Reducing Drinking Among Junior Enlisted Air Force Members in Five Communities: Early Findings of the EUDL Program's Influence on Self-Reported Drinking Behaviors*

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ABSTRACT. Objective: In the fall of 2006, the Office of Juvenile Justice and Delinquency Prevention awarded discretionary grants to five communities in four states as part of the Enforcing Underage Drinking Laws initiative. These 3-year grants were designed to support implementation of a set of interventions using an environmental strategies approach to reduce drinking and associated alcohol-related misconducts among active-duty Air Force members ages 18-25, with a specific focus on the underage population. The current article presents findings from Year 1 of the evaluation. **Method:** Data on alcohol use were obtained from a large-scale, anonymous survey that fielded in the spring of 2006 (i.e., pretest) and the spring of 2008 (i.e., posttest) from a stratified

random sample of Air Force members at five demonstration and five comparison communities. **Results:** The percentage of junior enlisted personnel at risk for an alcohol problem dropped 6.6% in the Air Force overall during the last 2 years but dropped as much as 13.6% and 9.8% in two Arizona demonstration communities that implemented the intervention. **Conclusions:** The first-year results suggest that the Enforcing Underage Drinking Laws intervention may have been one factor that helped to reduce the percentage of junior enlisted Air Force members at risk for an alcohol problem in the demonstration communities. (*J. Stud. Alcohol Drugs*, 71, 373-383, 2010)

IN THE FALL OF 2006, the Office of Juvenile Justice and Delinquency Prevention (OJJDP) awarded discretionary grants to five communities in four states as part of the Enforcing Underage Drinking Laws (EUDL) initiative to design and implement a set of interventions using an environmental strategies approach to reduce drinking and associated alcohol-related misconducts among active-duty Air Force members ages 18-25, with a focus on the underage population. The communities selected to receive awards partnered with a local Air Force base (AFB) to target active-duty members living in the community, both on- and off-base, and developed a broad-based coalition (e.g., law enforcement officials, government officials, alcohol and beverage commission representatives, and Air Force human service providers) to implement the intervention across the 3-year grant period. The five communities that received grant awards included the following: (a) Phoenix, AZ/Luke AFB; (b) Tucson, AZ/

Davis-Monthan AFB; (c) Honolulu, HI/Hickam AFB; (d) greater Sacramento area in California/Beale AFB; and (e) Great Falls, MT/Malmstrom AFB.

One year after these grants were awarded, the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the federal agency sponsoring the evaluation, in collaboration with the U.S. Air Force and OJJDP, selected ICF International as the external entity to conduct an evaluation of the EUDL activities implemented in these five communities (*community* in this article is defined as the geographic area of the larger civilian community in which the U.S. AFB lies, and therefore includes both the base and the surrounding civilian community). The goal of the evaluation is to measure the effectiveness of the interventions on drinking behavior and associated alcohol-related misconducts by active-duty personnel. The current article presents findings from Year 1 of the evaluation on self-reported drinking behaviors gath-

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ered from a large-scale, anonymous survey of junior enlisted active-duty members.

Drinking among junior enlisted active-duty members

Despite the national minimum legal drinking age, alcohol remains the drug of choice among adolescents, with 18- to 20-year-olds having the highest prevalence of alcohol dependence of any age group (U.S. Department of Health and Human Services, 2007). Given this problem, much of the research on underage drinking focuses on college students (Goldstein and Flett, 2009; LaBrie et al., 2009). College students of today share many demographic similarities with U.S. Air Force junior enlisted population. In the U.S. Air Force, the junior enlisted ranks (i.e., E1-E4) are comprised predominantly of young men and women between 18 and 25 years old. Active-duty members who volunteer for military service come from cities and towns across the United States, including urban, suburban, and rural communities. After basic training, active-duty members relocate to military installations and reside in dormitory-style housing, similar to college facilities, and begin the work of the U.S. Air Force.

In many regards, however, junior enlisted active-duty members are quite different from their civilian counterparts. Unique to this population is the intense level of stress placed on young active-duty members, particularly during wartime. Active-duty members in today's Air Force perform in jobs with a high operations tempo, often contributing long hours in combat-intensive environments. Researchers have found that working in a stressful and intense work environment, such as the case with military members, is a risk factor for increased levels of alcohol consumption (Bray et al., 2006). This high level of stress is associated with increased risk behaviors such as heavy episodic drinking during off-duty hours, particularly after combat, or on return home from a deployment (Ames et al., 2007).

The Air Force has a "zero-tolerance" policy toward underage drinking and problem use of alcohol. When problems arise, the Air Force applies a two-pronged approach of treatment and prevention. An integral part of the prevention approach is the Air Force's "Culture of Responsible Choices" (CoRC) program, which serves as a prevention and awareness campaign across every AFB, emphasizing drinking as one of many lifestyle choices active-duty members make each and every day that could affect combat readiness (U.S. Air Force, 2006). A standardized component of this initiative with respect to drinking is the 0-0-1-3 campaign. The basic premise behind this campaign is a message of "0" underage drinking; "0" driving-under-the influence (DUI) incidents; and if you are of legal drinking age and choose to drink alcohol, guidance for drinking responsibly is "1" drink per hour, with a maximum of "3" drinks per night for an average man of 175 pounds. Despite zero tolerance for underage drinking and aggressive treatment and prevention efforts, the

Air Force, like all parts of the larger society, faces problems associated with excessive drinking and alcohol-related misconducts, including DUIs or driving-while-intoxicated (DWI) incidents, domestic violence, and sexual assault (Hoge et al., 2004; Rosen, 2007). In fact, a recent Air Force report indicated that 33% of suicides, 57% of sexual assaults, 29% of domestic violence incidents, and 44% of motor vehicle accidents are alcohol related (U.S. Air Force, 2006).

Environmental strategies to reduce drinking

Whether in a civilian community or on an AFB, drinking has clear implications for broad community systems. Key community entities (e.g., hospitals, law enforcement, and service agencies) devote countless resources to the intervention and treatment of alcohol-related incidents that arise from high levels of alcohol consumption. At the other end of the spectrum is prevention programming, which is community based, environmental in nature, and aimed at reducing incidents of drinking. Environmental approaches have increased in popularity over the last 15 years and include interventions aimed at the overall community that ultimately have an impact on the individual drinker. As opposed to traditional prevention and treatment initiatives, community-level interventions using an environmental strategies approach place an emphasis on macro- or systems-level entities, such as policy influences, establishments that serve alcohol, and cultures or social networks that perpetuate attitudes or behaviors toward drinking.

The three overarching principles of an environmental approach include (a) media efforts targeted toward policy makers, (b) joint community-level collaboration, and (c) an emphasis on the supply of alcohol (Gruenewald et al., 2003). This approach, first empirically tested in the mid-1990s, has shown positive results within civilian U.S. communities in a number of states, including Massachusetts, Minnesota, and Wisconsin.

One such program, the Saving Lives Project (Hingson et al., 2006), found a 39% reduction in fatal crash injuries among 16- to 25-year-olds in the experimental community in Massachusetts, as compared with the rest of the state over a 5-year period. An evaluation of another program aimed at reducing alcohol-related misconducts, using a community trials approach that matched three experimental communities with three comparison communities, also found promising results. Results from this study included a 10% reduction in nighttime crashes involving an alcohol-related injury, a 43% reduction in alcohol-related assault injuries as evidenced by emergency room visits, and a 49% reduction in community members' self-report of driving after "having too much to drink" (Holder et al., 2006; Treno and Lee, 2002). A third example, the Communities Mobilizing for Change on Alcohol project, which focused on activating the citizenry of communities to achieve changes in local public policies and

practices of major community institutions, showed that the project significantly and favorably affected the behavior of 18- to 20-year-olds (e.g., less likely to purchase alcohol, frequent bars, and drive under the influence) and the alcohol sales practices of bars and restaurants (Wagenaar et al., 2000). Similarly, the Safer California Universities Project, which used an environmental approach to mitigate drinking by college students, found a relationship between the intervention and a significant decline in several key outcomes, including alcohol consumption (California State University at Chico, 2007). Two other community-based environmentally designed interventions—(a) the Border Project (Institute for Public Strategies, 2002) and (b) the Sacramento Neighborhood Alcohol Prevention Project, known as SNAPP (Treno et al., 2007)—reported decreases in access to and consumption of alcohol, as well as assaults and other violent crimes. Specifically, SNAPP found significant reductions in assaults as reported by police, aggregate emergency medical services (EMS) outcomes, EMS assaults, and EMS motor vehicle accidents.

These studies conducted in civilian communities lay the foundation for the current study on the effectiveness of environmental approaches within civilian towns/cities that are heavily occupied with active-duty Air Force members and their families. How does an environmental “lens” that incorporates both civilian and military entities working in collaboration, inside and outside the gates of an AFB, influence the reduction of drinking and associated consequences in that community? Anecdotal evidence indicates that, with an increased focus from senior leadership and the community at-large, underage drinking and the associated consequences among active-duty members can be lessened significantly. This was first demonstrated by the success of a program implemented by F.E. Warren AFB, where base-level senior leadership placed an increased emphasis on curbing drinking among junior enlisted personnel through the initiation of key environmental strategies, such as reaching out to community agencies inside and outside the gates, sending letters to local bars asking for policy compliance, and offering alternative activities to drinking during hours when junior enlisted personnel traditionally seek out alcohol. Across a 2-year period, the intervention activities resulted in a 74% decline in alcohol-related incidents, 81% fewer cases of underage drinking, and 45% fewer DWI cases (OJJDP, 2005). Based on this “success story,” OJJDP subsequently funded five communities, through their state EUDL offices, to implement a similar set of interventions across a 3-year period, which is the focus of the current article.

Primary research question

Building on the body of literature discussed previously, the current study sought to address the following overarching research question: Did the activities implemented by

each of the five communities have a measurable influence on their rate of problem drinking relative to their respective comparison community and relative to the Air Force overall rate of problem drinking? The methodology used to answer this primary research question is presented below.

Method

Evaluation conceptual framework and design

The conceptual framework for this evaluation was driven by a theory of change approach focusing on the pathways by which context, process (i.e., activities), and outcomes are linked. The framework is predicated on extant risk and protective factors in the community, as well as the incidence and prevalence of underage drinking, which establishes our baseline and must be measured before the implementation of the intervention activities. Once implemented across the 3-year grant period, the intervention activities are intended to raise awareness and increase knowledge of the dangers of underage drinking and its associated consequences, which will ultimately impact the outcomes of interest.

The evaluation design is a repeated cross-sectional within-site (i.e., each community) design comparing out-year data with baseline data for each demonstration site, as well as drawing comparisons between each demonstration site and a comparison community and between each demonstration site and the Air Force overall. The demonstration sites were awarded funding in October 2006 for a period of 3 years (2006-2009). The demonstration sites spent the first 6-12 months of the funding period developing their community coalition and creating a detailed work plan specifying the manner to implement the intervention, with some sites getting their coalition up and running (most notably Arizona and Montana) earlier than others. As a result, the demonstration sites began implementing their intervention sometime in the summer or fall of 2007, with the last site (Hawaii) receiving approval of their work plan from OJJDP in January 2008.

Selecting comparison communities

The selection of a comparison community for each demonstration site was accomplished by selecting communities that could be a potential match to each demonstration site, based on the following four factors: (a) urban/rural typology, (b) mission of the AFB, (c) size of the AFB and surrounding community, and (d) rate of problem drinking among junior enlisted personnel at pretest (i.e., spring 2006). The process resulted in a match of five to eight communities that could serve as a potential comparison site for each demonstration community. Following this process, we worked in conjunction with the federal partners (OJJDP, U.S. Air Force, and NIAAA) to select the best comparison community based on

the available data on the five factors listed above. Table 1 presents the relevant characteristics of each demonstration site and its respective comparison site.

Intervention activities

Each demonstration community implemented a set of environmental strategies to reduce drinking among underage and 18- to 25-year-old active-duty Air Force members. Intervention activities at all sites included the following:

(a) enforcement aimed at reducing the social availability of alcohol (e.g., shoulder-tap drinker identification verification operations, controlled party dispersal operations); the demonstration sites conducted shoulder-tap operations in at least three locations per year and controlled party dispersals at a minimum of two times per year;

(b) compliance checks of local alcohol establishments to ensure that the establishments are not selling alcohol to underage active-duty members (using covert underage buyers); demonstration sites conducted a minimum of two to three compliance checks at key identified alcohol retailers (i.e., ones near the base and in areas frequented by underage active-duty members) each grant year;

(c) impaired driving enforcement (i.e., increased number and frequency of DUI checks in the community); appropriate DUI enforcement operations conducted a minimum of at least two DUI patrol operations per year targeted at youth alcohol parties and subsequent driving in and around their respective areas/communities;

(d) local policy development, such as working to educate state legislatures on the issues of underage drinking that may lead to changes in policies and laws (e.g., orienting the photos on licenses of underage and adult drivers differently, such as head-on vs. profile or left side vs. right side);

(e) development and deployment of a community-based awareness/media campaign to reduce drinking, including heavy drinking; all sites used the 0-0-1-3 message in their campaign, as well as web sites discouraging underage drinking; and

(f) offering of alternative activities that do not include drinking (e.g., sports activities).

Although all demonstration sites implemented these six interventions (with a minimum number of events per activity as described above), given the varying size of each demonstration site (AFB plus surrounding community), each site implemented these activities at a frequency proportional to the size of their community (e.g., Arizona, the most urban grantee state, conducted shoulder-tap operations in as many as 80 locations per year). Although not an intervention, in support of their efforts, all communities received intensive training and technical assistance services provided by the Underage Drinking Enforcement Training Center at the Pacific Institute for Research and Evaluation. The resources provided by the Underage Drinking Enforcement Training Center included disseminating publications about "best practices" in reducing alcohol use through environmental strategies approaches, hosting audio-teleconferences, and providing "hands-on" training and technical assistance for

TABLE 1. Description of the communities

Site		
Site 1	Phoenix, AZ/Luke AFB	Comparison site
Urban/rural	Urban	Urban
Mission	Combat ops. and trg.	Combat ops.
Size (persons)	4,782	3,604
Problem drinking at pretest (E1-E4)	21.5%	17.5%
Site 2	Tucson, AZ/Davis-Monthan AFB	Comparison site
Urban/rural	Urban	Urban
Mission	Combat and support ops.	Combat and support ops.
Size (persons)	6,005	4,727
Problem drinking at pretest (E1-E4)	22.3%	21.4%
Site 3	Honolulu, HI/Hickam AFB	Comparison site
Urban/rural	Urban	Urban
Mission	Combat support	Combat ops.
Size (persons)	3,738	2,067
Problem drinking at pretest (E1-E4)	18.9%	22.3%
Site 4	Sacramento, CA/Beale AFB	Comparison site
Urban/rural	Rural	Rural
Mission	Combat support ops.	Combat and support ops/trg.
Size (persons)	3,172	3,151
Problem drinking at pretest (E1-E4)	20.0%	17.8%
Site 5	Great Falls, MT/Malmstrom AFB	Comparison site
Urban/rural	Rural	Rural
Mission	Operational missile base	Combat support ops.
Size (persons)	3,379	2,148
Problem drinking at pretest (E1-E4)	24.6%	20.8%

Notes: AFB = Air Force base; ops. = operations; trg. = training. Source: Air Force Personnel Command.

coalition work plan development and intervention implementation efforts.

Data collection

Data for the current study were collected as part of the Air Force Community Assessment survey, a biannual anonymous survey of active-duty personnel that was conducted in spring 2006 (i.e., pretest) and in spring 2008 (i.e., posttest) across all Air Force communities. Although the Community Assessment survey collects data from all active-duty members across all bases worldwide, this article focuses on data from junior enlisted members in the 18- to 25-year-old range within the five demonstration sites and the five comparison communities ($n = 2,008$ in 2006 and 2,112 in 2008), as well as the Air Force overall ($n = 11,964$ in 2006 and 12,993 in 2008). The Community Assessment survey included approximately 160 items on a range of community and well-being issues, which included questions on alcohol use. In both the 2006 and 2008 versions of the Community Assessment survey, a random stratified sample of active-duty members (stratified by rank, gender, and deployment status within each AFB) was selected and invited to complete the survey via the Web. In 2006, the final response rate across all bases for active-duty members was 48.5%; in 2008, it was 49.0%.

Following the data collection, data were weighted by rank, gender, deployment, and base to adjust for differences in the demographics of the respondents compared with the demographics of the overall population. The sample weight (overall Air Force weight) was applied when conducting all analyses for this article. Given the sensitive nature of questions about alcohol consumption, we conducted an item nonresponse analysis. Based on this assessment, we found that approximately 16.5% of junior enlisted personnel skipped the alcohol questions, and, thus, we were not able to develop an alcohol summary scale score for these individuals. Although data for all items could be analyzed by including only those with fully completed surveys, to use all the data that was gathered, we used multiple imputation to impute the missing data so that all cases could be analyzed, with the primary benefit being that it produces unbiased estimates of effects and significantly reduces item nonresponse bias (Schafer and Graham, 2002). This process involved two steps: (a) generating five complete data sets in which missing values were imputed by simulating values from a fitting probability distribution and (b) analyzing the multiple imputed data sets and averaging results from analyses to form overall conclusions for the variables of interest. We used the SAS-callable IVEware package (Raghunathan et al., 2000), which readily handles large, complex data sets comprising variables of various types (e.g., continuous, semicontinuous, categorical, dichotomous, and count). IVEware performs multiple imputations using the sequential regression imputation method.

Measure of rate of alcohol problems

The rate of alcohol problems on the Community Assessment survey was measured via the Alcohol Use Disorders Identification Test (AUDIT), developed by the World Health Organization (Babor et al., 2001). The AUDIT has been used in research and clinical practice to identify those at risk for problem drinking, based on self-reported drinking behaviors and associated consequences. The AUDIT was developed and evaluated over the last 2 decades using large multinational samples and consists of 10 questions. Specifically, there are three questions about dependence symptoms, three questions about recent alcohol use, and four questions about alcohol-related problems. Relevant to the current study, the AUDIT has proven to be valid in detecting alcohol dependence in persons ages 18-25 (Fleming et al., 1991). The AUDIT was included on the Community Assessment survey in both 2006 and 2008 for the current study and was asked of all survey participants. Each item uses five ordered response categories and assigns a score of 0 to 4, which is then summed across the 10 items to give a total score per person of a minimum of 0 and a maximum of 40. Based on the guidelines provided in the scoring manual, and consistent with previous research studies, a score of 8 and above was used in the current study to signify individuals at risk for problem drinking. As indicated in the AUDIT manual, "total scores of 8 or more are recommended as indicators of hazardous and harmful alcohol use, as well as possible alcohol dependence" (Babor et al., 2001, p. 19).

Results

To determine the effects of the intervention, our major research questions were whether the prevalence rate for problem drinking among junior enlisted personnel (as a proportion scoring 8 or higher) changes over time (i.e., comparing each demonstration community at pretest and posttest) and is different between sites (i.e., comparing each demonstration site with its corresponding comparison community and the Air Force overall). There were a number of important and differentiating factors that led us to treat each demonstration site separately in our analyses rather than pool all demonstration sites together. Among these factors were the following: (a) some demonstration sites started implementing their intervention earlier than others based on getting their work plan approved by OJJDP at an early stage; (b) although each demonstration site conducted the same set of intervention activities, each community implemented the intervention at a different magnitude based on the size of their respective community (e.g., larger communities conducted more DUI checks); (c) each demonstration site is very different from one another (e.g., rural community vs. large urban community); (d) all demonstration sites started at different points on the AUDIT continuum, with some hav-

ing higher drinking rates than others at baseline—therefore, pooling the communities would complicate this aspect of the analysis; and (e) each comparison community was selected to best match a specific demonstration site in a one-on-one comparison. As a result of all these collective differences, we determined that an independent examination of each demonstration site was warranted.

Because the AUDIT indicator is a dichotomous variable of either “problem drinker” or “not a problem drinker,” the calculation of the AUDIT percentages was based on (a) the number of junior enlisted personnel with a score of 8 or above, indicating being at risk for problem drinking divided by (b) the number of junior enlisted members. Data were weighted with sample weights; therefore, the analytical sample represented the targeted population. Because the multiple-imputation technique produced five data sets, the AUDIT percentages were obtained by averaging the percentages from each of the five imputed data sets. Two sample proportion tests (i.e., *z* tests) were conducted to evaluate the group differences in the percentages.

Table 2 presents the AUDIT percentages (i.e., prevalence for problem drinking) for three group units: (a) demonstration site, (b) comparison site, and (c) overall Air Force. The results are reported separately for the pretest period (2006) and the posttest period (2008). Each panel in the table presents results for each demonstration community and comparison community. In addition, we summarize three comparisons in each panel. The cross-sectional comparison, Comparison A, indicates whether a demonstration community is different from the comparison site and from Air Force overall for each of the two points in time. This set of comparisons assesses the extent to which the demonstration and comparison sites were different at Time 1 and Time 2. The over-time comparison, Comparison B, reports the difference in the percentage values between 2006 (pretest) and 2008 (posttest). In this comparison, a negative value signifies a decrease in the percentage of individuals classified at risk for problem drinking within a given community across time. Comparison C, labeled comparison of changes, reports the between-group differences in the percentage changes reported in Section B. Hypothetically, if the demonstration site and the comparison site changed the problem-drinking rate by -10% and -5%, respectively (minus signs indicate rate reduction), the value would be the difference of the two, namely, -5% (which is a result of -10% minus -5%). Large negative values indicate a favorable intervention result (i.e., a demonstration site managed to lower the prevalence rate more successfully than a comparison site).

As Table 2 reveals, in the Air Force overall, the rate of individuals classified as a problem drinker dropped by 6.6% from pretest to posttest, with a rate of 20.4% at Time 1 and 13.8% at Time 2, indicating a statistically significant drop at the $p < .001$ level. With respect to the Phoenix, AZ/Luke AFB community, the percentage of problem drinkers at this

demonstration community was not significantly different from either the comparison site or the Air Force overall at pretest; but, at posttest, the percentage of problem drinkers was 7.7% less than the comparison site ($p < .05$) and 5.9% less than Air Force overall ($p < .001$). When comparing the changes across time, the Phoenix, AZ/Luke AFB community had a drop of 13.6% in problem drinkers ($p < .001$), compared with a drop of 1.9% for the comparison site and 6.6% for Air Force overall (see Figure 1). When comparing these drops across time, the prevalence rate dropped in the Phoenix, AZ/Luke AFB community to a larger degree than at the comparison community ($p < .05$) and the Air Force overall ($p < .05$).

With respect to the Tucson, AZ/Davis-Monthan AFB community, the percentage of problem drinkers in this demonstration community was not significantly different from either the comparison site or the Air Force overall at pretest and posttest. When comparing the changes across time, the Tucson, AZ/Davis-Monthan AFB community had a drop of 9.8% in problem drinkers ($p < .01$), compared with a drop of 11.2% for the comparison site and 6.6% for Air Force overall (see Figure 2). When comparing these drops across time, the prevalence rate drop in the Tucson, AZ/Davis-Monthan AFB community was not significantly different from the comparison site and the Air Force overall drop.

For the Honolulu, HI/Hickam AFB community, the percentage of problem drinkers at this demonstration site was not significantly different from either the comparison site or the Air Force overall at pretest; but, at posttest, the percentage of problem drinkers was 7.0% less than the comparison site ($p < .05$) and 4.3% less than Air Force overall ($p < .10$). When comparing the changes across time, the Honolulu, HI/Hickam AFB community had a drop of 9.4% in problem drinkers ($p < .05$), compared with a drop of 5.8% for the comparison site and 6.6% for Air Force overall. When comparing these drops across time, the prevalence rate drop in the Honolulu, HI/Hickam AFB community was not significantly different from the comparison site and the Air Force overall drop.

In the Sacramento, California/Beale AFB community, the percentage of problem drinkers at this demonstration site was not significantly different from either the comparison site or the Air Force overall at pretest and posttest. When comparing the changes across time, the Sacramento, California/Beale AFB community had a drop of 8.1% in problem drinkers ($p < .05$), compared with a drop of 9.3% for the comparison site and 6.6% for Air Force overall. When comparing these drops across time, the prevalence rate drop in the Sacramento, California/Beale AFB community was not significantly different from the comparison site and the Air Force overall drop.

Finally, in the Great Falls, MT/Malmstrom AFB community, the percentage of problem drinkers at this demonstration site was not significantly different from either the

TABLE 2. AUDIT results for demonstration sites in relation to comparison sites and Air Force: Junior enlisted results

A. Phoenix, AZ/Luke AFB Community					B: Over-time comparison Change 2006-2008 %
	2006		2008		
	<i>N</i>	%	<i>N</i>	%	
Luke AFB	195	21.5%	292	7.9%	-13.6%****
Comparison site	166	17.5%	186	15.6%	-1.9%
Overall Air Force	11,964	20.4%	12,993	13.8%	-6.6%****
A: Cross-sectional comparison					C: Comparison of changes
	2006		2008		
	% Difference		% Difference		% Difference
Luke AFB vs. comparison site	4.0%		-7.7%**		-11.7%**
Luke AFB vs. overall Air Force	1.1%		-5.9%****		-7.0%**
B. Tucson, AZ/Davis-Monthan Community					B: Over-time comparison Change 2006-2008 %
	2006		2008		
	<i>N</i>	%	<i>N</i>	%	
Davis-Monthan	218	22.3%	269	12.5%	-9.8%***
Comparison site	201	21.4%	175	10.2%	-11.2%***
Overall Air Force	11,964	20.4%	12,993	13.8%	-6.6%****
A: Cross-sectional comparison					C: Comparison of changes
	2006		2008		
	% Difference		% Difference		% Difference
Davis-Monthan vs. comparison site	0.9%		2.3%		1.4%
Davis-Monthan vs. overall Air Force	1.9%		-1.3%		-3.2%
C. Honolulu, HI/Hickam Community					B: Over-time comparison Change 2006-2008 %
	2006		2008		
	<i>N</i>	%	<i>N</i>	%	
Hickam	129	18.9%	148	9.5%	-9.4%**
Comparison site	254	22.3%	271	16.5%	-5.8%*
Overall Air Force	11,964	20.4%	12,993	13.8%	-6.6%****
A: Cross-sectional comparison					C: Comparison of changes
	2006		2008		
	% Difference		% Difference		% Difference
Hickam vs. comparison site	-3.4%		-7.0%**		-3.6%
Hickam vs. overall Air Force	-1.5%		-4.3%*		-2.8%
D. Sacramento, CA/Beale Community					B: Over-time comparison Change 2006-2008 %
	2006		2008		
	<i>N</i>	%	<i>N</i>	%	
Beale	307	20.0%	248	11.9%	-8.1%**
Comparison site	230	17.8%	183	8.5%	-9.3%***
Overall Air Force	11,964	20.4%	12,993	13.8%	-6.6%****
A: Cross-sectional comparison					C: Comparison of changes
	2006		2008		
	% Difference		% Difference		% Difference
Beale vs. comparison site	2.2%		3.4%		1.2%
Beale vs. overall Air Force	-0.4%		-1.9%		-1.5%
E. Great Falls, MT/Malmstrom Community					B: Over-time comparison Change 2006-2008 %
	2006		2008		
	<i>N</i>	%	<i>N</i>	%	
Malmstrom	151	24.6%	159	19.3%	-5.3%
Comparison site	157	20.8%	181	32.1%	11.3%**
Overall Air Force	11,964	20.4%	12,993	13.8%	-6.6%****
A: Cross-sectional comparison					C: Comparison of changes
	2006		2008		
	% Difference		% Difference		% Difference
Malmstrom vs. comparison site	3.8%		-12.8%***		-16.6%**
Malmstrom vs. overall Air Force	4.2%		5.5%*		1.3%

Notes: AUDIT = Alcohol Use Disorders Identification Test; AFB = Air Force base.

* $p < .10$, ** $p < .05$, *** $p < .01$, **** $p < .001$.

FIGURE 1. Changes in prevalence of problem drinkers: Phoenix, AZ/Luke Air Force (AF) base community. Comp. = comparison.
*** $p < .001$.

FIGURE 2. Changes in prevalence of problem drinkers: Tucson, AZ/Davis-Monthan (DM) Air Force (AF) base community. Comp. = comparison.
** $p < .01$; *** $p < .001$.

FIGURE 3. Changes in prevalence of problem drinkers: Great Falls, MT/Malmstrom Air Force (AF) base community. Comp. = comparison. * $p < .05$; *** $p < .001$.

comparison site or the Air Force overall at pretest; however, at posttest, the percentage of problem drinkers was 12.8% less than the comparison site ($p < .01$) but 5.5% more than Air Force overall ($p < .10$). When comparing the changes across time, the Great Falls, MT/Malmstrom AFB community had a drop of 5.3% in problem drinkers, compared with an increase of 11.3% for the comparison site and a drop of 6.6% for Air Force overall (see Figure 3). When comparing these drops across time, the prevalence rate dropped in the Great Falls, MT/Malmstrom AFB community to a larger degree than at the comparison community ($p < .05$).

Discussion

The current study provides an early indication (Year 1 of the evaluation) of the potential effects of the EUDL interventions within the five communities with respect to self-reported drinking behavior. Data from out-years of the evaluation, including data from a broader range of variables (e.g., data on problem behaviors such as DUIs), are currently being collected and, once available, will be analyzed and reported. With respect to the current article, the first noteworthy finding in this study is that the percentage of Air Force junior enlisted personnel at risk for a drinking problem has decreased significantly over the last 2 years (a 6.6% drop from 2006 to 2008). Specifically, in 2006, approximately one in five junior enlisted active-duty members (20.4%) were at

risk for an alcohol problem, compared with 2008, when it dropped to one in seven (13.8%). It is difficult to empirically identify the reasons for this sizeable drop Air Force wide; however, although speculative, the drop may be, in part, the result of the implementation of CoRC and the use of the 0-0-1-3 campaign across the Air Force. CoRC emphasizes the Air Force's zero-tolerance policy for those younger than 21 and provides guidance for safe levels of drinking for those 21 or older, including 21- to 25-year-old active-duty members, who often socialize with the underage population. The drop in the rate of persons at risk for problem drinking may also be the result of decreased numbers of deployments within the Air Force from 2006 during the height of war in Iraq to 2008 (O'Bryant and Waterhouse, 2008), whereby reduced numbers of deployments and associated stresses may be related to a lower propensity for active-duty members to be classified at risk for being a problem drinker. Finally, although researchers have found that self-reported drinking behaviors within the military has good criterion validity (Bell et al., 2003) such that members report them accurately on anonymous surveys, it is possible that the increased attention on the dangers of drinking per the EUDL and CoRC programs since 2006 has inflated the number of junior personnel underreporting problem-drinking behaviors in 2008.

When examining whether the prevalence rate for problem drinking among junior enlisted personnel is different across time by comparing each demonstration community at pretest

and posttest with its corresponding comparison community and Air Force overall, it is first important to discuss the best “yardstick.” For communities that are typical of most Air Force communities, using the Air Force average as the benchmark for the demonstration sites may be optimal, because averaging all Air Force communities smoothes over any variance and measurement error across sites. On the other hand, for communities that are unique, such as in a small city within a larger rural area like the Great Falls, MT/Malmstrom AFB site, comparisons to the Air Force average may be misleading, and the best benchmark, in fact, might be another community with an AFB with a similar mission and in an area with a similar small city/rural profile. The issue of the best “yardstick” is important to discuss when evaluating the results presented in this article, because two measures of comparison were provided for each demonstration site (i.e., a selected comparison site and the Air Force overall). This issue is highlighted in the findings for the Great Falls, MT/Malmstrom AFB community, which had a smaller percentage drop from pretest to posttest in the prevalence rate compared with the Air Force overall but had a significantly larger drop than the comparison community (another rural area with a large concentration of active-duty members), where the prevalence rate of problem drinking actually increased over the past 2 years.

Although all five sites have seen decreases in the percentage of junior enlisted personnel at risk for problem drinking over the past 2 years, the most promising early findings from the evaluation are within the two Arizona communities, where the Phoenix, AZ/Luke AFB community had a drop of 13.6% and the Tucson, AZ/Davis-Monthan AFB community had a drop of 9.8% over the last 2 years, compared with a drop of 6.6% for Air Force overall. These drops in the percentage of individuals at risk for problem drinking represent promising, but not necessarily cause-and-effect, relationships between the intervention and anonymous self-report data on drinking for junior enlisted personnel. To better understand and explore the potential reasons why the early results seem to be most promising in these two Arizona communities, we reviewed information from the work plans and meeting minutes prepared by the community coalitions formed and operated to implement the interventions. From a review of this information, a few unique themes emerged. First, we learned that Arizona, along with Montana, was one of the two states that were quickest after grant funding to develop their coalition(s), get their work plan(s) approved by OJJDP, and begin implementing their intervention activities. Second, we learned that, in building their coalition, the two Arizona communities used guidance from the Underage Drinking Enforcement Training Center at the Pacific Institute for Research and Evaluation, input from the Federal partners (i.e., OJJDP, NIAAA, and U.S. Air Force), and “best practice” guidelines from the Substance Abuse and Mental Health Services Administration (2006) on building state-

based coalitions to promote community prevention using a network analysis. Related to this, Arizona had an existing underage-drinking task force in existence before the funding of the EUDL/Air Force discretionary grant project; therefore, the state had an existing network focused on this issue to build upon. Third, in addition to drawing on the technical assistance provided at that national level by the Underage Drinking Enforcement Training Center, these two communities hired an outside local partner (i.e., Pima Prevention Partnership) to help implement their activities. Having an experienced and well-established entity outside of the state and AFB infrastructure assist with the grant activities was reported by the coalition members in Arizona as key to their efforts. Fourth, given that both of these communities are in urban areas (Phoenix and Tucson), they have had success with readily identifying and offering alternative activities to drinking for young active-duty members, compared with sites in more rural areas, where the number of possibilities for alternative activities may be perhaps limited. Finally, as was the case with the “success story” of F.E. Warren AFB, the two Arizona communities have received strong support from base-level leadership on the EUDL project.

Although these early findings are promising for EUDL within communities containing a large population of active-duty Air Force members, it is important to be cautious in overinterpreting these findings for many reasons. First, given the quasi-experimental nature of the study, it is not possible to establish cause-and-effect relationships or to indicate the interventions are causing the drop in the rate of problem drinkers. It will be important to continue to measure prevalence rates over time to see if the effects reported in this article remain stable or increase in order to provide further evidence for the effect of the intervention; however, ultimately cause-and-effect cannot be established. Second, because CoRC has been implemented across the Air Force and the EUDL communities are offering, in a sense, CoRC plus EUDL activities, it is hard to tease out the impact from CoRC versus the impact from EUDL. Finally, it should be noted that the findings presented in this article focus solely on rates of problem drinking and do not include data on alcohol-related misconducts, such as DUI/DWIs, underage-drinking incidents, traffic accidents, emergency-department visits, and domestic violence. These types of outcome data are currently being collected, and when they are available, the findings presented in this study need to be corroborated with these data to further support the early evaluation findings.

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