



Big Country, by Heather S. Englehart, acrylic/watercolor on paper, Iraq, 2004.
Art: Courtesy of the Army Art Collection, US Army Center of Military History

Chapter 10

EPIDEMIOLOGICAL CONSULTATION TEAM FINDINGS

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INTRODUCTION

A behavioral health epidemiological consultation (BH EPICON) reviews target events in the social-behavioral context of an organization or community. The events studied, such as suicide, are often rare and not easily studied with conventional epidemiologic methods. Therefore, the consultants examine multiple measures through multiple modes (eg, index case review, surveys, focus groups) in an attempt to discern risk factors and potential mitigating strategies. Development of the BH EPICON process is modeled after a traditional outbreak investigation, to provide a rigorous, methodologically sound, nonjudgmental approach to assessing apparent clusters of negative behavioral health (BH) events within a military environment.

Typically a BH EPICON is initiated when a military installation or unit perceives an increase in BH related concerns that warrant additional scientific expertise. The most common reasons for initiating a BH EPICON historically have been perceived increases in the number of suicides, homicides, and aggressive behaviors among soldier populations at particular installations. Scientists and subject matter experts have collaborated to identify the most appropriate study objectives and methods necessary to collect the required data to provide clues to the development, identification, and mitigation of these events.

Army Regulation (AR) 40-5 designates certain organizations as public health agencies (the US Army Public Health Command and others), with the au-

thority to deem certain activities to be “Public Health Practice,”^{1,2} whereby these agencies will “provide support for comprehensive health surveillance for the Army and DoD [Department of Defense], and develop and maintain data analysis and archiving for worldwide military health surveillance activities.”^{1,2} In support of this mission, EPICONS are often conducted at the request of the senior mission commander of an installation or unit to provide actionable recommendations in a timely manner about public health threats or incidents.

The use of a multidisciplinary team to examine multiple sources and types of data is optimal to characterize the social-behavioral environment. Some of the earliest BH EPICONS were designed and conducted by the Walter Reed Army Institute of Research (WRAIR), with scientific expertise primarily in psychology and psychiatry. Building on much of the methodology and principles established by WRAIR, the US Army Public Health Command’s Behavioral and Social Health Outcomes Program, with scientific expertise primarily in epidemiology, social science, social work, and psychology, have also conducted BH EPICONS since 2008. Existing expertise is augmented with subject matter expertise from inside and outside the Army as needed, and has included experts in forensics, disaster response, occupational health, biostatistics, and religion/spirituality.

EPIDEMIOLOGICAL CONSULTATION DEVELOPMENT AND EXECUTION

Based on the overarching concerns expressed by the requestor and stakeholders, the EPICON team defines guiding domains to structure the specific areas of interest for instrument development and data collection. Appropriate modes of data collection and types of data are identified to ensure the best balance between efficient use of time and staffing and scientific methodology, which will enable the team to achieve the primary study objectives. Information used by EPICON teams can be classified into two categories: existing and unique. Existing data have already been collected or ascertained and may reside within a record, note files, or database, though not necessarily collected for scientific research. During recent BH EPICONS, as is the case in public health practice, existing data have been gathered from multiple data sources and linked together to create a large record of data for individual soldiers that allows for complex modeling of relationships.

Unique data are data that must be generated and

often include information on underlying behavioral and social risk factors (eg, financial problems, relationship troubles, problematic drinking). Proper sampling and systematic collection of unique data are critical to obtain valid results. Existing and unique data can each be further classified into quantitative and qualitative data. Quantitative data are typically numerical data that can be used to compare within and between groups of interest. Qualitative data are descriptive data drawn from interviews, notes, and focus groups that can increase understanding of observed relationships and help in forming additional hypotheses. Data will typically be drawn from specific units of scale—individual level data, unit level data, and population level data—which enable different types of assessments.

Modes of Data Collection

Typical modes of data collection can include the following:

- **Personal interviews:** one-on-one informal discussions conducted with leaders, family members, soldiers, special staff, or other relevant personnel. Interviews provide contextual and anecdotal information that can help increase understanding of the events, identification of additional data sources, and development of additional hypotheses. Information learned from interviews can be supported or refuted by other data gathered. Interviews can be structured or unstructured. Unstructured interviews allow questions to be changed or adapted based on the respondents' understanding of the concept and allow for a range of possible answers to choose from, and further questions are based on previous responses. Structured interviews are standardized (often using interview guides) to ensure each interview is as similar as possible, including the same order and types of questions. Structured interviews minimize variability between respondents to increase reliability when comparing responses among individuals.³
- **Focus groups:** structured groups specifically tailored to solicit open-ended feedback from all participants relevant to the defined domains of interest. Groups can be stratified by subpopulations of interest (eg, rank groups, units) and can be audio-recorded to ensure all participants' feedback is accurately captured. Qualitative data analysis of responses can reveal patterns, trends, and emerging themes, and it can help inform findings from other analyses.
- **Surveys:** tailored survey instruments are developed based on defined domains of interest, incorporating previously validated scales and questions, and administered to the population of interest. Results are summarized and integrated with the results from other analyses to provide context and characterization of the existence and magnitude of existing risk factors and outcomes.
- **Clinical case review:** where applicable, the relevant defined group of "index cases" that may have precipitated the request for assistance is reviewed in-depth using existing records to determine commonalities and factors that may be unique to the small population involved to help inform broader population analyses of other data.
- **Assessment of existing administrative data sources:** examination of individual, unit,

and installation data to determine historical trends and the prevalence of outcomes of interest in the broader population. Numerous types of data, if available at the individual level, can be linked to allow for characterization of the individuals within the population of interest and any representative comparable populations.

Aside from gathering all relevant data, the majority of the BH EPICON's time is spent analyzing the data. The time it takes to complete this process can vary depending on the magnitude of the BH EPICON and the data collected. Data analysis is completed using the most current, scientifically proven methods in each chosen discipline to evaluate the data collected and provide an unbiased determination of the results. Within and across scientific disciplines, experts coordinate and discuss the most appropriate data analysis strategies to ensure the primary study objectives are met. Following the completion of all preliminary analyses, a scientific review is conducted during which internal and external subject matter experts convene to collaboratively determine an understanding of the major findings. Data from each mode of data collection are analyzed individually and then integrated in the context of findings from the other areas. Convergence of findings across populations and methods allows greater confidence in the results as well as a more comprehensive understanding of the problem. The findings from each mode of data collection may inform other findings and provide additional hypotheses not previously considered, requiring a reassessment of data.

Dissemination of Results

The BH EPICON team briefs the stakeholders before and after every visit to the installation, remaining available to explain and answer any questions throughout the process to ensure the stakeholders are aware of ongoing developments and informed of any immediate concerns that may emerge. Ongoing findings from major phases of the investigation are reported so that the stakeholders can immediately begin developing mitigating strategies. At the EPICON's conclusion, the complete findings are written up into a formal report and presented to the leadership in advance of release. Often the findings and recommendations have broader implications beyond the groups affected and can influence policy changes across the Army and Department of Defense.

PUBLISHED EPIDEMIOLOGICAL CONSULTATION FINDINGS

Findings and recommendations from EPICONS related to suicides and homicides are described below, as they were determined during the consultations. It is not known whether the recommendations and interventions specified were effective, nor have any judgments been made as to the appropriateness of the recommendations.

Suicide-Related Epidemiological Consultations

Fort Leonard Wood, 2001

Findings discussed here were adapted directly from WRAIR's final EPICON report.⁴ In the summer of 2000, two Army basic trainees committed suicide at Fort Leonard Wood (FLW) within a 40-day period. These were the first trainee deaths to occur on the installation in more than 10 years. A subsequent increase in referrals for and utilization of behavioral health services overwhelmed the inpatient capabilities at FLW. There was concern that the two most recent suicides were indicative of an increase in suicidal behavior among initial entry training (IET) soldiers during this time. An EPICON team was requested to conduct a quality assurance investigation and better characterize the magnitude and reasons for the outbreak. The EPICON team conducted the following activities:

- a review of the two index cases;
- interviews with senior leadership from the units, BH personnel, and special staff; and
- a population-based cohort study of all IET soldiers to determine whether the observed increase in mental health visits exceeded the expected rate during the summer population surge.

The clinical review of the two suicide cases revealed both trainees had been evaluated by staff at the Community Mental Health Services and had been placed on unit watch because of concern about suicidal ideation. The purpose of unit watch is to prevent soldiers from harming themselves or others in the unit. Around the same time the two suicides occurred, 317 IET soldiers within one battalion and four training brigades (>3,000 IET soldiers) were identified who were referred for behavioral health services or separated for behavioral problems, including 211 (67%) expressing suicidal ideation or gestures. Rates of suicidal behavior, unit watch, psychiatric hospitalization, and discharges for preexisting psychiatric conditions were two- to three-fold higher than expected, based on comparable earlier

time periods. Significantly higher rates of suicidal ideation were associated with being assigned to the reception center, being in the first 2 weeks of basic training, and spending longer time in "holdunder" status (a low training and minimal supervision environment). IET trainees are placed in this status when they are waiting to start basic training, and this occurred at FLW in the summer of 2000 because of an atypically large number of new personnel recruited to meet the Army's end strength goals. A strong significant correlation was found between expressing suicidal ideation and the week of basic training, with the highest risk in the first 2 weeks of the 9-week cycle (Table 10-1).

Clustering of cases within specific units suggested "contagiousness" of these behaviors. The "contagiousness" of suicidal behavior has been argued,^{5,6} but some reports suggest an exposure to suicidal behavior (directly or through media reports) may be an important risk factor among adolescents and young adults.⁷⁻¹¹ Additionally, there was an equal risk of suicidal ideation between men and women, contrary to the two- to three-fold higher rate typically observed among women.

The EPICON team concluded that a significant outbreak of suicidal ideation and subsequent BH referrals at FLW occurred in association with the two completed suicides. With the exception of the two completed suicides, the vast majority of cases did not involve serious risk (based on an extensive case review), but the outbreak had considerable impact on the training environment (through the large numbers of unit watches, EPTS [existed prior to entering service] discharges, and numbers of trainees who required supervised transport from their unit to the medical

TABLE 10-1
RATE OF SUICIDAL IDEATION BY WEEK OF TRAINING FOR 3RD INFANTRY BRIGADE

Training Week	Rate per 1,000 Trainees/Week*
Weeks 1-2	3.36
Weeks 3-4	2.08
Weeks 5-6	1.25
Weeks 7-9	1.05

* $P < .0125$

Reproduced from: Hoge CW, Russell RK, Orman DT, Milliken C, Bliese P. *Final Report of Epidemiologic Investigation of Outbreak of Suicidal Behaviors Among Initial Entry Army Trainees at Fort Leonard Wood, July-October 2000*. Washington, DC: Walter Reed Army Institute of Research; 2001. WRAIR Technical Report.

clinics). Recommendations included recognizing the low risk of suicide and providing the necessary skills to recognize the signs and symptoms to leaders within the unit; forward deploying BH expertise to within the training areas; isolating the “contagious” (ie, clearly distinguishing between those with serious pathology and those who should be maintained in their unit); establishing a clear criteria for use of unit watch; and reducing the length of time in “holdunder” status to provide a more structured environment including basic life skills and stress reduction training.

Fort Riley, 2005

Findings discussed here were adapted directly from the EPICON report.¹² Between 2003 and 2004, six suicides among active duty soldiers and one suicide of a family member occurred at Fort Riley, Kansas. The occurrence of suicides was monitored by the installation risk management program, and leadership identified a potential suicide outbreak, conducted extensive reviews of installation suicide prevention measures, and implemented several new measures. The division surgeon, who is responsible for the technical control of all command medical activities, conducted detailed analyses of the suicides, and a broader scope review, including a review of installation resources, was also done. An EPICON was requested to add to the existing knowledge and draw appropriate comparisons to other Army installations and soldier populations. The EPICON team was directed to address medical and community support and resources, and the role of multiple combat deployments as they may relate to suicidal behaviors. The team conducted interviews with family support personnel, BH professionals, and chaplains and other unit leadership, and it assessed a variety of data sources from more than 1,000 soldiers, Behavioral Health Needs Assessment surveys,¹³ installation serious incident reports and BH records from suicide cases, mental health utilization data, domestic violence data, predeployment and postdeployment training feedback forms, and risk assessment and population surveillance data compiled by the division surgeon on both case and control populations.

In calendar years 2003 and 2004, a significantly elevated rate of completed suicides was observed at Fort Riley (27.3 per 100,000) as compared with an Army baseline rate for this same period of time (12 per 100,000). The clinical index case review determined that the principal stressors contributing to these events appeared to be severe marital and relationship problems, likely compounded by geographic separation and Operation Iraqi Freedom (OIF) deployments. Significantly higher rates of BH problems and lower

marital satisfaction were observed among Fort Riley soldiers as compared with soldiers at comparable installations, and a higher rate of family violence was observed at Fort Riley compared with broader Army rates. The prevalence of self-reported symptoms of posttraumatic stress disorder and general mental distress were the highest of any observed using the same survey within other Army and Marine infantry units following OIF combat deployments. The demand for BH services increased significantly compared to pre-OIF levels as a result of a higher prevalence of BH problems and the implementation of the postdeployment health assessment process. Screening instruments being used at Fort Riley to identify high-risk soldiers were found to lack validity based on review by subject matter experts, and no evidence indicated they were preventing adverse outcomes. Despite a high incidence of behavioral health problems, soldiers reported a positive perception of leadership, positive unit morale, and high unit cohesion, as compared with other units.

The EPICON team concluded the findings from Fort Riley had considerable implications for soldiers at other installations facing multiple OIF and Operation Enduring Freedom rotations. The following recommendations were made:

- Integrate BH services into the troop medical clinic; ensure adequate staffing of BH professionals to meet increased demand for services at both the clinic and unit levels;
- Establish marriage/family therapy capacity within the military medical treatment facility (MTF);
- Ensure synchronization and case management between the Fort Riley, chaplain, and MTF BH services; conduct training to educate soldiers and leaders about the occurrence of and relationship between BH symptoms and adverse effects (eg, alcohol misuse, functional impairment); and
- Emphasize the role of leaders at all levels in supporting and facilitating recognition of BH problems, access to services, and handling the stresses of deployment.

Fort Hood, 2006

Findings discussed here were adapted directly from the EPICON report.¹⁴ In the 32-month period between January 2003 and August 2005, a total of 22 suicides occurred among soldiers assigned to Fort Hood, three occurring in Iraq. An EPICON was requested by the 4th Infantry Division commander, whose own monitoring of soldier stressors resulted in concern about a

possible increased incidence of suicidal behaviors. The 4th Infantry Division was within 30 days of its second deployment to Iraq, and the 1st Cavalry Division had returned from its first OIF deployment several months earlier. The EPICON team was asked to examine the perceived increase in suicidal behavior, determine whether there was a true increase, and offer target areas for mitigation. The team conducted a review of the completed suicides and assessed installation BH support, family programs, and suicide prevention actions, using data from a variety of sources including surveys with more than 750 soldiers, a clinical index review of BH records and criminal investigation reports related to completed suicide cases, and population assessments of domestic violence data and Military OneSource utilization data. The EPICON team augmented their findings by conducting interviews with key family support program personnel, BH professionals, and chaplains.

Many Fort Hood soldiers had previously deployed in support of OIF one or more times. During the time period of interest (January 2003–August 2005), Fort Hood's suicide rate (19.9 per 100,000 soldiers) was higher than the annual Army rate (11.9 per 100,000 for 2003–2004). The rate among deployed Fort Hood soldiers during the 32-month period (26.4 per 100,000 soldiers) was markedly higher than the rate for deployed soldiers (7.8 per 100,000 soldiers) throughout the Army. Similar to data for total Army suicides, the suicides at Fort Hood were primarily a result of self-inflicted gunshot wounds (64%) and among male (95%), younger (median age 23.5 years), Caucasian (68%), and married (50%) soldiers. The primary stressors associated with the Fort Hood suicides were failed partner relationships (55%) and legal problems (18%). Nearly half (45%, 10 of 22) of those involved in these index cases had received BH care; only one had been diagnosed with depression; five had received treatment for alcohol or substance abuse, and none had received marital counseling through the MTF. A known history for previous suicide behaviors was determined (6 of 22); some had used alcohol before the suicide (5 of 22); and six had previous combat deployments, including the three who committed suicide during deployment.

A significant prevalence of BH issues was reported on surveys (9.2% had depression and 13.5% had post-traumatic stress). These rates were similar to levels reported previously by other soldiers' postdeployment, but higher than comparison samples of soldiers' predeployment. Previously deployed soldiers had significantly higher rates of posttraumatic stress symptoms (18%) compared with soldiers who had not deployed (10%). Fifteen percent of soldiers reported

having thoughts within the previous 4 weeks that they were better off dead, comparable to other military units. Nearly 57% reported experiencing current stress and emotional, alcohol, or family problems, which was much higher than in comparison groups. A high proportion of soldiers reported attending suicide prevention training (80%) and expressed confidence in their ability to identify soldiers who were suicidal (65%), but fewer agreed the suicide prevention training was sufficient (58%). Barriers to using BH services reported by Fort Hood soldiers included difficulty getting time off work (35%), concerns about confidentiality (27%), and difficulty getting appointments (23%). These rates were higher than in other predeployment or postdeployment units examined. Stigma against seeking services was also reported, such as being seen as weak (39%) and feeling that others would have less confidence in them (36%).

Population rates of family violence at Fort Hood were elevated over Army rates and appeared to be increasing. Spousal abuse and child abuse were mostly higher than Army rates since fiscal year 2001, and appeared to be increasing since fiscal year 2000. On surveys, about 20% of soldiers reported moderate or severe spousal abuse in the previous 12 months, a higher rate than comparison units. Through anecdotal reports from multiple agencies (eg, the New Parent Support Program, Exceptional Family Member Program, Army Community Service, chaplains, and social work staff), it was determined that the installation did not have a systematic method to identify common patterns and themes across agencies of soldier and families in distress or at risk for suicide, and there were limited options for marital and family counseling. The lack of integration between the suicide prevention program for the installation and the division hindered implementing coordinated efforts, tracking suicidal behaviors in the population, and monitoring intervention efficacy.

The EPICON made the following recommendations: develop integrated relationship training that aligns with the deployment cycle support program to support all phases surrounding and including deployment, coordinate agencies that offer marital counseling and integrate them with MTF treatment for serious disruption, develop (and advertise to the Fort Hood population) additional screening processes through family support groups and other community gatherings that address high-risk behaviors (eg, infidelity, overspending), offer one-on-one counseling, consider nontraditional relationship support programs that mitigate intense distress associated with failed relationships, and reestablish the Installation Suicide Prevention Program in accordance with AR 600-63.¹⁵

Fort Campbell, 2008

Findings discussed here were adapted directly from the EPICON report.¹⁶ In November 2007, the 101st Airborne Division (Air Assault) commanding general perceived an increasing trend in suicide-related deaths since 2006. Several suicides had occurred during the predeployment preparation, and concerns arose that intense operational tempo may be contributing to suicidal behavior and that more suicides may occur if current trends continued without an intervention. There were also concerns that Fort Campbell lacked sufficient BH resources to address the installation's needs. An EPICON was requested to (1) determine whether there was a statistically significant increase in the number of suicides among soldiers of the 101st Airborne Division and other tenant units, (2) review current installation support programs and practices, and (3) recommend strategies to enhance resources on the installation.

The EPICON team conducted an index case review of all confirmed and suspected suicides (n=14) occurring between January 2006 and October 2007, including a review of all medical, BH, administrative, and legal data. The team also conducted a population assessment

of prior suicide rates (compared with other relevant installations and the total US Army); general population data for Fort Campbell since 2001 (including deployments and redeployments); BH services utilization, workload, and staffing; Military OneSource usage; the Risk Reduction Program metrics (eg, risk-taking behaviors); and trends in positive urine analysis tests and spouse abuse. A survey was designed to assess the prevalence of suicidal thoughts among current Fort Campbell soldiers and to identify potential risk factors. A series of interviews and focus groups was conducted to explore concerns of the military leadership, MTF staff, community-based agency and support staff, and military family members.

No statistically significant difference was observed between the overall time period from 2001 to 2007 for the suicide rate at Fort Campbell (20 per 100,000 soldiers) and a comparison with similar installations (19 per 100,000 soldiers); however, both rates were significantly higher than the overall Army rate for the same time period (13.5 per 100,000 soldiers), as shown in Table 10-2. The Fort Campbell suicide rate for 2007 (34 per 100,000 soldiers) was significantly higher than the relevant comparison installations (24.5 per 100,000 soldiers) and the overall Army rate (19 per 100,000

TABLE 10-2**SUICIDE COUNTS AND POPULATION DATA, US ARMY, FORT CAMPBELL, AND FOUR COMPARISON INSTALLATIONS, 2001–2007***

	2001	2002	2003	2004	2005	2006	2007	2001–2007 [†]
Fort Campbell								
Count	1	4	5	3	6	7	10	36
Population	23,616	24,546	25,373	25,869	28,977	29,535	29,535	187,451
Rate [‡] (per 100,000)	4.2	16.3	19.7	11.6	20.7	23.7	33.8	19.2
Army								
Count	47	55	62	54	63	88	100	469
Population	481,435	488,065	498,773	499,178	490,974	505,395	522,144	348,5964
Rate (per 100,000)	9.8	11.3	12.4	10.8	12.8	17.5	19.1	13.5
Comparison Installations								
Count	16	12	22	15	23	33	32	159
Population	107,576	111,941	116,005	120,035	124,445	130,552	130,552	841,106
Rate (per 100,000)	14.8	10.7	19	12.5	18.5	25.2	24.5	18.9

*Active Army only, activated Army Reserve and National Guard excluded.

[†]The difference in aggregate 2001–2007 rates between Fort Campbell and comparison installations was not statistically significant; however, both rates were significantly higher than the Army rate ($\chi^2 = 3.9, 13.5$, respectively $P < 0.05$).

[‡]Rates representing fewer than 20 suicides per year are statistically unreliable and should be interpreted with caution.

Reproduced from: *Epidemiological Consultation Report: Investigation of Completed Suicides at Fort Campbell, Kentucky, November–December 2007*. Washington, DC: Office of The Surgeon General, Department of the Army; 2008.

soldiers) for 2007. For the time period 2001 to 2007, a significant upward trend of annual suicide rates was observed for Fort Campbell, comparison installations, and the overall Army.

The index cases (n=14) were predominantly young (<30 years), Caucasian, and men with significant relationship issues, histories of alcohol or drug use, and at least one combat deployment. These data were consistent with both the overall population distribution at Fort Campbell and known risk factors for suicides in the Army and general population. None of the soldiers was granted an enlistment waiver, but more than one-third evidenced some behavior change (eg, legal issues, relationship problems, work issues) before committing suicide. Relationship conflict, alcohol or drug abuse, and a history of BH issues were the primary risk factors for suicide identified in this group. Although the majority (64%) of those who committed suicide had deployed, no single characteristic (eg, frequency, location, or duration of deployment) was prevalent among deployers.

Of more than 2,000 soldiers who completed an anonymous survey, approximately 6% reported current or recent (in the previous 4 weeks) suicidal thoughts at the time of the survey. Most soldiers reporting suicidal ideation did not seek help for those thoughts. Although the majority of soldiers surveyed stated they could access resources at Fort Campbell for BH and physical health concerns, barriers reported were significantly different between soldiers expressing suicidal ideation and soldiers who did not have suicidal ideation. There was also a strong correlation between soldiers' perceptions of the negative impact of operational tempo on their health and risk for suicidal ideation.

The team found a lack of standardized approaches to tracking suicide and suicide-related data on Fort Campbell and other installations. Data ascertained were inconsistent and incomplete, limiting the utility of quarterly installation risk reduction data presented to commanders. Also, personnel resources for BH providers were insufficient to meet the demand for services on Fort Campbell. The adult BH clinic noted a five-fold increase in clinic visits among soldiers between deployments (ie, the "reset" period), while simultaneously experiencing a reduction in staffing.

The EPICON team concluded that a need exists for closer case management of soldiers with BH problems, including improved coordination and communication among healthcare professionals. The following recommendations were made:

- address the critical BH staffing shortages;
- develop a comprehensive BH case-management system enabling risk identification;

- provide continuity of care and professional communication among BH specialists;
- strengthen the effectiveness of the installation health promotion council as a professional forum for collaborative efforts to prevent suicides and other adverse outcomes;
- bolster training for suicide awareness and prevention on Fort Campbell with a focus on developing resiliency; and
- reduce stigma associated with BH concerns across all levels within operational and support organizations.

A recommendation was also made to conduct an AR 15-6¹⁷ investigation on each suicide that occurs at Fort Campbell to ensure that a standard quality of data collection occurs with each incident and to help strengthen suicide prevention efforts on the installation by providing the most current data/findings to help mitigate risk within specific populations.

Homicide-Related Epidemiological Consultations

Fort Bragg, 2002

Findings discussed here were adapted directly from the EPICON report.¹⁸ During a 43-day period between June and July 2002, four homicides of spouses of active duty soldiers stationed at Fort Bragg, North Carolina, were committed—all cases allegedly perpetrated by the soldiers. An additional homicide of an active duty soldier involving the wife as one of the alleged perpetrators also occurred during the same time period. Two of these cases were murder-suicides, in which the alleged perpetrators took their own life following the homicide of their spouse. Significant news coverage and media attention led to postulations about the etiology of these events, including the possible link between deployment-related stress and the potential effects of combat experiences (3 of the 4 soldiers suspected of homicide were previously deployed to Afghanistan), as well as the potential neuro-psychiatric side effects of the malarial prophylaxis drug mefloquine. The US Army Office of The Surgeon General requested an EPICON team composed of Army and Centers for Disease Control and Prevention subject matter experts to assess and provide recommendations to address potential systematic, cultural, and resource-limitation factors that may be related to the apparent clustering of homicides and suicides, as well as any deployment-related BH issues. The primary goals of the EPICON were to:

- assess predeployment and postdeployment soldier and family education programs, support services, and clinical services relative to policies, procedures, and requirements;
- organize relevant statistical data for comparative analysis;
- assess data associated with the index cases; and
- use data from index cases to assess relevancy and adequacy of the services' current systemic policies, procedures, and resource requirements.

The EPICON team conducted interviews and focus groups with soldiers, spouses, leadership, and other stakeholders; an index case analysis of soldiers allegedly perpetrating (n=4) or being the victim (n=1) of fatal intimate partner violence; and an assessment of population data related to completed suicides at Fort Bragg in 2001 and 2002 and to rates of BH inpatient and outpatient utilization.

The overall homicide rate among soldiers at Fort Bragg over the previous 12 months was not statistically significantly different from the national rate (6 per 100,000)¹⁹; however, the occurrence of all five events involving intimate partners was highly unusual and represented a statistically significant finding.^{20,21} All the soldiers in the active duty index cases were experiencing marital discord, and two of them had returned early from a combat deployment in Afghanistan to address their marital problems (although neither accessed support services). Marital problems were also a very commonly mentioned theme at Fort Bragg within focus groups. Operational mission demands may have been a contributing factor, including inadequate time for family reintegration, unpredictable work schedules, and problems with leave management.

Mefloquine did not explain the clustering of index cases. Only two of four active duty homicide suspects were prescribed mefloquine, and neither had a documented history of subsequent changes in personality or unusual behavioral symptoms.

Variable resourcing, organizational "stove-piping," and inconsistent application of tailored programs to facilitate marital reintegration for soldiers and spouses in the context of operational missions were significant concerns. There was a perception among medical professionals, leadership, soldiers, and spouses that the current model of delivering services for domestic violence, substance abuse, and BH care prevention and treatment (as described in Army policy, structure, and resourcing) was flawed and counterproductive, thus discouraging early identification of and therapeutic engagement with those with BH problems.

The EPICON team recommended making BH care available for active duty families on post, where they already receive the majority of their medical care, increasing the availability of appointments, and instituting reimbursement for marital, family, and abuse counseling. Further analysis of the association between combat deployments and health outcomes, divorce rates, domestic violence, premature attrition (ie, discharged early because of various issues), health-care delivery, and barriers to treatment, as well as an assessment of command-sponsored transition programs (eg, Family Readiness Groups) for their content, effectiveness, consistency of resources, and how they are tailored to specific units, were also recommended. Lastly, the EPICON team suggested reengineering the delivery of integrated BH services (mental health, the Family Advocacy Program, and the Army Substance Abuse Program) to optimize delivery of proactive, accessible, and career-safe BH care to soldiers and families (Table 10-3).

Fort Carson, 2009

Findings discussed here were adapted directly from the EPICON report.²² In a 12-month period from 2007 to 2009, eight homicides were allegedly perpetrated by six soldiers from units at Fort Carson, Colorado. The senior mission commander initiated a task force in October 2008 to investigate soldiers currently or recently assigned to Fort Carson units who were alleged to have committed homicide, attempted homicide, or been accessories to homicide since 2005. Based on broader concerns voiced by Army and congressional leadership, an EPICON was requested to augment the task force in the following manner:

- Examine the rates and trends in violent deaths involving soldiers within tenant organizations of Fort Carson compared with the Army overall and with a group of relevant comparison installations;
- Identify risk factors associated with the violent deaths;
- Assess the adequacy of BH programs, resources, and social support at the installation; and
- Recommend strategies to enhance current programs and reduce the installation's incidence of violent death.

The EPICON team conducted an extensive epidemiologic and clinical analysis that included detailed examination of the individual crimes (index cases) of any soldiers assigned to Fort Carson (or recently

TABLE 10-3
BEHAVIORAL HEALTHCARE* REENGINEERING RECOMMENDATIONS

New Feature	Rationale
Systematic screening	To identify and proactively treat those at risk
Single BH data system	Care continuity, integration, efficiency, evaluation
Surveillance: talking/survey/databases	Earlier care protects careers and marriages; greater readiness
Preclinical, workplace-centric focus	Career-safe, promotes access, command-consultation
Integrated BH system: FAP, ASAP, MH, with: <ul style="list-style-type: none"> • Single BH professional liaison to units who provides preventive and preclinical care • Single portal of entry • Core of BH evaluation is integrated across service providers 	<ul style="list-style-type: none"> • Forward-deployed BH professionals can develop existing partnerships with soldiers and leaders leading to early intervention and prevention • Chaplain model relationships, trust developed, including FRG consultation • Decrease confusion for commanders and soldiers • Less redundancy, accurate info, less perceived danger
BH care for spouse and children on post	Fewer barriers leads to better care, which leads to increased readiness and well-being
Tricare: improve BH network care <ul style="list-style-type: none"> • Cover marital, family, abuse problems • Address reimbursement levels, problems 	<ul style="list-style-type: none"> • Improve access: earlier care while problems are manageable • Increased resources and V-codes used to maximize early recognition of need and prevention of severe diagnoses • Increase the number and type of providers who accept Tricare

*BH Care = FAP + ASAP + MH

ASAP: Army Substance Abuse Program

BH: behavioral health

FAP: Family Advocacy Program

FRG: Family Readiness Group

MH: mental health

Tricare: triple option benefit plan available to military families

Reproduced from: *Fort Bragg Epidemiological Consultation Report*. Washington, DC: Office of The Surgeon General, Department of the Army; 2002.

discharged from service after having served at Fort Carson) charged with homicide or accessory to homicide from 2005 to 2008 (n=14). The study included examination of demographic, medical, administrative, and legal information. Interviews were conducted with those involved in nine of the 14 index cases that were incarcerated and consented to be interviewed. Population comparisons were made for installation-level data between Fort Carson and other installations to assess community trends in crime rates, high-risk behaviors, substance abuse, and BH service utilization. Interviews were conducted with key leaders and staff at Fort Carson, and focus groups (n=59) were completed with soldiers (n=402) from every rank and every battalion in the index brigade combat team (BCT; to which the majority of index cases were associated), to obtain a detailed understanding of soldiers' perceptions, awareness, and

utilization of BH resources as well as their thoughts on the command climate, discipline standards, quality of soldiers, needed changes, and the increased homicides and suicides. The team also conducted a cohort analysis to assess differences in exposures and BH outcomes between the index BCT and another Fort Carson BCT with similar OIF deployment experiences. Using administrative and personnel information collected for soldiers (n=20,737) assigned to the two BCTs from the beginning of the first outside continental US assignment during 2003 through the date of the most recent homicide, the team assessed the potential cumulative effect of operational tempo and deployments on the outcomes of interest as well as the effect of enlistment waivers. A survey was developed to assess the experiences, attitudes, and climate of the BCT population (n=2,775) with whom many of the perpetrators served, including assess-

ment of mental illness, criminal history, substance abuse, combat experiences, physical aggression, and posttraumatic growth.

Soldiers allegedly involved in crimes related to homicide at Fort Carson from 2005 to 2008 were, in retrospect, at risk for engaging in violent behavior based on clustering of known risk factors for violence,²³ namely prior criminal behavior and psychopathology. Several common threads were identified among the 13 soldiers charged with homicide (n=10), attempted homicide (n=2), accessory to homicide (n=1) and the soldier who committed homicide/suicide, including unit of assignment (10 of 14 were assigned to the index BCT, 6 of these were within the same battalion, 8 were infantry soldiers); deployment history (12 of 14 had deployed at least once to OIF); early redeployment (6 of 12 previously deployed soldiers returned from combat early, thus not receiving normal reintegration training); and behavioral risk factors (substance abuse [79%], BH diagnoses [71%], criminal activity [78%]). Those involved in the index cases were at very high risk for negative behavioral outcomes compared to the overall Fort Carson population and in the index BCT, based on three of the four main contributory factors of criminal behavior²⁴: mental illness, criminal history or past history of violence, and substance abuse (8 cases had documentation of all three major risk factors, 3 had only least two risk factors, and 3 had only one risk factor). Relevant literature showed that the existence of multiple comorbid risk factors in individuals poses the greatest risk for potential expression of violent behavior.^{23,25}

Although the overall trend of enlistment waivers granted to soldiers previously or currently assigned to both BCTs was increasing, no difference existed in

the proportion of soldiers with these waivers across the two BCTs. Thus, waivers could not account for the clustering of index cases. However, the data available did show that soldiers in these BCTs who were granted a waiver for alcohol or drug use were approximately two to three times more likely to test positive for illicit drugs and more likely to separate from the Army due to misconduct or Uniform Code of Military Justice violations. Rates of arrests for major crimes (eg, murder, rape, aggravated assault) increased among relevant comparison installations and across the Army between 2003 and 2008, and rates were higher at Fort Carson than relevant comparison installations in 2007 and 2008; although murder was a rare event.

The index BCT and battalion to which the majority of perpetrators were assigned experienced significantly higher levels of combat intensity (as represented by combat death rates during OIF deployments and postdeployment BH diagnosis rates) than the comparison BCT and infantry battalion (Tables 10-4 and 10-5). Survey data showed evidence of a possible association between increasing levels of combat exposure and risk for negative BH outcomes, consistent with recent research on combat exposure and subsequent behavioral outcomes among soldiers.^{26,27}

Stigma and lack of referral by commanders to the Army Substance Abuse Program for required substance abuse screening were important barriers to soldiers from the index BCT seeking and receiving treatment for BH problems. Stigma was multifactorial and experienced differently across rank groups. Peer and personal factors were at least as important in perpetuating stigma as leadership issues (Exhibit 10-1). Lower-rank enlisted soldiers were more concerned about peer and self-perceptions, while senior enlisted soldiers were more concerned about their career and perceived leadership abilities.

The EPICON team concluded that a combination of individual, unit, and environmental factors converged to increase the population risk in the index BCT, which made clustering of negative outcomes more likely. Accumulation of BH risk based on individual predisposing factors (eg, prior criminal behavior, drug or alcohol abuse, BH issues); unit factors (eg, combat exposure and intensity, leadership, barriers to seeking care); and environmental factors (eg, operation tempo, installation and community trends) may have increased the overall population-level risk for negative outcomes. Recommendations were made to identify and develop mitigating strategies to decrease both individual and population-level risk, such as improving screening and case management to identify as well as follow-up with high-risk soldiers and units; eliminate barriers to substance abuse and BH

TABLE 10-4

COMPARISON OF COMBAT DEATH RATES (PER 1,000) BY DEPLOYMENT FOR THE INDEX BRIGADE COMBAT TEAM AND A COMPARISON BRIGADE COMBAT TEAM*

	Index BCT Deaths	Comparison BCT Deaths	Rate Ratio
Deployment A	23.2	0.1	>100*
Deployment B	13.0	0.8	>16*

* $P < 0.001$ for difference between BCTs for both deployments
BCT: brigade combat team

Reproduced from: *Epidemiological Consultation Report: Investigation of Homicides at Fort Carson, Colorado November 2008–May 2009*. Washington, DC: Office of The Surgeon General, Department of the Army; 2009.

TABLE 10-5

DESCRIPTION OF MENTAL HEALTH DIAGNOSES, SUBSTANCE-RELATED DISORDERS, AND TRAUMATIC BRAIN INJURY FOR SOLDIERS BY BRIGADE COMBAT TEAM AND DEPLOYMENT (RATES/10,000 SOLDIERS)

	Index BCT				Comparison BCT			
	Deployment A		Deployment B		Deployment A		Deployment B	
	Pre	Post*	Pre	Post	Pre	Post	Pre	Post
Any MH diagnosis	258.2	2515.0 [†]	2009.5	4087.3	776.6	1380.2	2403.7	3739.4
Acute stress	7.5	269.5 [†]	95.0	187.0	3.8	115.3	92.9	218.5
PTSD	11.2	621.3 [†]	118.7	780.6	19.2	176.9	202.1	718.4
Anxiety disorders, not PTSD	18.7	160.9 [†]	65.3	374.0	46.1	69.2	150.2	284.1
Adjustment disorder	104.8	434.1 [†]	270.1	875.6	103.8	157.6	458.9	715.7
Mood disorder	67.4	505.2 [†]	270.1	572.9	130.7	238.4	401.5	680.1
Substance-related disorders	44.9	632.5 [†]	382.9	418.5	184.5	303.7	393.3	543.6
TBI	11.2	250.7 [†]	95.0	1392.1	38.4	65.4	103.8	1526.9

BCT: brigade combat team

MH: mental health

Pre: predeployment

Post: postdeployment

PTSD: posttraumatic stress disorder

TBI: traumatic brain injury

*Postdeployment data reflect diagnoses in the 6 months following redeployment. A focused study of TBI in the index BCT following the first deployment may have resulted in a disproportionate number of TBI diagnoses.

[†]P < 0.01 comparing diagnosis rates during predeployment and postdeployment periods between the two BCTs.

Reproduced from: *Epidemiological Consultation Report: Investigation of Homicides at Fort Carson, Colorado November 2008–May 2009*. Washington, DC: Office of The Surgeon General, Department of the Army; 2009.

treatment; expedite processes for treatment or military discharge as appropriate; enhance resources and training for small unit leaders; and improve social support programs for soldiers and families. To understand the impact on the Army overall, the team also

recommended more comprehensive studies of the potential impact of deployment and combat exposure, as well as the relative weights of various individual, unit, and environmental factors on violent behavior and criminal outcomes in Army populations.

LESSONS LEARNED

Common Behavioral Health Themes

The BH EPICONS have shown that multiple factors converge to increase the overall population risk and the subsequent individual risk, rather than one single contributing risk factor being the cause of the negative BH events (suicide or homicide) analyzed. Clinical reviews of index cases commonly identified multiple risk factors present among soldiers before the event. Often, although an EPICON was requested in response to a specific clustering of small index events, the EPICON teams observed and reported broader underlying issues affecting a larger segment of the population of interest. Recommendations targeting broader underlying concerns were common.

Specific findings from the EPICONS varied accord-

ing to the primary study objectives, methodology used, and the events that precipitated the official request, but several common themes have emerged, including factors related to individual risk and systemic issues (Table 10-6). Nearly all the EPICON teams observed an increased negative impact on BH outcomes (suicides and homicides) from individual risk factors related to deployment, family issues, increased violence against persons, evidence of previous suicidal gestures or attempts, accessing BH care, and legal or financial issues. Likewise, increased negative BH outcomes were observed in association with systemic issues related to stigma, transition and reintegration from deployment to garrison, problems with BH services and resources, lack of integrated care, and issues surrounding leadership and unit climate.

EXHIBIT 10-1**PERCEPTIONS RELATED TO THE FOUR TYPES OF STIGMA REPORTED BY FORT CARSON SOLDIER FOCUS GROUPS****Career**

- on permanent record, effects future promotion and employment
- end career, lose retirement
- lose security clearance
- “boarded out” rather than rehabilitated

Leadership

- some old school, senior NCOs, and early promoted NCOs create/maintain stigma
- more stigma for senior enlisted, others think they can’t lead, fear of affecting retirement
- many squad/platoon leaders don’t support
- treated differently; doubt “warrior” abilities; ridicule those with a profile

Peer-to-peer

- peer stigma is the worst
- more stigma if never deployed
- treated differently, ridiculed
- gossiped about/perceived faking

Personal

- weak, isolated, embarrassed
- profile makes them feel worthless
- pride/denial
- don’t want to be viewed as a “bad” soldier

NCO: noncommissioned officer

Data source: *Epidemiological Consultation Report: Investigation of Homicides at Fort Carson, Colorado November 2008–May 2009*. Washington, DC: Office of The Surgeon General, Department of the Army; 2009.

Recommendations

EPICON team recommendations have typically involved a combination of mitigating strategies designed to increase identification of soldiers at high risk for negative BH outcomes and those that attempt to decrease overall population risk. A recommendation made in nearly all the BH EPICONS examined was the need for quality services for soldiers and their families with better case management and integration among programs. Other commonly stated recommendations included education of leadership about combat reactions, reintegration, stigma and support; proactive screening, systematic surveillance, and collection of data related to BH outcomes; utilization of evidence-based initiatives; and increased access to services with reduced barriers to seeking care.

Process and Methodology

Epidemiological investigations are far from a new science, but the application of scientific meth-

odology to examine BH outbreaks is a developing scientific process for which a perfect study design has yet to be crafted. From the EPICONS examined and established epidemiologic methodology, it is apparent that to fully understand the occurrence of rare events, scientists must consider the broader environment in which the cases occurred. To do this correctly when examining behavioral outcomes, it is necessary for researchers to talk to leaders, battle buddies, family members, and medical professionals; survey the broader population to assess hypothesized risk factors and the burden of disease; and assess population rates of outcomes within the population over time and in comparison with other relevant groups. Standardized methodology based on guiding scientific principles was integral to the EPICONS examined, providing the basis and rationale for the findings generated.

Over time the implementation and analysis of focus groups have grown, and the EPICONS examined made it obvious that focus groups were integral to understanding contextual information surrounding

TABLE 10-6
COMPARISON OF BEHAVIORAL HEALTH EPIDEMIOLOGICAL CONSULTATION (SUICIDE AND HOMICIDE) FINDINGS AND THEMES, 2001–2009

	Suicide			Homicide		
	Fort Leonard Wood, 2001 ¹	Fort Riley, 2005 ²	Fort Hood, 2006 ³	Fort Campbell, 2008 ⁴	Fort Bragg, 2002 ⁵	Fort Carson, 2009 ⁶
Individual Risk Factors						
Deployment: length, multiple, unpredictability		X	X	X	X	X
Family separation, relationship stress, lack of social support		X	X	X	X	X
Increased violence against persons including spouse/family		X	X	X	X	X
Increased use of alcohol and drugs, and related offenses		X	X	X		X
Previous gestures/attempts/BH contact	X	X	X	X	X	X
Perceptions of manipulating the BH system or malingering	X	X		X		X
Legal or financial issues		X	X	X	X	X
Systemic Issues						
Stigma: personal, peer, leadership, career		X	X	X	X	X
Poor service delivery for dependents		X	X		X	
Combat intensity, transition, reintegration		X	X	X	X	X
Problems with BH services, family advocacy program, Army Substance Abuse Program	X	X	X	X	X	X
Lack of BH standardized screening, intervention, case management, data collection	X	X	X	X	X	X
Leadership management/climate	X		X	X	X	X

BH: behavioral health

Data sources: (1) Hoge CW, Russell RK, Orman DT, Milliken C, Bliese P. *Final Report of Epidemiologic Investigation of Outbreak of Suicidal Behaviors Among Initial Entry Army Trainees at Fort Leonard Wood, July–October 2000*. Washington, DC: Walter Reed Army Institute of Research; 2001. WRAIR Technical Report. (2) *Epidemiological Consultation Report: Suicides at Fort Riley, Kansas*. Fort Sam Houston, Texas: Great Plains Regional Medical Command, US Army Medical Command; 2005. (3) *Epidemiological Consultation Report: Suicides at Fort Hood, Texas*. Washington, DC: Office of The Surgeon General, Department of the Army; 2006. (4) *Epidemiological Consultation Report: Investigation of Completed Suicides at Fort Campbell, Kentucky, November–December 2007*. Washington, DC: Office of The Surgeon General, Department of the Army; 2008. (5) *Fort Bragg Epidemiological Consultation Report*. Washington, DC: Office of The Surgeon General, Department of the Army; 2002. (6) *Epidemiological Consultation Report: Investigation of Homicides at Fort Carson, Colorado November 2008–May 2009*. Washington, DC: Office of The Surgeon General, Department of the Army; 2009.

some issues (eg, unit climate, stigma, perceptions of leadership) that otherwise may not have been captured. The use of surveys in some EPICONS provided the unique opportunity to assess—within the broader population—the prevalence of exposures, risk factors, and outcomes observed among the index cases. The use of existing data—to the extent possible—pro-

vided a wealth of information related to the index cases, units, and population of interest, and involved minimal impact on the population studied. Often the use of existing data in conducting time trend analyses and population comparisons enabled researchers to determine whether a significant increase in negative BH outcomes had truly occurred.

CONCLUSION

The request, planning, data collection, and completion of a BH EPICON is a collaborative partnership that combines the primary stakeholders' overarch-

ing concerns with scientific expertise and rigorous methodology to provide leaders with actionable intelligence to help shape policy, recommendations,

training, and screening practices. A combination of scientific methodology and scientific expertise is integral to understanding more fully the underlying causes of negative BH outcomes. Examining multiple measures through multiple modes is necessary to discern risk factors and potential mitigating strategies. The impact of simply talking to the soldiers and their families, unit leaders, and other experts

in the community cannot be overstated. Although each element of information collected may not be entirely reliable, as data from the multiple areas of surveillance (surveys, focus groups, population data, and interviews) emerge, the convergence of findings across populations and methods allows greater confidence in the results, as well as a more comprehensive understanding of the problem.

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