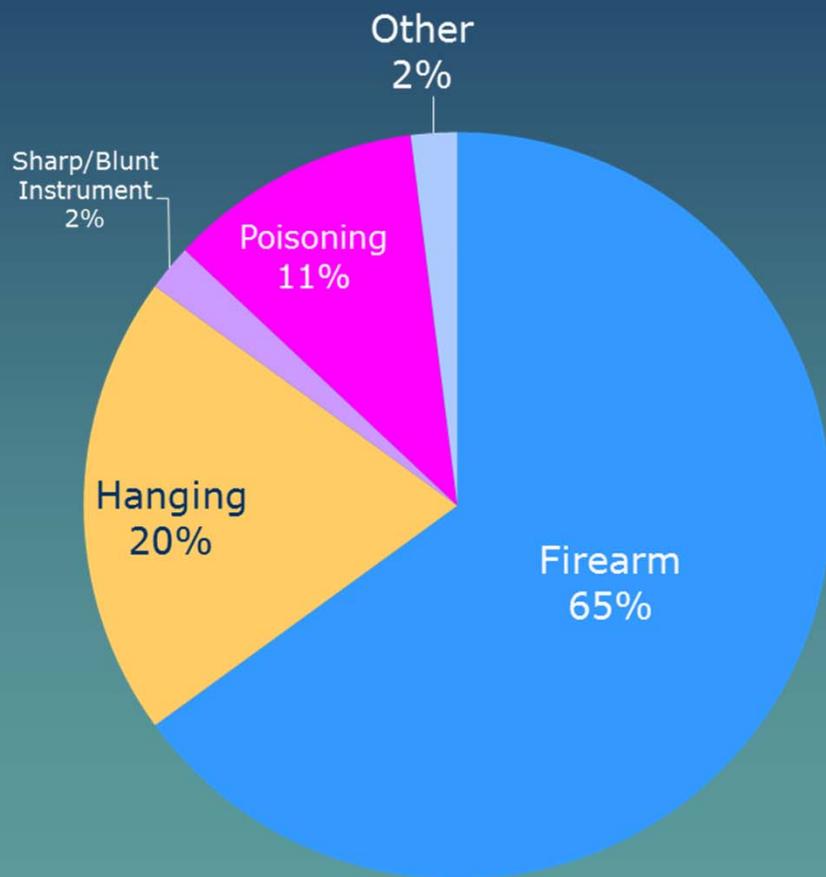


Females

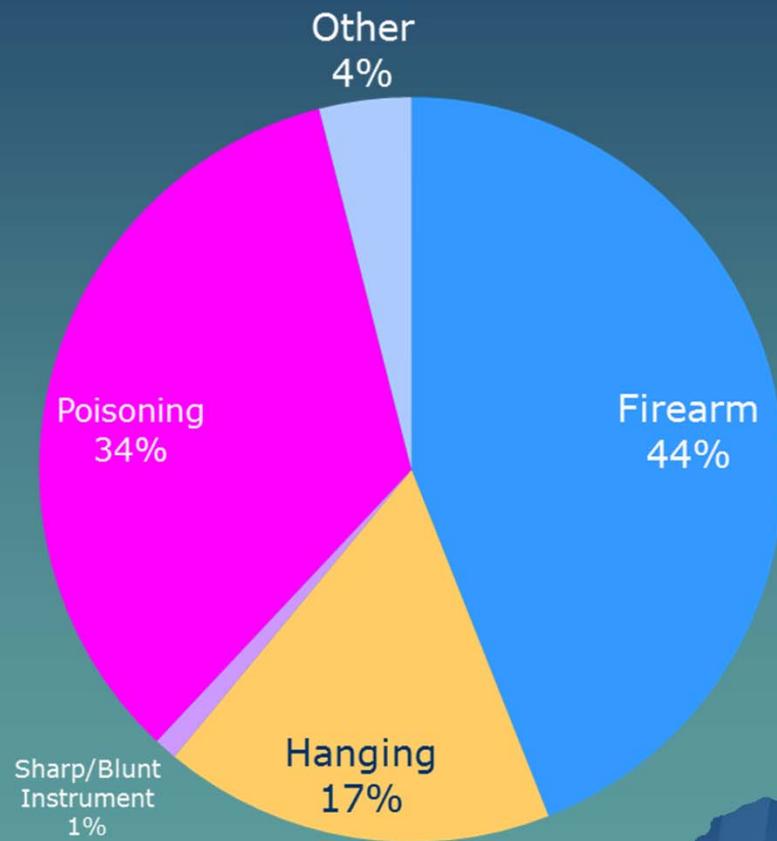
*Includes 1,034 suicide victims 18 and older with a BAC \geq 0.08 g/dl.



Suicide Method by Gender, Oklahoma, 2004-2011



Males



Females



Table 4: Risk Factors Associated with Acute Alcohol Intoxication among Suicide Victims

| Risk Factors | Male O.R. (95% CI) (N=3195) | Female O.R. (95% CI) (N=859) |
|--------------------------|--------------------------------|---------------------------------|
| Age Group | | |
| 18-24 | 1.00 | 1.00 |
| 25-34 | 1.15 (0.84 – 1.59) | 1.57 (0.72 – 3.42) |
| 35-44 | 1.12 (0.84 – 1.68) | 1.58 (0.70 – 3.55) |
| 45-54 | 1.08 (0.76 – 1.54) | 1.82 (0.81 – 4.10) |
| 55-64 | 0.76 (0.50 – 1.15) | 0.83 (0.32 – 2.18) |
| 65-74 | 0.29 (0.17 – 0.51) | 0.80 (0.24 – 2.60) |
| 75+ | 0.16 (0.080 – 0.32) | 0.18 (0.021 – 1.59) |
| Race | | |
| White | 1.00 | 1.00 |
| African American | 0.53 (0.34 – 0.84) | 0.13 (0.014 – 1.22) |
| American Indian | 1.41 (1.05 – 1.90) | 1.22 (0.61 – 2.43) |
| Other | 0.19 (0.040 – 0.85) | 0.50 (0.056 – 4.47) |
| Hispanic | 1.32 (0.812 – 2.11) | 2.08 (0.83 – 5.21) |
| Education | | |
| < High School | 1.27 (0.99 – 1.62) | 1.05 (0.60 – 1.84) |
| High School Graduate | 1.07 (0.87 – 1.31) | 0.96 (0.64 – 1.44) |
| > High School | 1.00 | 1.00 |
| Marital Status | | |
| Married | 1.00 | 1.00 |
| Divorced | 1.43 (1.15 – 1.78) | 1.26 (0.82 – 1.95) |
| Not Married | 1.58 (1.22 – 2.04) | 1.50 (0.78 – 2.87) |
| Widowed | 1.16 (0.70 – 1.94) | 1.10 (0.48 – 2.49) |
| Suicide Method | | |
| Firearm | 2.51 (1.80 – 3.5) | 2.08 (1.28 – 3.36) |
| Hanging | 1.80 (1.25 – 2.61) | 2.49 (1.38 – 4.49) |
| Poison | 1.00 | 1.00 |
| Other | 1.08 (0.60 – 1.94) | 3.60 (1.56 – 8.33) |
| Urban | 1.25 (1.04 – 1.51) | 1.49 (1.02 – 2.17) |
| Veteran | 1.07 (0.851 – 1.340) | 0.94 (0.28 – 3.10) |
| Intimate Partner Problem | 1.85 (1.53 – 2.24) | 1.38 (0.91 – 2.08) |
| Mental Health Problem | 0.71 (0.58 – 0.87) | 0.57 (0.39 – 0.83) |
| Current Depressed Mood | 0.89 (0.74 – 1.08) | 0.96 (0.644 – 1.432) |
| Financial Problem | 0.72 (0.54 – 0.96) | 0.43 (0.190 – 0.972) |
| Job Problem | 0.91 (0.69 – 1.21) | 0.90 (0.398 – 2.024) |
| Substance Abuse Problem | 0.53 (0.40 – 0.70) | 0.56 (0.318 – 0.972) |
| Alcohol Problem | 7.22 (5.67 – 9.20) | 7.23 (4.26 – 12.27) |

*Note: Bold signifies a significant association (p-value < 0.05)



Discussion

- ◆ One in four suicide victims were legally intoxicated at the time of death.
- ◆ The rate of alcohol-related suicides doubled since 2004.
- ◆ Factors that increased the odds of alcohol-related suicide among males were American Indian, divorced/not married, access to firearms, residing in urban areas, intimate partner and alcohol problems.
- ◆ Factors that increased the odds of alcohol-related suicide among females were access to firearms, residing in urban areas and alcohol problems.



Discussion

◆ Strengths:

- Data generalizable to Oklahoma
- More than 90% of victims had alcohol testing
- Large sample population

◆ Limitations:

- Didn't account for interaction/confounding
- Unknown manner cases could be missed
- Information bias



Alcohol's Association with Suicide

- ◆ Act as a lubricant to suicide (Ali S, *et al*)
- ◆ “Diminishes inhibitory control of the brain and increases pain threshold” (Abernathy K, *et al*)
- ◆ Intoxicated individuals are more likely to attempt suicide through the use of more lethal means (e.g. firearm) (Hufford M)



Prevention

- ◆ Promote protective factors such as social support, stable relationships, access to care
- ◆ Reduce access to lethal means
- ◆ Alcohol restriction to subgroup with high risk



SUICIDE AMONG VETERANS IN OKLAHOMA, 2005 – 2012



Objectives

- ◆ Differentiate suicide trends based on veteran status
- ◆ Examine veteran suicide circumstances by life stage

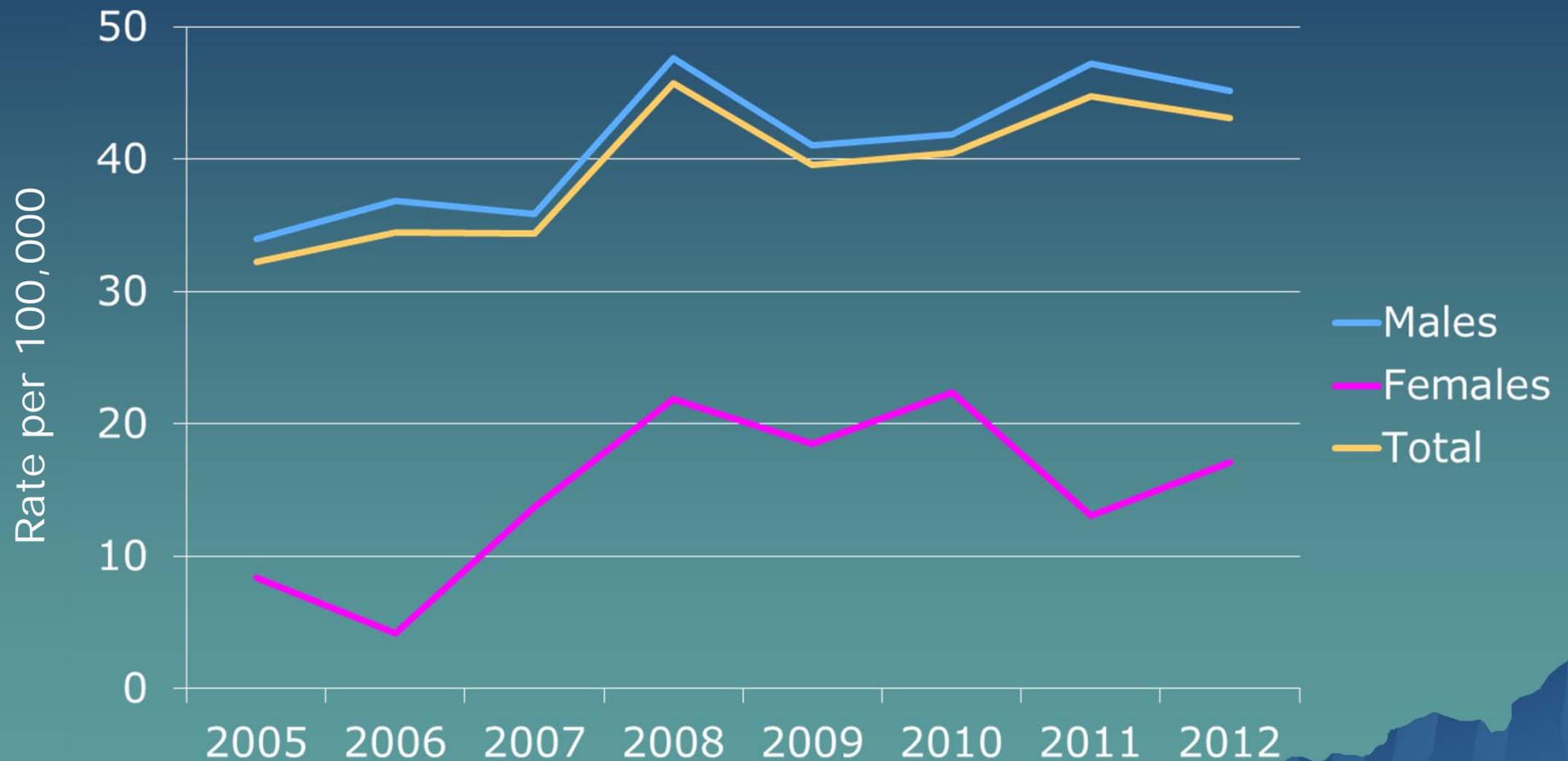


Background

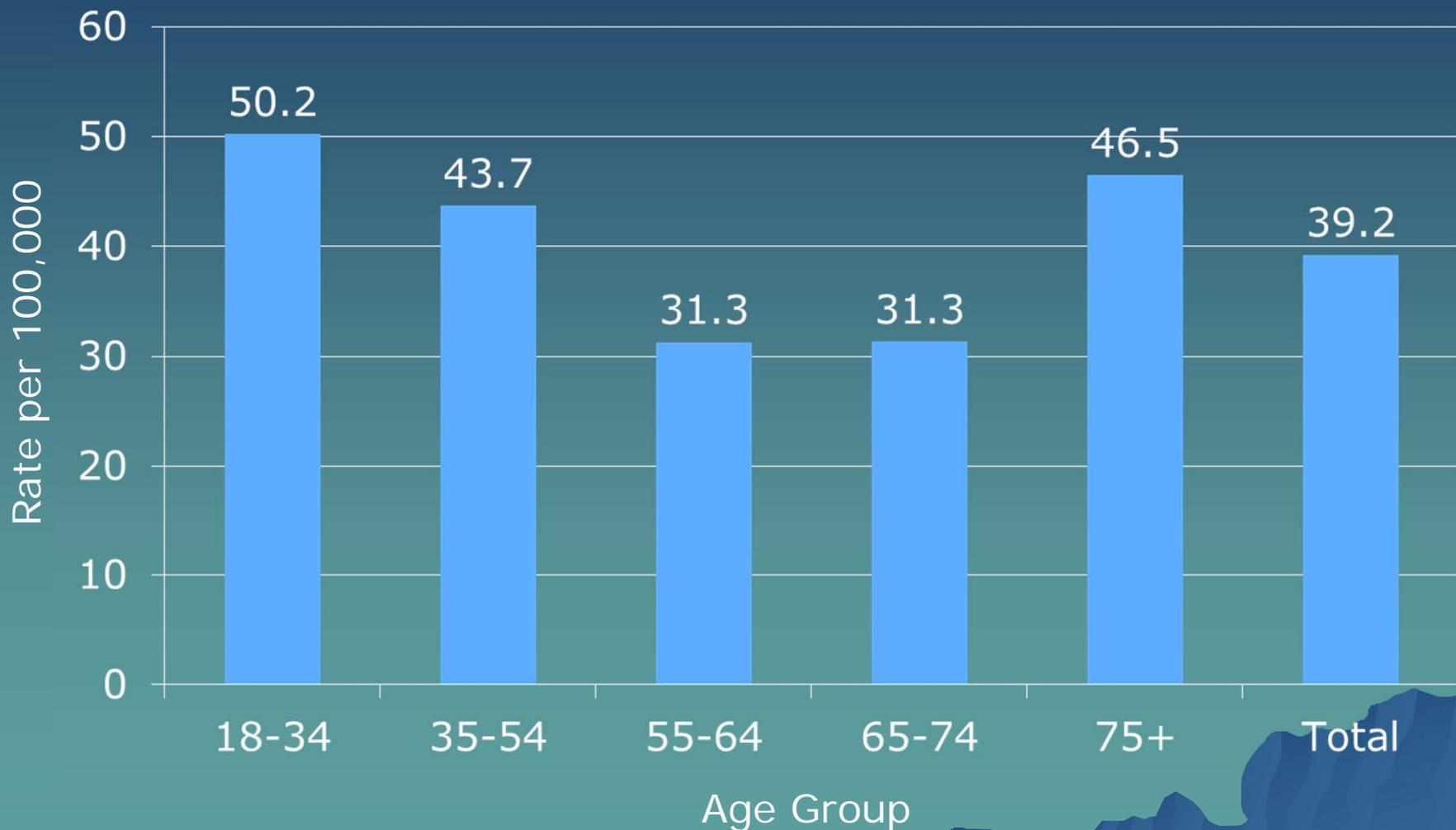
- ◆ From 2005 to 2012, there were 1,018 veteran suicide deaths
- ◆ Average annual rate = 39.2 per 100,000 veteran population
- ◆ Veteran status based on death certificate data



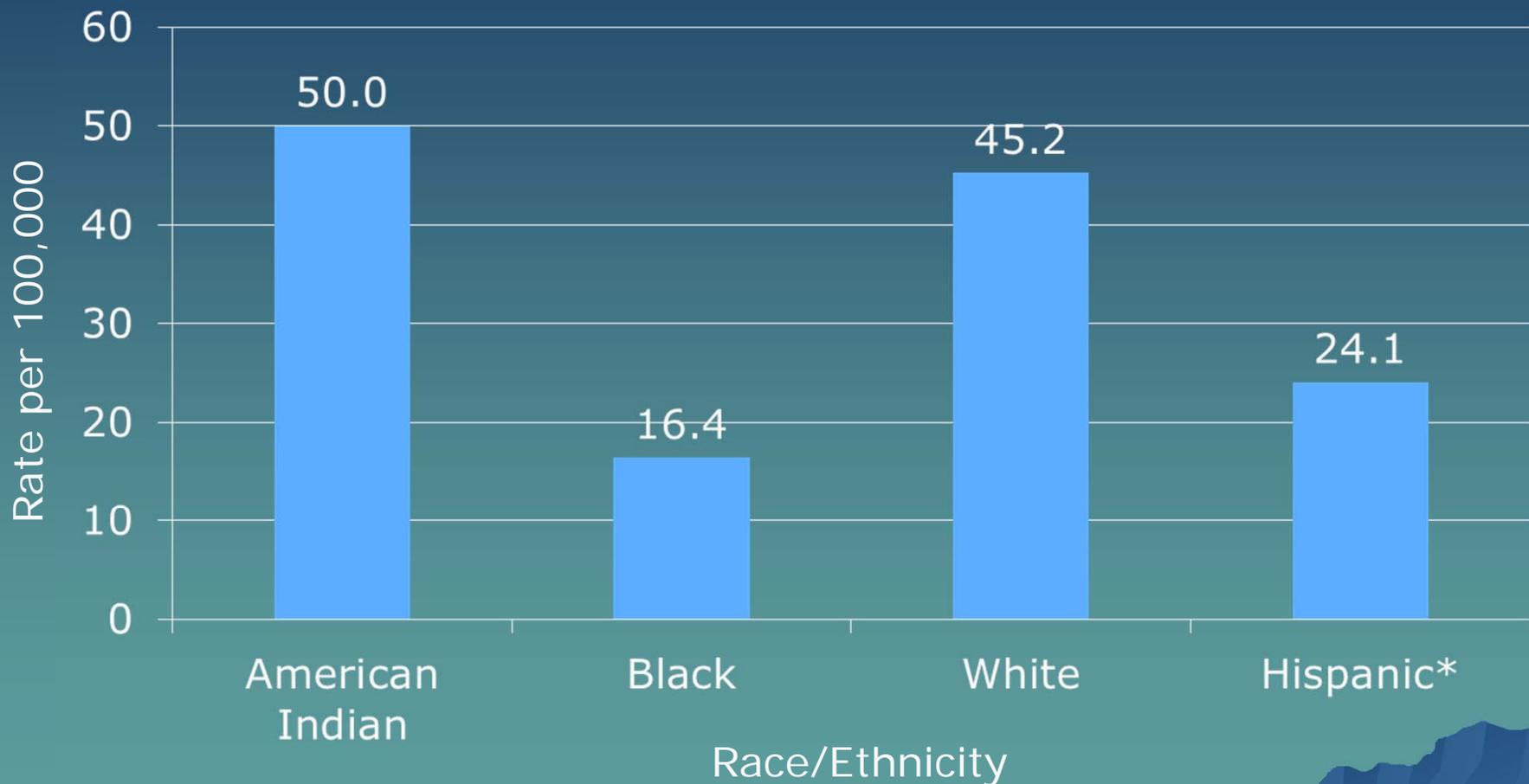
Annual Veteran Suicide Rate by Gender, Oklahoma, 2005-2012



Age-specific Veteran Suicide Rate, Oklahoma, 2005-2012



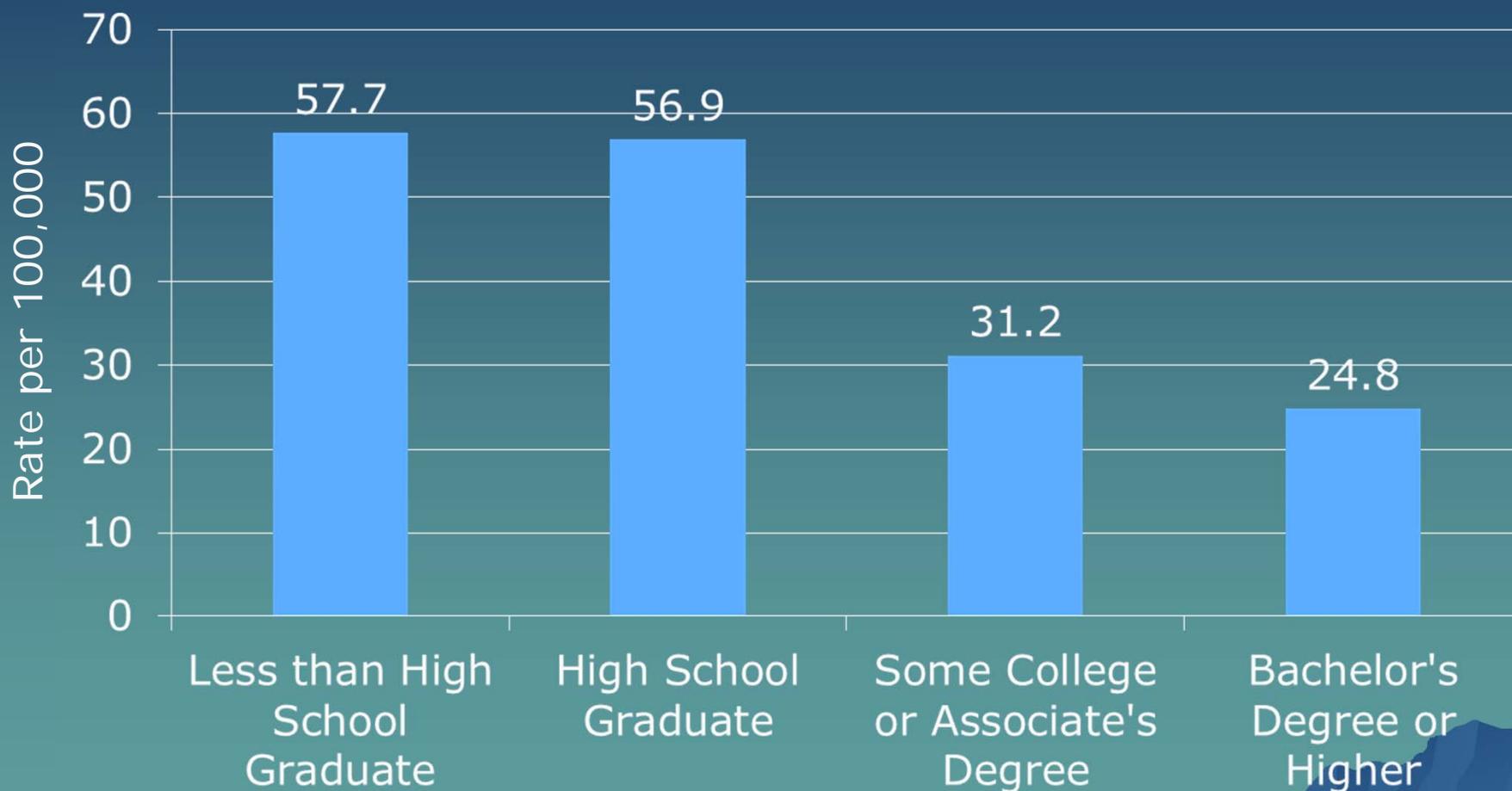
Veteran Suicide Rate by Race, Oklahoma, 2005-2012



*Hispanic ethnicity is not a racial category.



Veteran Suicide Rate by Educational Status, Oklahoma, 2005-2012



* Age \geq 25 years

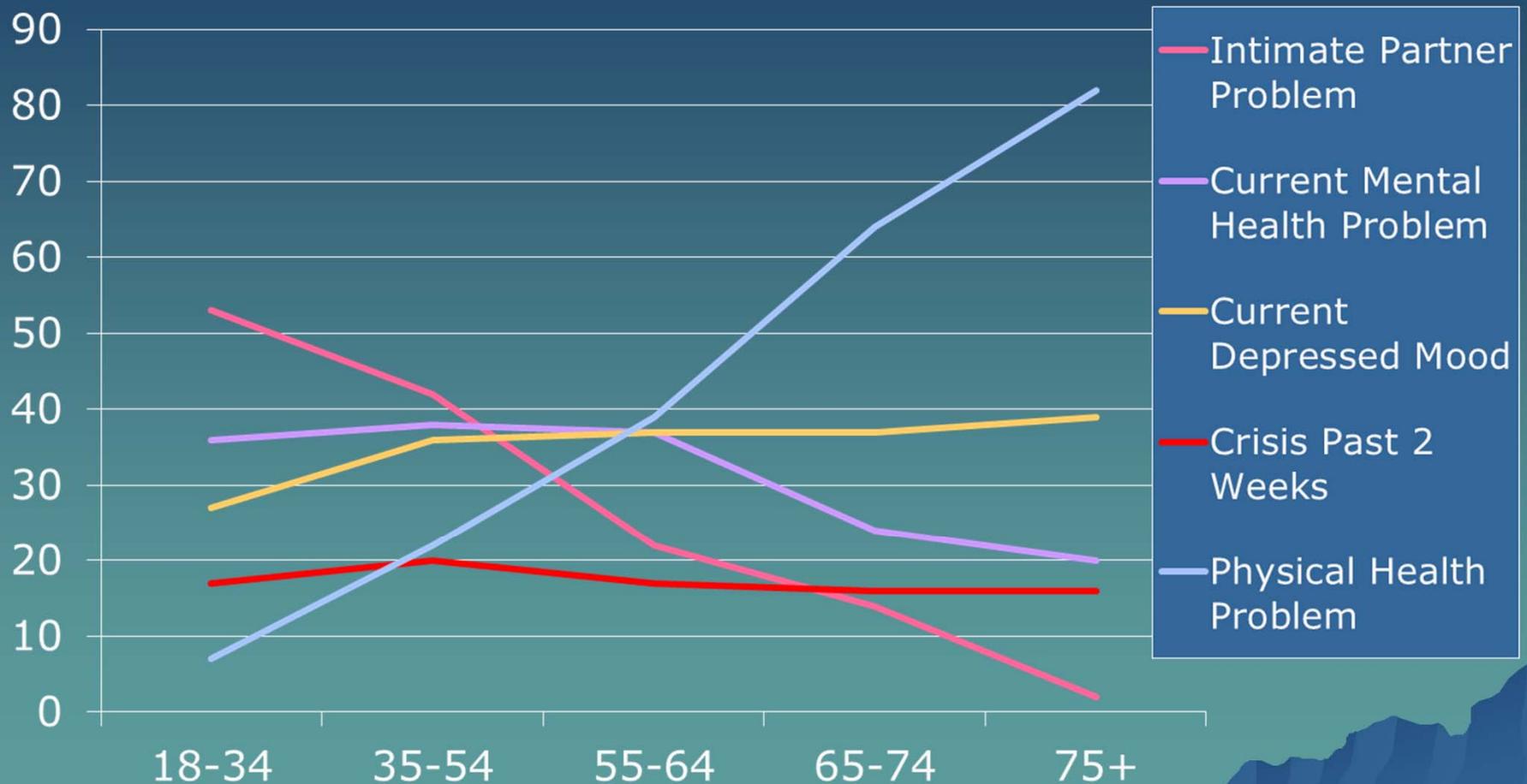


Leading Circumstances by Veteran Status, Oklahoma, 2005-2012

| Rank | Veteran | Non-Veteran |
|------|--------------------------------------|--------------------------------------|
| 1 | Physical Health Problem 44% | Intimate Partner Problem 38% |
| 2 | Current Depressed Mood 36% | Current Mental Health Problem 36% |
| 3 | Current Mental Health Problem 31% | Current Depressed Mood 35% |
| 4 | Intimate Partner Problem 26% | Physical Health Problem 22% |
| 5 | Crisis in Past 2 Weeks 18% | Crisis in Past 2 Weeks 18% |



Circumstances by Life Stage among Veterans, Oklahoma, 2005-2012



Weapon by Veteran Status, Oklahoma, 2005-2012

| Weapon Type | Veteran | Non-Veteran |
|-------------|---------|-------------|
| Firearm | 74% | 57% |
| Hanging | 13% | 22% |
| Poison | 10% | 16% |
| Other | 3% | 5% |



Summary

- ◆ The veteran suicide rate was 2 times higher than the rate among non-veterans (39.2 and 18.2, respectively)
- ◆ Veterans aged 18-34 and 75 years and older were at greatest risk for suicide
- ◆ Suicide circumstances varied by life stage. Physical health problems were cited more often with increasing age. Intimate partner problems were more common among younger veterans



Thank You!

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