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TECHNICAL REPORT

# A Cost-Benefit Analysis of the National Guard Youth ChalleNGe Program

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Sponsored by the National Guard Youth Foundation



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## Summary

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According to the most recent data compiled by the National Center for Education Statistics (NCES), about 10 percent of 18- to 24-year-olds in the United States are neither enrolled in high school nor have they received a high school diploma or alternative high school credential such as the General Educational Development (GED) credential; 25 percent of high school freshman fail to graduate from high school within four years. Decades of research show that these high school dropouts are more likely to commit crimes, abuse drugs and alcohol, have children out of wedlock, earn low wages, be un- or underemployed, and suffer poor health than are individuals who successfully complete high school. The ChalleNGe program, an intensive residential and mentoring program for high school dropouts ages 16–18 currently operating in 27 states and Puerto Rico and graduating more than 8,200 young people each year, seeks to avert these negative outcomes.

The research described in this report estimates the social return on investment in the ChalleNGe program through a rigorous quantitative assessment of the monetary costs of operating the program and the benefits it generates by altering the life course of its participants. It concludes that the estimated return on investment in the ChalleNGe program supports ongoing public investment in it. This cost-benefit analysis will be of use to federal and state legislators, private foundations, and other decisionmakers as they consider maintaining and perhaps increasing investment in the ChalleNGe program in an era of increasing fiscal austerity.

## Background

ChalleNGe program participants, called cadets, are housed together, often on a National Guard base or at a training center, for the first 22 weeks of the program. During these weeks, the program immerses cadets in a quasi-military environment in which they focus on discipline, academic excellence, teamwork, physical fitness, leadership, and service to the community. The program encourages cadets to obtain a GED and to seek further education and training or employment during the one-year post-residential phase of the program. Individuals ages 16–18 who have dropped out or been expelled from high school and are U.S. citizens or legal residents, un- or underemployed, drug free, physically and mentally capable of participating in the program, and have either no police record or a police record limited to juvenile status offenses are eligible to apply for admission to a ChalleNGe program in their state of residence.

Beginning in 2005, with the support the Department of Defense (DoD) and a variety of nonprofit foundations, MDRC, an independent, nonprofit, nonpartisan social policy research

organization, designed and implemented a rigorous evaluation of the ChalleNGe program at ten ChalleNGe sites, employing random assignment. This program evaluation demonstrated strong causal effects of being admitted to the ChalleNGe program on educational attainment and employment. Thirty-six months following randomization, admission to the program had increased GED attainment by 22 percentage points, traditional high school degree attainment by 4 percentage points, some college attendance by 16 percentage points, vocational training and employment by 7 percentage points, and annual earnings by \$2,266 (an increase of 20 percent). The evaluation also found some evidence that admission to the ChalleNGe program lowered criminal activity 9 and 21 months after randomization, but these effects were no longer evident 36 months after randomization.

### **Valuing Costs and Benefits of the ChalleNGe Program**

Employing individual site budget data for the ten ChalleNGe sites that participated in the program evaluation, supplemented with information on off-budget costs obtained through interviews with site directors, we estimate that the present discounted value (PDV) of operating costs total \$11,633 per ChalleNGe admittee.<sup>1</sup> We estimate additional opportunity costs associated with operating the program—the value of the time spent by ChalleNGe applicants, admittees, and mentors that could have been spent in some other productive activity net of in-kind benefits received by program participants—of \$2,058 per admittee.

As noted above, the ChalleNGe program evaluation indicates that its principal benefit is to increase educational attainment, employment, and earnings. Those program effects were observed 36 months following randomization when the ChalleNGe admittees were, on average, only 20 years old. However, research suggests that the benefits of obtaining higher levels of education accrue over an entire lifetime. Thus, to estimate the full benefits of the ChalleNGe program, we must first estimate how education affects lifetime earnings. We estimate this relationship employing data from the 1979 cohort of the National Longitudinal Survey of Youth (NLSY79), a nationally representative longitudinal survey of 12,686 men and women ages 14–22 in 1979.

Consistent with other published research, our empirical estimates indicate substantial effects of receiving a high school diploma and attending a year or more of college on the present discounted value of lifetime earnings but no statistically significant effect of obtaining a GED or participating in vocational training. Applying these empirical estimates to the estimated treatment effects obtained by the ChalleNGe program evaluation yields present discounted value of lifetime earnings benefits (net of the cost of education) totaling \$38,654 per admittee.

We employ a similar method to estimate how the increased educational attainment induced by the ChalleNGe program affects social welfare dependency, and we generate separate estimates of the value of the effect of ChalleNGe admission on criminal activity 9 and 21 months following randomization and on service to the community during the residential phase of the program. The present discounted value of estimated benefits generated by the ChalleNGe program for these outcomes totals \$1,334 per admittee.

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<sup>1</sup> Under our baseline assumptions, all costs and benefits were discounted to the year of admission to the ChalleNGe program at a rate of 3 percent. All dollar figures are expressed in 2010 dollars.

## Comparing Costs and Benefits of the ChalleNGe Program

Table S.1 summarizes our estimates of the costs and benefits of the ChalleNGe program assuming that the social discount rate is 3 percent. The discount rate assumes that individuals value current consumption over future consumption; a discount rate of 3 percent is consistent with current rates of interest on long-term treasury bonds and government cost-benefit guidance. The baseline estimates also assume an efficiency loss attributable to taxation (also referred to as “deadweight loss” of taxation) amounting to 15 percent of the change in tax revenue induced by the program. Given these baseline assumptions (which we relax in various sensitivity analyses), the present discounted value of operating and opportunity costs totals \$15,436 whereas the present discounted value of social benefits totals \$40,985.

Subtracting the estimated present discounted value of costs from benefits, we find that, for each admitted cadet, the program generates net benefits of \$25,549. Total benefits of \$40,985 are 2.66 times total costs, implying that the ChalleNGe program generates \$2.66 in benefits for every dollar spent on the program. The estimated return on investment (net benefits divided by costs) in the ChalleNGe program is 166 percent. Because higher educational attainment yields benefits to individuals and society that are not fully captured in the outcomes con-

**Table S.1**  
**Baseline Cost-Benefit Comparison**

Item	PDV Benefit per Admittee (\$2010)
<b>Costs</b>	
Operating costs	-\$11,633
Opportunity costs	-\$2,058
Deadweight loss of taxation (15%)	-\$1,745
Total costs	-\$15,436
<b>Benefits</b>	
Lifetime earnings	\$43,514
Cost of education	-\$4,860
Social welfare dependency	\$249
Criminal activity	\$662
Service to the community	\$423
Deadweight loss of taxation (15%)	\$997
Total benefits	\$40,985
<b>Cost-benefit comparison</b>	
Net benefits	\$25,549
Benefit-cost ratio	2.66
Return on investment	166%
Internal rate of return	6.4%

NOTE: Estimates assume a social discount rate of 3 percent.

sidered here, it is likely that, all else equal, these benefit estimates understate the social return on investment in the ChalleNGe program, although to what extent is not known.

However, it is important to acknowledge that the “baseline” benefit-cost ratio of 2.66 is sensitive to the approach taken to forecasting future earnings of ChalleNGe admittees and the assumed social discount rate. Table S.2 presents estimated benefit-cost ratios in which we compute estimated earnings benefits employing six different empirical models (by which we mean empirically estimated statistical relationships between earnings and education), for three different social discount rates, assuming a deadweight loss factor of 15 percent. The six different earnings models are as follows:

- **Baseline model.**
- **Complete less than one year of college model.** This model assumes that the effect of ChalleNGe admission is to increase the probability of attending one year of college by age 20 but not the probability of completing that year of college.
- **No postsecondary degree models.** These two models assume that the effect of ChalleNGe admission is to increase the probability of attending one year of college by age 20 but not to increase the probability of (1) obtaining an advanced or professional degree such as a master’s or law degree or (2) more restrictively, a four-year college degree.
- **NLSY97 model.** This model employs data from the NLSY97, a nationally representative cohort of American youth ages 12–18 in 1997. This model has the advantage of estimating the effect of education on earnings in a birth cohort that is closer in age to the ChalleNGe program evaluation sample but has the disadvantage of observing their labor market earnings only through ages 24–29 (the last available survey wave is 2009).
- **Causal effect of education model.** Estimating the effect of education on earnings is complicated by the fact that we cannot observe all of the factors that affect both educational attainment and earnings. This model employs parameter estimates reported in published studies that employ “natural experiments” to isolate the causal effect of education on earnings.

At a social discount rate of 3 percent, the most conservative estimate of the benefit-cost ratio is 1.54, which assumes that ChalleNGe admission has no effect on the probability of obtaining a four-year college degree. On the other hand, employing widely cited returns to

**Table S.2**  
**Benefit-Cost Ratio, by Lifetime Earnings Model and Social Discount Rate**

Earnings Model	Social Discount Rate		
	3%	5%	7%
Baseline	2.66	1.46	0.82
Complete less than one year of college	1.78	1.11	0.74
No advanced or professional degree	2.42	1.32	0.73
No four-year college degree	1.54	0.85	0.47
NLSY97	3.17	2.03	1.38
Causal effect of education	2.71–4.98	1.62–3.13	1.05–2.08

NOTE: Estimates assume a deadweight loss factor of 15 percent.

educational attainment published in the economics literature or data from the more recent 1997 NLSY cohort yields benefit-cost ratios of 2.71–4.98 and 3.17, respectively.

Because the earnings benefits attributable to higher education occur in the future, whereas the costs of the ChalleNGe program occur in the present, the benefit-cost ratio declines rapidly with the social discount rate. At social discount rates above 6.4 percent (the “internal rate of return”), the ChalleNGe program no longer yields positive social returns under the assumptions of the baseline model. The benefit-cost ratio, though, is not nearly as sensitive to the choice of deadweight loss factor, since the deadweight loss of taxation increases both costs and benefits.

## Policy Implications

Under baseline assumptions, these cost-benefit comparisons suggest that continued operation of existing ChalleNGe sites will yield substantial net benefits, albeit largely in the form of private benefits to program participants from higher earnings rather than benefits to the public sector and other members of society. This analytical conclusion supports continued public investment in the ChalleNGe program, especially considering that educational attainment likely yields benefits to individuals and society that are not fully captured in the outcomes considered here and that the estimated return on investment in the ChalleNGe program is considerably higher than that estimated for other rigorously evaluated social programs, such as Job Corps, Big Brothers Big Sisters, and state welfare-to-work programs that seek to alter the life course of disadvantaged youth and young adults.

The extent to which these cost-benefit estimates lend support to proposals to expand the ChalleNGe program to serve more youth depends on several additional factors. First, program effects achieved at the ChalleNGe evaluation sites must be generalizable to future applicant cohorts. This is perhaps reasonable to assume, provided that the program continues to serve what appears to be a relatively advantaged population of high school dropouts. Second, one must assume that the average cost of serving a larger population of dropouts does not increase significantly relative to the estimated benefits. Again, this may be reasonable to assume, provided that the program expansion targets a similarly situated population of dropouts.