Deployment Cycle Effects on the Psychological Screening of Soldiers

Amy B. Adler, PhD†
Kathleen M. Wright, PhD††
Ann H. Huffman, MEd†††
CPT Jeffrey L. Thomas, MS, USA††††
LTC Carl A. Castro, MS, USA†††††

The goal of psychological screening with U.S. soldiers is to identify individuals in need of intervention. Through the expansion of the original screening program, comparison of screening results from across the deployment cycle (garrison, pre-deployment, re-deployment, and post-deployment) is now possible using cross-sectional data. Despite the different missions supported by the screening program (for example, Bosnia, Albania, and Kosovo), the screening process has remained essentially the same. Soldiers scoring above criteria on any one of three symptom scales are briefly interviewed to determine referral need. Results from over 10,000 soldiers in one Army division stationed in Germany revealed that rates of exceeding criteria are highest in garrison (the initial phase of the deployment cycle), at pre-deployment, and at post-deployment, and lowest at re-deployment. Recommendations for improving the screening program, intervention efforts, and follow-up research are highlighted.

Deployment Cycle Effects on the Psychological Screening of U.S. Army Soldiers Psychological screening began as part of the Joint Medical Surveillance Program conducted from 1996 to 1999 for U.S. military personnel prior to the soldiers' completing their deployment to Bosnia. Since that time, soldiers have been screened across the deployment cycle: in garrison, at pre-deployment as they prepared to deploy, at re-deployment just prior to return, and at post-deployment several months later. The screening has also expanded to include deployments to Albania and Kosovo.[1] As a consequence of this expansion, screenings allow for comparisons of soldier well-being across the various deployment phases.

There are six major goals of the psychological screening program: (1) provide proactive mental health outreach; (2) identify deployment mental health issues for interventions; (3) provide commanders with information on the mental health of the force; (4) establish a reference database for comparison to future operations and follow on operations; (5) project the patient load for deployed mental health assets; and (6) monitor the health of the deploying force.[2] However, the comparison of screening data across deployments and across different phases of the deployment cycle has not been conducted. The present study addresses this gap by comparing screening rates cross-sectionally in order to assess the role of deployment cycle in soldier mental health and well-being.

The deployment cycle represents a series of environmental conditions that reflect the requirements and stressors associated with preparing and recovering from a deployment. Initially, soldiers are in garrison, living in the barracks or in a private home performing their regular duties, and possibly going on training exercises as part of a basic readiness plan. In the pre-deployment phase, soldiers intensify their training in preparation for specific deployment objectives, complete packing and preparation of equipment, and take care of personal business in preparation for an extended absence. Screening conducted during this phase is typically completed in the weeks prior to the actual deployment. In the deployment phase itself, soldiers execute their particular mission while living in a base camp or at a remote site. For U.S. Army personnel, a peacekeeping deployment typically lasts 6 months although some deployments have been longer (for example, Operation Joint Endeavor [OJE]) and some have been shorter (Task Force Hawk). The re-deployment phase occurs in the weeks just prior to returning back to home station when soldiers prepare to leave the deployed environment, transfer information to incoming forces where appropriate, and pack professional and personal

belongings. In the post-deployment phase, which lasts about 3 months after returning home, soldiers are engaged in recovery from the deployment. This phase typically involves leave time for the unit, reintegration with family and friends, and concentrated training that returns the unit to its pre-deployment level of readiness. After this 3-month period, soldiers complete the full deployment cycle and resume garrison life, which includes the possibility of participating in regular training exercises.

In order to facilitate comparisons across the deployment cycle, we have selected the screening results from one U.S. Army Division based in Germany. These data are cross-sectional and do not track the same individuals over the course of one deployment. The results presented here are an initial attempt to assess patterns in screening results across deployment phases.

Method

Participants.

A series of screening programs have involved about 10,000 soldiers from one division based in Germany between February 1996 and June 2000. Results from these psychological screenings have been organized cross-sectionally to represent the different phases of the deployment cycle. Table 1 summarizes the screening conducted for one Army division across three different major deployments (Bosnia, Albania, and Kosovo) and at four different points in the deployment cycle. The data presented in this article are a composite from different missions over several years and are to compare cross-sectional screening results across different phases of the deployment cycle.

There were some demographic differences across the samples. In terms of gender, the Kosovo pre-deployment sample had fewer female soldiers than the Bosnia re-deployment samples, χ^2 *(4, N=11,654)=110.82, P<.001* (Table 2). In terms of rank, the Kosovo pre-deployment sample had more junior-ranking soldiers than the Bosnia re-deployment samples and fewer junior-ranking soldiers than the Garrison sample, χ^2 *(8, N=11,624)=95.48, P<.001* (Table 3).

Procedures.

The procedures remained essentially the same across all of the screening programs. Military personnel completed a primary psychological screening survey designed to measure post-traumatic stress, depression, and alcohol abuse symptoms. If scores on one of the scales exceeded established criteria, a mental health staff member conducted a brief on-site interview to determine the soldier's referral need. The brief interview, regarded as a form of psychological triage, resulted in one of four possibilities. The soldier's problems were considered: (1) false positive; (2) mild and not necessarily in need of a referral for follow-up assessment; (3) moderate and in need of a referral; or (4) severe and in need of immediate follow-up. The primary screen was administered in groups of soldiers as large as 100, and mental health personnel conducted on-site interviews immediately after the survey administration and hand scoring of the primary screen. The entire procedure took about 30 minutes.

Instruments.

The psychological screening survey included a section on soldier demographics (for example, rank and gender) and three scales measuring depression, post-traumatic stress symptoms, and alcohol problems. The 20-item Self-rating Depression Scale (Cronbach's α=.74-.76), measured depressive symptoms on a 4-point scale (a little of the time, some of the time, a good part of the time, and most of the time).[3,4] The cutoff criterion was a raw score of 44 points midway in the mild depression range.[5] In addition, personnel indicating any agreement with the statement, "I feel that others would be better off if I were dead," were also interviewed regardless of their overall cutoff score.

The 17-item post-traumatic stress disorder checklist (Cronbach's α=.91-.94), developed by the U.S. Army Medical Research Unit-Europe measured post-traumatic stress symptoms delineated in the Diagnostic and Statistical Manual for Mental Disorders IV.[6-8] Items were rated on a 5-point scale (1= not at all to 5 = very often). Mental health staff briefly interviewed respondents who reported at least six symptoms (often or very often). Alcohol abuse symptoms were measured using the CAGE Questionnaire.[9,10] The CAGE Questionnaire (Split-half reliability = .53-.55) included items such as "Have you ever been annoyed by comments made about your drinking?" and "Have you ever felt guilty about drinking?" Respondents with affirmative responses to two or more questions were then interviewed.

Phase of Deployment Cycle	Mission (Location of Mission)	Screening Site	N	Dates of Screening
Garrison	Garrison (Germany)	Germany	338	Apr 98 - Jul 98
Pre-Deployment	Task Force Falcon (Kosovo)	Germany	1,803	Jun 99 - Apr 00
Re-Deployment	OJE (Bosnia AO)	Hungary	4,746	Feb 96 - Dec 96
Re-Deployment	OJ Guard/Forge (Bosnia AO)	Bosnia	3,891	Jan 97 - Jun 98
Post-Deployment	Task Force Hawk (Albania AO)	Germany	1,043	Aug 99 - Oct 99

Note: AO is the Area of Operations

Table 1. Summary of Deployment Phase and Mission

Phase of Deployment Cycle[1]	Gender	
	Male	Female
Garrison	91.1	8.9
Pre-Deployment[a]	93.0	7.0
Re-Deployment (OJE)[b]	86.4	13.6
Re-Deployment (OJG/OJF)[b]	90.7	9.3
Post-Deployment	94.9	5.1

[1]The Kosovo pre-deployment sample had fewer female soldiers than the Bosnia re-deployment samples, χ^2 (1, N=5,637-6,515)>8.40, $P<.01$

Table 2. Percent of Sample by Gender Across the Deployment Cycle Phases

	Rank		
Phase of Deployment Cycle[1]	Junior Enlisted Soldier	Non-Commissioned Officer	Officer
Garrison[a]	60.7	33.7	5.6
Pre-Deployment[b]	58.0	32.2	9.9
Re-Deployment (OJE)[c]	49.1	35.8	15.0
Re-Deployment (OJG/ OJF)[C]	52.8	33.9	13.3
Post-Deployment	58.4	32.9	8.6

[1]The Kosovo pre-deployment sample had more junior-ranking soldiers than the Bosnia samples and fewer junior-ranking soldiers than the Garrison sample χ^2 (2, N=2, 104-6,401) 6.1, $P<.05$.

Table 3. Percent of Sample by Rank Across the Deployment Cycle Phases

Results

Data were analyzed to evaluate the impact of different phases of deployment on soldiers' responses to psychological screening. Overall rates exceeding primary screen cutoff criteria differed by deployment phase (Figure 1) such that soldiers who were re-deploying reported lower rates of exceeding criteria than soldiers in other phases of the deployment cycle (in garrison at the initial phase of the deployment cycle, at pre-deployment, or at post-deployment). Soldiers who were deployed reported lower rates of exceeding criteria when compared to soldiers in garrison, χ^2 *(4,N=11,753)=76.48, P<.001.* The primary screen differences across samples were found for both men and women as well as for junior-enlisted soldiers and noncommissioned officers (NCOs).

When the three psychological screening scales were examined separately, the same pattern of results was found only for depression. On the depression scale, soldiers screened during pre-deployment and garrison reported higher rates of depression symptoms than soldiers screened during post-deployment and re-deployment, χ^2 *(4,N=11,821)=85.84, P<.001* (Figure 2). The depression screen differences across samples were found for both men and women as well as for junior-enlisted soldiers and NCOs.

The post-traumatic stress and alcohol problem scales had a different pattern of results although the redeployment rates for OJE were below the rates obtained during other deployment phases, χ^2 *(4, N=6,548)=7.30, P<.01* (Figure 3). The post-traumatic stress screen differences

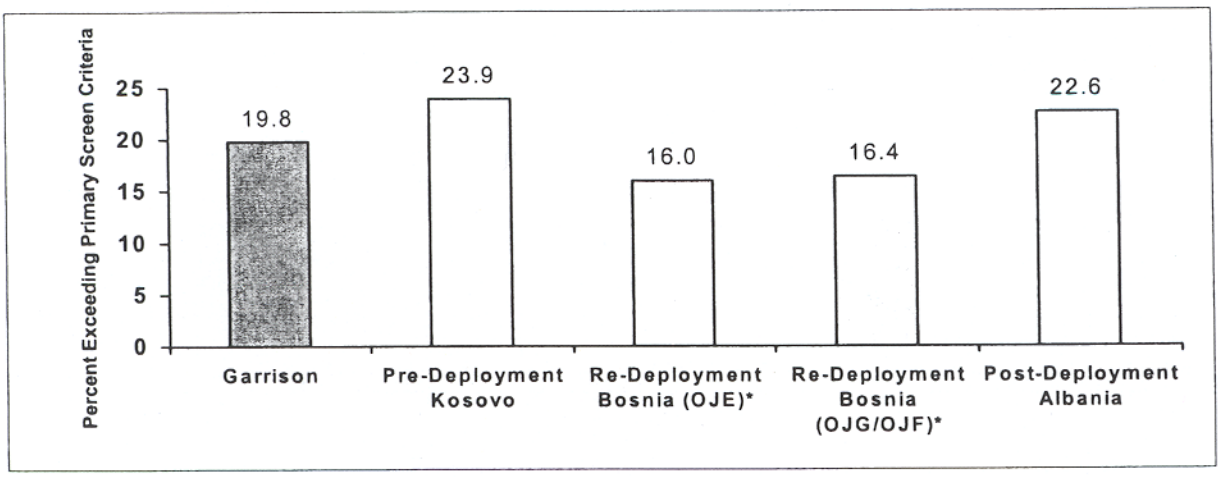

*Fig 1. Rate of exceeding criteria on primary screen as a function of deployment cycle phase. *χ^2 (1, N=5,687-6,483)>44.88, P<.001.*

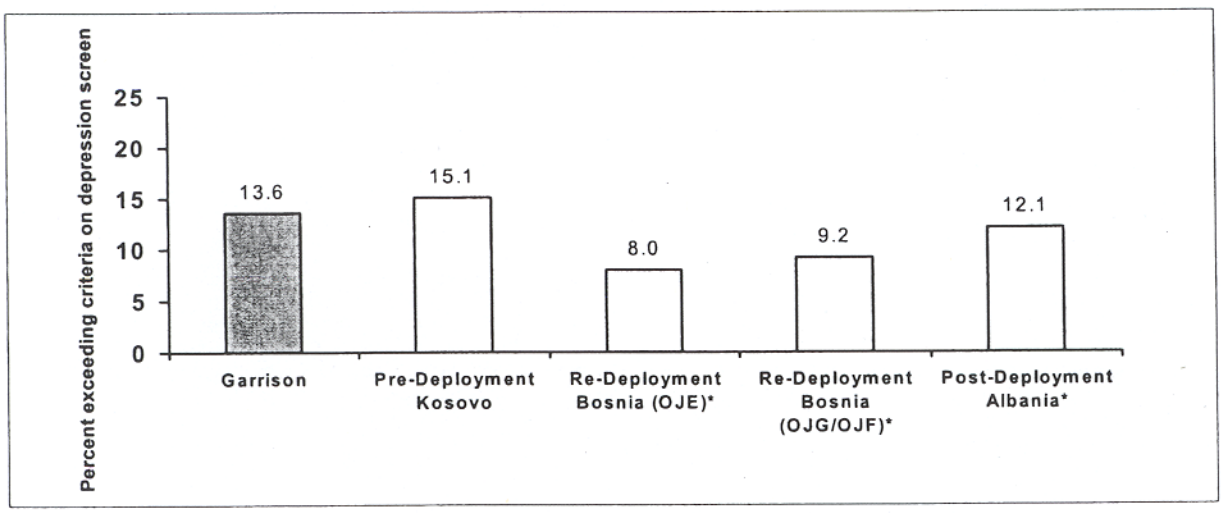

Fig 2. Rate of exceeding criteria on depression screen as a function of deployment cycle phase. *χ^2 *(1, N=2,845-6,549)>5.09, P<.02.*

across samples were found for women and for junior-enlisted soldiers.

On the alcohol scale, the pre-deployment and post-deployment rates were similar (Figure 4). The re-deployment and garrison rates were similar to each other, but lower than the pre- and post-deployment rate, $\chi^2(4, N=11,760)=33.98, P<.001$. The alcohol screen differences across samples were found for men and for junior-enlisted soldiers.

Conclusion

Data from several different psychological screening programs conducted across different deployment cycle phase indicate a pattern of psychological effects (Table 4 for summary). Rates of exceeding primary screen criteria depended on when the screening occurred during the deployment cycle. Specifically, soldiers who were in the garrison phase of the deployment cycle, in the pre-deployment phase, and in the post-deployment phase reported higher rates of distress than soldiers returning from deployment.

Results also suggested some unique deployment cycle patterns for specific symptom categories. In the case of alcohol problems, soldiers at pre- and post-deployment reported more problems than at re-deployment. This difference may be related to the fact that soldiers are not allowed to drink alcohol during deployment to Bosnia or

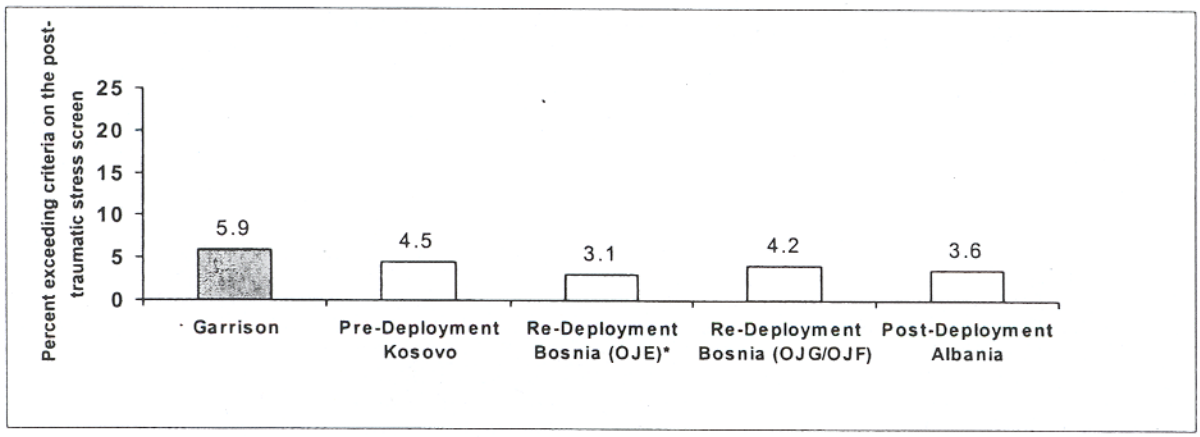

Fig 3. Rate of exceeding criteria on post-traumatic stress screen as a function of deployment cycle phase. $*\chi^2(1, N=6,548)=7.30, P<.01$.

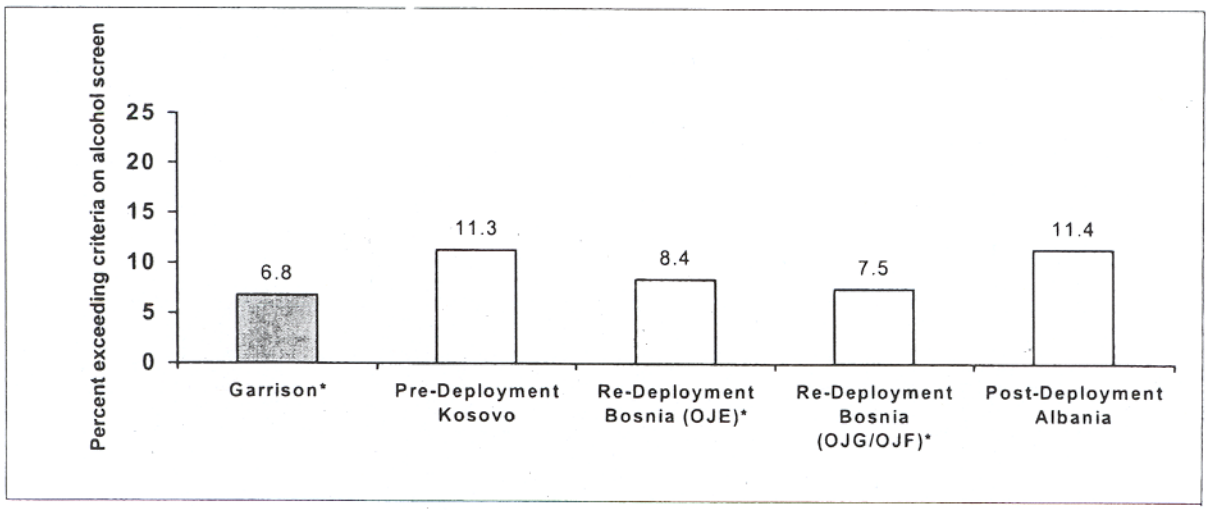

Fig 4. Rate of exceeding criteria on alcohol screen as a function of deployment cycle phase. $*\chi^2(1, N=2,135\text{-}6,489)>6.07, P<.01$.

Deployment (Phase)	Finding
Garrison	Elevated rates on all scales but alcohol Highest on traumatic stress
Pre-Deployment	Elevated rates on all scales Highest on depression
Deployment	No data available
Re-Deployment	Lower rates on all scales
Post-Deployment	Elevated rates on all scales Highest on alcohol problems

Note: Data came from three separate deployments which did not involve direct combat

Table 4. Summary of Screening Results Across the Deployment Cycle

Kosovo and so have less opportunity to experience problems with alcohol. In addition, the increase in alcohol problem rates before and after deployment may also reflect some kind of alcohol compensation effect in which soldiers have more drinking problems in anticipation of not being allowed to drink and following a long period of time in which drinking is not allowed.

The results indicating that rates were lowest at redeployment were found regardless of rank and gender for the overall screen and for depression. The patterns found for post-traumatic stress and alcohol problems differed slightly by gender and rank. Differences based on deployment cycle phase were not found for officers.

The data presented here are taken from real-world applications of a screening program that has been revised several times. Given the limitations of the current cross-sectional analysis, the findings need to be re-examined using longitudinal data. For example, as noted above, the sample groups reported in this paper were not matched and the data were collected at different times and over the course of different deployments. In future screening and research, we plan to track individual soldiers over the course of one deployment cycle in order to assess more closely the impact of the deployment cycle phases on soldier well-being. Such an analysis could also then demonstrate whether the findings from the cross-sectional data are indeed a good reflection of mental health patterns associated with the deployment cycle. In addition, screening over the course of the deployment cycle should include a mid-deployment assessment – a phase for which we currently do not have screening data.

Another limitation is the extent to which screening results are being compared between Bosnia and Kosovo, two deployments that differ in terms of level of threat and theater maturity. The differences we found in screening outcomes could be confounded by the unique nature of each deployment. Furthermore, the degree to which the findings apply to other kinds of deployments, including other peace enforcement operations as well as combat missions, is unclear. Future screening programs with these other types of deployments can address this question.

Additional screening issues that require study include further development, expansion, and assessment of screening scale content. For example, family distress and soldier hostility levels are important symptom areas that are now included in the current screening program with soldiers deployed to Kosovo. Such programming also needs to emphasize the integration of psychological triage in the training of mental health personnel and the formal evaluation of the screening program's validity and effectiveness.

In an environment where the rate of military operations for U.S. Forces is increasing, it is critical to provide operational commanders and division health staff information on the psychological readiness of the deploying force.[7] A psychological screening program can identify risk factors at different phases of the deployment cycle and provide continuous monitoring of the mental health of soldiers, resulting in effective prevention and education. Through the integration of psychological screening with a comprehensive health screening system, the U.S. Army has the opportunity to bring medical care

to the soldier as part of a proactive health promotion effort. This effort can be increasingly tailored to meet the mental health needs of soldiers at particular points in the deployment cycle.

References

1. Martinez J, Huffman AH, Adler AB, Castro CA. Assessing psychological readiness in U.S. soldiers following NATO operations. International Review of the Armed Forces Medical Services. 2000; 73:139-142.

2. Castro CA, Adler AB, Huffman AH. Psychological screening of U.S. peacekeepers in Bosnia. Proceeding of the 41st Annual Conference of the International Military Testing Association and NATO Officer Selection Workshop: Monterey, CA; November 9-11, 1999.

3. Zung WKW. A Self-Rating Depression Scale. *Arch Gen Psychiatry.* 1964;12:63-70.

4. Zung WKW. The Measurement of Depression. Indianapolis, IN: Dista Product Company, Eli Lilly and Company; 1993.

5. Zung WKW. From art to science. The diagnosis and treatment of depression. *Arch Gen Psychiatry.* 1973; 29: 328-337.

6. Bartone PT, Vaitkus MA, Adler AB: Measuring post-traumatic stress symptoms in soldiers. Paper presented at the USAREUR/7A Army AMEDD Symposium, Garmisch-Partenkirchen, Germany. 1994.

7. Castro CA, Adler AB. The impact of operations tempo on soldier and unit readiness. Parameters. 1999; 86-95.

8. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders (4th ed). Washington, DC: Author; 1994.

9. Ewing JA. Detecting Alcoholism: the CAGE questionnaire. *JAMA.* 1984; 252:1905-1907.

10. Mayfield D, McLeod G, Hall P. The CAGE Questionnaire: Validation of a new alcoholism screening instrument. *Am J Psychiatry.* 1974;131:1121-1123.

AUTHORS:

At the time this article was written, the following authors were assigned to Walter Reed Army Institute of Research (U.S. Army Medical Research Unit-Europe), Heidelberg, Germany:

†Dr Amy B. Adler
††Dr Kathleen M. Wright
†††Ms Ann H. Huffman
††††CPT Jeffrey L. Thomas
†††††LTC Carl A. Castro

Ms Huffman is currently a graduate student at Texas A&M University, Bryan, TX; LTC Castro is currently assigned to the Division of Neuropsychiatry, Walter Reed Army Institute of Research, Washington, DC.