



# Epidemiological and Public Health Perspectives in Military Suicide Research:

## Presentation to the DoD Suicide Prevention Task Force November 10, 2009

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# Pre-OIF/OEF (1990-2000): What Did We Know?



- Rate of suicide for entire military averaged 11.8/100,000/year (adjusted 8.3), with apparent service differences.
- Service differences in rates were entirely explained by differences in demographics and death classification biases:

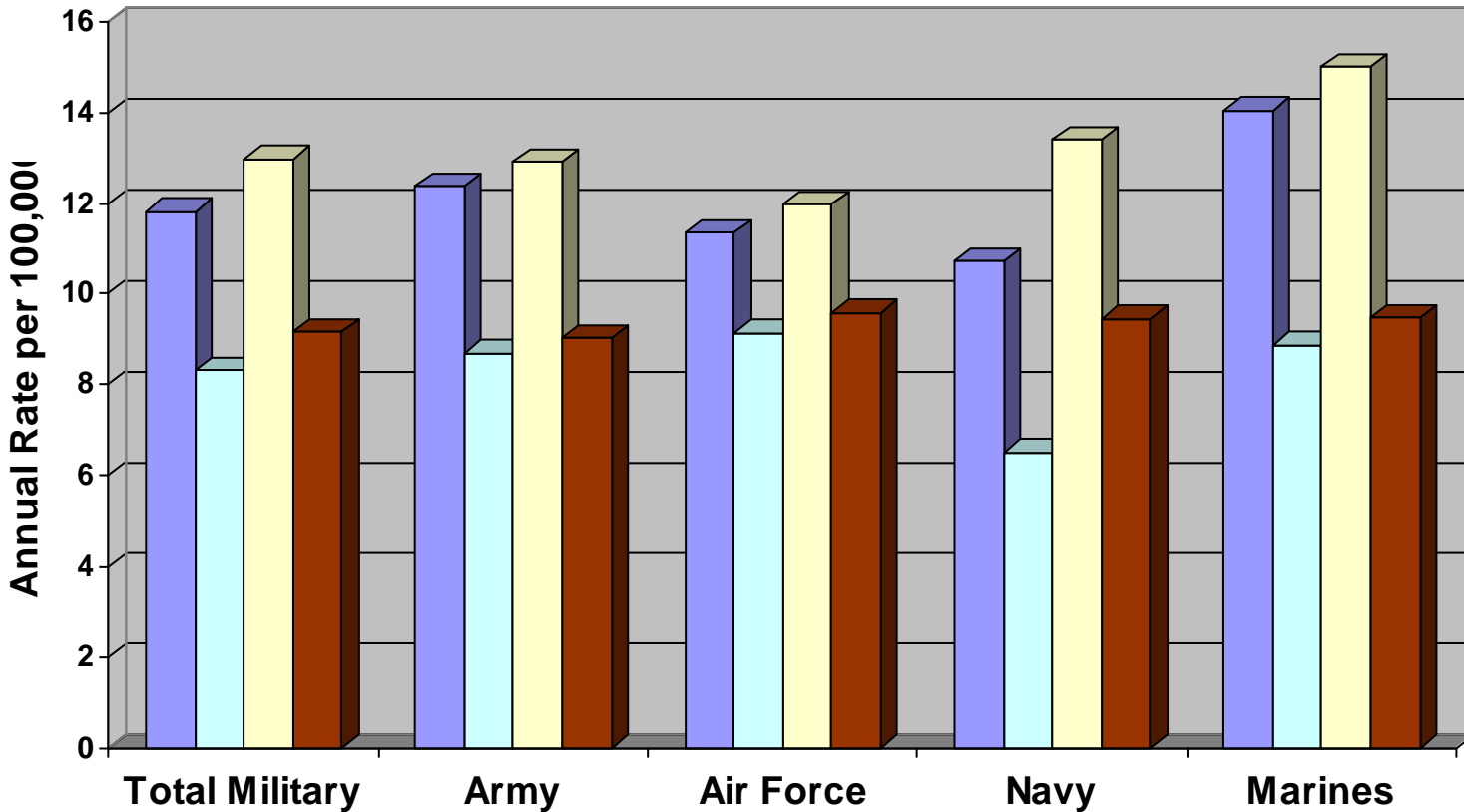
	<b>Crude</b>	<b>Adjusted</b>	<b>Suicides + Undetermined</b>	<b>Adjusted Suicides + Undetermined</b>
Army	12.4	8.7	12.9	<b>9.0</b>
Marines	14.1	8.9	15.0	<b>9.5</b>
Navy	10.7	6.5	13.4	<b>9.5</b>
Air Force	11.4	9.1	12.0	<b>9.6</b>

- Annual fluctuations in rates of 24-38% (depending on service) were determined to be within normal statistical variation using the Poisson rare events vs. expected events test.

\* Eaton KM, Messer SC, Wilson ALG, Hoge CW. *Suicide and Life Threatening Behavior* 2006; 36:182-191



# Civilian vs. Military Suicide Rates, 1990-2000

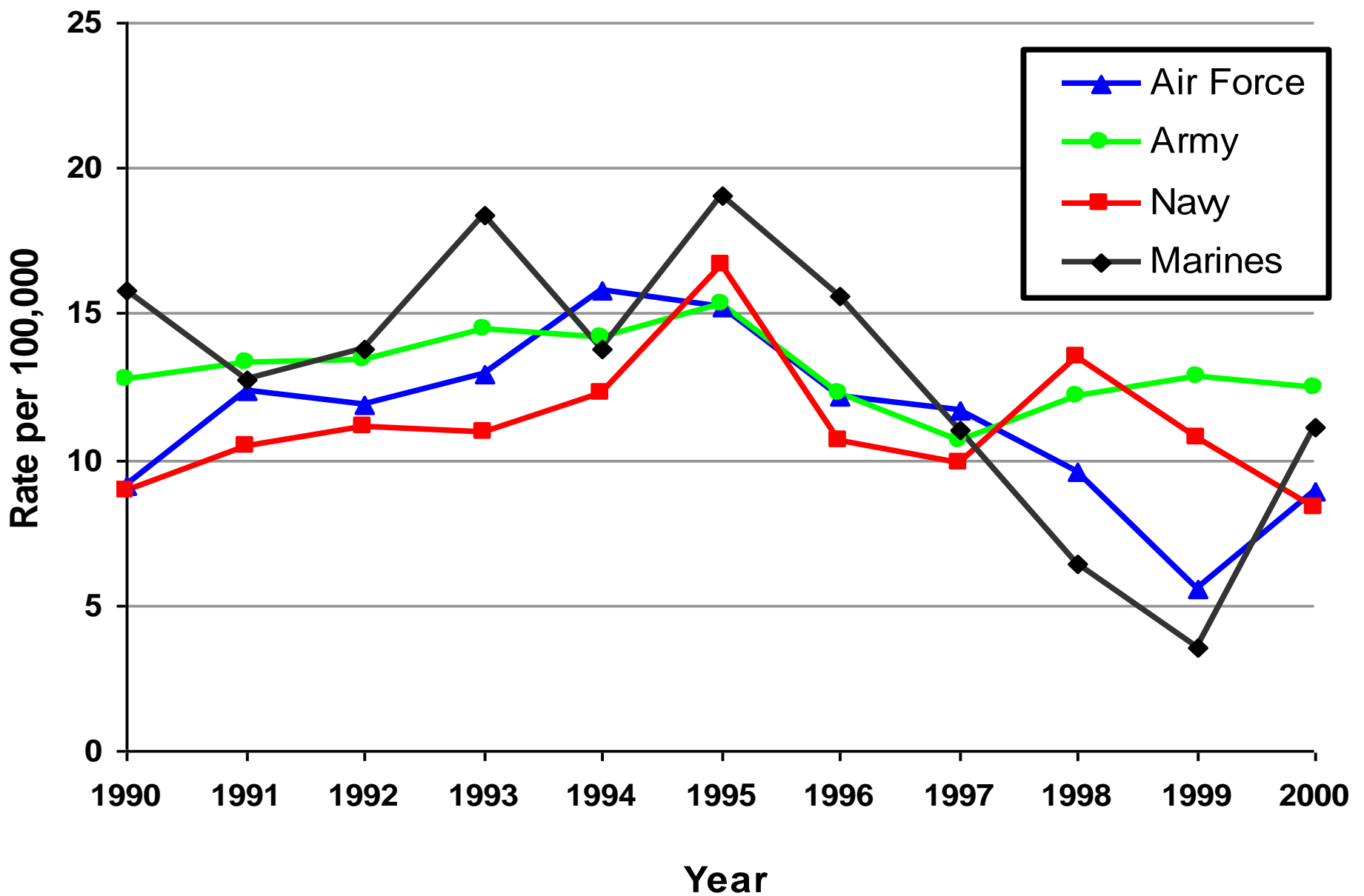


Direct method of adjustment standardized to U.S. 2000 census population

- Crude Rate
- Adjusted Rate (for age, gender, race)
- Suicide + Undetermined Crude Rate
- Suicide + Undetermined Adjusted Rate



# Official DoD Suicide Rates, 1990-2000





# OIF/OEF: What's Happening Now?



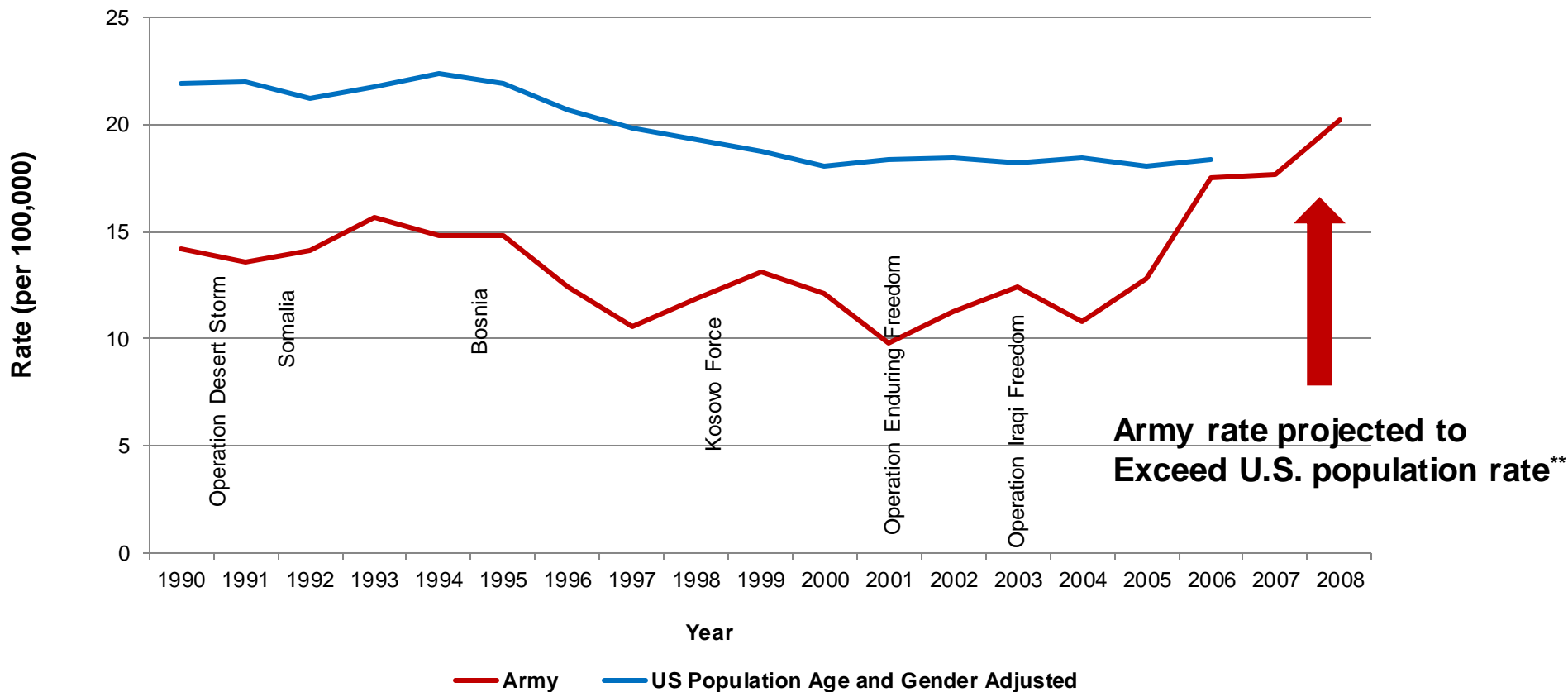
- Rates have significantly increased over the last several years to (or above) demographically matched civilian levels in Army and Marines, but not in Air Force and Navy.
- Statistically significant clusters at several posts.
- Most consistent factors identified in reports:
  - Deployment length, multiple deployments
  - Relationship problems
  - Legal or financial problems
  - Increased use of alcohol or drugs/ alcohol/drug offenses
  - Increased family violence
  - Access to weapons
  - BH problems / previous gestures or attempts



# Army Suicide Rates from 1990-2008



- Historically, the US Army rate has been lower than the US population rate. The U.S. population rate was age and gender adjusted to the Army population.



SOURCE: CDC/NCHS, National Vital Statistics System(civilian data). G1 (Army data)



# Correlation with Mental Disorders



- Of all Army suicides from JAN 2003-JUL 2009, 45% had received one or more behavioral health diagnoses, 15% had inpatient treatment, and 7% had a history of a prior attempt:

	Total N=696
Any BH Diagnosis (n=313)	45.0%
Adjustment Disorder	23.2%
Mood Disorder	19.6%
Substance Related	16.4%
Any Anxiety Disorder (not PTSD)	12.7%
PTSD	7.2%
Personality Disorder	5.3%
Acute Stress	3.0%
Psychosis	2.7%

References: *USACHPPM Analysis of Army Suicides 1 Jan 2003-31 July 2009 (technical report).*



# Increased Suicide Rate: Hypotheses



- Increased population prevalence of mental disorders due to high levels of combat exposure (e.g. PTSD, depression, anxiety, substances)
- Multiple deployments involving ground combat operations with relatively short dwell times
- Increased Use of SSRIs and other psychotropic medications (FDA Black Box Warning).
- Stigma / barriers have increased. Preventive interventions to date are not efficacious.
- The resilience of the population is changing due to changes in recruitment standards or accession of a less fit force.





# Increased Suicide Rate: Evidence Related to Hypotheses

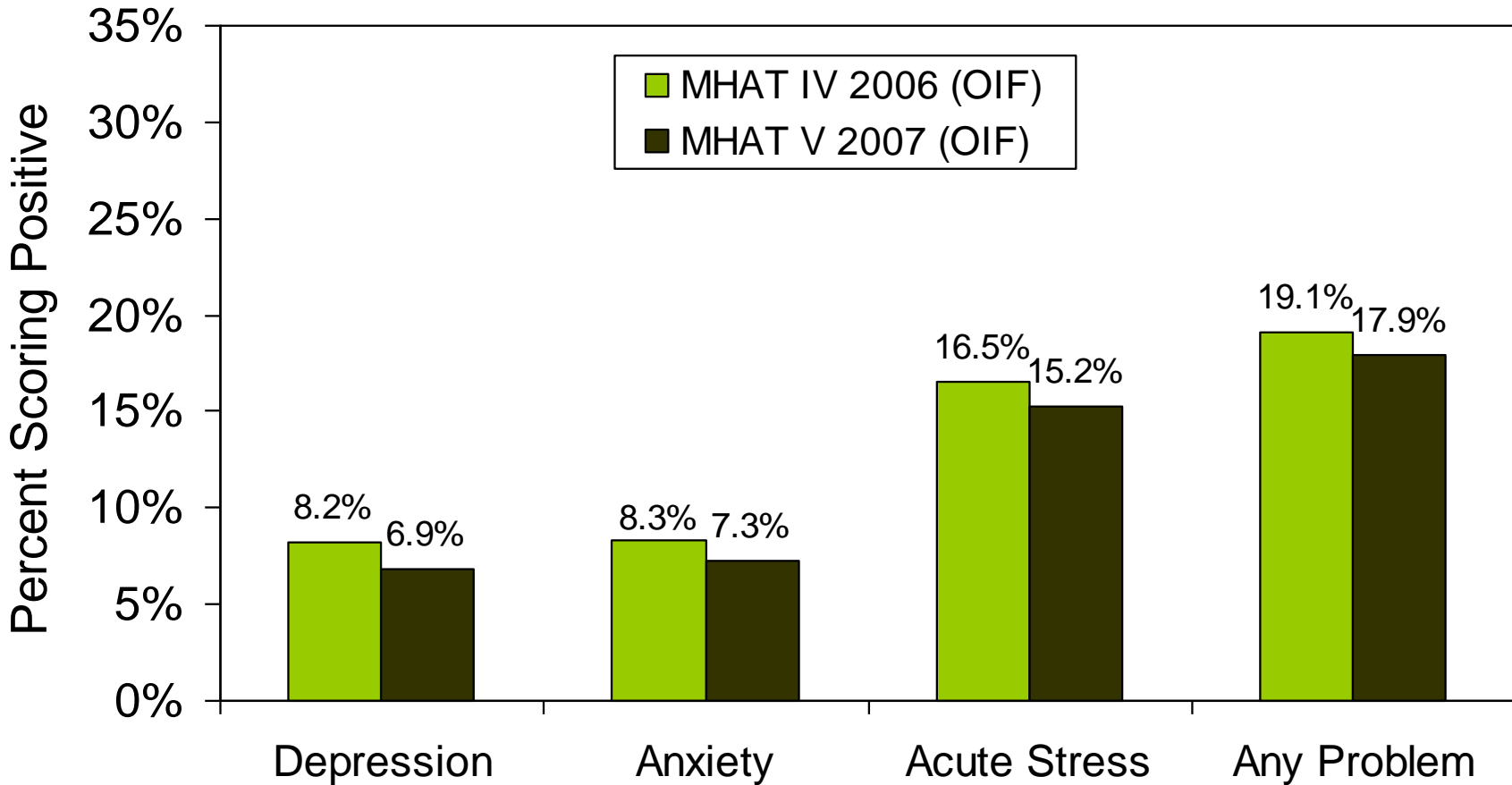


- 1. Increased population prevalence of mental disorders due to combat operations (e.g. PTSD, depression, anxiety, substances)
  - A large percentage of force has deployed (including unit leaders).
  - PTSD, depression, suicide rates are significantly higher in personnel with h/o of deployment to OIF and OEF.
  - Frequency/intensity of combat is most important BH predictor.
  - Relative rates of suicide by occupation is being assessed.
- 2. Multiple deployments involving ground combat operations with relatively short dwell times
  - Differences in rates between services.
  - Multiple deployment effect for BH problems documented in MHATs.
  - 12 months “reset” time has been documented to be insufficient. Optimal length of dwell time is being assessed.
  - Attrition is a likely confounder.

*References: Millennium Cohort Study, Land Combat Study (e.g. Hoge, et. al. 2004, 2007), MHATs*

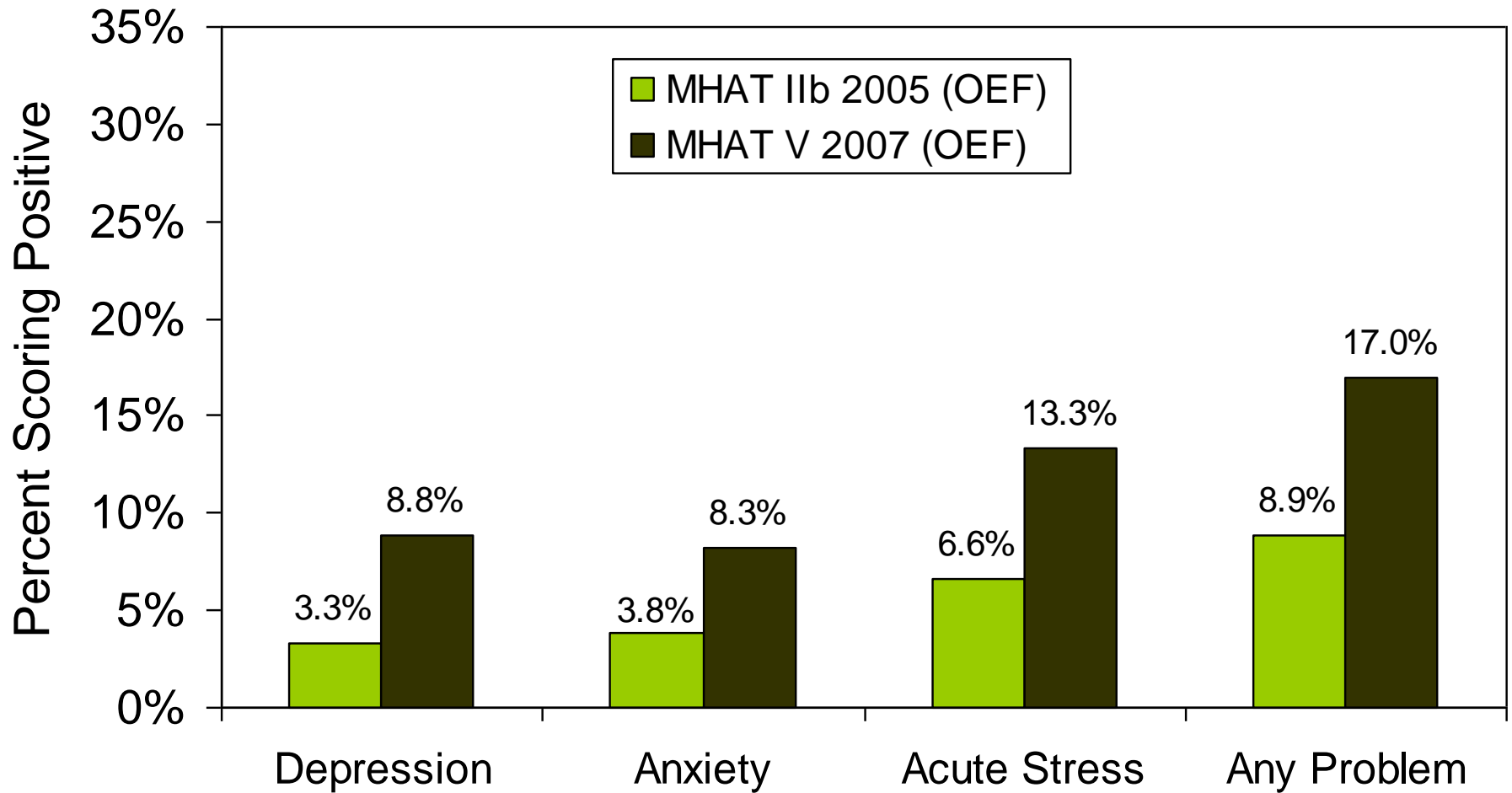


# OIF Behavioral Health Status: PTSD (Acute Stress) /Depression/Anxiety



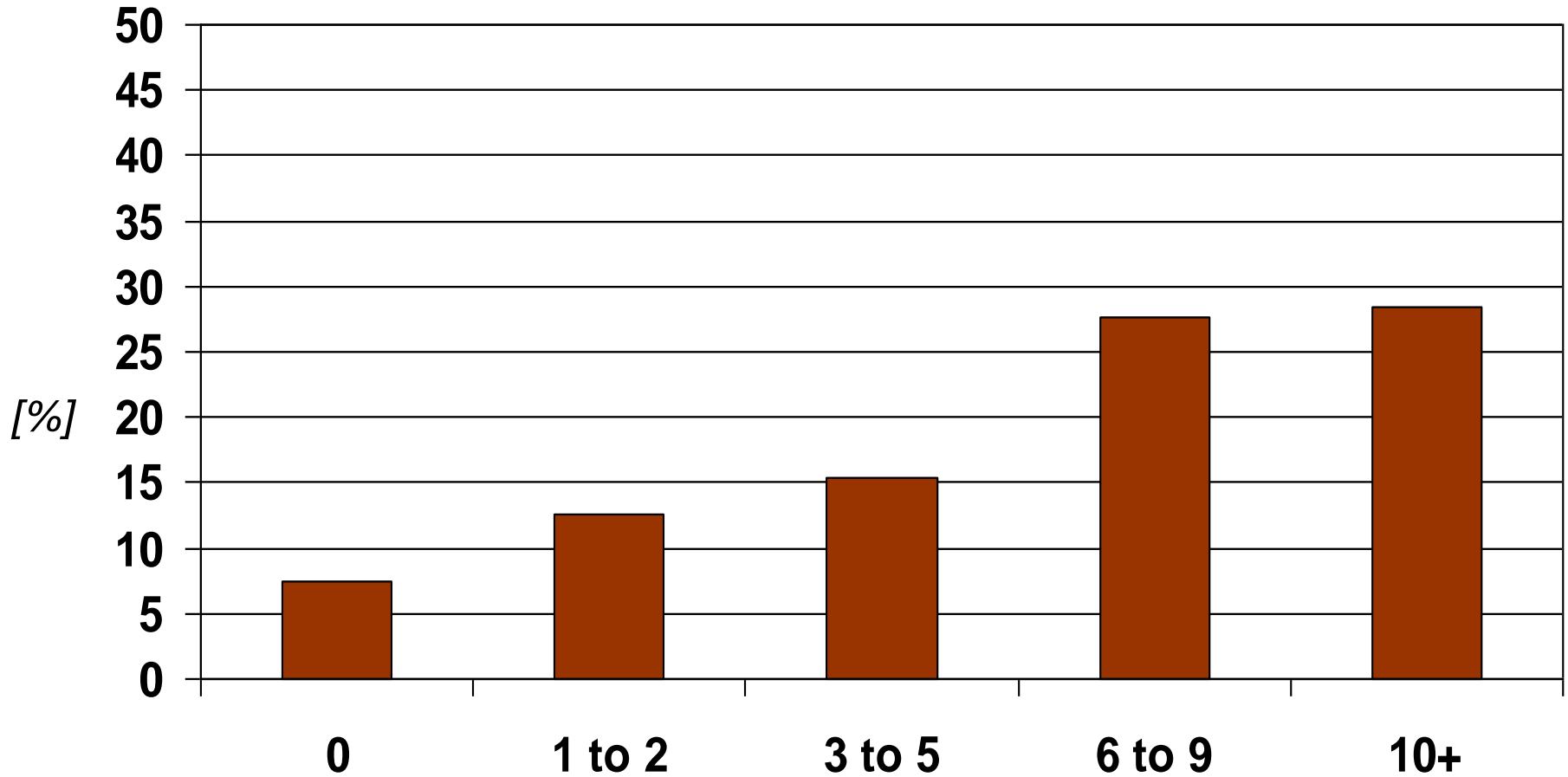


# OEF Behavioral Health Status (MHAT5)





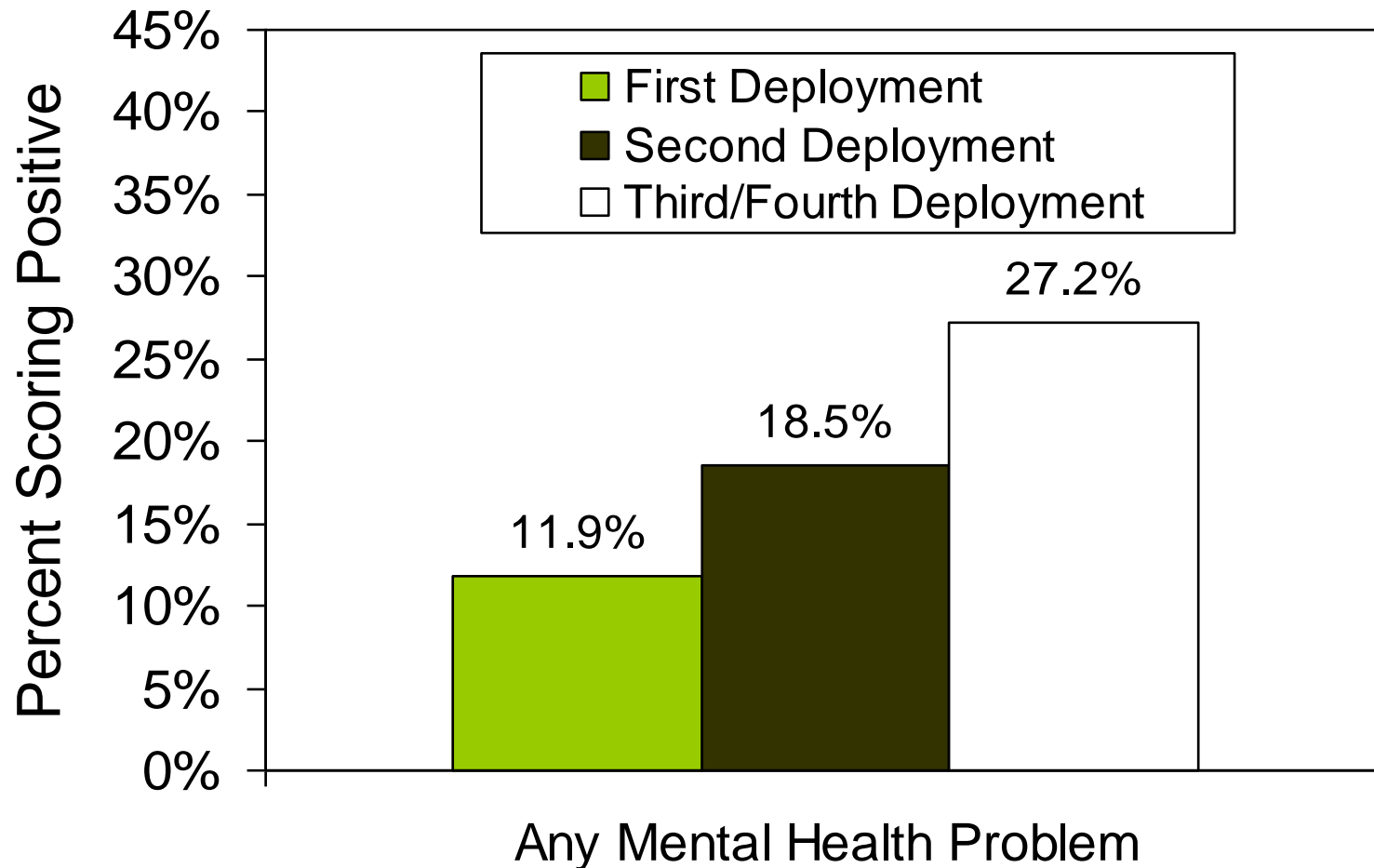
# Prevalence of PTSD by Number of Firefights During Deployment



*From WRAIR Land Combat Study, 3 months post-deployment*



# Multiple Deployments (NCOs) (MHAT5)





# Increased Suicide Rate: Evidence Related to Hypotheses



- 3. Increased Use of SSRIs and other psychotropic medications (FDA Black Box Warning). SSRIs are commonly prescribed by primary care and BH professionals; commonly used in theater.
  - However,
    - Only involves ideation/ behaviors, not completed suicides.
    - No evidence of increased risk in adults.
    - Evidence indicates that black box warning may have actually led to decrease in prescribing and increase in suicides nationally.
    - Analysis among veterans in VA indicates that SSRIs are protective.
    - Overall consensus is that benefits far outweigh theoretical risks.



# Increased Suicide Rate: Evidence Related to Hypotheses



- 4. Stigma / barriers have increased. Preventive interventions are not efficacious.
  - No evidence exists that stigma/barriers or effectiveness of programs has changed.
  - Multiple stigma reduction efforts are underway.
- 5. The resilience of the population is changing due to changes in recruitment standards or accession of a less fit force.
  - No evidence exists that there are significant population changes to explain the increased rate of suicide (e.g., HS diploma, Armed Forces Qualification Test, etc.)



# Prevention / Intervention Strategies



- Education / Stigma Reduction / Resiliency Training
- Post-Deployment Screening (PDHA/PDHRA)
- Surveillance
- Treatment





# Prevention / Intervention Strategies



- 1. Education / Stigma Reduction / Resiliency Training.
  - No education effort has been proven to be effective in reducing suicidal behaviors, although there are outstanding efforts to codify best practices using consensus processes:
    - CDC, American Foundation for Suicide Prevention, SAMHSA, American Association of Suicidology
      - <http://www.cdc.gov/ViolencePrevention/suicide/prevention.html>
      - [http://www.sprc.org/featured\\_resources/bpr/index.asp](http://www.sprc.org/featured_resources/bpr/index.asp)
      - <http://mentalhealth.samhsa.gov/suicideprevention/default.asp>
- 2. Post-Deployment Screening (PDHA/PDHRA)
  - The PDHA/PDHRA process has gotten increasingly complicated
  - Benefits remain uncertain
  - There is little or no evidence that it has reduced stigma
  - Risks include labeling and stigma to individuals who don't have deployment-related mental disorder (many false positives) and draining scarce BH resources away from treatment.



# Program Evaluation of PDHA Screening for PTSD, Army (JAMA 2007) (N=56,350)



<b>PTSD Screen Positive (PC-PTSD <math>\geq</math> 3) N=3474</b>	<b>Number (%) Who Received Mental Health Treatment and Number of MH Sessions</b>	<b>Number (%) Recovered 6 Months Post-Iraq (PC-PTSD &lt; 3)</b>
<b>Referred to Mental Health n=804</b>	None, 349 (43.4)	205 (58.7)
	1 Session, 128 (15.9)	69 (53.9)
	2 Sessions, 70 (8.7)	36 (51.4)
	$\geq$ 3 Sessions, 257 (32.0)	96 (37.3)
<b>Not Referred to Mental Health n=2670</b>	None, 1721 (64.5)	1181 (68.6)
	1 Session, 419 (15.7)	254 (60.6)
	2 Sessions, 129 (4.8)	67 (51.9)
	$\geq$ 3 Sessions, 401 (15.0)	150 (37.4)



## Example of Population Screen for PTSD



### Conditions:

*Population = 1000*

*Weighted Sensitivity = 80%*

*Weighted Specificity = 80%*

- 30 (20%) of 150 Soldiers with PTSD will not be identified.*
- 29% of the population will screen positive.*
- Only 120 of 290 (41%) of those who screen positive will actually have PTSD (PPV).*

	PTSD (+)	PTSD (-)	Total
Screen (+)	120	170	<b>290</b>
Screen (-)	30	680	710
Total	<b>150</b>	850	1000



# Prevention / Intervention Strategies



- 3. Surveillance
  - The epidemiology of completed suicides is different than behaviors (rare events vs. common impulsivity/ attention seeking behaviors)
  - Accurate reporting is likely for completed suicides
  - For serious attempts (hospitalizations, evacuations), DoDSER is a passive surveillance system.
- 4. Treatment
  - CBT for suicidal ideation or behaviors shows promise. Dissemination of best practices recommended.
  - Primary care interventions (RESPECT-MIL) are promising.
  - Case/Care management, continuity of care



# Recommendations



- Critically reevaluate PDHA and PDHRA processes to ensure that the potential benefits outweigh the risks and clinicians have clear guidance on what to do with screening results.
- Program evaluation, research, and evidence should guide interventions.
- More attention needs to be given to dissemination of evidence-based CBT modalities.
- Primary care interventions is likely to be of benefit in reducing stigma (e.g. RESPECT-MIL)
- Analyses of risk factors (e.g. combat vs. non-combat arms, deployed vs. non-deployed) should always adjust for age (or rank) and gender. Attrition is a likely confounder.
- Existing programs will not likely address the ongoing effects of high deployment frequency/duration or short dwell time.