# Approaches to Suicide Surveillance in the Army

USAPHC

ARMY INSTITUTE OF PUBLIC HEALTH

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# Agenda

- Overview of Army suicide surveillance program
- Description of suicide surveillance data sources and reporting processes
- Update on Army suicide surveillance trends

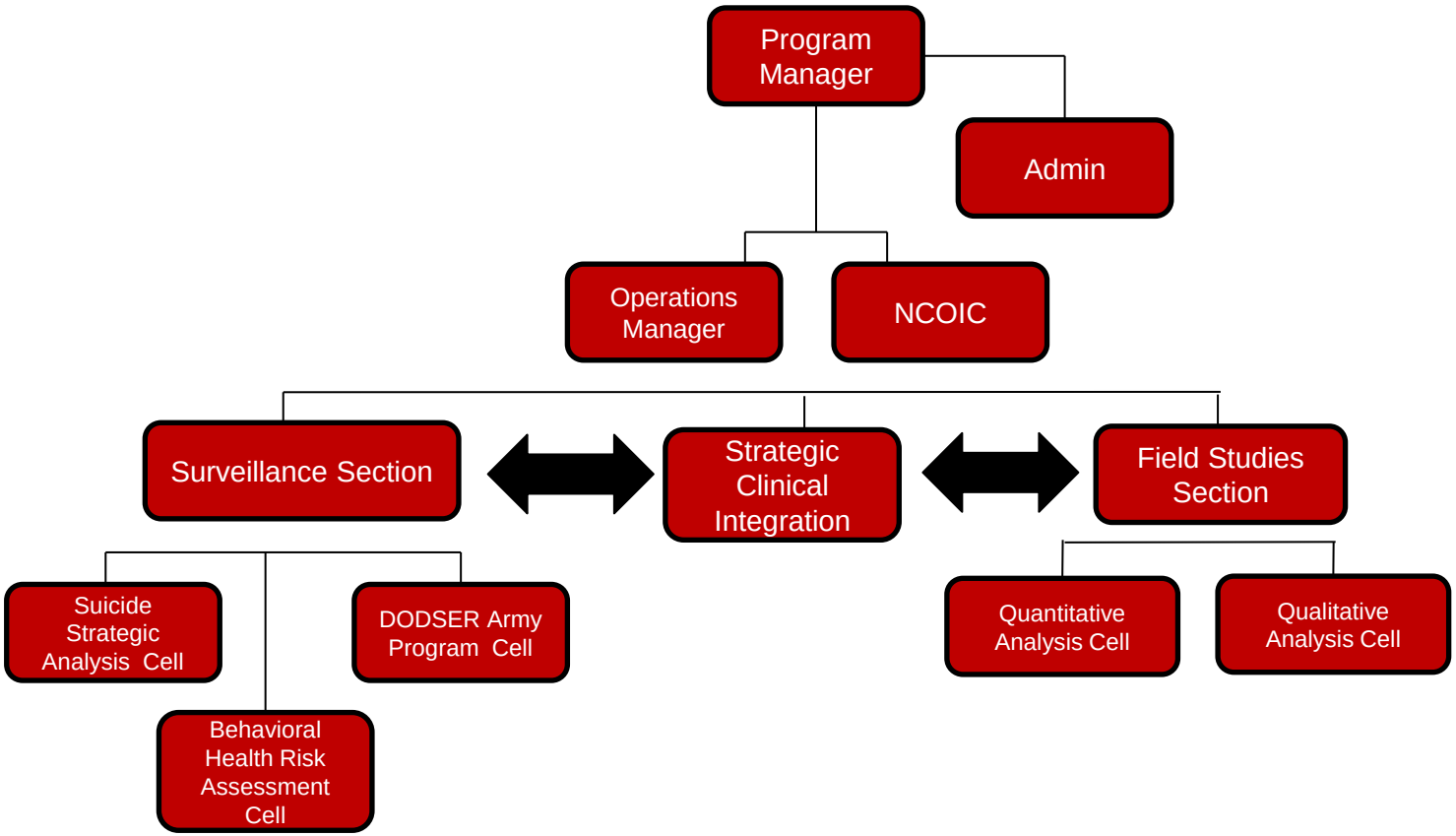
# Army Suicide Prevention and Reporting: Historical Context

- Prior to 2008, suicide surveillance and reporting was not a component of Army medical or public health programs.
- The Army Suicide Prevention Program (SPP) was, and still is, housed within DA G-1.
  - "Owns" and publishes official Army suicide counts and rates
  - Sets priorities for suicide prevention training in coordination with outside agencies and USAPHC
  - Coordinates with Office of the Chief of Chaplains for implementation
- Army Medical Command (MEDCOM) has primary responsibility for DoD Suicide Event Report (DoDSER) completion and conducts After Action Reviews (AARs) and psychological autopsies when indicated.
  - Information not routinely analyzed, summarized, or reported
- The USAPHC Injury Prevention Program does not include risk for violence or self-harm.
  - Suicide spectrum behavior is frequently incorporated into injury prevention programs (CDC, university-based research programs)

# Behavioral and Social Health Outcomes Program

- In 2008, the Behavioral and Social Health Outcomes Program (BSHOP) was established at US Army Public Health Command.
- BSHOP's mission is to apply the Public Health process to behavioral health issues by
  - Conducting *systematic surveillance* and in-depth analysis of suicide and other behavioral health outcomes
  - Deploying *behavioral health epidemiological consultation* (EPICON) teams to evaluate and characterize outcomes through population-based studies
  - *Disseminating information* regarding behavioral health threats and providing the basis for preventive action and future research in the areas of behavioral and social outcomes.

# BSHOP Organization Chart




Current BSHOP Staff :
1 Preventive Medicine Physician
1 Active Duty Social Worker
1 Operations Manager
1 Active Duty NCOIC
1 Budget Analyst
1 Physician Epidemiologist
3 PhD Epidemiologists
3 PhD Qualitative Researchers
2 PhD Social Workers
1 PhD Psychologist
1 PhD Social Scientist
5 MPH Epidemiologists
2 Master's Qualitative Analysts
1 Data Analyst
4 Data Techs

Pending Hires:
1 PhD Epidemiologists
2 PhD qualitative Researchers
2 MPH Qualitative Analysts
1 MPH Epidemiologists
1 Health Economist
1 Medical Editor

# Suicide Surveillance

- In late 2008, BSHOP began development of the Army Behavioral Health Integrated Data Environment.
- The ABHIDE includes a registry of Army suicides and suicidal behaviors, as well as a compilation of relevant data from 2001 forward, and is in the process of acquiring comparison populations.
  - Data from a variety of Army and Department of Defense sources have been integrated into the ABHIDE.
  - Ongoing confirmation of suicide deaths obtained from the Armed Forces Medical Examiner's System (AFMES).
- ABHIDE data supports analysis and reporting on suicidal behavior to DA organizations and installation/medical command stakeholders.

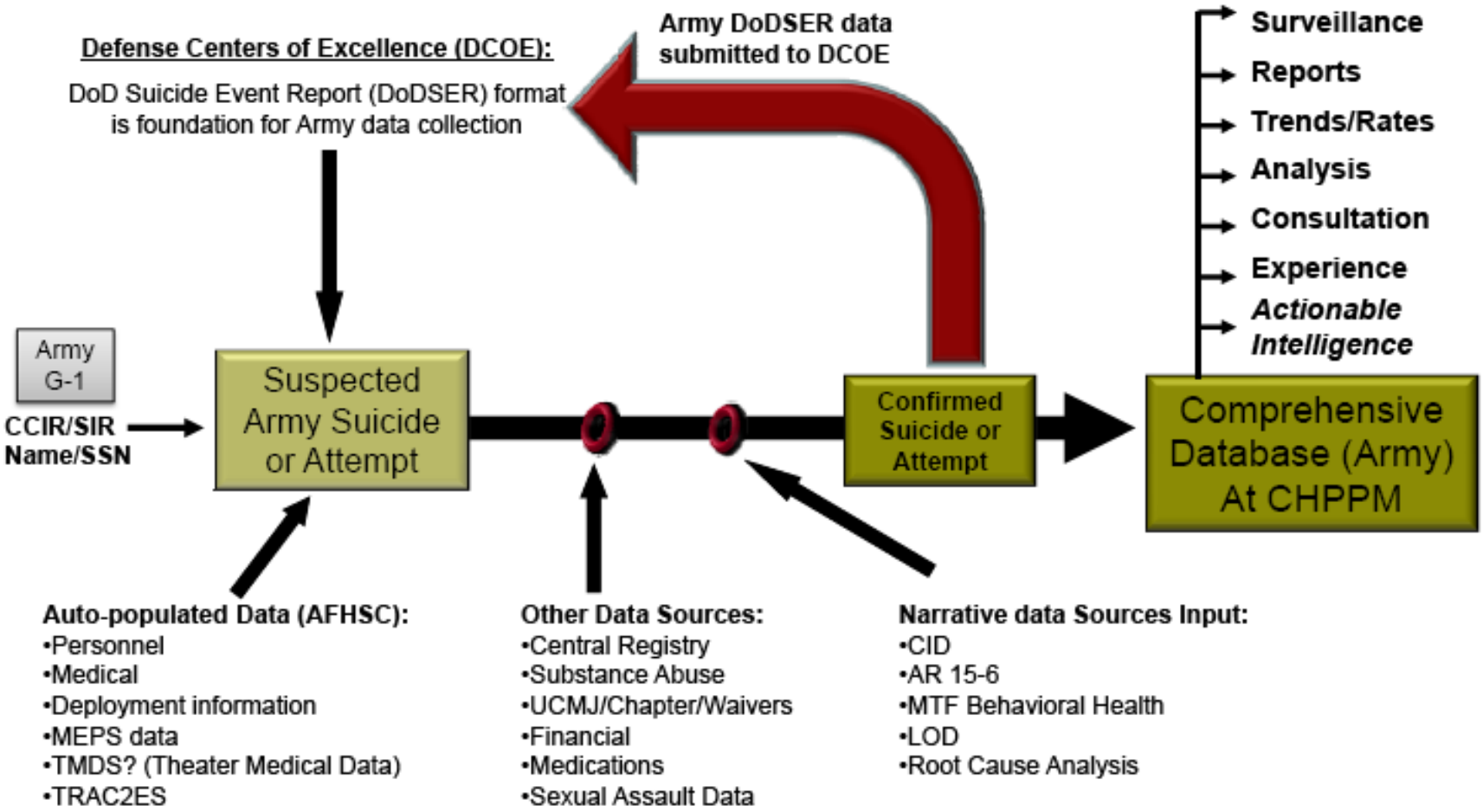
# ABHIDE Background

- ABHIDE was developed to provide a comprehensive, case-based suicide registry that enables a retrospective look at self-harm behaviors
- ABHIDE was initially established in June 2009 and is now the primary data source for the Army Institute of Public Health's, Behavioral and Social Health Outcome Program (BSHOP)
- ABHIDE is used by BSHOP epidemiologists to conduct surveillance and assessment of leader-prioritized behavioral health outcomes such as PTSD, depression, substance abuse, domestic violence, and violent crimes

# ABHIDE Contents

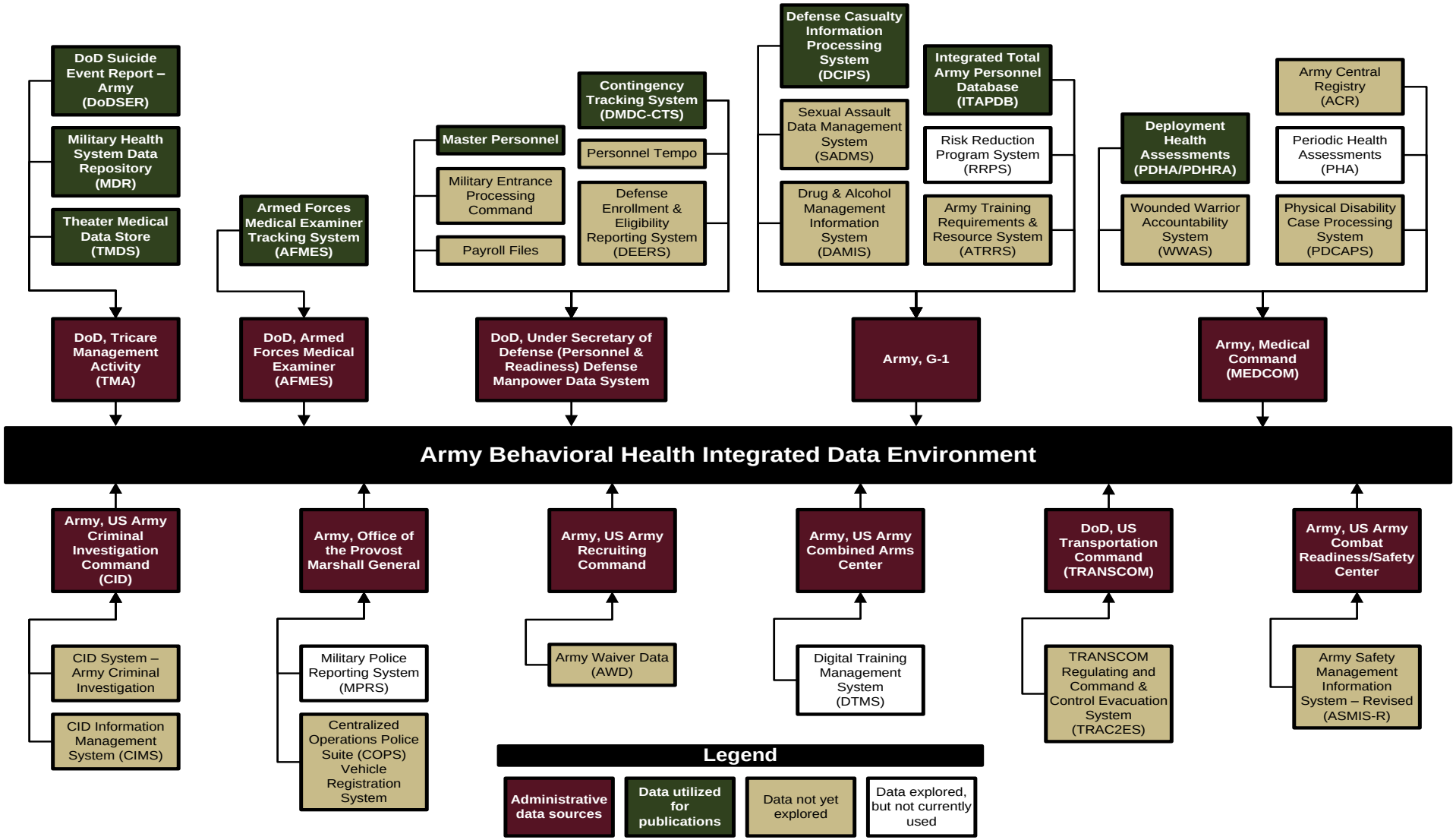
- ABHIDE currently contains:
  - All Army suicides confirmed by the Armed Forces Medical Examiner since 2001
  - All reported Army suicide ideations and attempts that resulted in a hospitalization or evacuation since 2004
  - 1,050 suicides, 3,800 ideations and 4,000 attempts
- ABHIDE gathers data from 26 separate Army and DoD data systems
- Types of data include:
  - Personnel, deployment, medical, criminal, waivers, training, drug and alcohol abuse and health assessment data
- ABHIDE data is updated monthly
  - Mainly manual requests but also uses 7 Web services

# USAPHC Suicide Registry (Army Behavioral Health Integrated Data Environment – ABHIDE)




*** Only suspected and confirmed case information will be maintained in registry. Periodic studies will require control and cohort data to be collected and analyzed.**

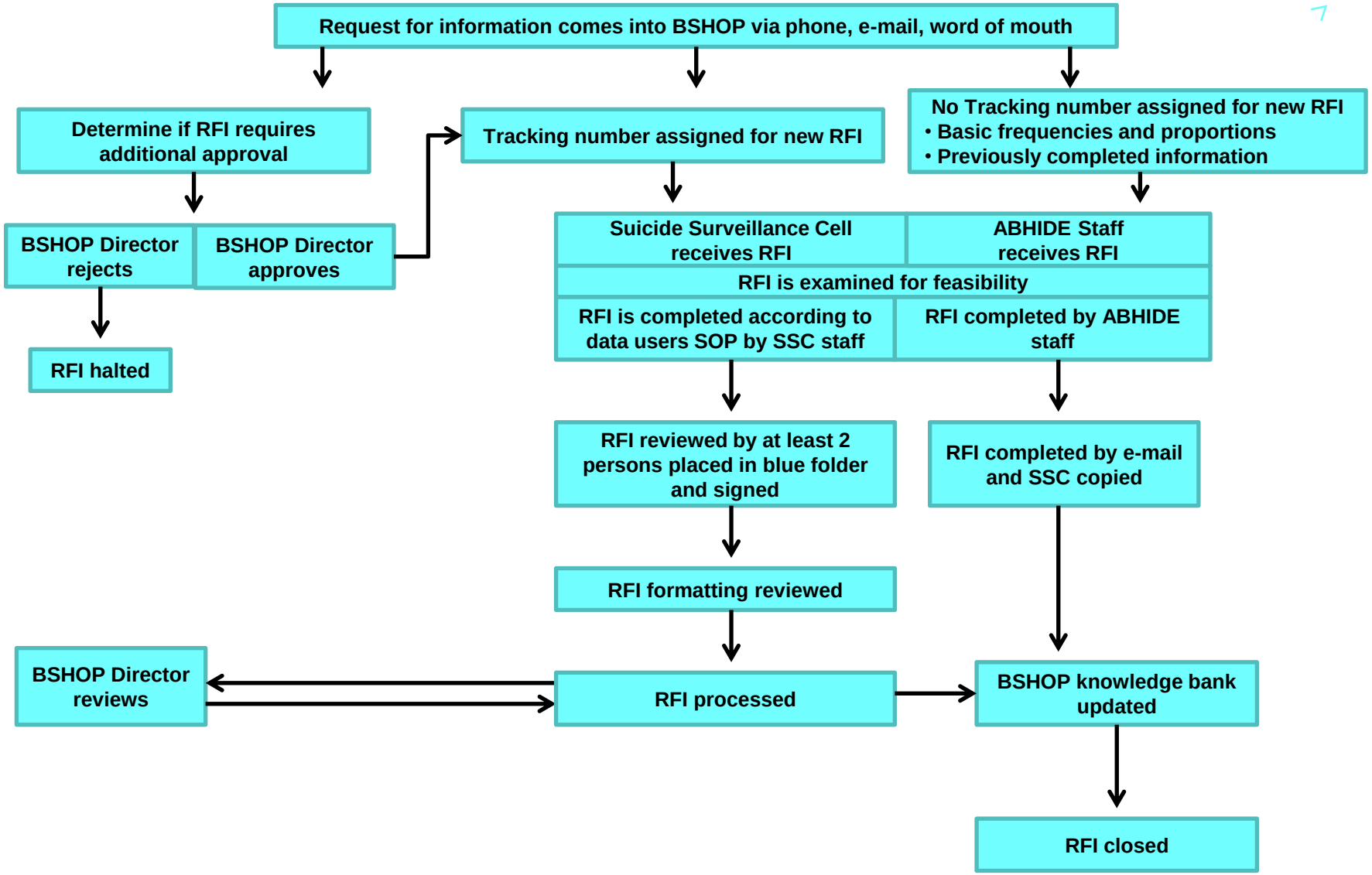
# ABHIDE Data Sources



# ABHIDE – Current Staffing

- 4 Epidemiologists
- 2 Data Analysts
- 2 Database Administrators
- 1 Project Manager

# RFI Process Flow



# ABHIDE Challenges

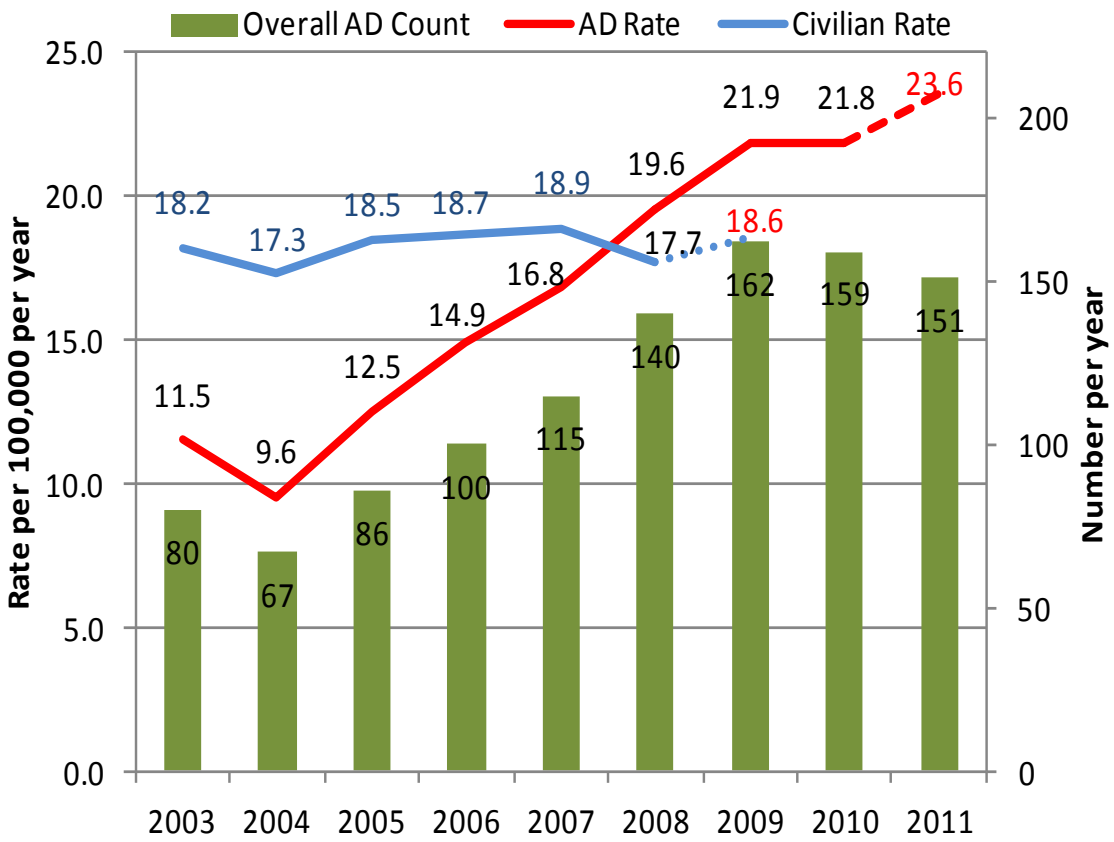
- ABHIDE contains index cases only (completed suicides, attempts and ideations)
  - Effective analysis requires control population
  - DUA must be modified to acquire data
- Data management is time and resource intensive
  - Understanding the meaning and quality of the data elements
  - Transforming raw data into a framework that supports analysis
  - Data sources constantly change, requiring frequent adaptations
  - Resolving conflicting information from multiple sources
- Annual re-certification of the ABHIDE through Defense Business Systems Management Committee is required for continued funding
- New development requires Research, Development, Test and Evaluation (RDT&E)

# ABHIDE – Next Steps

- Increase the number of sources providing data through web services
- Improve timeliness and reliability of monthly submissions from data sources
- Transform the data to support more efficient analysis
  - Combine like data into common categories (e.g., crime data, waivers, medical claims)
  - Create analytic tables designed for rapid analysis
- Improve Data Quality
  - Identify the authoritative source for specific data topics/elements (e.g., marital status, deployment history, current residence)
  - Reduce duplication of data topics to increase consistency

# Comparison of US Army Suicides and US Population Suicides

## Figure A. Counts and rates by year of suicide, 2001–2011

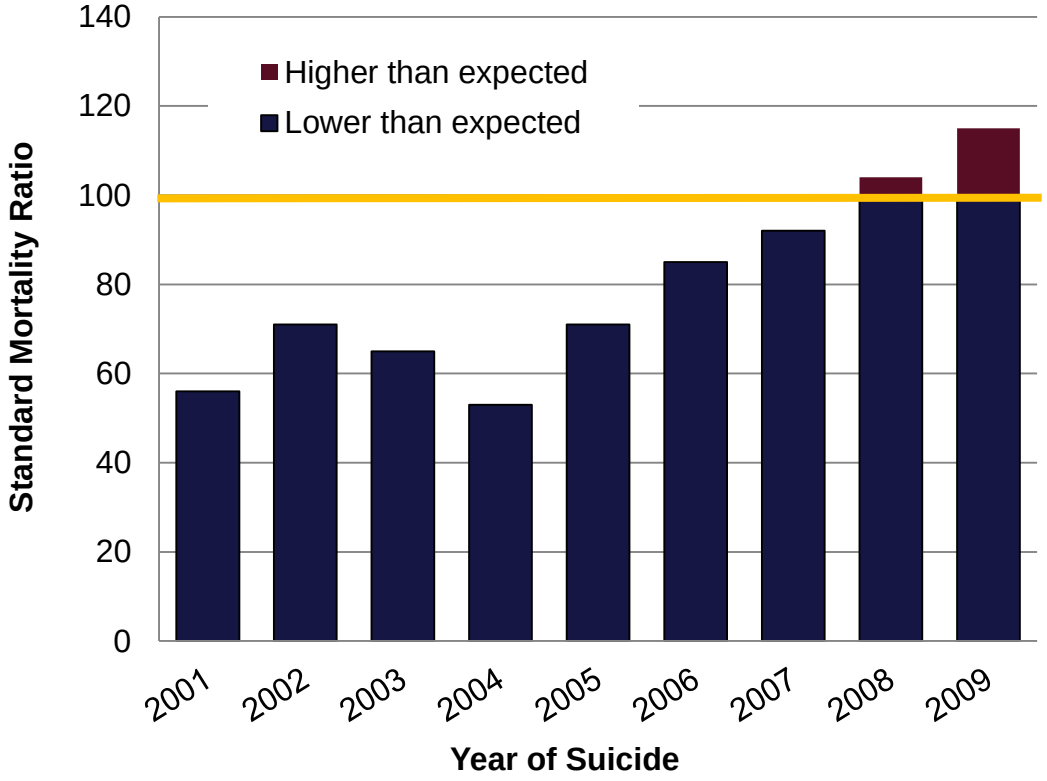



Data source: AIPH Suicide Surveillance Reports

- The suicide rate among US Army active-duty Soldiers has increased steadily since 2005.
- In 2008, the Army suicide rate surpassed the US Population rate.

# Comparison of US Army Suicides and US Population Suicides

**Figure B. Standardized mortality ratio (SMR) by year of suicide, 2001–2009**




- Accounting for differences in age, gender, and race-ethnicity between the two populations, the US Army began experiencing higher than expected numbers of suicides in 2008.

Data source: AIPH Suicide Surveillance Reports

# Table 1. Demographic Characteristics of Suicides, US Army, 2001–2011

| Characteristic – n (%) | Suicide Cases 2001–2011 (N = 1204) | Army Distribution 2011 |
|---|---|---|
| **SEX** | | % |
| Male | 1139 (95) | 86 |
| Female | 65 (5) | 14 |
| **AGE (YR)** | | |
| 17–24 | 526 (44) | 32 |
| 25–34 | 427 (35) | 40 |
| 35–64 | 251 (21) | 28 |
| Mean | 28 | NA |
| Mode | 21 | NA |

Legend: NA – not available

- Demographic characteristics of Soldiers who died by suicide reflect the overall composition of the Army: predominantly male and younger than 35 years of age.
- Females, accounting for 5% of suicides deaths and 14% of the Army, are somewhat less represented than males.

Data source: AIPH Suicide Surveillance Reports

# Table 1. Demographics Characteristics of Suicides, US Army, 2001–2011

| Characteristic – n (%) | Suicide Cases 2001–2011 (N = 1204) | Army Distribution 2011 |
|---|---|---|
| **RACE-ETHNICITY** | | % |
| Non-Hispanic White | 867 (72) | 65 |
| Non-Hispanic Black | 150 (12) | 20 |
| Hispanic and Other | 187 (16) | 16 |
| **MARITAL STATUS** | | |
| Single | 548 (46) | NA |
| Married | 579 (48) | NA |
| Divorced | 69 (6) | NA |
| Other[a] | 3 (<1) | NA |
| Unknown | 5 (<1) | NA |

Note: [a] Includes widowed and legally separated

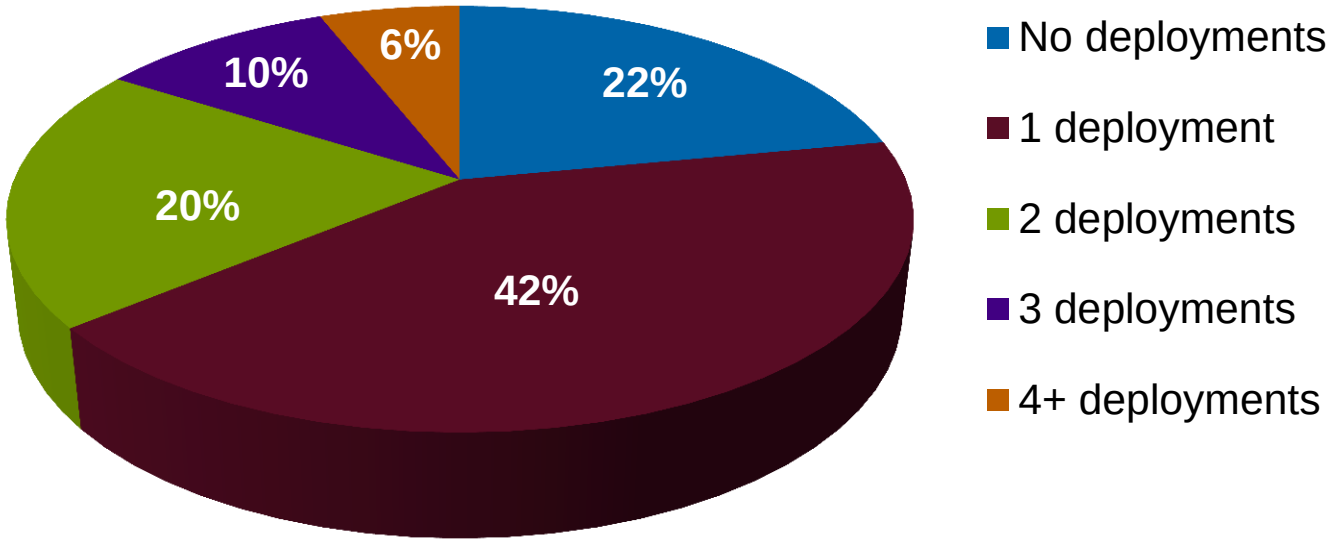
- Demographic characteristics of Soldiers who died by suicide reflect the overall composition of the Army: predominantly non-Hispanic white

Data source: AIPH Suicide Surveillance Reports

# US Army Suicides: Deployment History

The largest proportion of suicides were by Soldiers with one deployment, followed by those who never deployed.

**Figure C. Lifetime deployment history of suicide cases, 2001– 2011**




Data source: AIPH Suicide Surveillance Reports

# US Army Suicides: Deployment History

- Increases in total number of deployments among suicides may reflect increases in total number of deployments among Soldiers, rather than risk associated with suicide.

- However, Soldiers with one previous deployment are at greater risk for suicide than those who have never deployed and those with 2+ prior deployments, but this is limited by lack of data on Soldiers who leave service following deployment.

**Table 2. Association of suicide among deployed and non-deployed US Army Soldiers (N = 5196)**

| | AOR[a] (95% CI) |
|---|---|
| **Deployment Status** | |
| Never Deployed | 1.00 |
| Deployed | 1.23* (1.01–1.51) |
| **Total Deployments** | |
| 0 | 1.00 |
| 1 | 1.29* (1.05–1.59) |
| 2 or more | 1.07 (0.81–1.40) |

Legend: AOR – adjusted odds ratio
Notes: [a] Adjusting for the matched factors and confounders (race, marital status and any BH Dx).
* significant ($p \leq 0.05$).

# US Army Suicide Cases: Behavioral Health Disorders, 2001–2011

- 47% of Army Soldiers who died by suicide received at least one behavioral health diagnosis (BH) in their military medical record; 27% received more than one diagnosis:
  - Adjustment (29%), Mood (23%), and Substance (21%) Disorders were the most common diagnoses.
  - PTSD was diagnosed in 9%.
- Only 7% had medical documentation of prior self-harm or a previous suicide attempt.
- These findings are consistent with known risk factors for suicide, but highlight the fact that over half of the Soldiers who died by suicide did not have evidence of a BH condition in their medical record.

Data source: AIPH Suicide Surveillance Reports

# Table 3. Suicide Attempts versus Suicides

- Characteristics of Soldiers who attempt suicide are very different from characteristics of those who die by suicide.
- Females constitute a greater portion of suicide attempt cases than suicide cases, as do younger Soldiers.

| Characteristic - n(%) | Suicide Attempt Cases 2004–2011 (N = 4509) | Suicide Cases 2001–2011 (N = 1204) |
|---|---|---|
| **SEX** | | |
| Male | 3299 (73) | 1139 (95) |
| Female | 1210 (27) | 65 (5) |
| **AGE (YR)** | | |
| 17–24 | 2885 (64) | 526 (44) |
| 25–34 | 1251 (28) | 427 (35) |
| 35–64 | 364 (8) | 251 (21) |
| Mean | 25 | 28 |
| Mode | 21 | 20 |

Data source: AIPH Suicide Surveillance Reports

# Table 3. Suicide Attempts versus Suicides

- Soldiers with no history of deployment constitute a greater portion of suicide attempt cases than suicide cases.

| Characteristic - n (%) | Suicide Attempt Cases 2004–2011 (N = 4509) | | Suicide Cases 2001–2011 (N = 1204) | |
|---|---|---|---|---|
| **COMPONENT** | | | | |
| Regular Army | 3976 | (88) | 1012 | (84) |
| National Guard | 311 | (7) | 131 | (11) |
| Reserve | 221 | (5) | 61 | (5) |
| **NUMBER OF DEPLOYMENTS** | | | | |
| 0 | 2649 | (59) | 477 | (40) |
| 1 | 1266 | (28) | 474 | (39) |
| 2 | 444 | (10) | 174 | (14) |
| 3 | 115 | (3) | 50 | (4) |
| 4+ | 35 | (1) | 29 | (2) |

Data source: AIPH Suicide Surveillance Reports

# Table 3. Suicide Attempts versus Suicides

| Characteristics n (%) | Suicide Attempt Cases[a] 2004–2010 (N = 4509)[b] | Suicide Cases 2001–2011 (N = 1204)[b] |
|---|---|---|
| **LOCATION** | | |
| USA | 3694 (82) | 894 (74) |
| In Theater | 292 (6) | 231 (19) |
| Other | 273 (6) | 79 (7) |
| **METHOD** | | |
| Gunshot Wound | 256 (6) | 807 (67) |
| Hanging | 279 (6) | 247 (21) |
| Drug/Alcohol OD | 2442 (54) | 70 (6) |
| Other[a] | 655 (15) | 66 (5) |
| Cutting | 750 (17) | 11 (<1) |

Note: [a] Includes carbon monoxide and other poisoning, jumping from heights or in front of vehicles, vehicle crashes, or drowning.

- Suicide attempts are less likely than suicide deaths to occur in theater
- Suicide attempts are more likely than suicides to involve drugs/alcohol or cutting as methods.

Data source: AIPH Suicide Surveillance Reports

# Table 3. Suicide Attempts versus Suicides

| Characteristics - n (%) | Suicide Attempt Cases 2004–2010 (N = 4509) | Suicide Cases 2001–2011 (N = 1204) |
|---|---|---|
| **SUBSTANCE INVOLVEMENT** | | |
| Event Involved Alcohol | 1057 (23) | 193 (21) |
| Event Involved Drugs | 2287 (51) | 80 (9) |
| **STRESSORS[a]** | | |
| Relationship Problem | 2076 (46) | 468 (51) |
| Work Stress | 1734 (38) | 259 (28) |
| Physical Health Problem | 850 (19) | 173 (19) |
| Victim of Abuse | 1344 (30) | 98 (11) |
| Family/Friend Death | 1169 (26) | 115 (12) |
| Perpetrator of Abuse | 319 (7) | 100 (11) |
| Financial Stress | 474 (11) | 80 (9) |

Note: [a] May have more than one.

- Drugs, whether or not as the method, are more likely to be involved in attempts than suicides.
- Soldiers who attempt suicide are more likely to have evidence of being a victim of abuse and to have experienced recent death of a close family member or friend.

Data source: AIPH Suicide Surveillance Reports

# Stratum-specific crude rates over cumulative period(s)

**Table 4. Rates of suicidal behavior stratified by various characteristics**

| | Events per 100,000 (95% confidence interval) | | |
|---|---|---|---|
| Characteristic | Ideation Rate Jan07–Jun11 | Attempt Rate Jan04–Jun11 | Suicide Rate Jan01–Jun11 |
| **Gender** | | | |
| Male | 111.0 (107.1–114.8) | 72.4 (70.0–74.9) | 19.2 (18.1–20.3) |
| Female | 183.7 (171.5–196.0) | 158.7 (149.7–167.8) | 6.5 (4.9–8.1) |
| **Age Group** | | | |
| 18–24 | 207.8 (199.5–216.2) | 153.4 (147.8–159.1) | 21.0 (19.2–22.8) |
| 25–34 | 96.1 (90.7–101.6) | 64.9 (61.3–68.5) | 17.0 (15.4–18.6) |
| ≥ 35 | 49.1 (44.7–53.6) | 24.6 (22.1–27.1) | 13.1 (11.5–14.7) |

# Stratum-specific crude rates over cumulative period(s)

**Table 4. Rates of suicidal behavior stratified by various characteristics,** continued

| Characteristic | Events per 100,000 (95% confidence interval) | | |
|---|---|---|---|
| | Ideation Rate Jan07-Jun11 | Attempt Rate Jan04-Jun11 | Suicide Rate Jan01-Jun11 |
| **Race** | | | |
| Non-Hispanic White | 126.4 (121.7–131.2) | 87.5 (84.3–90.6) | 19.5 (18.2–20.8) |
| Non-Hispanic Black | 95.4 (88.0–102.9) | 64.9 (60.1–69.8) | 10.1 (8.5–11.7) |
| Hispanic | 129.9 (118.2–141.5) | 101.3 (93.0–109.6) | 15.2 (12.4–18.1) |
| Non-Hispanic Asian/ Pacific Islander | 128.3 (107.7–148.9) | 87.0 (73.2–100.8) | 26.5 (19.6–33.4) |
| Non-Hispanic Native American/Alaskan Native | 169.5 (121.1–217.9) | 122.2 (89.3–155.0) | 35.3 (19.9–50.8) |

# Stratum-specific crude rates over cumulative period(s)

**Table 4. Rates of suicidal behavior stratified by various characteristics,** continued

| Characteristic | Events per 100,000 (95% confidence interval) | | |
|---|---|---|---|
| | Ideation Rate Jan07-Jun11 | Attempt Rate Jan04-Jun11 | Suicide Rate Jan01-Jun11 |
| **Rank Group** | | | |
| E1–E4 | 223.4 (215.7–231.1) | 158.8 (153.6–164.0) | 22.3 (20.6–23.9) |
| E5–E9 | 51.6 (47.8–55.4) | 35.0 (32.5–37.5) | 14.4 (13.0–15.8) |
| W1–W5 | 9.6 (3.3–15.8) | 10.6 (5.3–16.0) | 7.7 (3.7–11.7) |
| O1–O3 | 22.6 (17.0–28.3) | 16.7 (12.8–20.6) | 10.6 (7.9–13.3) |
| O4–O10 | 18.4 (12.6–24.2) | 9.4 (6.1–12.7) | 7.8 (5.2–10.5) |

# Future Reporting Schedule

- *Surveillance of Suicidal Behavior* is published semiannually.
  - The first full publication contains data on suicidal behavior cases from the first half of the year (1st and 2nd quarters).
  - The second full publication contains data on suicidal behavior cases for the entire year (1st – 4th quarters).

- *Surveillance of Suicidal Behavior Quarterly Updates* will be provided for the 1st and 3rd quarters of each calendar year. The update is a condensed version of the full publication and describes notable differences in case characteristics from previously reported time periods.

- The *2011 Annual Surveillance of Suicidal Behavior* publication will be staffed in July 2012 with anticipated release between August and September 2012.

# Questions?