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Optimizing financial incentives to improve health among military personnel: Differences by pay grade and across branches

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The focus of this volume is to provide information on financial incentives to develop and sustain habits that can improve the health of military personnel. There are several reasons to use financial incentives in the military, including that the military already successfully relies on incentives to recruit and retain personnel. Furthermore, substantial evidence already indicates that financial incentives can improve health habits in the civilian population. They have been shown to reduce the use of illicit drugs (e.g., Higgins et al., 2008; Higgins et al., 2004; Lussier et al., 2006), help smokers to quit smoking (Heil et al., 2008; Volpp et al., 2006, 2009a; Sindelar, 2008), encourage others to lose weight (John et al., 2011; Volpp et al., 2008a) and address other health habits (Volpp et al., 2008b). However, research is needed in military populations to assess the effectiveness and cost-benefit of incentive systems as well as to adapt them to specifics of the military.

There is heterogeneity across military populations, specifically by branch of the military and by pay grade that might be potentially important in designing incentive systems (Volpp et al., 2011). Differences will likely occur in the costs of the programs, responsiveness to the incentives and the benefits accrued. These differences will affect the optimal design, implementation and selection of incentive programs for the military as well as the value obtained.

There are several important implications of this heterogeneity. One is that a single incentive system and level of payments may have differential effectiveness and benefit across population characteristics such as pay grade and branch of the service. There may not be a single cost–benefit value but rather multiple values depending on the size, structure, type and timing of payments and on the population under consideration. For instance, lower pay level groups may have a higher discount rate (Yoon et al., 2007) and thus may need reinforcement through more frequent incentives, however, the monetary amounts to encourage change may not need to be as high (Gourville, 1998; Volpp et al., 2009b). At higher pay grades, a larger amount of financial incentives may be needed, and the reinforcement may not need to be as frequent, but evidence is lacking in these areas. Furthermore, the military may place a higher value on health improvements for top personnel; the military has invested significantly in their training, expects them to be in the military longer and wants them to serve as role models.

A second and related point is that it may be valuable to tailor incentive systems to different pay grades or branches, or even to different levels of health (Stein et al., 2000). For example, if a particular group has a high rate of smoking and is very responsive to incentives, an incentive program is likely to offer greater value to the military and to taxpayers. These

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considerations suggest that the efficiency and cost-benefit of financial incentives should be analyzed with a focus on different sub-populations of the military. Empirical evidence is needed on the responsiveness to incentives and the cost-effectiveness by pay grade and branch of the military as there is little direct evidence to guide program development.

Smoking to illustrate key points

Smoking is considered to be the most important preventable cause of poor health in the US (CDC, 2010; DHHS, 2000, 2004). Smoking by those in the military imposes some unique costs. It directly harms health, job performance, and battle readiness (DHHS, 2000, 2004; IOM, 2009). Also, it is estimated that each year military hospitals spend nearly \$500 million and the VA spends more than \$5 billion on tobacco-related medical services (IOM, 2009). These expenditures represent potential benefits to reducing smoking, but the financial incentives represent additional costs. Weighing the costs and benefits to ensure value can be accomplished through cost-benefit analysis.

Cost-benefit analysis (CBA) basics

Cost-benefit analysis is a form of economic analysis often used in economic evaluations of programs designed to achieve specific goals such as improvement in health. In CBA, costs and benefits to all who are enrolled in a program are assessed in monetary terms and aggregated. A program with positive benefits compared to cost is desirable (i.e. net benefit), while those with the greatest net benefits are the most desirable. Note that when the benefits are multiple and difficult to put in pecuniary terms, cost-effectiveness analysis (CEA) is often used because outcomes can be compared (one at a time) to costs; nevertheless, the same points apply to CEA as to CBA with respect to heterogeneity.

Key to any CBA is to consider all benefits and assess their values, that is, who benefits and by how much. In the case of incentives to achieve smoking cessation, there are several potential beneficiaries: military personnel, their families and society at large. Benefits to the military personnel include better health while in the military, plus attendant benefits such as lower out-of-pocket expenses for health care. In addition, benefits will spill over to family and others because of lessened exposure to second-hand smoke. Society at large will benefit from greater readiness for war, enhanced security and greater retention of human capital investment, which also will avoid costs of recruiting and training new personnel. Finally, taxpayers benefit from lower expenses for medical care for military personnel while active in the service and then later as veterans.

Costs of the incentive program have to be identified, measured and aggregated. Costs of the incentives themselves are the most obvious. Administrative costs of operating the program (e.g. testing and monitoring payments) also are relevant, and there may be economies of scale in implementing programs across branches of the government and pay groups. Hidden costs also need to be considered. In the case of tobacco use cessation, a hidden cost may be that of greater use of nicotine replacement therapies (e.g. the patch) and counseling, either of which may increase due to a higher motivation to quit. However, these extra costs likely will increase the effectiveness of the incentives and will be measured in the benefits.

Balancing the costs and benefits of incentives in the military

The purpose of cost-benefit analysis is to assess whether the higher costs are worthwhile in terms of better outcomes (Cahill and Perera, 2011). Both the benefits and the costs of incentive payments can depend on the characteristics of the population selected for the incentive system. For example, those who are most addicted to and smoking the most cigarettes may have the greatest potential gain from cessation. However, it may be most

difficult to change their behavior, thus requiring higher payments, more frequent testing and complementary approaches.

There may be systematic differences in the responsiveness to incentives by pay grade and branch of the military. These would result in different cost–benefit outcomes across these sub-populations. Differences in the smoking rate in the military could also affect the value of the incentive system across groups. While 40% of the lowest paid enlisted individuals smoke, the smoking rate drops to 10% for Officers (grades 01–05) and only 5% for the highest pay grade Officers (Bray et al., 2009). Note that similarly, the smoking rate varies by education level in the US population. There are important differences between branches of the military as well, with the Marine Corps reporting the highest percentage of smokers (37%), followed by the Army (33%), Navy (31%), Coast Guard (28%) and Air Force (23%). The magnitude of the benefits and the costs from a specific incentive system will depend on the size and structure (e.g. escalating benefits) of the benefits, including: *frequency* of testing and paying incentives, *method of testing* for achievement of the outcomes (e.g., cotinine levels vs. self-report) and *length* of the incentive program and follow-up, among other behavioral factors (Haisley et al., 2012; Volpp et al., 2009b, 2011). Interestingly, higher and more frequent payments, more frequent testing and a longer program all increase effectiveness and benefits. However, they also tend to increase costs. Research in the military is needed to provide evidence on how to optimally tailor and design incentive programs across population sub-groups and military branches.

Conclusion

The recognition of potential heterogeneity in the effectiveness and cost–benefit of incentive systems across specific populations has several important policy implications. One is that any particular incentive system is likely to be more cost-beneficial for some groups than others. That is, greater value will be produced for different populations given the same program. One decision the military would face is whether to offer incentives to only those with the greatest net gain. However, the size, structure and other properties of the incentive system could be tailored to different branches and pay grades. This would maximize the value from incentives, but could result in offering different payments to different populations. Whether to offer to all populations the same incentive system, to offer incentives only to some populations or to tailor the system to different populations would become both an economic and political issue (e.g., see Volpp et al., 2011). For example, the military might offer the same incentives to all in order to be equitable. Alternatively, they might pay larger incentives based on responsiveness to the incentives, economies of scale in operation and/or benefits accrued. Thus, a critical question will be whether to implement incentives for all branches and all pay grades on the grounds of broad-based equity or to prioritize specific groups based on efficiency. Heterogeneity in responsiveness and costs may offer opportunities to improve incentive programs through tailoring.

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