NBER WORKING PAPER SERIES

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Anna Aizer
Shari Eli
Adriana Lleras-Muney
Keyoung Lee

Working Paper 27103
http://www.nber.org/papers/w27103

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138

June 2020

We are very grateful to many research assistants that worked on this project, especially to Ryan Boone, Taehoon Kang and Kyle Sherman. We have benefitted from comments from participants in the various conferences. We are particularly indebted to Rodrigo Pinto for many valuable contributions. This research was funded by the Social Science and Humanities Research Council of Canada and by the Social Security Administration Grant #NB17-16. This research was also supported by the U.S. Social Security Administration through grant #5-RRC08098400-10 to the National Bureau of Economic Research as part of the SSA Retirement Research Consortium. The findings and conclusions expressed are solely those of the author(s) and do not represent the views of SSA, any agency of the Federal Government, or the NBER. This project was also supported by the California Center for Population Research at UCLA (CCPR), which receives core support (P2C- HD041022) from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD). Finally, his material is based upon work supported by the National Science Foundation Graduate Research Fellowship under Grant No. DGE-1650604. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation. All errors are our own. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 27103
June 2020
JEL No. J01,J08,J38,J68

ABSTRACT

We study the Civilian Conservation Corps (CCC) – the first and largest youth training program in the U.S. in operation between 1933 and 1942 – to provide the first comprehensive assessment of the short- and long-term effects of means-tested youth employment programs. We use digitized enrollee records from the CCC program in Colorado and New Mexico and matched these records to the 1940 Census, WWII enlistment records, Social Security Administration records, and death certificates. We find that enrollees who spent more time in CCC training grew taller, lived longer lives and had higher lifetime earnings as a result of their participation in the program. We also find modest increases in the educational attainment of the participants and increases in short term geographic mobility. In contrast, we find no evidence that their labor force participation or wages increased in the short run. To assess the internal and external validity of the results, we compare our estimates to those derived from a randomized evaluation of Job Corps, the modern version of the CCC, conducted in the 1990s. The RCT's results show that our empirical strategy delivers estimates that are in line with the experimental estimates. Overall, we find significant long-term benefits in both longevity and earnings, suggesting short and medium-term evaluations underestimate the returns of training programs, as do those that fail to consider effects on longevity.

Anna Aizer
Brown University
Department of Economics
64 Waterman Street
Providence, RI 02912
and NBER
anna_aizer@brown.edu

Adriana Lleras-Muney
Department of Economics
9373 Bunche Hall
UCLA
Los Angeles, CA 90095
and NBER
allerasmuney@gmail.com

Shari Eli
Department of Economics
University of Toronto
150 St. George Street
Toronto, ON M5S 3G7
CANADA
and NBER
shari.eli@utoronto.ca

Keyoung Lee
Department of Economics
8283 Bunche Hall
UCLA
Los Angeles, CA 90095
keyounglee@ucla.edu

A data appendix is available at http://www.nber.org/data-appendix/w27103

I. Introduction

Unemployment rates are typically highest among the young, particularly those from poor backgrounds and during recessions. At the height of the Great Recession, unemployment rates for those over age 25 peaked at 8.4% in 2010 but were as high as 19.6% for those aged 16-24 (US Bureau of Labor Statistics 2018). To address youth unemployment, government-run employment training programs specifically target young adults. However, the short run effects of these programs have been shown to be modest, at best, and there is very limited evidence of their effectiveness over the long run. There is also very limited evidence on the effects of these programs on non-labor market outcomes and on the mechanisms by which labor market effects operate (Card, Kluve, and Weber 2018, Barnow and Smith 2015, Crepon and van den Berg 2016).

We re-evaluate the *short-* and *long-run* effects of means-tested employment and training programs targeted at young adults by studying the impact of the Civilian Conservation Corps (CCC). The CCC was the first and largest employment program in U.S. history and was implemented during a period of profound levels of youth unemployment – the Great Depression. Unemployment rates among young adults during the Depression were estimated to be as high as 60 percent, depending on how partial employment is counted.[1] To address high youth unemployment, the CCC was created in 1933 by the Roosevelt Administration. It employed young men aged 17 to 23 in unskilled, manual labor. Under the Army's supervision, enrollees were sent to work in camps in rural areas where they were also fed, housed and given access to medical treatment. In addition to work experience, the CCC provided academic and vocational courses as well as cash transfers to the families of poor unemployed youths. The CCC also helped enrollees obtain employment upon completion. Enrollment in the CCC was voluntary and enlistment periods lasted 6 months with an option to re-enlist up to three times. Between 1933 and 1942, the CCC had three million enrollees and operated about 2,600 camps. Several programs in existence today such as Job Corps, Youth Conservation Corps, JobsFirstNYC, and CalWORKs are modeled after the CCC.[2]

[1] Salmond (1967) reports that in 1932, 25 percent of youths were unemployed, and another 29 percent were only employed part-time. Rawick (1957) estimates that about 20% of youths were unemployed and another 30% were working part-time.
[2] Levine (2010).

We collect a new, large individual-level data set of CCC participants and their long-term outcomes. We digitize administrative records from the CCC program in Colorado and New Mexico covering the population of men in the CCC program between 1938 and 1943. Our data include dismissal records on more than 25,000 men and details their demographic characteristics, compensation, enlistment duration and reasons for leaving the program. We matched these enrollee records to 1940 Census records, WWII enlistment records, Social Security Administration records, and individual death certificates. These data allow us to investigate the effects of the CCC on important long-run outcomes and mediators including education, health, geographic mobility, employment, earnings and longevity.

To estimate the effect of the program, we exploit variation in the service duration of the enrollees. Treatment duration varied from a few days to more than two years with the average enrollee participating for approximately nine months. We show that the determinants of duration are complex and that those who trained for long periods were not necessarily from higher or lower SES backgrounds. Moreover, many ended their training for arbitrary reasons. We confirm these observations by investigating the reasons for dismissal. To assess the validity of our approach, we use the rich data from Colorado to perform some placebo tests. We find that duration does not predict pre-CCC labor outcomes or health, though we do find some effects on education. We then explicitly control for many individual and aggregate characteristics that predict participation and long-term outcomes and assess the sensitivity of our results to adding these covariates, informally and formally, as suggested by Oster (2017).

We find that individuals who trained longer in the CCC also lived longer. These gains appear to be driven by the improved health of the participants (measured by height and weight) as well as their increased geographic mobility towards richer areas, and their larger lifetime incomes. These effects are larger among Hispanics, and for those serving in times of high unemployment. We also find modest increases on educational attainment and in the probability of serving in WWII. In the short run, we find no evidence that their labor force participation, employment, or wages increased—these effects are very small and statistically insignificant. Overall, the results are consistent with the hypothesis that the program provided important in-kind goods and services to disadvantaged populations in a time of need, improving their long-term health and survival. They are also consistent with the program having returns in the labor market.

To further investigate the internal and external validity of our findings, we make use of publicly available experimental data from the Job Corps (JC) program, the largest job training program in the US targeting youth with an annual budget of $1.7 billion. The JC experiment followed randomly assigned participants for four years.[3] With these data, we are able to follow Lalonde (1986), using experimental data to shed light on the internal validity of a study based on observational data. Although the JC data pertains to youth training that took place in the 1990s, the program was modeled after the CCC and so retained many similar features. We focus on men that participated in the RCT for comparability. We document that JC participants are quite similar to CCC participants with regard to socio-economic characteristics (with some notable exceptions), and that they train for similar durations and quit for similar reasons.

The estimated treatment effects of training from the JC RCTs are similar in both direction and magnitude to the effects of duration in a simple OLS model that controls for basic observables at baseline, suggesting that our estimation strategy is internally valid. The results also speak to external validity. The original JC RCT reported that the program increases education levels, has small effects on employment rates and has positive, but statistically insignificant, effects on wages among those employed. We replicate these findings for men. We also document that JC and CCC both increased geographic mobility and improved health. Our results from CCC are similar in the short-term to the effects of JC, except for employment and wages.

This suggests that our long-run estimates of job training based on the CCC are likely informative about the long-run effects of JC particularly for health. There does exist a single study examining the effects of JC on labor market outcomes over 20 years using administrative tax data. Schochet (2018) finds no employment or earnings effects in the overall sample, though there are some positive effects for individuals who were older at baseline. They also report a 40% reduction in SSDI benefits, suggesting JC improved health, consistent with our longevity results. Using data from the Social Security Administration, we find CCC resulted in a 3.9% increase in pension amounts, which are a function of individuals' highest 35 years of earnings. This corresponds to an increase of roughly 6% in lifetime earnings. These effects are larger than the 2% (imprecise) increase Schochet (2018) documented, suggesting that the 20-year evaluation

[3] There was a longer 9-year follow-up as well but these data are not publicly available.

underestimates the returns of the program, or alternatively, that the economic conditions prevailing in the 20 years after the training took place have large effects on its return.

Our results suggest that JC participants today may live longer as a result of the program. As such, job training evaluations that focus only on the labor market impact of the program may underestimate the overall benefits. Our findings also suggest that there are in fact positive returns to investing in young adults, contrary to the commonly stated findings that returns on human capital investment are low after age 18. Our conclusion differs from that of Hendren and Sprung-Keyser (2020), who report low values for JC, because we are able to incorporate large increases in longevity, as well as increases in lifetime earnings into the benefits of the program.

This paper also contributes to the broader evaluation of the New Deal programs developed during the Great Depression. The Great Recession of 2008 renewed interest in understanding whether and for whom government programs deployed during large economic crises can be effective. Fishback (2017) provides a comprehensive survey of the literature on the effects of New Deal programs, and reports that studies show New Deal programs increased internal migration, lowered crime and reduced mortality in the short run. (See also Fishback, Haines and Kantor, 2007 and Vellore 2014.) Our results are consistent with these findings for migration and health. To our knowledge, there have not been any statistical studies of the long-term causal effects of the CCC program or of any other New Deal program on individual lifetime outcomes. Our results suggest that cost benefit analysis that do not include such outcomes may generate incorrect estimates.

II. Background: The CCC Program

Program Overview. The CCC, which was signed into law on March 31, 1933, was created by President Franklin Delano Roosevelt by executive order "for the relief of unemployment through the performance of useful public work and for other purposes."[4] The CCC had two objectives: 1) to provide relief to unemployed youth; and 2) to preserve and enhance natural resources.

[4] The program was extended in 1935, 1937 and 1939, and ended in 1942 when Congress voted against another renewal, despite prior efforts to make the program permanent. In addition, the program was originally called the Emergency Conservation Work Program, but its name was changed in 1937 to Civilian Conservation Corps, its popular name. Data Appendix Figure 1 contains a timeline describing the major changes to the program throughout its existence.

Because of the prevailing view at the time that the provision of work would be more beneficial to the unemployed than the receipt of cash transfers "relief through work" rather than "direct relief" was a basic tenet of all the work programs in the New Deal. There was also a belief that idle youth would commit crimes and cause social disturbances (Brock 2005).

The untapped work capacity of idle youth was to be used to create national parks and forests, and to help cope with the Dust Bowl. One of the primary appeals of the CCC was that the work of enrollees would not directly compete (in terms of labor) with private sector activities. As the program evolved, it added education components, which became mandatory in 1937. The nature of the program changed again in 1941 when military training was added to the program as a result of growing tension in Europe during World War II.[5]

Size and allocation of projects and enrollees. The federal government commissioned the CCC to build national parks, preserve forests and irrigate land. Within weeks of the creation of the CCC program, 1,250 projects had been submitted and 749 camp sites had been approved by the director of the CCC and the President.[6] Camp locations were chosen to be close to work sites, and to minimize the distance to communities that would supply them. Most camps had 200 enrollees at a time. Many smaller "side camps" were also created to allow for work in remote locations.[7]

Eligibility. Only unmarried unemployed men, ages 17 to 25, who were American citizens, were eligible.[8] Preference was given to those in greater need—in practice, CCC enrollees were often selected from families already enrolled in relief programs.[9] Government reports at the time

[5] Although perhaps unintended, and due to the fact that the military was in charge of running the camps, another perceived benefit of the CCC program was that "enrollees made splendid soldier material" (McEntee 1942).
[6] US Department of Labor Report, 1933.
[7] Local labor could be employed when there were needs for specific skills to complete a project. Although initially some communities were concerned with possible increases in crime resulting from nearby camps, most communities eventually welcomed and moreover demanded camps be placed nearby, with the notable exception of black-only camps, and camps with a large share of Hispanics. The CCC program was popular and many communities welcomed the camps and the monies that it brought (Parham, 1981). A nation-wide poll in 1936 showed that more than 80 percent supported the continuation of the program, and this support was larger in the Rocky Mountain states (Paige 1985). However, there were racial tensions (Rawick 1957)
[8] There were some changes to these initial criteria, importantly age eligibility of juniors was modified twice. Data Appendix Figure 1 documents some of the important changes in the history of the program.
[9] In 1935 when the program was expanded, it became a requirement that enrollees be drawn from relief rolls, though in practice this was not always the case. In 1937 this requirement was eliminated.

confirm that enrollees were poorly educated, with little work experience, and undernourished (McEntee 1942).[10] Enrollees had to present in good physical condition (an examination was required at enlistment) and have no history of criminal activity.[11] Finally, they had to be willing to send a substantial portion of their wages to an assigned family member and to move to the designated camp location for the duration of the enrollment period. After the enrollee signed the contract there was a two-week conditioning period, after which enrollees were sent to a camp.[12]

Compensation and program cost. Enrollees were required to work 40 hours per week and paid $30 per month, of which $25 was sent home to a designated family member.[13] The government also paid for the transportation to and from the camp, provided housing, uniforms, food, dental and medical care, and workers' compensation insurance. Thus, it is estimated that the real monthly wages of CCC enrollees was $66.25 per month.[14] CCC administration estimated that on average a CCC camp would spend about $5,000 per month in local markets.[15]

Duration of enrollment. Individuals initially enrolled for a six-month period, and were allowed to re-enroll, for a maximum of two years (4 terms). Although the *average* enrollee worked for 9 months, there is large variation. CCC contracts could be terminated unilaterally by the government, based on governmental needs, at any point. Many individuals deserted, resigned or were expelled prior to completing their contract. Enrollees could leave early if they had secured employment, were enrolled in a formal schooling program or for "urgent and proper call" reasons, for instance the death of a parent or some other personal emergency. Enrollee turnover was costly, and efforts were made to keep it low.

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[10] For example, in 1939 and 1940, about 52% had 8 years of schooling or less (Annual Report 1940).
[11] Enrollees were vaccinated against typhoid, paratyphoid and smallpox at enlistment.
[12] In addition to accepting "juniors"—that is youth 18-25 to be trained, the CCC program also made veterans eligible. There was also a large CCC program for American Indians, which operated under somewhat different rules and was managed by the Bureau of Indian Affairs. Finally, the CCC also enrolled LEM "local enlisted men" which had skills and knowledge not available among its Army personnel. The total number of men training in the CCC was reported to be 3.2 million, LEMs accounted for 263,000, Indians 127,000, and veterans. There was a small separate program for women started in 1936 which eventually served about 8,500 women nationwide in about 80 camps.
[13] Later in the program, a portion was retained as savings and given to enrollees upon dismissal.
[14] See BLS (1941). Levine (2010) reports this program was considerably more expensive than Works Progress Administration as it was estimated to cost approximately $800 per enrollee. Critics of the program pointed out that direct relief would have cost an estimated $250 per year instead (McEntee 1942). The value of the training and of the work achieved in terms of conservation is of course not considered in this estimate.
[15] Paige (1985).

Education and training components. Vocational training and skill provision were always a part of the program. In addition to on-the-job training, camps offered several vocational courses. Attendance was voluntary. Soon after the creation of the CCC, there was a realization that an educational component would be needed as a large number of enrollees were illiterate or had education levels so low it prevented them from performing their assigned tasks at the camp.[16] An education program was put into place by March of 1934, and the 1937 extension of the CCC program included an important requirement that the CCC provide at least ten hours a week of general or vocation training.[17] Participation was not mandatory unless the enrollee was illiterate.

a. The CCC in Colorado and New Mexico

We study the program using administrative data from Colorado (CO) and New Mexico (NM). Both CO and NM were relatively poor states during the Great Depression, though NM was poorer and arguably one of the poorest states at the time. Estimates from National Income Accounts for 1930 suggest that per capita annual personal income was $571 in CO, and $329 in NM, while the nationwide average was $618.[18] About a quarter of the population in CO was on relief in 1933; New Mexico had the highest share of the population on relief in the nation (Hinton 2008).[19]

Due to the large number of parks and forests in these states, and the severe impact of the Dust Bowl, CO and NM had disproportionate participation in the CCC Colorado and New Mexico had disproportionate participation in the CCC program. In a given year, on average, there were 34 main camps operating in CO and 32 in NM in operation in a given year.[20] The number of individuals training in CO and NM was disproportionately large. In CO, a total of 57,944 men served, of which 35,000 came from CO. In NM, a total of 54,500 served of which

[16] Britton reports than in Northern camps an average of 3 to 5 percent of enrollees were illiterate, but as many as 25% were illiterate in Virginia camps.
[17] Act of June 28, 1937, Public No 163, 75th Congress.
[18] Bureau of Economic Analysis NIPA 1929-today. SA1-3
[19] Census of relief 1933. Table 9.
[20] Final report. This number does not include the so-called side camps, which were smaller in size than typical camps, whose population hovered around 200 men.

32,300 came from NM.[21] Enrollees in Colorado and New Mexico were disproportionately Hispanic.[22]

III. Estimation Strategy and Estimation Issues

We estimate the effect of the program on lifetime outcomes by comparing outcomes for those who served longer and shorter periods among individuals who served. This strategy is similar to what Flores et al. (2012) do to estimate the returns to the number of courses taken in JC and to Lechner et al. (2011), who evaluate impacts of short and long training programs in Germany. The intuition behind this approach is simple: if training increases skills through some standard production function, then more training should result in greater skills, though the rate of increase might change with the level of training.

We use the following specification,

$$Y_{ibj} = c + b * \left(duration\ of\ CCC\ service_{ibj}\right) + X_{ibj}B + e_{ibj} \qquad (1)$$

where Y_{ibj} is an outcome, such as employment or age at death for individual i born in year b training in CCC camp j, and X_{ibj} includes individual-level and camp-level covariates. The independent variable of interest is $duration\ of\ CCC\ service_{ibj}$, the duration of training in years. We estimate equation (1) clustering the standard errors at the application county and enrollment year-quarter level, though the results are not sensitive to this choice.[23]

The coefficient b identifies the causal effect of duration on a given outcome only if duration is uncorrelated with other determinants of the outcome, conditional on the observables. There are several threats to identification. First, duration is measured with error because dates are often incomplete or missing, possibly causing downward bias in the estimates. Second, there is a possible omitted variable bias: it may be that individuals with higher abilities trained longer because they benefitted more from the program and were able to better adapt to military life in camps (positive selection). Alternatively, poorer individuals may have had stronger incentives to train in the CCC because they were more in need of the payment that they and their families

[21] Cohen (1980).
[22] New Mexico also had a large share of Native Americans. Native Americans had their own CCC programs which operated separately within Indian reservations and were administered by the Bureau of Indian Affairs. See Parman (1971) for details. We have no data on the Indian CCC program.
[23] We also experimented with alternative approaches and estimate results clustering at the application county, enrollment year level. Overall, we found these alternatives do not materially impact our conclusions, and the evidence suggests that there is little correlation across individuals in the data.

received (negative selection). Third, it is also possible that camp characteristics are omitted. For example, individuals might have stayed longer in camps with good weather, and good weather could improve long-term health (positive selection). Demand for work might have been greater in places where the dust bowl hit, leading enrollees to stay longer in unhealthy locations (negative selection). In these cases, the coefficient on duration would be biased.

To address these concerns, we take multiple approaches. First, we investigate the determinants of duration to determine the extent of possible selection issues. We also make use of the reasons why individuals dropped out to understand who leaves early and why. Then, to account for selection on observables, we explore how the inclusion of individual- and camp-level covariates affect the estimates of the effect of duration. We estimate bounds using the method proposed by Oster (2017). For a subset of the data we also conduct placebo tests to see if duration predicts pre-CCC enrollment outcomes (education, labor market experience, height and weight). Finally, we use the data from JC to investigate whether our approach generates biases in the estimates by comparing OLS type estimates to the estimates derived from the RCT.[24]

IV. Data and descriptive statistics

A. Data collection

Colorado (CO) Enrollees. We digitized the entirety of CCC records contained at the State Archives of Colorado. These records include original applications of all individuals who applied.[25] The entire collection, which includes 21,538 individuals, accounts for the population of individuals who trained between 1937 and 1942 but not for those who enrolled prior to 1937.[26] The applications contain the following: name, address, date of birth, place-of-birth, height, weight, race, and social security number (SSN), marital status, whether the father or mother is living, number of brothers, number of sisters, number of family members in household, rural status, farm ownership, occupation of main wage earner in household, educational details,

[24] We also investigated a large number of IVs to instrument for individual duration including the use of weather, camp closures, measures of the intensity of the Dust Bowl and leave-out duration at the camp. Unfortunately, most of the IV estimates we produced had large standard errors and suffered from weak IV problems.
[25] Of the 35,000 that trained in CO and came from CO, about 30,000 were junior and veterans, and 5,000 were non-enrolled personnel (hired from local population), and about 500 were part of the Indian CCC program.
[26] We established based on published reports from the CCC that the records account for the complete population of records starting in 1937 (see Data Appendix Figure 4).

employment status and history. With the exception of information on height, weight and race, which were collected upon medical examination, the rest was self-reported. In addition, previous CCC enrollment information was collected, and information on the designated allottee(s) (the family member who would receive the allotment from the CCC): name, relationship and amount allotted, for up to two allottees. If the individual was rejected, it is noted in the file. Otherwise we observe the discharge information detailing the company and camp the individual attended, reason for dismissal, the date of dismissal, and whether the dismissal was honorable.

New Mexico (NM) Enrollees. We digitized the entirety of CCC records from the New Mexico State Records Center, which has the entire set of discharge forms for the state from 1938 to 1942. These records include information on 9,699 individuals, covering the population of individuals that trained in state from 1938 to 1942.[27] For each individual, the records contain the following: name, date of birth, address, family information (head of family, address of family, and relationship to enrollee), allottee information (name, address and relationship to allottee, for up to two allottees), enrollment date, assigned camp, date and reason for dismissal and whether the dismissal was honorable. Because enrollment forms are unavailable, NM records contain substantially less information on participants than CO records.

Camp-level Data. We collected information on the exact location of camps. In particular, each camp was assigned to a zip code within a county using post-office codes. Then, we coupled camp location information (latitude and longitude) with historical weather patterns (temperature and precipitation), which come from PRISM Climate Group. Additionally, we retrieve longitude and latitude information of closest towns and individual's residence cities from the United States Board of Geographic Names, and use them to compute (Euclidian) distances to the closest towns and to each enrollee's hometown. Using the camp name, we can construct indicators for the agency (and thus the type of work) that created the camp. We use our records to construct average characteristics of enrollees (such as the fraction under age 18) in each camp and point in time. Finally, we match camps to census county-level information about the county in which it was located, such as unemployment rates.

[27] We established based on published reports from the CCC that the records account for the complete population of records starting in 1938 (see Data Appendix Figure 4).

Death Records. The administrative data from CO and NM was matched to death records (including the Social Security Death Master File and state-level death records) to identify the date of death and social security number of each enrollee. This match was done manually by trained genealogists at BYU, who found CCC enrollees in the collection of records kept by Ancestry.com and FamilySearch.org. A summary of this process is available in Appendix 6. We find death dates for 88% of CO recipients and 75% of NM recipients, representing much higher match rates than typically found in the literature.[28] We use these data to compute the age at death using the date of death in the death certificate and date of birth in the CCC application.[29] We also match the data using automated methods as a robustness check.

1940 and WWII records. We match our records to the Federal Census of 1940 and to WWII Enlistment Records. These matches are made using the Abramitzky, Mill, and Perez (2018) algorithm. Details of the procedure are available in Data Appendix D and E. The 1940 census includes location, demographics (race and ethnicity, marital status, place of birth, household information), and labor market information (employment occupation and wages). We successfully match 44% of individuals to the census, and about 29% to WWII enlistment records. This lower match rate to WWII records is to be expected: not all individuals enlisted or served in WWII, even when they were eligible. Also, not all records of those who served survived.[30]

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[28] Our match rates are higher than those typically found in the literature (which range from 20 to 50%) for two reasons (Bailey et al. 2017, Abramitzky et al 2019). First, administrative records contain information not just on individuals but also on their family members. This greatly improves our ability to find individuals by using information from family trees and various vital registration records. Second, the death records come from various sources. Most commonly these come from the Death Master File (DMF) which includes the universe of death certificates in the US starting in the mid 1970s. But the collection also includes records from other sources, including state vital registration sources, deaths during WWII, and gravestones. A few individuals are observed as dying during CCC training.

[29] Mortality information is missing for some individuals for several reasons. First, some individuals died prior to 1975, which is the first year of complete death records in the Social Security Death Master File (For more information about coverage of the DMF, refer to Hill and Rosenwaike (2001). In this case, we might find a death record for them if one exists in state vital records. Second, some individuals might still be alive, so the age at death is censored. Based on SSA life tables we compute that about 1.1% of individuals born in 1920 (our median birth year) would be expected to be alive by 2017. Lastly, we might not have found individuals who died in the 1975-2017 interval due to measurement error and matching errors. The key issue for estimation will be whether missing data is differentially missing for those that trained for linger durations.

[30] Several cards were lost to fire or were unreadable. See https://aad.archives.gov/aad/series-description.jsp?s=3360&cat=all&bc=sl

Social Security Records. We match our data to the Master Beneficiary Record File (MBR) in the Social Security administration, which contains information on individual lifetime earnings, disability, and retirement. (More details are available in Data Appendix 1F.) We merge these data on SSNs.[31] We are able to match 52% of our records to the MBR records. But only those that apply for benefits (social security pensions or disability) appear in the MBR. We have information on 80% of individuals who survived to age 65, so our match rate for the targeted population is high. In these records we can observe the Primary Insurance Amount (PIA), which is a proxy for lifetime earnings. The PIA corresponds to the pension a person receives if they start receiving retirement benefits at his/her normal retirement age. The PIA is a non-linear transformation of the AIME (average indexed monthly earnings), which computed as the average of the highest 35 years of earnings after adjusting for inflation.

B. Sample Selection.

For our analysis, we restrict attention only to individuals for whom we can observe duration of training, camp, and the outcome of interest. Therefore, we drop individuals who have no birth year, enrollment year, discharge year or application county, as well as those whose entire discharge records are missing. This results in a sample of 23,722 men out of 26,292. Appendix Table 1 details the number of observations that are lost due to missing data.

For the mortality analysis, we make additional restrictions. We include only individuals with age of death information but investigate the effects of missing data and also use imputations in alternative specifications. The final mortality sample contains information on 17,639 men. This estimation sample generally is representative of the initial data (Table 1) except that, by construction, the age at death is significantly higher. For the lifetime outcomes from the SSA, our sample includes 12,455 individuals, 64% of the original analytic sample. Again, this sample is relatively representative of the initial full sample in many dimensions (duration, YOB, age, height, weight, education, father alive, mother alive, household size, farm) with some notable exceptions (Table 1). By construction, the age at death in this sample is higher because only

[31] We only observe SSN if they person reported it in the application in CO, or if it is available in the death certificate. However, SSNs are not available for anyone who died after 2008 (these are masked for privacy reasons) or for those who died young and never applied for a SS card.

those who survive to at least 62 are eligible to apply for pensions. We also see fewer Hispanics, more people who lied about their age, and more people who sent money to their mothers. But these differences are not too large. We investigate the extent of sample selection further below.

C. Summary Statistics: CCC Training and Lifetime Outcomes

Pre-CCC Characteristics. Characteristics of the men in our data are presented in Table 1a and 1b. The average CCC enrollee enlisted around 1939 and was 18.7 years old, but many enrollees appear to have misrepresented their age: 22% overstated their age (their age in the death certificates suggest they were younger than they reported), and another 11% understated their age. While some of these discrepancies might be due to errors in matching individuals to death certificates, they might also indicate that many men, particularly the young ones, were quite desperate to train and lied about their age to gain eligibility.[32]

As expected, more detailed data for CO suggest that the enrollees were relatively disadvantaged. On average, enrollees completed 8.7 years of schooling and came from a household of about 5 individuals. About 25% came from a farm, 20% had a deceased father and 15% had a deceased mother. Despite height and weight examinations to exclude the unhealthy, about 7% were underweight. Imputing the ethnic origin of the participants, we estimate that about 45% were Hispanic.[33] In the Online Appendix we show that these young men came from poorer counties than the average males of the same age in CO and NM in the 1930 and 1940 census, consistent with them being recruited from relief rolls. Consistent with the fact that CO and NM were very poor states, CO and NM enrollees were even more disadvantaged than the average CCC enrollee in the nation—they are substantially younger, shorter, weigh less, have more dependents, and more of them have fewer than 4 years of schooling.[34] Data Appendix Figure 6 documents this graphically. Data on the camps suggest that they were typically rural in nature and as such, located relatively far from the enrollees' hometowns (150 miles on average).

[32] A few of the men are not junior (less than 1%) which can also explain a small fraction of the violations in the age criteria. Individual accounts of CCC participants include accounts of lying and over-eating in order to qualify, see Melzer (2000).

[33] See Data Appendix for method of imputation.

[34] We check this by comparing the means in our estimation sample to the published national means. These were published in *Annual Report of the Director of the Civilian Conservation Corps: Fiscal Year Ended June 30, 1937* Appendix H: Census of Civilian Conservation Corps Enrollees.

Post CCC outcomes. Table 1b shows the mean outcomes for CCC enrollees after they left the program. The average enrollee eventually lived to be 70 years old, below what SSA cohort life tables predict for male cohorts born in 1920 who survived to age 17 (71). In our estimation sample, conditioning for dying after 45, the average enrollee lived to be 73.6 years old, which is also lower than 74.5 from the SSA cohort life tables. This evidence is consistent with the fact CCC men were poor and came from poor states. Among those in the SSA records, the average PIA was around 430 dollars per month. In 1940, 91% of those who had already completed their training were in the labor force, and 72% were working conditional on being in the labor force, making about 400 dollars in annual wages. A substantial fraction (29%) were living in a different county from their prior county of residence. Similar patterns are observed in the WWII enlistment data.[35]

V. Determinants of Training Duration.

We start by investigating the determinants of enrollment duration. On average enrollees in our estimation sample trained for 9.8 months (S.D. 0.7) or .82 years. Aggregate data on the national CCC program from a 1937 CCC Census shows that the distribution of duration in our states (using CO) is skewed slightly towards shorter durations than the national distribution (Data Appendix Figure 6).

There is large variation in the duration of training. Figure 1, Panel A shows the histogram of duration in months. It shows spikes exactly at 6, 12, 18 and 24 months, corresponding to 1, 2, 3 and 4 terms. However, most individuals (62%) dropped out in the middle of their assignment (Table 1a, 38% ended due to "end of term"). And there is significant variation in duration among those serving partial terms: 9% of individuals trained fewer than 2 months and a few individuals (about 1%) trained for more than 3 years despite program rules. Figure 2 Panel A shows that among those who left before completing their term, 21% deserted, 15% were dismissed "for the convenience of the government" (e.g., the camp closed), 12% left for a job, and another 12% left because of an "urgent and proper call" (e.g., a family member was sick, though the specific reason is not generally noted).

[35] At the time of WWII enlistment (around 1942) 30% were living in a different county from their prior county of residence.

Figure 2 also shows that those leaving before completing their term tend to have shorter average durations. Individuals with honorable discharges trained for longer, suggesting positive selection into duration. However, among those who quit early, the results are more ambiguous: individuals with "urgent and proper calls" trained less than those who deserted. Furthermore, those who were rejected upon further examination trained for just as long as those who were dismissed for the convenience of the government. Thus, short durations may have resulted from either positive or negative circumstances.

To investigate the determinants of duration we estimate simple OLS regressions of the duration of training as a function of individual, family, and camp characteristics. We include year-of-birth fixed effects (YOB) because different cohorts were eligible to train for different amounts of time (Data Appendix Figure 5). We include county-of-enlistment by quarter-of-enlistment (CQE) fixed effects for two reasons. This addresses the fact that the number and types of camps that were opened varied over time and space, affecting where individuals ended up serving and potentially the duration of training. It also addresses differential selection based on location and time over the program years because the type of individuals who apply for training (and other government benefits) varies substantially with economic conditions (Méndez and Sepúlveda. 2012).

Figure 3 shows the results for selected characteristics, with full results shown in Appendix Table 2. In examining the relationship between personal characteristics and duration, no clear relationship emerges. Individuals who reported being older than they truly were trained for shorter durations whereas those who were older trained for longer durations. Those who were farther away from home also trained for shorter.[36] Surprisingly, individuals with a higher weight, who were presumably healthier individuals, trained for *shorter* durations. Height, which is a marker of improved nutrition and health during the growing years, does not predict training duration. Those with more education trained for longer but so did those who came from larger households or whose parents were deceased.[37]

[36] Other traits predict durations: e.g. those who were paid more and those that were not juniors trained longer.
[37] These results are qualitatively similar if we estimate regressions separately for CO and NM (see Appendix Table 2) but some coefficients are only significant in one state. Notably Hispanics were more likely to train longer in NM but not in CO. Individuals who were older than they reported trained longer in CO but not in NM. Weather is a significant predictor in CO but not in NM. There are no cases in which the coefficients are statistically significant and of opposite signs.

This evidence is not consistent with a single narrative of selection. There appear to be three groups of enrollees. First, some who served for longer because they were positively selected, such as those with more education, older, or honorably dismissed. A second group seems to be negatively selected and in need of the CCC payments, such as those from more disadvantaged backgrounds. Third, some appear to have more or less random reasons due to good or bad luck, such as a job appearing, a camp closing or having an emergency at home.

The evidence also suggests that, conditional on individual characteristics and place and time of enrollment, camp conditions mattered, as shown in Appendix Table 2. For instance, in places with less rain and milder weather, individuals trained for longer, as did those assigned to camps farther from cities. Peer characteristics also mattered. Durations were longer in camps with larger Hispanic shares of the population or with more men under 18, but shorter in camps with many men who misrepresented their age or sent smaller amounts to their families.

In sum, the primary evidence shows that desirable traits in an enrollee or in a camp did not necessarily lead to longer durations, and there is no single narrative of selection.

VI. The Long-Term Effect of CCC Training on Mortality and Lifetime Earnings

We now investigate the effect of duration of enrollment on lifetime outcomes, namely mortality and earnings.

A. Mortality results

For this analysis, we restrict attention to individuals who died after age 45 to avoid WWII related deaths and who have been linked to a death certificate. The results are not sensitive to these restrictions. Figure 4 shows the relationship between average duration of training and mean age at death among CCC men: the longer an enrollee trained, the longer he lived. The relationship is positive and linear. Figure 5 shows the estimated density of the age at death for individuals who trained for less than one term, between 1 and 2 terms, and more than three terms. The distribution of the age at death appears to shift to the right for those who trained for longer.

Next, we estimate an accelerated failure time model of the age at death on duration in which we add controls for the characteristics of the enrollees and the camps to examine whether and how our estimates change in response. The first column of Table 2 with no controls shows a very precise coefficient on duration of 0.013. Controlling for cohort fixed-effects and county-of-

enrollment-quarter-of-the-year (CQE) fixed-effects (column 2) does not change the coefficient estimate. Including family and individual characteristics (column 3) lowers the coefficient to 0.011. Adding camp characteristics (column 4), peer characteristics (column 5), or camp fixed effects (column 6) changes the coefficient very little. The magnitudes imply that one more year of training increased the age at death by one year (roughly 1.3 percent of 73.6 years of life). When we limit our sample to CO where the records contain a lot more important baseline information, such as education, height, etc., the results are again similar (column 7).[38]

The fact that the coefficient is essentially unchanged from columns 1-7 suggests that selection bias may be small. However, to more formally assess the magnitude of the omitted variable bias, we re-estimate these coefficients under various assumptions about the unobservables following Oster (2017). If delta (the proportionality value) is assumed to be 1 (i.e., unobservables as important as observables) then our coefficient would be 0.0136. Alternatively, if delta is assumed to be -1, we would estimate 0.0127. Thus, one more year of training would increase the age at death between 0.96 and 1.02 years.

Coefficients on other covariates (shown in Appendix Table 3) are interesting and shed some light on the issue of selection. They show that variables that predict longer duration do not always predict longer lives, providing additional evidence that selection into duration is unlikely to drive our results. More educated individuals trained longer and lived longer as well. Similarly, individuals who were accepted but eventually rejected trained for shorter durations and lived shorter lives, consistent with accounts that these shorter durations were mostly related to physical disabilities. On the other hand, individuals who were older than they reported, trained for longer durations but lived shorter lives. Similarly, those who lived far away trained longer but lived shorter lives.

Finally, to examine possible non-linearities, Figure 6 shows the results of the regression of probability of survival to age *x* on duration for every age between 45 and 90. The coefficients are small and statistically insignificant at younger ages, when the survival is very high. They become positive and statistically significant starting at age 56 and continue to increase and peak between ages 68 and 78, and then decline thereafter. As a function of the baseline survival rate, which is declining throughout, the effects rise until age 67, and then decline.

[38] For NM and for CO records with missing data we impute using the mean and include a series for dummies to indicate when the covariate is missing.

Sample attrition. About 20% of the original sample is missing information on age at death. We assess whether missing age at death is systematically related to training duration (with or without conditioning on covariates). Table 3 shows that, without controls, the missing rates are not a function of training duration. But conditional on camp, family and individual characteristics, age at death is about 9% *less* likely to be missing for those who trained for an additional year. This suggests that differential attrition could bias our OLS estimates. To address this issue, we estimate survival models where we make various assumptions about the missing data. The results in Appendix Table 4 show that our findings are robust to various imputation approaches.

Quality of the longevity data. Our main results use the information found by trained genealogists from multiple sources to determine the age at death. To assess the quality of the data and whether the hand matching procedure introduces unknown biases, we replicate the results using machine matches only. To do this we use the EM algorithm to match our records to the Death Master File. The results in Appendix Table 8 show that we still obtain a positive and statistically significant coefficient of duration on age at death that is very similar in magnitude to our main estimates.

B. Lifetime income results

We examine the effects of the program on lifetime income by investigating the effects of duration on the Primary Insurance Amount (PIA), our proxy for lifetime earnings. The PIA is the amount of Social Security pension an individual would receive if they retired at the normal retirement age. To compute PIA, the SSA takes the average of an individuals' best 35 years of earnings, known as the AIME (Average Indexed Monthly Earnings). The SSA transforms the AIME into pension amounts using a non-linear formula, where each additional dollar earned is weighted by a smaller factor as earnings increase, with the weights tapering to zero. Thus, the formula compresses the distribution of PIA compared to the distribution of earnings. Because the PIA computation changed in 1979, we focus on results post 1979, but show results for the pre-1979 sample as well.

We plot the mean PIA as a function of duration for the sample claiming after 1979 and find a flat or slightly negative relationship between duration and PIA (Figure 7). We investigate these results further by estimating OLS regressions. Without covariates there is indeed a negative and statistically significant relationship that is however very small in magnitude (Table 2 Panel B,

column 1). This relationship reverses and becomes positive and statistically significant when we add controls for birth cohort and for quarter and county of enlistment (column 2). It remains stable thereafter regardless of the additional controls we add: one more year of training increases the pension amount by $17 per month, or 3.9%. If we convert this to the effect on the AIME, it corresponds to a 5.9% increase relative to the mean. Panel C shows we obtain similar results in the sample who claimed before 1979: increasing training by a year raises earnings by 2.7%, though this is not statistically significant. If we compute the weighted average between the two samples, we arrive at a 3.7% increase in earnings for the entire sample.

These results do not appear to be driven by sample selection or attrition in the SSA data. This can be seen from Table 3 Panel B, which shows that there is no effect of duration on whether we match an enrollee to MBR. As an additional check, Table 3 Panel C shows that, even when restricting the sample to those matched to the MBR, the effect of duration on longevity is very close to the results from the full sample.

We can compare the size of the gains by comparing our returns to the returns to schooling. The coefficient of years of schooling in the regression of column 6 of Panel B is 10.57 (s.e. = 1.4) so the effect of a year of school on the PIA is smaller than the $17 we estimate for one year of JC, though schooling is measured with error, potentially causing downward bias in the estimate of schooling. Alternatively, OLS estimates of the returns to schooling for our cohorts range from 5% (Goldin and Katz 2000) to 8% (Clay et al 2012). Based on these estimates, the returns to one year of CCC training are roughly equivalent to a year of school or a bit larger.

For reference, the latest evaluation of JC, which tracks individual tax records 20 years after the program, finds that participation in JC had a statistically insignificant increase in wages of 2%, with our effects well within their confidence interval [-4%; 8%]. There are at least two reasons why the returns are lower for JC:The JC evaluation only uses 15 years of labor market outcomes, whereas we use 35 years. The shorter length of the evaluation may lower the estimated returns. Alternatively, the post-WWII economy was better for low-skilled labor than the economy of the early 2000s, which had stagnant wages for low-income groups (Piketty, Saez and Zucman 2018).

C. Treatment Effect Heterogeneity

A recent meta-analysis of 200 training programs around the world by Card, Kluve, and Weber (2018) suggests substantial heterogeneity in estimated impacts. Other recent reviews (Barnow and Smith 2015, Crépon and van den Berg 2016) come to similar conclusions. While we cannot evaluate gender differences (women were ineligible for the CCC), we can investigate other differences that have been found important, such as age, SES and economic conditions at the time of enlistment (Appendix Table 5).[39]

We find that the poorest and most disadvantaged benefitted more, provided they were in good health. The effects were also larger when unemployment was higher. These findings are consistent with Card et al. (2018)'s finding of larger effects of job training in recessions and among the more disadvantaged. Our results differ in one important way from existing work: we find larger pension gains for the young, and significant benefits for Hispanics.[40]

VII. Short-Term Outcomes: Evidence from the 1940 Census and WWII Enlistment Records

What might explain the long-run effects? To investigate, we examine the impact of training on short-run outcomes. First, we investigate the effects on employment and wages, the standard outcomes that are typically assessed in job training programs. Next we investigate other mechanisms that include formal education, health improvements, and geographic mobility.

A. Labor market outcomes: Evidence from the 1940 census

Table 4 shows estimated effect of training duration on outcomes as measured in the 1940 census. We constrain our sample to 9,623 men who participated in CCC before January 1st, 1940, of whom we find 43% percent in the 1940 census.[41] On average these men had left the CCC two years before the 1940 census.

[39] Effects are generally larger for women partly explaining why our results are more modest than those found by Attanasio et al. (2017) (or Kugler et al. 2015) who evaluate programs in Colombia after ten years and find large effects on earnings of about 11% for men and 18% for women. But our estimates for men are still lower than what these studies find.

[40] We suspect these differences are due to several factors: 1-we compute Hispanic ancestry and do not rely on self-reports, b-our enrollees are from only 2 states with large number of Hispanics in the population; 3-the country of origin among our enrollees differs substantially from today.

[41] Duration does not predict whether we find an enrollee in the 1940 census once we include birth cohort and county-quarter fixed effects (Table 4 top panel).

CCC training duration appears to have little effect on the short-run labor market outcomes of CCC enlistees. Most men (91%) are in the labor force, and longer CCC training had at best a very small effect on this outcome: a 1.5% increase relative to the mean of 0.91. We observe no effect on employment (conditional on labor force participation) during the week prior to the Census. There appears to be a small, negative and imprecise effect of duration on weeks worked and earnings.[42] Overall, our results are consistent with the observation in recent reviews that the labor market effects are more positive in the long run than in the short run.

B. Health and military service: Evidence from WWII enlistment records

Table 5 presents results on other short-run outcomes. Because these outcomes are observed at different points in time, in these regressions we include age at enlistment dummies. Duration does predict whether we find enrollees in these records. Each year of CCC training leads to about a 3-percentage point increase in the probability we find the individual in the WWII enlistment records, about a 10% increase relative to the mean, robust and statistically significant. This result is not surprising: the army organized and administered life in the camps, and CCC men who trained for a long time were well acquainted with military life. Some men (2% in our data) ended their CCC engagement to enlist in the military directly, particularly toward the end of the program in 1942. Given that we have not found differential matching rates in any of our other data, we do not believe differential matching explains this result. Rather, we conclude that the program made men more likely to serve.

We observe measured height and BMI in the WWII enlistment data for about 7,300 observations. We find that one more year of training translated into roughly 1 more inch of height—this result is statistically significant and relatively robust to the inclusion of covariates once cohort dummies are included as controls.[43] While this effect is small relative to the mean (about 1.5%), it is large by historical standards: for example, it took British men 100 years for their average height to increase by 6 inches (Fogel 1994). This result holds conditional on height at enlistment, so it corresponds to additional growth rather than initial differences in height.

[42] For example, the largest coefficient for weeks worked is -0.937 which corresponds to 3.4% change relative to the mean of 28 weeks worked. Similarly, we observe a negative but statistically insignificant effect on earnings, corresponding to about a 3% decrease in wages at the mean.

[43] Controlling for cohort matters a lot because individuals born in more recent cohorts are taller but less likely to serve for long, since the program ended with WWII. This possibly explains the negative correlation in the raw data.

It might seem surprising that the program increased heights given that these enrollees' average age is 19. However, undernourished populations grow more slowly and achieve their final adult height at older ages (Steckel 1986) and our results are consistent with this. Also note that our effects are consistent with national reports of the CCC program that the average height gain was half an inch (McEntee 1942). Our estimates are a bit larger, possibly because our population is more disadvantaged than the average CCC enrollee. Also recall that individuals in the CCC received food and medical care, including vaccinations, as part of their participation in the program, likely improving their nutritional status. Finally recall that many individuals (9% in our estimation) were likely younger than they reported.

Consistent with this, the results for BMI, which is a commonly used indicator of short-term nutrition, also show statistically significant increases, across specifications, implying gains of about 5-6% on BMI depending on the specification. The final CCC report documents an average weight gain of enrollees during the program of 11 pounds (McEntee 1942), and our results suggests that 40-60% of these gains persisted.[44]

C. Effects on education, and geographic mobility

We conclude by showing results on formal years of schooling and geographic mobility, which are observed in both the Census of 1940 and WWII Enlistment Records. For these outcomes, we combine information from the two sources to maximize sample size.[45] We control for the time since discharge (or equivalently the year of observation) to account for the fact the outcomes are not observed at the same time.

We find a positive and statistically significant effect of duration on years of schooling of about 0.18 years, relative to a mean of 9.4 years of schooling and controlling for education at baseline (Table 5). When we restrict our analysis to those with non-missing baseline education, the estimate declines to 0.12 and remains significant at the 5% level.[46] Though small in absolute

[44] For an average enrollee in our sample, adding 11 pounds would translate to a gain of 8%, so our results suggest that about 40-60% of the weight gain obtained during the program persisted.
[45] Because the WWII records contain the latest information, we take information from WWII if the enrollee can be found in WWII record and 1940 Census if cannot be found in WWII record and discharged before 1940. For education and marriage, we take the value at WWII, which is later than 1940, if observed in WWII and the value at 1940 Census if only observed in the Census. For moving, we code some as moved if they moved counties in either 1940 or in WWII. The results are not qualitatively different if we run the regressions separately although they are less frequently statistically significant as a result of the smaller sample size. Results available upon request.
[46] Results available upon request.

terms, this represents one tenth of the standard deviation of schooling in WWII records, and it is larger than the effect of many education policies, such as child labor laws, on educational attainment during the early 20th century.[47]

This magnitude is somewhat larger than what one would expect based on the number of individuals that gained formal education during their CCC enlistment and suggests that perhaps individuals obtained school after participating in the CCC. CCC reports indicate that 8% of men obtained additional schooling during the program.[48] Assuming 8% obtained one more year of school, this would result in a gain in years of schooling of 0.08, below but close to our estimate. Given that about 3.5% of enrollees in our data cited education as an explicit reason for leaving the program, post-CCC education gains likely accounts for the rest of the effect.

Finally, we look at the relationship between duration and short and long-term geographic mobility. In Table 6, we compare the county of individuals in their original CCC application with the county of residence indicated in the 1940 Census records, the WWII records and in the death certificates. Thirty five percent of participants moved in the short term. Training for more time in the CCC substantially increased the likelihood of moving. The coefficient on duration is positive and statistically significant in many specifications, hovering around 0.05; thus one more year of training increases the chance of moving by about 15%. This is substantial particularly during this period, which was characterized by historically low migration nationwide, at least across states.[49] Moreover, when CCC men moved, they moved to locations with higher paying weekly or annual wages in 1940, and thus potentially better economic opportunities, as well as lower mortality, measured by the average county level mortality from 1950 to 1968.[50] Over the long run, however, most individuals moved and the effect of duration on mobility fades.

[47] For example, see Lleras-Muney (2002) or Goldin and Katz (2008). One more year of compulsory schooling led to about 0.05 years of schooling.
[48] The final report states that over one hundred thousand enrollees (3%) were taught how to read and write in the CCC program, 4% of men received primary school degrees (8th grade), 0.6% got their high school diplomas and a handful (270 out of more than 3 million) obtained college degrees. Thus, about 7-8% obtained some schooling.
[49] In the 1940 census 12% of people report living in a different county than in 1935. https://www.census.gov/dataviz/visualizations/010/
[50] We use this measure instead of the county mortality from 1940 onwards because of the disruptions that occurred during the WWII.

In sum, enrollees who served longer had better health, more schooling and greater short-term mobility towards healthier, richer places. But in the short run, there appear to be no effects on labor market outcomes.[51]

VIII. Internal and External Validity: Comparisons to Modern Job Corps program

To shed some light on the internal and external validity of our results, we analyze data from the modern Federal Job Corps program (JC hereafter), which was modeled after the CCC.[52] Using publicly available data from a randomized evaluation of the JC program conducted in 1994-1996, we first compare JC and CCC enrollees along a number of dimensions, including prior schooling and training duration. We then compare our estimated treatment effects (using OLS methods) with JC estimates based on randomization to assess the validity of our research design. We then compare estimates of duration in JC and the CCC on short run outcomes.

A. Comparing CCC and JC Enrollees.

JC participants differ from CCC participants in two key respects: JC includes women and married individuals, whereas the CCC excluded both. If we restrict attention to men in JC, Table 7 shows that overall, JC and CCC participants are similar. Both are young (19 years old on average) and have relatively few years of schooling. JC participants have completed 10 years of schooling, compared with 8.5 for the CCC enrollees, and 19% have graduated from high school compared with 12% of the CCC enrollees. Our sample has considerably more Hispanics, due to the fact we concentrate on CO and NM, whereas the JC data is national.

Participants are also similar in terms of duration of enrollment and reasons for unenrolling. Mean duration is 9.44 months (s.d. 7.47) for CCC and 5.8 months (s.d. 6.6) for JC. The main reason for the lower duration of the JC participants is that 20% never serve (Figure 2). Conditional on training, the duration among the treated group in JC is 7.8 months. Rates of

[51] For CO we have baseline measures for several outcomes: height, weight, education and prior labor market experience. In our main results we control for these. However, this allows us to test if duration predicts these pre-labor market outcomes. Appendix Table 6 shows that duration does not predict these pre-CCC outcomes, except for education. These results suggest that by in large our approach produces unbiased estimates of the effects of the program.

[52] The current website (https://www.doleta.gov/job_corps/) states that "The program helps eligible young people ages 16 through 24 complete their high school education, trains them for meaningful careers, and assists them with obtaining employment." "Students can earn a high school diploma or the equivalent, and college credits. Job Corps also offers tuition-free housing, meals, basic health care, a living allowance, and career transition assistance."

completion are similar across the two programs as are the reasons for leaving.[53] Finally, and perhaps most importantly, when we try to predict duration in the JC, we also find evidence of both positive and negative selection into duration, as well as evidence that duration might have ended at a random time, just as we found in the CCC data (Figure 3).[54]

B. Comparison of experimental and non-experimental estimates.

We reproduce the JC randomized evaluation results in Schochet et al. (2008) using only the sample of males (Table 8).[55] In the first column we present estimates that compare the outcomes of those assigned to treatment to those of the control. In the second column we present the implied effects of training duration by estimating the implied 2SLS effect of duration using the randomized treatment status as an instrument. Thus, these estimates represent the causal effect of duration under a certain set of assumptions.[56] The third and fourth columns show the results of our OLS strategy for JC and for CCC, respectively, which we discuss below.[57]

OLS as a reasonable approximation of experimental estimates in the JC data. We find that OLS estimates are a reasonable approximation of the causal impact of duration on short run outcomes in the JC data. For example, the 2SLS estimate of duration on years of schooling using assignment to treatment as an instrument is 0.39. When we use data only from the treated group and estimate the effect of training duration on education using OLS, the coefficient we would estimate is 0.36, statistically indistinguishable from the experimental estimate. We find similar effects in the OLS and RCT settings for employment, weeks worked, and log earnings

[53] About 30% of JC enrollees complete the program, compared with 38% of the CCC. And of those who leave before completing, 30% in the JC and 22% in the CCC "deserted" while 12% and 4%, respectively, left because of employment opportunities.

[54] We find that education, Hispanic ethnicity, non-native speakers trained longer and individuals with a criminal history or those with shorter work histories trained for shorter periods of time (Figure 3 Panel B). As in the CCC, participants that found employment and those that deserted, were rejected or had urgent and proper calls also served shorter durations compared to those that completed their term.

[55] The results in the first column are almost identical to those in Schochet et al. (2008) except that we are restricting the sample to males and we constructed a few new outcomes (years of education, mobility and marriage). We can reproduce the full RCT results very closely using the full sample.

[56] Assuming that there are no heterogeneous treatment effects, and that the effect of training duration on the outcomes is linear starting at 0.

[57] Appendix Table 7 shows that the treated and control groups are balanced among males only suggesting that the RCT results for this subsample are valid. However, we show both groups since the original RCT was not designed or powered to estimated effects among males only.

conditional on employment. The OLS approach underestimates annual earnings (including zeros) and over-estimates mobility, but the results are still similar given the estimated standard errors.

Comparing CCC estimates with the JC estimates. We find that the JC and the CCC programs both had positive and statistically significant effects on education, mobility and self-reported health. The latter two outcomes had not previously been examined, although the 20-year evaluation did report that a 40% reduction in SSDI benefits among JC participants. We find that JC increases the likelihood that respondents report being in excellent or very good health. Thus the JC evidence on health is similar to CCC findings for height and BMI.[58]

However, we find different effects of JC and CCC training on labor market outcomes. While small positive effects on employment, weeks worked, and annual earnings are found in the JC program, we find that the CCC program had no significant effects on employment and earnings. The differences might be due to the effects of experience: the labor market outcomes are measured on average only two years after leaving the CCC program, but they are measured 3 years out for JC. The differences could also be driven by the fact that labor market conditions differed at the time of the evaluation and were still quite dire in the 1930s and early 1940s.

Overall, we conclude that CCC participants are comparable in some important dimensions to JC participants: they are young and uneducated, and they participate in training for about 7 to 9 months. In the short run, both programs appear to raise educational attainment and geographic mobility and improve health. JC has more beneficial labor market effects in the short run. But CCC appears to have increased lifetime earnings, suggesting the 20-year evaluation might underestimate the effects of the program. This suggests that in the long-term JC participants will benefit from JC by living longer lives and enjoying greater pensions.

IX. Discussion.

In the long run, we find that individuals who participated longer in CCC had increased longevity by about 0.7 years. In the short run (within 2 years of training), we find no significant effects of training duration on labor force participation, employment, or earnings. We do however find significant income effects in the long-term despite no short-term effects, consistent

[58] Results are similar if we use the entire scale or only look at whether the respondents are in excellent health alone.

with Card et al.'s (2018) findings. We also find small improvements in education and large increases in geographic mobility, height, and BMI.

Our longevity finding is consistent with the literature on the determinants of mortality. Height and normal BMI are both associated with longevity (Fogel 1994), and both indicators of health improved with CCC duration. The education of the men (formal and informal) also increased, and education is associated with longevity (Cutler et al. 2006). Greater lifetime earnings are also associated with lower mortality (Chetty et al. 2016). Finally, the enrollees moved to locations with lower mortality, which Finkelstein et al. (2019) and Deryugina and Molitor (2019) show also increase longevity.

Was the program worth it? We calculate the Marginal Value of Public Funds (MVPF) to answer the question, following the approach by Hendren and Sprung-Keyser (2019). CCC program costs we include are 1) upfront cost of the program and 2) increases in social security payouts from enrollees both living longer and having increased PIA. These costs are mitigated by tax increases from earnings benefits of the program. The program benefits include: 1) willingness to pay (WTP) for life extensions, 2) increase in after-tax earnings, 3) $30 per month wage paid (most of which went to families), and 4) the value of other services received by enrollees during the program, such as room and board. The MVPF is estimated to be 2.13 including the WTP for life increase, and 0.96 excluding the WTP for life increase.[59] Thus our conclusions are similar to Hendren and Sprung-Keyser (2019)[60] in that the MVFP is below one when computed based on earnings, but they differ once we incorporate longevity gains.

Historical accounts suggest that the program may have positively affected other "soft skills," improved mental health, and enlarged social networks, but we have no data to assess

[59] Assumptions made and details of calculation are presented in the Online Appendix. Some of the increases in life expectancy could lead to greater government spending through Medicare, potentially lowering the marginal value of public funds (Hendren and Sprung-Keyser 2019). Families received transfers, which could have benefitted them but also potentially distorted their behaviors. We do not have estimates of these effects. We do not assess the general equilibrium effects of job training programs. Recent research suggests these effects could be substantial and possibly offset the benefits to individuals (Crepon et al. 2013). Relatedly, the CCC program had impacts not just on the individuals that participated in the program but also on the communities where the CCC operated. In the short run these effects were driven in part by the economic and social activity that the camps generated, bringing men and resources to nearby towns. These short-term effects ended with the end of the program and the closure of the parks. But the changes in the landscape related to the building of national parks and forests, and the irrigation of the land, might have affected these communities more permanently. We do not incorporate these. Van der Berg et al. (2016) discuss this extensively—full cost benefit evaluations of training programs are rare and difficult to do.

[60] They compute an MVFP of 0.18 for JC. This computation does not incorporate the lower SSDI claims or the potential life extensions we compute here.

these effects. For example, enrollees reported making many life-long friendships and experiencing improvements in their state of mind. Additionally, the Army ran the CCC camps and imposed rules of behavior that were likely unusual for most individuals and may have been beneficial. Criminality is an important outcome which may have been affected as well. Though we do not observe these outcomes directly, we do observe that the CCC increased the probability that young men served in the Army, consistent with a change in either discipline or attitudes towards national service. Also, worth noting is that the program likely benefitted not just enrollees and their families, but the communities and the landscape where the CCC operated. Future work should attempt to measure these outcomes and conduct a more extensive cost-benefit evaluation of the program.

Our results have important implications for evaluations of job training programs. The vast majority of evaluations focus on labor market outcomes in the short- to medium-term and find small and/or insignificant effects. We confirm these findings in our data. But we observe large changes in lifetime outcomes that are not usually studied, namely health, military service, and geographic mobility. As previous scholars have noted, these findings suggest that it is essential to evaluate multiple mechanisms and indicators of well-being when assessing the impacts of various interventions.

Individuals entering the labor force today will begin their job search in the midst of high unemployment rates not seen since the Great Depression. Our results suggest that job training during periods of high unemployment has the potential to generate significant long-term benefits for participants, particularly on health outcomes. Thus, the results may be highly applicable to more modern periods with high rates of unemployment, such as the Great Recession of 2009 and the 2020 global pandemic. Our findings demonstrate these programs can improve both health and labor market outcomes. However, the contrast between our findings and the long-term evaluation of the JC program also underscores that the labor market benefits of training programs may depend heavily on the economic conditions that prevail in the decades that follow the program. Indeed, this point has been raised by Rosenzweig and Udry (2019) who have documented that the causal impact of multiple types of investment (including education) can vary significantly over time with changes in aggregate economic conditions. Whether and how the returns to modern job training programs varies with both current and future economic conditions is an important area for future monitoring and study.

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Table 1a: Summary Statistics From Enrollment Records

	Analytic Sample			Mortality Sample			Analytic Sample (matched to MBR)		
	N	mean	sd	N	mean	sd	N	mean	sd
Characteristics in Enrollment Application									
Birth year	23,722	1,920	3.712	17,639	1,920	3.649	12,455	1920	3.546
Age at enrollment	23,488	18.75	2.122	17,449	18.73	2.170	12,330	18.74	2.242
Enrollment year	23,722	1,939	1.902	17,639	1,939	1.894	12,455	1939	1.889
Reported age younger than DMF*	23,722	0.0888	0.284	17,639	0.113	0.317	12,455	0.130	0.336
Reported age older than DMF*	23,722	0.167	0.373	17,639	0.219	0.413	12,455	0.253	0.435
Age is 17 or 18	23,488	0.564	0.496	17,449	0.535	0.499	12,330	0.513	0.500
Not Eligible	23,722	0.0151	0.122	17,639	0.0143	0.119	12,455	0.0139	0.117
Allottee is father	23,722	0.334	0.472	17,639	0.332	0.471	12,455	0.330	0.470
Allottee is mother	23,722	0.466	0.499	17,639	0.475	0.499	12,455	0.475	0.499
Non-junior	23,722	0.00628	0.0790	17,639	0.00675	0.0819	12,455	0.0067	0.0818
Hispanic (imputed using hispanic index)	23,722	0.484	0.500	17,639	0.451	0.498	12,455	0.432	0.495
Additional information in CO records									
Highest grade completed	14,507	8.592	2.109	11,235	8.674	2.081	8,225	8.700	2.055
Household size excluding applicant	7,870	4.745	2.600	6,283	4.763	2.591	4,730	4.725	2.575
Live on farm?	8,101	0.248	0.432	6,460	0.253	0.435	4,846	0.252	0.434
Height (Inches)	8,141	67.80	3.089	6,475	67.88	3.083	4,860	67.92	3.053
Weight (100 pounds)	8,234	1.385	0.171	6,561	1.390	0.172	4,922	1.391	0.171
Body Mass Index	8,115	21.21	2.178	6,461	21.23	2.174	4,849	21.23	2.190
Underweight	8,115	0.0694	0.254	6,461	0.0689	0.253	4,849	0.0685	0.253
Overweight	8,115	0.0450	0.207	6,461	0.0461	0.210	4,849	0.0462	0.210
Father Living	7,943	0.799	0.401	6,339	0.803	0.398	4,765	0.806	0.396
Mother Living	8,006	0.850	0.357	6,391	0.855	0.352	4,808	0.855	0.352
Tenure in county (years)	5,432	12.66	6.483	4,326	12.68	6.504	3,353	12.59	6.522
Ever had a paid regular job?	8,841	0.375	0.484	7,022	0.386	0.487	5,256	0.394	0.489
Male White Unemployed / Male White Pop 1937	23,709	0.0885	0.0397	17,629	0.0864	0.0388	12,450	0.085	0.0378
Male White Unemployed / Male White Pop 1940	23,709	0.0710	0.0308	17,629	0.0696	0.0299	12,450	0.0688	0.0291
Service Characteristics									
First allottee amount (dollars per month)	22,970	21.63	3.772	17,088	21.67	3.721	12,097	21.70	3.683
Duration of service (yrs)	23,722	0.821	0.706	17,639	0.826	0.708	12,455	0.816	0.701
Ever Rejected?	23,722	0.0194	0.138	17,639	0.0201	0.140	12,455	0.0199	0.1397
=1 if disabled	23,722	0.00847	0.0917	17,639	0.00686	0.0825	12,455	0.0069	0.0828
Gap in service (more than 3 months)	23,722	0.160	0.366	17,639	0.173	0.378	12,455	0.180	0.384
Reason ended: End of term	23,722	0.379	0.485	17,639	0.379	0.485	12,455	0.372	0.483
Reason ended: Employment	23,722	0.116	0.320	17,639	0.124	0.329	12,455	0.125	0.331
Reason ended: Convenience of the government	23,722	0.145	0.352	17,639	0.151	0.358	12,455	0.154	0.361
Reason ended: Urgent and Proper Call	23,722	0.117	0.321	17,639	0.122	0.327	12,455	0.125	0.330
Reason ended: Deserted	23,722	0.222	0.416	17,639	0.206	0.404	12,455	0.205	0.404
Reason ended: Rejected upon examination	23,722	0.00915	0.0952	17,639	0.00754	0.0865	12,455	0.0069	0.0828
Reason ended: No Record	23,722	0.0128	0.112	17,639	0.0120	0.109	12,455	0.012	0.109
Honorable Discharge	23,722	0.767	0.423	17,639	0.785	0.411	12,455	0.786	0.410
Camp Characteristics									
Distance from home to camp in miles (derived)	22,405	154.8	207.1	16,645	157.2	208.0	11,740	159.5	209.1
1st closest city distance form camp (miles)	23,480	26.68	22.50	17,454	26.57	22.26	12,322	26.40	22.06
2nd closest city distance form camp (miles)	23,480	49.86	22.49	17,454	49.33	22.32	12,322	48.71	22.17
Mean precipitation in camp 1933-1942	23,202	33.43	9.281	17,253	33.52	9.321	12,174	33.66	9.382
Mean min temp in camp 1933-1942	23,202	1.459	3.474	17,253	1.382	3.457	12,174	1.265	3.450
Mean max temp in camp 1933-1942	23,202	17.51	4.114	17,253	17.39	4.108	12,174	17.24	4.106
Camp Mean Hispanic (imputed using hispanic index)	23,722	0.482	0.313	17,639	0.462	0.312	12,455	0.430	0.329
Camp Type: Department of Grazing	23,671	0.135	0.341	17,593	0.132	0.339	12,455	0.131	0.337
Camp Type: Federal Reclamation Project	23,671	0.0553	0.229	17,593	0.0566	0.231	12,455	0.056	0.230
Camp Type: Fish and Wildlife Service	23,671	0.0118	0.108	17,593	0.0111	0.105	12,455	0.0106	0.102
Camp Type: National Forest	23,671	0.295	0.456	17,593	0.290	0.454	12,455	0.292	0.454
Camp Type: National Monument	23,671	0.0191	0.137	17,593	0.0184	0.134	12,455	0.0188	0.136
Camp Type: National Park	23,671	0.105	0.307	17,593	0.108	0.310	12,455	0.108	0.310
Camp Type: Soil Conservation	23,671	0.307	0.461	17,593	0.311	0.463	12,455	0.306	0.461
Camp Type: State Park	23,671	0.0524	0.223	17,593	0.0527	0.223	12,455	0.054	0.226
Camp Type: Other	23,671	0.0202	0.141	17,593	0.0206	0.142	12,455	0.0214	0.145

Notes: Basic sample includes records with duration (begin and end date of enrollment), camp id and enrollment county. The analytical sample for the mortality analysis only includes those not missing death age and death age more than 45. When multiple records were found for a single individual we use the information in the first enrollment record. *Reported age being younger (older) than DMF OR than the oldest (youngest) reported if the individual has multiple enrollment spells.

Table 1b: Summary Statistics From Death Certificate, 1940 and WWII Records

	Analytic Sample			Analytic Sample for mortality Analysis			Analytic Sample (MBR matched)		
	N	mean	sd	N	mean	sd	N	mean	sd
Death Certificate Data									
Age at death	19,377	69.82	16.84	17,639	73.62	12.03	12,348	74.76	9.25
=1 if missing age at death	23,722	0.183	0.387	17,639	0	0	12,455	0.009	0.092
Survive at 70	19,377	0.587	0.492	17,639	0.644	0.479	12,348	0.706	0.456
P(70), imputed to 0 if missing	23,722	0.479	0.500	17,639	0.644	0.479	12,455	0.700	0.458
Imputed Prob of Survival at 70 Using Age at Discharge	23,718	0.589	0.446	17,636	0.644	0.479	12,455	0.705	0.454
1940 Census Data									
Matched to 1940 Census	23,722	0.449	0.497	17,639	0.479	0.500	12,455	0.487	0.500
Panel a: those that served before 1940									
Year of birth	4,217	1,918	3.836	3,410	1,918	3.803	2,451	1918	3.559
Age at last birthday (in years)	4,217	21.77	3.836	3,410	21.75	3.803	2,451	21.74	3.559
Hispanic	4,217	0.279	0.449	3,410	0.258	0.438	2,451	0.245	0.430
White	4,217	0.991	0.0933	3,410	0.992	0.0903	2,451	0.991	0.092
In labor force	4,217	0.909	0.288	3,410	0.912	0.283	2,451	0.909	0.288
Working, conditional on labor force	3,833	0.711	0.453	3,110	0.718	0.450	2,228	0.711	0.453
Wage, conditional on working	2,983	405.3	361.0	2,424	401.8	337.4	1,764	410.8	360.7
Lives in CO	4,217	0.776	0.417	3,410	0.787	0.409	2,451	0.790	0.407
Lives in NM	4,217	0.166	0.372	3,410	0.152	0.360	2,451	0.144	0.351
Years of educ	4,159	8.770	2.477	3,363	8.842	2.445	2,415	8.873	2.420
Moved Residence Counties	4,215	0.299	0.458	3,408	0.291	0.454	2,450	0.296	0.457
Panel b: those that served after 1940									
Year of birth	636	1,920	3.486	532	1,920	3.493	418	1921	2.621
Age at last birthday (in years)	636	19.66	3.486	532	19.62	3.493	418	19.45	2.621
Hispanic	636	0.365	0.482	532	0.340	0.474	418	0.330	0.471
White	636	0.994	0.0791	532	0.992	0.0865	418	0.995	0.069
In labor force	636	0.879	0.326	532	0.883	0.321	418	0.880	0.325
Working, conditional on labor force	559	0.719	0.450	470	0.711	0.454	368	0.712	0.453
Wage, conditional on working	440	253.8	167.2	366	258.6	172.1	282	252.9	149.6
Lives in CO	636	0.855	0.352	532	0.868	0.338	418	0.864	0.344
Lives in NM	636	0.134	0.341	532	0.122	0.328	418	0.129	0.336
Years of educ	629	8.347	2.135	526	8.390	2.114	413	8.370	2.097
Moved Residence Counties	636	0.145	0.352	532	0.139	0.346	418	0.136	0.344
WWII Records									
Matched to WWII records	23,722	0.306	0.461	17,639	0.338	0.473	12,455	0.347	0.476
Birth year	7,263	1,920	2.810	5,954	1,920	2.831	4,321	1920	2.815
Enrollment year	7,262	1,942	1.424	5,954	1,942	1.439	4,321	1942	1.45
Years of education	7,263	9.395	1.787	5,954	9.404	1.785	4,321	9.399	1.766
Height in inches*	5,971	67.52	6.089	4,876	67.70	6.098	3,510	67.73	6.164
Weight in lbs**	5,641	138.6	26.19	4,595	138.7	25.70	3,327	139.4	27.17
BMI	5,466	21.55	4.500	4,451	21.50	4.101	3,214	21.55	4.399
Ever Married	7,256	0.215	0.411	5,947	0.221	0.415	4,316	0.224	0.417
Home State CO	7,232	0.591	0.492	5,928	0.605	0.489	4,300	0.617	0.486
Moved Residence Counties	7,215	0.303	0.460	5,914	0.296	0.457	4,290	0.303	0.46
Home State NM	7,232	0.319	0.466	5,928	0.305	0.460	4,300	0.289	0.453
Birthplace CO	7,215	0.444	0.497	5,913	0.451	0.498	4,295	0.462	0.499
Birthplace NM	7,215	0.322	0.467	5,913	0.309	0.462	4,295	0.292	0.455
Birthplace Rest of US	7,215	0.230	0.421	5,913	0.237	0.425	4,295	0.244	0.429

Notes: Basic sample includes records with duration (begin and end date of enrollment), camp id and enrollment county. The analytical sample for the mortality analysis only includes those not missing death age and death age more than 45. When multiple records were found for a single individual we use the information in the first enrollment record. * Dropped values below 40. ** Dropped values below 90 and over 350

Table 2: Effect of Service Duration on Longevity and Lifetime Earnings

VARIABLES	(1) No Controls	(2) Add Birth, County-qtr Dummies	(3) Add Indiv Controls	(4) Add Camp Chars	(5) Add Peer Chars	(6) Add Camp FE	(7) CO Only
Panel A: Longevity for the full sample							
Duration of service (yrs)	0.013***	0.013***	0.011***	0.011***	0.013***	0.013***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Observations	17,086	17,086	17,086	17,086	17,086	17,086	10,944
R-squared	0.003	0.117	0.126	0.127	0.128	0.138	0.149
Mean Dep	73.62	73.62	73.62	73.62	73.62	73.62	73.30
Panel B: What is the effect of duration on PIA in the MBR sample? (Claimed 1979 and later)							
Duration of service (yrs)	-1.675***	21.706***	19.893***	19.717***	18.979***	17.083***	15.459***
	(2.869)	(3.743)	(3.827)	(3.841)	(4.284)	(4.636)	(5.414)
Observations	10,241	10,241	10,241	10,241	10,241	10,241	6,525
R-squared	0.000	0.200	0.215	0.216	0.218	0.233	0.254
Mean Dep	437.70	437.70	437.70	437.70	437.70	437.70	449.34
Mean Implied AIME	904.62	904.62	904.62	904.62	904.62	904.62	940.99
Implied AIME Increase	-5.23	67.83	62.17	61.62	59.31	53.38	48.31
Panel C: What is the effect of duration on PIA in the MBR sample? (Claimed earlier than 1979)							
Duration of service (yrs)	13.075***	12.552**	12.692**	10.713*	8.819	8.792	8.088
	(3.857)	(6.107)	(6.313)	(6.481)	(7.394)	(10.585)	(11.020)
Observations	1,562	1,562	1,562	1,562	1,562	1,562	1,284
R-squared	0.007	0.456	0.503	0.507	0.511	0.557	0.526
Mean Dep	314.02	314.02	314.02	314.02	314.02	314.02	317.41

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample is restricted only to those that died after age >= 45.

Table 3: Effect of Service Duration on Missing Data and Sample Selection

VARIABLES	(1) No Controls	(2) Add Birth, County-qtr Dummies	(3) Add Indiv Controls	(4) Add Camp Chars	(5) Add Peer Chars	(6) Add Camp FE	(7) CO Only
Panel A: Does duration predict whether longevity is missing?							
Duration of service (yrs)	0.001	-0.017***	-0.020***	-0.020***	-0.017***	-0.015***	-0.008
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Observations	22,964	22,964	22,964	22,964	22,964	22,964	14,116
R-squared	0.000	0.111	0.196	0.197	0.198	0.206	0.200
Mean Dep	0.18	0.18	0.18	0.18	0.18	0.18	0.15
Panel B: Does duration predict being in the MBR sample?							
Duration of service (yrs)	-0.006	0.004***	0.010*	0.011*	0.009	0.005	0.002
	(0.005)	(0.001)	(0.006)	(0.006)	(0.007)	(0.007)	(0.009)
Observations	22,980	22,980	22,980	22,980	22,980	22,980	14,116
R-squared	0.000	0.102	0.205	0.206	0.206	0.212	0.187
Mean Dep	0.53	0.53	0.53	0.53	0.53	0.53	0.57
Panel C: Is the effect of duration on longevity for the MBR sample the same as in the full sample?							
Duration of service (yrs)	0.013***	0.010***	0.009***	0.009***	0.012***	0.011***	0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Observations	11,953	11,953	11,953	11,953	11,953	11,953	7,913
R-squared	0.005	0.157	0.169	0.169	0.170	0.185	0.190
Mean Dep	74.81	74.81	74.81	74.81	74.81	74.81	74.78

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Effect of Service Duration on Labor Market Outcomes Observed in the 1940 Census

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Regression of Outcome on Duration	No Controls	Add Birth, County-qtr Dummies	Add Indiv Controls	Add Camp Chars	Add Peer Chars	Add Camp FE	CO Only
Census							
Found in Census Records	Mean Dep	0.43					
Duration of service (yrs)	-0.015**	0.009	0.007	0.009	0.006	0.012	0.011
	(0.007)	(0.010)	(0.010)	(0.010)	(0.011)	(0.012)	(0.013)
Observations	9,518	9,518	9,518	9,518	9,518	9,518	7,553
R-squared	0.001	0.137	0.152	0.154	0.155	0.166	0.154
In Labor Force	Mean Dep	0.91					
Duration of service (yrs)	0.014**	0.013*	0.013*	0.015**	0.016*	0.019*	0.018*
	(0.006)	(0.007)	(0.007)	(0.007)	(0.009)	(0.010)	(0.011)
Observations	4,052	4,052	4,052	4,052	4,052	4,052	3,374
R-squared	0.001	0.272	0.279	0.280	0.280	0.305	0.286
Working in Census Week | Labor Force	Mean Dep	0.71					
Duration of service (yrs)	0.006	-0.004	-0.005	-0.004	-0.010	-0.015	-0.011
	(0.011)	(0.014)	(0.014)	(0.014)	(0.019)	(0.022)	(0.023)
Observations	3,684	3,684	3,684	3,684	3,684	3,684	3,067
R-squared	0.000	0.265	0.279	0.283	0.286	0.310	0.295
Weeks Worked in 1939^	Mean Dep	27.88					
Duration of service (yrs)	0.669	-0.691	-0.911	-0.937	-0.896	0.265	0.227
	(0.732)	(1.044)	(1.049)	(1.029)	(1.082)	(1.199)	(1.213)
Observations	2,360	2,360	2,360	2,360	2,360	2,360	2,208
R-squared	0.000	0.314	0.345	0.351	0.354	0.383	0.361
Total Annual Wage in 1939^	Mean Dep	383.71					
Duration of service (yrs)	16.773	-12.266	-18.948	-20.038	-21.185	-14.497	-14.633
	(16.061)	(23.145)	(23.911)	(23.533)	(25.577)	(26.389)	(26.652)
Observations	2,148	2,148	2,148	2,148	2,148	2,148	2,011
R-squared	0.001	0.318	0.352	0.357	0.359	0.391	0.376
Ln Total Annual Wage | Working^	Mean Dep	471.25					
Duration of service (yrs)	0.047	-0.035	-0.047	-0.042	-0.051	-0.014	-0.012
	(0.039)	(0.052)	(0.051)	(0.052)	(0.058)	(0.062)	(0.062)
Observations	1,749	1,749	1,749	1,749	1,749	1,749	1,649
R-squared	0.001	0.396	0.447	0.452	0.454	0.487	0.456

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample are those whose first term in CCC is before 1940 and are not enrolled in 1940. The 1940 Census was taken on April 1, 1940. ^ Sample are those whose first term in CCC is before 1939 and are not enrolled in 1939. Census asks labor force and work status on the week before the Census enumeration, while wage information and weeks worked is asked for the year before the Census 1939.

Table 5: Effect of Service Duration on WWII Service, Health and Education Observed in WWII Enlistment and 1940

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Regression of Outcome on Duration	No Controls	Add Birth, County-qtr Dummies	Add Indiv Controls	Add Camp Chars	Add Peer Chars	Add Camp FE	CO Only
WW2							
Found in WWII Records	Mean Dep	0.31					
Duration of service (yrs)	0.018***	0.036***	0.034***	0.035***	0.038***	0.038***	0.042***
	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.009)
Observations	22,963	22,963	22,963	22,963	22,963	22,963	14,116
Enlistment Year	Mean Dep	1942.24					
Duration of service (yrs)	-0.181***	0.976***	0.975***	0.976***	0.966***	0.962***	0.964***
	(0.025)	(0.008)	(0.008)	(0.008)	(0.009)	(0.010)	(0.011)
Observations	7,018	7,018	7,018	7,018	7,018	7,018	4,785
Height	Mean Dep	67.55					
Duration of service (yrs)	-0.022	1.098***	1.098***	1.097***	1.161***	1.143***	1.207***
	(0.103)	(0.190)	(0.191)	(0.190)	(0.209)	(0.221)	(0.276)
Observations	5,770	5,770	5,770	5,770	5,770	5,770	3,816
BMI	Mean Dep	21.53					
Duration of service (yrs)	-0.134**	0.789***	0.829***	0.822***	0.874***	1.018***	1.157***
	(0.064)	(0.191)	(0.191)	(0.190)	(0.195)	(0.204)	(0.265)
Observations	5,287	5,287	5,287	5,287	5,287	5,287	3,454
Combined WW2 Census							
Education	Mean Dep	9.23					
Duration of service (yrs)	-0.072**	0.299***	0.185***	0.186***	0.188***	0.169***	0.115***
	(0.035)	(0.041)	(0.035)	(0.036)	(0.038)	(0.040)	(0.043)
Observations	9,586	9,586	9,586	9,586	9,586	9,586	6,907

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample are those found in WWII records. WWII: additionally includes the age at enlistment dummies. Combined: additionally includes age at observation dummies, where if observed in Census, the age is 1940 - birth year.

Table 6: Effect of Service Duration on Geographic Mobility Over the Lifetime

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Regression of Outcome on Duration	No Controls	Add Birth, County-qtr Dummies	Add Indiv Controls	Add Camp Chars	Add Peer Chars	Add Camp FE	CO Only
Panel a: Short-term geographic mobility (Combined WW2 and Census)							
Moved to a Different State	Mean Dep	0.09					
Duration of service (yrs)	-0.014***	0.023***	0.024***	0.023***	0.028***	0.026***	0.033***
	(0.004)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.009)
Observations	9,568	9,568	9,568	9,568	9,568	9,568	6,891
Moved to a Different County	Mean Dep	0.33					
Duration of service (yrs)	0.006	0.053***	0.054***	0.053***	0.062***	0.057***	0.067***
	(0.007)	(0.009)	(0.009)	(0.009)	(0.011)	(0.011)	(0.012)
Observations	9,568	9,568	9,568	9,568	9,568	9,568	6,891
New County Has Higher Yearly Wage Than Sending County				Mean Dep	0.59		
Duration of service (yrs)	-0.005	0.046**	0.049**	0.047**	0.062**	0.077**	0.079**
	(0.020)	(0.020)	(0.020)	(0.021)	(0.026)	(0.034)	(0.035)
Observations	1,452	1,452	1,452	1,452	1,452	1,452	1,209
New County Has Above Median Mortality Rate (1950-1968)				Mean Dep	0.38		
Duration of service (yrs)	-0.061***	-0.071***	-0.068***	-0.072***	-0.068***	-0.065***	-0.064**
	(0.012)	(0.019)	(0.019)	(0.020)	(0.021)	(0.024)	(0.026)
Observations	3,003	3,003	3,003	3,003	3,003	3,003	2,403
Panel b: Long-term geographic mobility							
Died in a Different State	Mean Dep	0.5					
Duration of service (yrs)	-0.016*	-0.020*	-0.025**	-0.025**	-0.026**	-0.029*	-0.027*
	(0.008)	(0.012)	(0.012)	(0.012)	(0.013)	(0.015)	(0.015)
Observations	7,235	7,235	7,235	7,235	7,235	7,235	4,784
Died in a Different County	Mean Dep	0.8					
Duration of service (yrs)	0.003	-0.002	-0.004	-0.003	0.003	0.005	0.002
	(0.007)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.012)
Observations	7,231	7,231	7,231	7,231	7,231	7,231	4,781
New County Has Above Median Mortality Rate (1950-1968)				Mean Dep	0.25		
Duration of service (yrs)	-0.030***	0.004	0.006	0.005	0.003	0.006	0.009
	(0.008)	(0.012)	(0.012)	(0.012)	(0.013)	(0.015)	(0.016)
Observations	5,313	5,313	5,313	5,313	5,313	5,313	3,678

We assume that the person lived in the county of application when defininig wheter a person moved. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample are those found in WWII records. WWII: additionally includes the age at enlistment dummies. Combined: additionally includes age at observation dummies, where if observed in Census, the age is 1940 - birth year.

Table 7: Characteristics of Eligible Job Corps Applicants and Comparison to CCC

Characteristic	Job Corps Data		CCC
	All Applicants	Males only	Males Only
Baseline Characteristics			
Duration (in years, only positive durations)	0.67	0.652	0.819
Male	0.6	1	1
Age at application	18.8	18.728	18.75
White, non-Hispanic	0.3	0.304	NA
Black, non-Hispanic	0.5	0.451	NA
Hispanic	0.2	0.169	0.484
Other	0.1	0.076	NA
Years of education	10.2	10.042	8.581
High school diploma or more (including GED)	0.2	0.19	0.12
Ever arrested	0.3	0.332	NA
Had a job in the past year	0.6	0.662	NA
Ever had job	0.8	0.808	0.375
Average earnings in the past year (dollars)	2974.9	3255.739	NA
Mean for outcomes			
Duration for treated (years, duration > 0)	0.67	0.652	0.826
Duration for treated (years)	0.483	0.487	0.819
Years of school	11.145	11.07	9.403
Employment (in week of the survey)^	0.606	0.631	0.71
Weeks worked in previous year	30.62	32.17	27.88
Total ann. earnings in prev. yr	10538.31	11947.78	382.43
Total ann. earnings in prev. yr (weeks worked > 0)	12990.85	14471.77	466.69
Moved^^	0.198	0.207	0.34
Self-reported health status in 12 months^^^	1.786	1.733	NA
Self-reported health status in 30 months^^^	1.799	1.739	NA
Self-reported health status in 48 months^^^	1.809	1.757	NA
Self-reported health excellent or good (12-month)*	0.838	0.855	NA
Self-reported health excellent or good (30-month)*	0.838	0.856	NA
Self-reported health excellent or good (48-month)*	0.828	0.842	NA
Reason ended: End of term	0.31	0.302	0.378
Reason ended: Employment	0.042	0.038	0.116
Reason ended: Convenience of the government	0.001	0	0.145
Reason ended: Urgent and Proper Call	0.09	0.056	0.116
Reason ended: Deserted	0.331	0.373	0.223
Reason ended: Rejected upon examination	0	0	0.0101
Reason ended: No Record	0.228	0.232	0.0127
Observations: Baseline	14327	8646	NA
Observations: Outcomes	11313	6528	NA

Source: Baseline data. ^employment is not conditional on labor force participation. ^^for Job Corps it is defined as living more than 20 miles away from baseline residence. For CCC it is defined as living in a different county than the county of residence at the time of enrollment. For Job Corps, employment is defined as having a job during the 208th week after the baseline survey (four years). ^^^Self-reported health status with 1 = excellent health, 2 = good, 3 = fair, and 4 = poor health. *Constructed variable that is equal to 1 if self-reported health status is 1 or 2 (excellent health or good health).

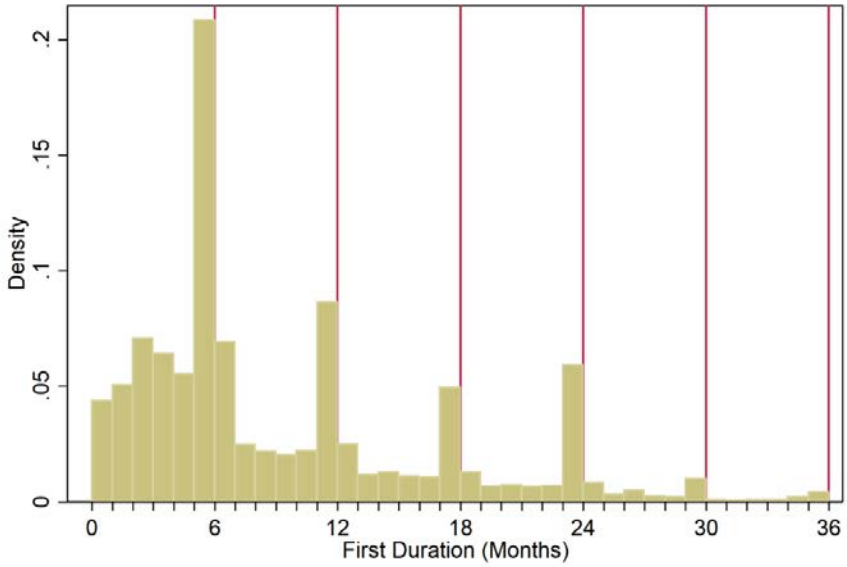
Table 8: Comparison to Job Corps

	Jobs Corps Data			CCC
	RCT		OLS	OLS
	Coefficient on Treatment Dummy (ITT)	2SLS Instrument Duration with Treatment	Coefficient on Duration (years)+	Coefficient on Duration (years)
Years of school	0.184***	0.393	0.360***	0.169***
	(0.039)	(0.084)	(0.041)	(0.040)
N	6,280	6,280	3,407	9,620
Employment (in week of the survey)^	0.026**	0.056	0.060***	0.006
	(0.013)	(0.027)	(0.015)	(0.025)
N	6,022	6,022	3,285	2,686
Weeks worked in previous year	1.615***	3.443	2.629***	0.434
	(0.536)	(1.142)	(0.610)	(1.203)
N	6,235	6,235	3,382	2,383
Total Annual Earnings in previous year	969.765***	2,083.466	1,055.435***	-16.226
	(280.804)	(603.598)	(336.311)	(26.061)
N	6,081	6,081	3,317	2,168
ln(Earnings) | weeks worked>0	0.038	0.080	0.078**	-0.010
	(0.027)	(0.057)	(0.031)	(0.061)
N	5,009	5,009	2,753	23,103
Moved^^	0.018*	0.038	0.060***	0.054***
	(0.011)	(0.023)	(0.014)	(0.011)
N	6,301	6,301	3,419	9,603
Self-reported health excellent or good (12-month)^^^	0.035***	0.073	0.020*	
	(0.009)	(0.020)	(0.010)	
N	5,920	5,920	3,234	
Self-reported health excellent or good (30-month)^^^	0.018*	0.037	0.020*	
	(0.010)	(0.020)	(0.011)	
N	5,458	5,458	2,944	
Self-reported health excellent or good (48-month)^^^	0.016*	0.034	0.013	
	(0.010)	(0.020)	(0.011)	
N	6,279	6,279	3,407	
Duration of training in months			5.829	
Individual controls?	No	No	Yes	Yes

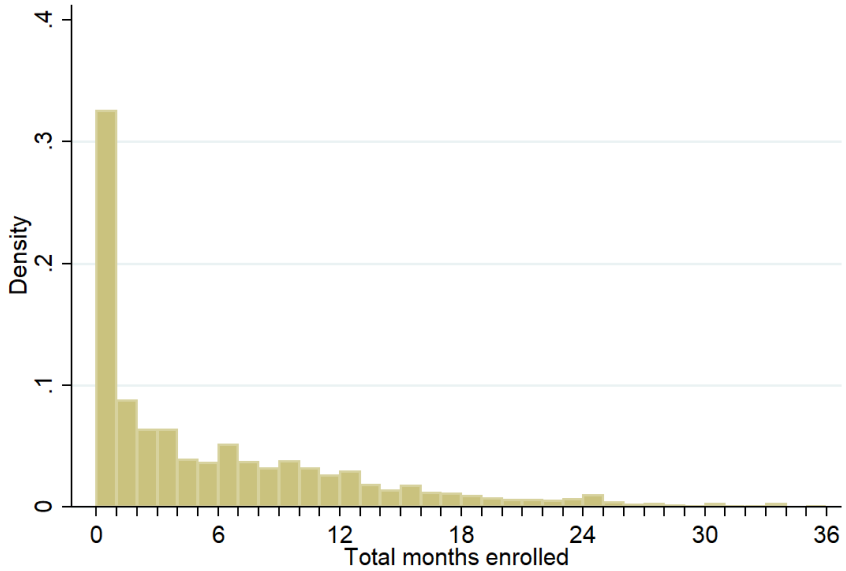
Sample is males only. +Sample includes all treated, including those with zero duration. Controls include year and quarter of baseline, year and quarter of 48-mo followup survey, whether individual was enrolled in non-residential program and baseline characteristics such as whether individual had child, was ever arrested, had ever used drugs, had a job, had a job in the previous year, ever had a job, race, native language, on welfare as a child, education, baseline marital status and others. ^ Employment is not conditional on labor force participation. ^^ For Job Corps it is defined as living more than 20 miles away from baseline residence. For CCC it is defined as living in a different county than the county of residence at the time of enrollment. For Job Corps, employment is defined as having a job during the 208th week after the baseline survey (four years). Earnings conditional on employment only includes the earnings of individuals employed during the 208th week after the baseline survey. ^^^ Constructed variable that is equal to 1 if self-reported health status is 1 or 2 (excellent health or good health).

Figure 1: Distribution of Service Duration in the CCC Records and Jobs Corps

Panel A: CCC



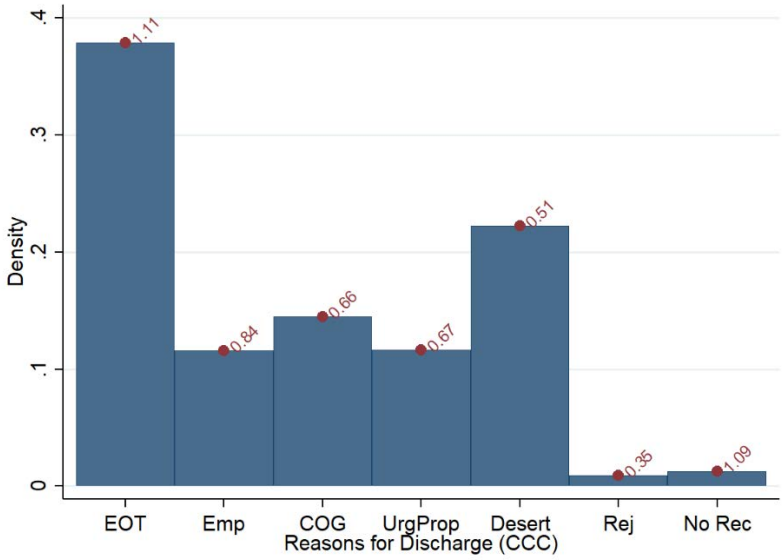
Panel B: Jobs Corps



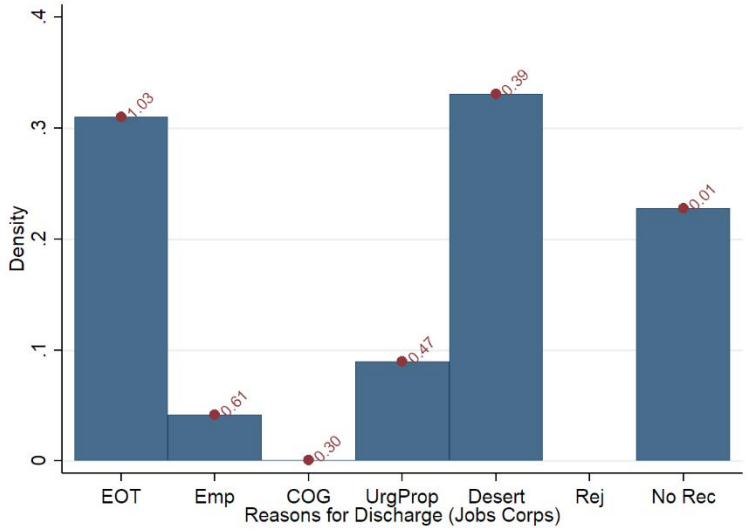
Notes: We exclude durations greater than 3 years (less than 1% of the observations) in this figure. Mean duration is 9.44 months (s.d. 7.47) for CCC and 5.8 months (s.d. 6.6) for Jobs Corps.

Figure 2: Distribution of Reason for Discharge

Panel A: CCC



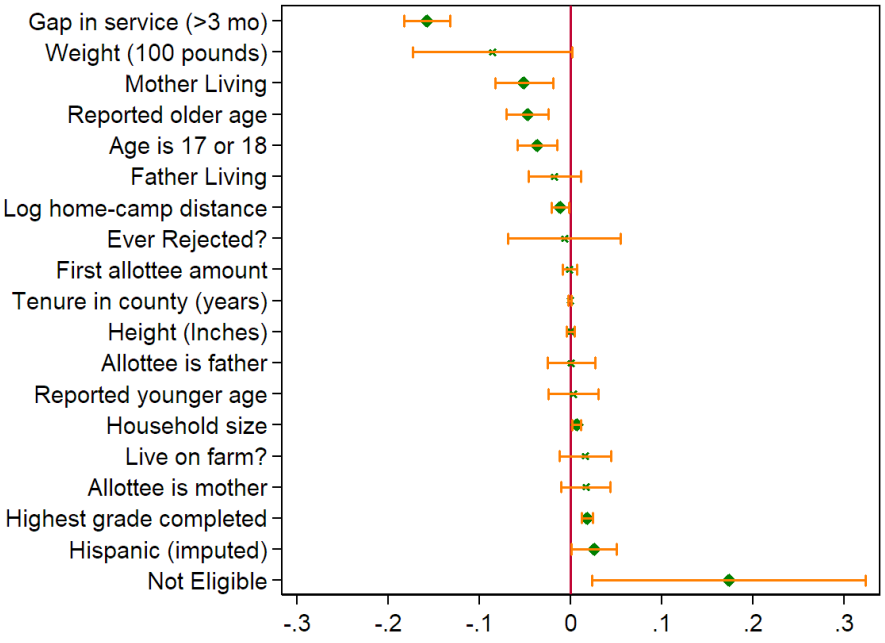
Panel B: Jobs Corps



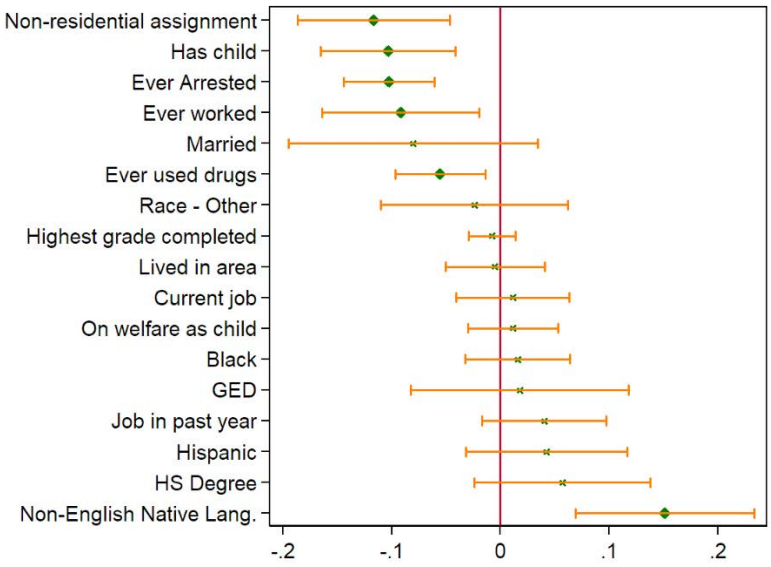
Note: Values on top of the bar graph are mean duration (in years) for each category: EOT (End of Term), Emp (employment outside the program), COG (Convenience of the Government), UrgProp (Urgent and Proper Call), Desert, Rej (Rejected), No Rec (No record). Reasons for Jobs Corps was harmonized to match with CCC's reasons for discharge.

Figure 3: Determinants of Duration

Panel A: CCC

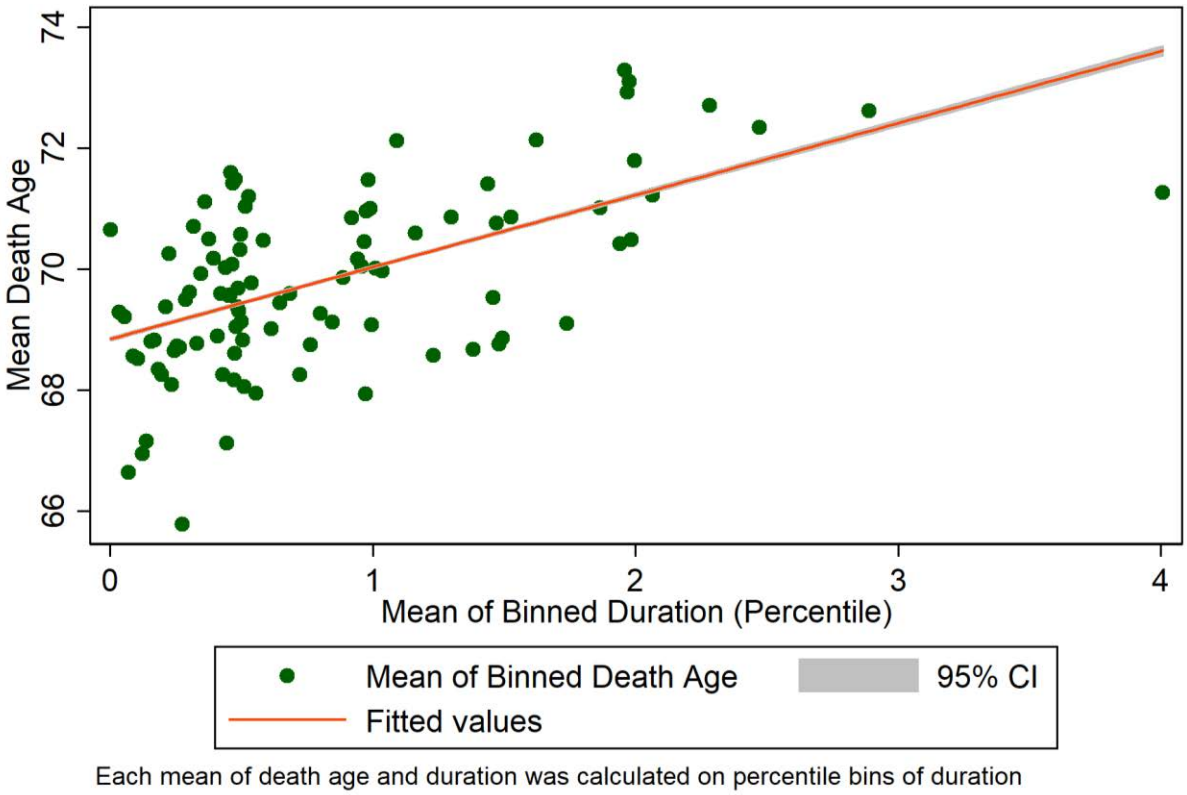


Panel B: Jobs Corps



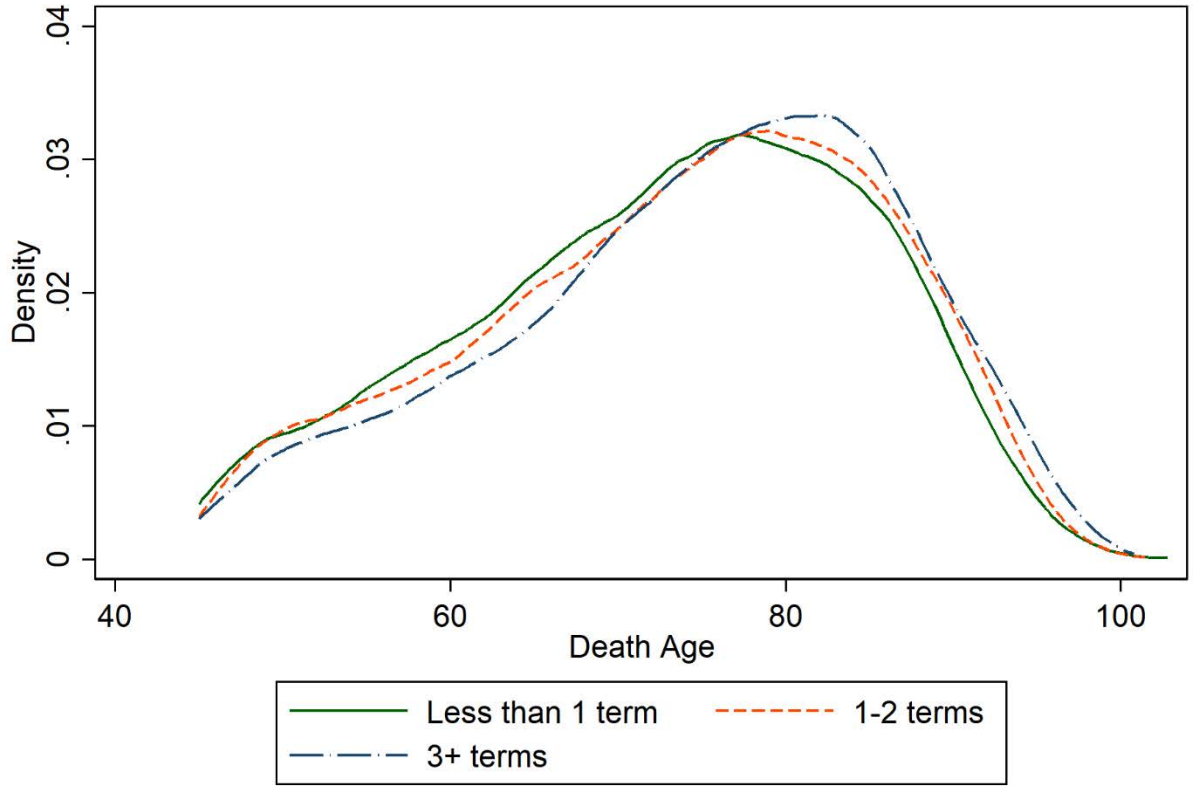
Note: Estimates and 95% confidence intervals plotted for coefficient estimates on selected variables from regressing duration on various individual, camp, and peer characteristics. Coefficients in diamond are statistically significant at the 95% level. Mean duration for the estimation sample is 0.84 years for CCC and 0.49 years for Jobs Corps. Full results of the regression estimates are shown in Appendix Table 2.

Figure 4: Longevity Increases with CCC Service Duration



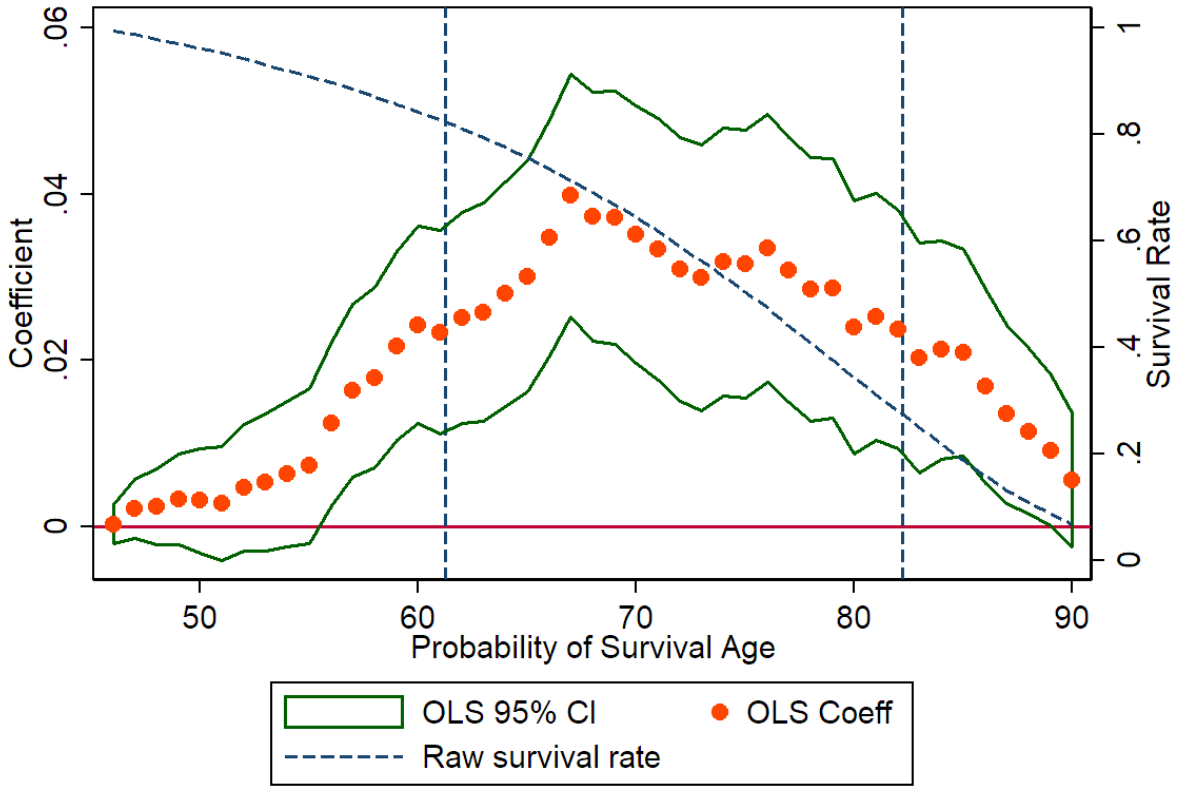
Notes: figure plots the linear fit of mean death age within each percentile bin of duration. Data: Administrative records matched to death certificates. See text for more details.

Figure 5: CCC Enrollees Who Served More Terms Lived Longer



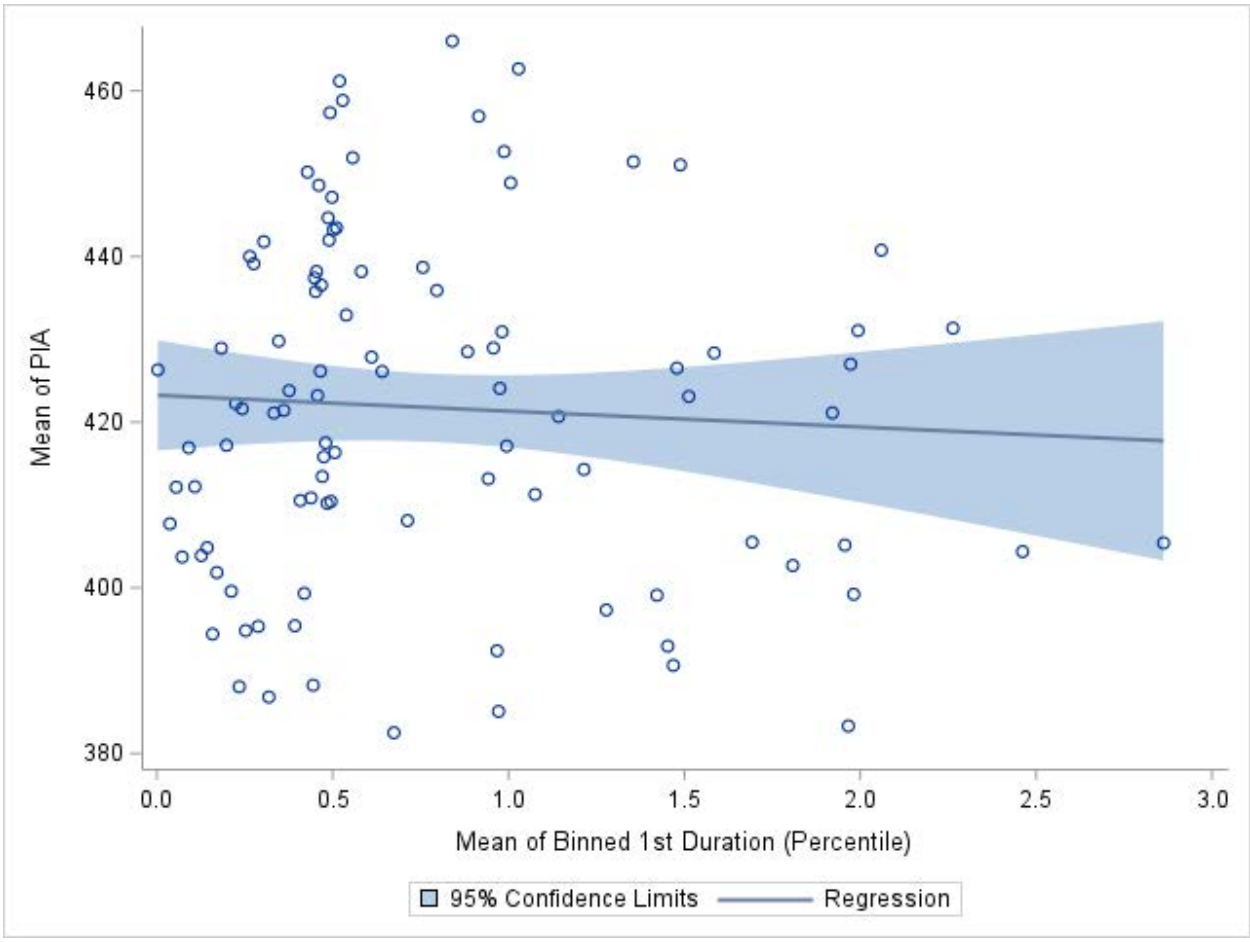
Notes: this figure plots the estimated density of the age at death, separately for those serving less than one term, 1-2 terms and 3 terms or more.

Figure 6: Effect of Service Duration on the Probability of Survival to Different Ages



Notes: On the left y-axis, this figure reports the coefficients (and standard errors) from running linear regressions of the probability that the person survived to a given age a on duration, where age ranges from age 45 to age 90. The regressions use the administrative data we collected and control for all observables at baseline (see Table 2 for details). On the right y-axis we plot the survival rate.

Figure 7: CCC Duration and PIA



Notes: Authors computation based on administrative program data matched to the Master Beneficiary Records.

Appendix Table 1: Sample Selection

Sample Restriction	Itself	Sequential
All	26290	26290
Camp Exist	25165	25165
Enrollment Exist	24832	23943
Duration Exist	26050	23722
Final analytic sample	**26050**	**23722**
Death Age Exist	21457	19377
Death Age Restrict	24386	17639
Final analytic sample for mortality	**24386**	**17639**

The rows show many observations survive after dropping for each restriction. Itself column shows how many observations survive if we drop for just the restriction in the row. Sequential column shows the final observations that survive when we drop for each reason sequentially. Our working sample is 23,889, where we additionally lose observations to Death Age Exist for death age analysis

Appendix Table 2: Determinants of CCC Service Duration

VARIABLES	(1) Indiv Controls	(2) Camp Controls	(3) Indiv+Camp	(4) Add County-Quarter FE	(5) CO Only	(6) CO Non-missing Only
Individual characteristics						
Ever Rejected?	-0.201***		-0.020	-0.007	-0.009	0.060
	(0.033)		(0.034)	(0.031)	(0.034)	(0.038)
=1 if disabled	-0.446***		-0.464***	-0.328***	-0.363***	-0.237*
	(0.055)		(0.055)	(0.050)	(0.061)	(0.127)
Non-junior	0.834***		0.840***	0.509***	0.574***	0.005
	(0.122)		(0.119)	(0.097)	(0.127)	(0.235)
Reported Age Younger than DMF^	0.033*		0.026	0.003	0.003	-0.005
	(0.019)		(0.019)	(0.014)	(0.020)	(0.024)
Reported Age Older than DMF	0.081***		0.089***	-0.047***	-0.029*	-0.033
	(0.015)		(0.015)	(0.012)	(0.016)	(0.025)
Not Eligible	0.300**		0.265*	0.174**	0.186*	0.662***
	(0.139)		(0.141)	(0.077)	(0.106)	(0.134)
Age is 17 or 18	0.100***		0.103***	-0.037***	-0.045***	-0.020
	(0.014)		(0.014)	(0.011)	(0.014)	(0.021)
Allottee amount	0.058***		0.060***	-0.001	0.009	0.026***
	(0.004)		(0.005)	(0.004)	(0.006)	(0.009)
Allottee is father	0.045***		0.045***	0.001	0.001	-0.003
	(0.017)		(0.017)	(0.013)	(0.019)	(0.027)
Allottee is mother	0.045***		0.045***	0.017	0.030	0.012
	(0.017)		(0.016)	(0.014)	(0.019)	(0.027)
Gap in service	-0.201***		-0.156***	-0.158***	-0.126***	-0.113***
	(0.016)		(0.015)	(0.013)	(0.016)	(0.020)
Log distance from home to camp (miles)	-0.016***		-0.013**	-0.011**	-0.015***	-0.021**
	(0.005)		(0.005)	(0.005)	(0.006)	(0.008)
Hispanic (imputed using hispanic index)	0.078***		0.058***	0.026**	-0.014	0.007
	(0.014)		(0.014)	(0.013)	(0.017)	(0.019)
Highest grade completed (CO only)	0.024***		0.021***	0.019***	0.016***	0.007*
	(0.003)		(0.003)	(0.003)	(0.003)	(0.004)
Household size excluding applicant (CO only)	0.012***		0.013***	0.007***	0.008***	0.007***
	(0.003)		(0.003)	(0.002)	(0.002)	(0.003)
Live on farm? (CO only)	0.053***		0.053***	0.016	0.012	0.017
	(0.016)		(0.017)	(0.014)	(0.015)	(0.017)
Height (Inches) (CO only)	0.002		0.001	0.000	-0.000	-0.001
	(0.003)		(0.003)	(0.002)	(0.002)	(0.002)
Weight (100 pounds) (CO only)	-0.189***		-0.154***	-0.085*	-0.113**	-0.019
	(0.054)		(0.052)	(0.045)	(0.047)	(0.045)
Father Living (CO only)	-0.054***		-0.055***	-0.018	-0.015	-0.006
	(0.019)		(0.019)	(0.015)	(0.015)	(0.017)
Mother Living (CO only)	-0.088***		-0.095***	-0.051***	-0.056***	-0.032
	(0.021)		(0.021)	(0.016)	(0.017)	(0.024)
Tenure in county (years) (CO only)	-0.001		-0.001	-0.001	-0.001	-0.001
	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)

Camp characteristics						
=1 if camp is in enrollment state		-0.094***	0.053	0.154***	0.165***	-0.027
		(0.034)	(0.051)	(0.058)	(0.059)	(0.066)
Mean precipitation in camp 1933-1942		-0.001	-0.001	-0.004***	0.001	0.001
		(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
Mean min temp in camp 1933-1942		0.010	0.014**	0.030***	0.027***	0.012
		(0.006)	(0.006)	(0.008)	(0.008)	(0.010)
Mean max temp in camp 1933-1942		-0.018***	-0.021***	-0.034***	-0.022**	-0.006
		(0.006)	(0.006)	(0.007)	(0.009)	(0.011)
Camp Type: Department of Grazing		0.131***	0.123***	-0.075	0.117	-0.052
		(0.044)	(0.041)	(0.063)	(0.087)	(0.116)
Camp Type: Federal Reclamation Project		0.118**	0.099**	-0.055	0.147	0.031
		(0.047)	(0.045)	(0.070)	(0.096)	(0.120)
Camp Type: Fish and Wildlife Service		0.106**	0.024	-0.383***		
		(0.051)	(0.048)	(0.131)		
Camp Type: National Forest		0.008	-0.006	-0.106*	0.024	-0.091
		(0.043)	(0.041)	(0.060)	(0.078)	(0.109)
Camp Type: National Monument		0.145*	0.121	-0.303***	-0.265*	-0.166
		(0.088)	(0.084)	(0.090)	(0.147)	(0.179)
Camp Type: National Park		0.069	0.060	-0.117*	-0.012	-0.165
		(0.044)	(0.042)	(0.063)	(0.079)	(0.101)
Camp Type: Soil Conservation		0.121***	0.100***	-0.075	0.092	-0.070
		(0.040)	(0.038)	(0.059)	(0.080)	(0.108)
Camp Type: State Park		-0.031	-0.041	-0.119*	-0.078	-0.176
		(0.054)	(0.050)	(0.069)	(0.090)	(0.147)
Log distance to closest city (miles)		-0.007*	-0.007**	0.011**	0.000	0.022**
		(0.004)	(0.004)	(0.005)	(0.007)	(0.008)
Log distance to 2nd closest city (miles)		0.028	0.035*	-0.017	-0.044*	0.012
		(0.019)	(0.019)	(0.022)	(0.025)	(0.037)
Peer Char: Hispanic at enrollment		0.386***	0.239***	0.249***	0.015	0.051
		(0.044)	(0.047)	(0.070)	(0.071)	(0.098)
Peer Char: Age at enrollment		-0.200***	-0.235***	-0.319***	-0.313***	0.052
		(0.021)	(0.023)	(0.034)	(0.035)	(0.041)
Peer Char: Reported Age Younger than DMF		0.483***	0.381**	-0.607***	-0.579**	0.478*
		(0.170)	(0.169)	(0.211)	(0.254)	(0.262)
Peer Char: Reported Age Older than DMF		-0.276**	-0.452***	-1.025***	-0.814***	0.397
		(0.127)	(0.137)	(0.200)	(0.236)	(0.318)
Peer Char: Not Eligible (First enrollment)		1.861***	1.587***	1.349***	-0.295	1.949*
		(0.256)	(0.273)	(0.389)	(0.452)	(1.041)
Peer Char: Allottee amount		0.083***	0.030***	-0.255***	-0.360***	-0.305***
		(0.005)	(0.007)	(0.017)	(0.024)	(0.018)
Peer Char: Allottee: Father		-0.083	-0.120	0.019	-0.040	0.088
		(0.126)	(0.122)	(0.149)	(0.177)	(0.198)
Peer Char: Allottee: Mother		-0.163	-0.117	-0.032	-0.078	-0.221
		(0.126)	(0.128)	(0.133)	(0.147)	(0.202)
Peer Char: Gap in service		-0.931***	-0.692***	-0.652***	-0.156	-1.462***
		(0.098)	(0.099)	(0.133)	(0.140)	(0.191)
Constant	-1.457***	3.342***	2.800***	12.992***	14.686***	6.747***
	(0.458)	(0.518)	(0.569)	(0.868)	(0.991)	(0.807)
Observations	17,639	17,086	17,086	17,086	10,944	3,013
R-squared	0.181	0.160	0.222	0.574	0.482	0.465
Mean Dep	0.83	0.84	0.84	0.84	0.76	0.67
FE	BD	BD	BD	BD,CYQ	BD,CYQ	BD,CYQ
Sample	All	All	All	All	CO	CO
Reason	N	N	N	N	N	N
Number of County-Quarter Groups				1,789	1,231	477

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Only Duration <= 3 years, death age >= 45 are included in regression. Variables imputed if missing and missing dummies included. County Unemployment is from ICPSR compilation of County statistics from 1937 Census of Unemployment and 1940 Decenniel Census. Those values are given to enrollment years 1937, 1938 for 1937 Census and 1939-1942 for 1940 Census. ^ =1 if reported age in CCC documents is smaller than in the DMF, or maximum of all reported age for enrollee.

Appendix Table 3: Full Regressions of Log Death Age on Duration

VARIABLES	(1) No Controls	(2) Add Birth, County-qtr Dummies	(3) Add Indiv Controls	(4) Add Camp Chars	(5) Add Peer Chars	(6) Add Camp FE	(7) CO only
Duration of service (yrs)	0.013***	0.013***	0.011***	0.011***	0.013***	0.013***	0.009**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Ever Rejected?			-0.031***	-0.031***	-0.031***	-0.030***	-0.031***
			(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
=1 if disabled			-0.006	-0.006	-0.006	-0.004	0.008
			(0.016)	(0.016)	(0.016)	(0.016)	(0.023)
Non-junior			0.002	0.004	0.003	-0.000	-0.034
			(0.018)	(0.019)	(0.019)	(0.019)	(0.025)
Reported age younger than DMF^			-0.019***	-0.019***	-0.019***	-0.019***	-0.010*
			(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Reported age older than DMF			-0.022***	-0.022***	-0.022***	-0.022***	-0.017***
			(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Not Eligible			0.010	0.011	0.010	0.011	0.014
			(0.017)	(0.017)	(0.017)	(0.017)	(0.022)
Age is 17 or 18			0.007*	0.007*	0.007*	0.007*	0.004
			(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
First allottee amount (dollars per month)			0.000	0.000	0.000	0.000	0.000
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Allottee is father			0.008*	0.008*	0.008*	0.008	0.003
			(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Allottee is mother			0.001	0.001	0.001	0.001	-0.001
			(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Gap in service (more than 3 months)			0.001	0.001	0.001	0.001	-0.006
			(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Log distance from home to camp			0.001	0.002	0.002	0.002	0.002
			(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Hispanic (imputed using hispanic index)			0.018***	0.018***	0.018***	0.019***	0.018***
			(0.004)	(0.004)	(0.004)	(0.004)	(0.006)
Highest grade completed (CO only)			0.004***	0.004***	0.004***	0.005***	0.005***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Household size excluding applicant (CO only)			0.003***	0.003***	0.003***	0.003***	0.003***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Live on farm? (CO only)			0.011*	0.011*	0.011*	0.011*	0.011**
			(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Height (Inches) (CO only)			0.001	0.001	0.001	0.001	0.001
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Weight (100 pounds) (CO only)			-0.042**	-0.041**	-0.041**	-0.041**	-0.041**
			(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Father Living (CO only)			0.000	0.001	0.000	-0.000	-0.000
			(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Mother Living (CO only)			0.008	0.008	0.008	0.008	0.007
			(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Tenure in county (years) (CO only)			-0.001	-0.001	-0.001	-0.001	-0.001
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
=1 if camp is in enrollment state				-0.015	-0.017		
				(0.012)	(0.012)		
Mean precipitation in camp 1933-1942				0.000	0.000		
				(0.000)	(0.000)		
Mean min temp in camp 1933-1942				-0.002	-0.002		
				(0.001)	(0.002)		
Mean max temp in camp 1933-1942				0.000	0.001		
				(0.001)	(0.001)		

Camp Type: Department of Grazing				-0.020	-0.019		
				(0.024)	(0.024)		
Camp Type: Federal Reclamation Project				-0.017	-0.019		
				(0.025)	(0.026)		
Camp Type: Fish and Wildlife Service				-0.012	-0.013		
				(0.032)	(0.033)		
Camp Type: National Forest				-0.015	-0.013		
				(0.024)	(0.025)		
Camp Type: National Monument				-0.006	-0.001		
				(0.028)	(0.028)		
Camp Type: National Park				-0.021	-0.017		
				(0.024)	(0.025)		
Camp Type: Soil Conservation				-0.010	-0.007		
				(0.024)	(0.024)		
Camp Type: State Park				-0.013	-0.012		
				(0.024)	(0.025)		
Log distance to closest city				-0.002**	-0.002**		
				(0.001)	(0.001)		
Log distance to 2nd closest city				0.003	0.005		
				(0.006)	(0.006)		
Peer Char: Hispanic at enrollment					0.002	-0.024	-0.010
					(0.014)	(0.021)	(0.023)
Peer Char: Age at enrollment					0.011**	0.014**	0.011
					(0.005)	(0.006)	(0.007)
Peer Char: Reported Age Younger than DMF					0.006	-0.031	-0.058
					(0.043)	(0.057)	(0.066)
Peer Char: Reported Age Older than DMF					-0.017	-0.007	-0.054
					(0.029)	(0.037)	(0.040)
Peer Char: Not Eligible (First enrollment)					-0.029	-0.070	-0.188*
					(0.051)	(0.077)	(0.098)
Peer Char: Allottee amount					0.002	-0.000	0.004
					(0.002)	(0.003)	(0.004)
Peer Char: Allottee: Father					-0.050*	-0.079**	-0.081*
					(0.030)	(0.038)	(0.044)
Peer Char: Allottee: Mother					-0.004	0.003	0.019
					(0.025)	(0.031)	(0.036)
Peer Char: Gap in service					-0.025	-0.026	0.008
					(0.026)	(0.033)	(0.033)
Reason for discharge (code) = 2, Emp							-0.006
							(0.006)
Reason for discharge (code) = 3, COG							-0.007
							(0.006)
Reason for discharge (code) = 4, UrgProp							-0.009
							(0.006)
Reason for discharge (code) = 5, Desert							-0.017
							(0.019)
Reason for discharge (code) = 6, Rej							-0.016
							(0.031)
Reason for discharge (code) = 7, No Rec							0.001
							(0.019)
Honorable Discharge							0.007
							(0.019)
Constant	4.274***	4.391***	4.308***	4.294***	4.063***	4.363***	4.309***
	(0.002)	(0.137)	(0.159)	(0.168)	(0.206)	(0.162)	(0.183)
Observations	17,086	17,086	17,086	17,086	17,086	17,086	10,944
R-squared	0.003	0.117	0.126	0.127	0.128	0.138	0.149
Mean Dep	73.62	73.62	73.62	73.62	73.62	73.62	73.30
FE	None	BD,CYQ	BD,CYQ	BD,CYQ	BD,CYQ	BD,CYQ,Camp	BD,CYQ,Camp
Sample	All	All	All	All	All	All	CO
Number of County-Quarter Groups		1,789	1,789	1,789	1,789	1,789	1,231

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample only includes duration <= 3 years and death age >= 45.

Appendix Table 4: Effect of Service Duration on Survival Rates by Age

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Survival to age 70	Mean Dep	0.65				
Duration of service (yrs)	0.030***	0.032***	0.028***	0.035***	0.030***	0.030***
	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)	(0.008)
Observations	17,086					
Panel B: Survival to age 70 missing imputed	Mean Dep	0.64				
Duration of service (yrs)	0.022***	0.026***	0.023***	0.028***	0.023***	0.016**
	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)
Observations	21,269					
Panel C: Survival to age 70 missing imputed to 0	Mean Dep	0.52				
Duration of service (yrs)	0.024***	0.037***	0.037***	0.040***	0.034***	0.020***
	(0.005)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)
Observations	21,269					
County-Quarter FE	N	Y	Y	Y	Y	Y
Controls	N	N	Y	Y	Y	Y
Peer + Camp Controls	N	N	N	Y	Y	Y
Camp FE	N	N	N	N	Y	Y
Type of Dismissal	N	N	N	N	N	Y

Standard errors (clustered at the application county and enrollment year-quarter level) in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample only includes death ages >= 45. Panel B imputes survival probability using the age at discharge, birth year, and life tables from SSA. Panel C imputes 0 for missing survival probability.

Appendix Table 5: Heterogeneity in OLS effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sample	CO	NM	Age <= 18	Age > 18	Allottee Mother	Allottee Father	Allottee Other	Urate above median	Urate below median
Panel A: Log Death Age									
Duration of service (yrs)	0.013***	0.014**	0.014***	0.013***	0.018***	0.009	0.011	0.017***	0.013
	(0.003)	(0.005)	(0.005)	(0.004)	(0.004)	(0.006)	(0.009)	(0.004)	(0.009)
Observations	11,148	6,243	8,042	9,349	8,253	5,801	3,337	8,238	2,742
Panel B: PIA									
Duration of service (yrs)	15.677***	19.203**	25.859***	11.645	12.425*	15.848*	31.316*	29.252***	15.337*
	(5.375)	(9.202)	(6.878)	(7.209)	(6.956)	(9.045)	(17.003)	(9.434)	(7.893)
Observations	6,641	3,779	5,680	4,740	5,077	3,536	1,807	3,415	3,520

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Sample	Hispanic	Not Hispanic	BMI < 18.5 (CO)	BMI 18.5-25 (CO)	BMI >= 25 (CO)	Phase 2 (1935-1937)	Phase 3 (1937-1940)	Phase 4 (1940-1942)	Random-ized
Panel A: Log Death Age									
Duration of service (yrs)	0.018***	0.009**	0.008	0.013**	0.098	0.022***	0.022***	0.015	0.020***
	(0.005)	(0.004)	(0.071)	(0.007)	(0.137)	(0.006)	(0.005)	(0.009)	(0.005)
Observations	7,864	9,527	433	5,627	290	3,852	7,256	6,049	5,170
Panel B: PIA									
Duration of service (yrs)	19.052**	19.827***	-17.382	21.666**	-724.479	6.741	23.239***	40.099***	17.739**
	(7.672)	(6.285)	(127.386)	(9.369)	-	(9.789)	(7.662)	(14.172)	(8.346)
Observations	4,720	5,700	309	3,943	204	1,739	4,597	4,049	3,097

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample is restricted only to those that died after age >= 45 and restrictions described by column headings. The specification uses the most restrictive specification with Camp FE, which was the specification used in Table 2, Column 6.

Appendix Table 6: Placebo Tests for CO Only

Regression of Outcome on Duration	(1) No Controls	(2) Add Birth, County-qtr Dummies	(3) Add Indiv Controls	(4) Add Camp Chars	(5) Add Peer Chars	(6) Add Camp FE	(7) CO Only
Education	Mean Dep	8.72					
Duration of service (yrs)	0.223***	0.225**	0.261***	0.257***	0.216**	0.212*	0.212*
	(0.080)	(0.095)	(0.091)	(0.090)	(0.107)	(0.118)	(0.118)
N	2,987	2,987	2,987	2,987	2,987	2,987	2,987
Height	Mean Dep	67.94					
Duration of service (yrs)	-0.035	-0.218	-0.062	-0.054	-0.162	-0.209	-0.209
	(0.125)	(0.170)	(0.146)	(0.149)	(0.179)	(0.186)	(0.186)
N	2,334	2,334	2,334	2,334	2,334	2,334	2,334
Weight (100 pounds)	Mean Dep	1.40					
Duration of service (yrs)	-0.012*	-0.016	-0.008	-0.008	-0.005	-0.002	-0.002
	(0.007)	(0.011)	(0.008)	(0.008)	(0.010)	(0.010)	(0.010)
N	2,067	2,067	2,067	2,067	2,067	2,067	2,067
Ever Had a Paid Job	Mean Dep	0.45					
Duration	-0.007	-0.018	-0.048	-0.061	-0.065	-0.048	-0.048
	(0.032)	(0.051)	(0.048)	(0.047)	(0.049)	(0.059)	(0.059)
Observations	1,104	1,104	1,104	1,104	1,104	1,104	1,104

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Dependent variables are pre-program characteristics of individuals. Each column's specification corresponds to column specifications in Table 5. Regressions do not include imputed values.

Appendix Table 7: Balance Test of Baseline Characteristics for Job Corps Applicants

	Full sample				Males only			
Characteristic	Treatment	Control	Difference		Treatment	Control	Difference	
Male	0.591	0.599	-0.008	(0.009)				
Age	18.861	18.826	0.035	(0.038)	18.735	18.717	0.018	(0.047)
White - Non-Hispanic	0.274	0.265	0.009	(0.008)	0.309	0.295	0.014	(0.01)
Black - Non-Hispanic	0.476	0.478	-0.002	(0.009)	0.45	0.452	-0.002	(0.011)
Hispanic	0.174	0.181	-0.007	(0.007)	0.163	0.178	-0.015*	(0.008)
Non-English Native Language	0.141	0.143	-0.001	(0.006)	0.14	0.144	-0.004	(0.008)
Has Child	0.181	0.179	0.002	(0.007)	0.106	0.108	-0.002	(0.007)
Childhood Household Head - Mother	0.483	0.49	-0.007	(0.009)	0.45	0.467	-0.016	(0.011)
Highest Grade Completed - Mother	11.516	11.539	-0.022	(0.051)	11.678	11.658	0.02	(0.062)
Highest Grade Completed - Father	11.471	11.578	-0.107	(0.064)	11.605	11.608	-0.003	(0.079)
Never on Welfare During Childhood	0.47	0.459	0.012	(0.009)	0.489	0.485	0.004	(0.012)
Highest Grade Completed	10.069	10.081	-0.012	(0.027)	9.953	9.969	-0.016	(0.032)
High School Degree	0.178	0.182	-0.004	(0.007)	0.139	0.142	-0.003	(0.008)
GED	0.047	0.055	-0.008*	(0.004)	0.05	0.052	-0.001	(0.005)
Ever Worked	0.8	0.788	0.011	(0.007)	0.812	0.801	0.011	(0.009)
Worked in Past Year	0.649	0.64	0.009	(0.008)	0.666	0.655	0.012	(0.01)
Currently has Job	0.215	0.208	0.007	(0.007)	0.221	0.204	0.017*	(0.009)
Months Worked in Past Year	6.055	6.127	-0.072	(0.092)	6.028	6.067	-0.039	(0.113)
Earnings in Past Year (if employed during past year	3019.377	2903.822	115.556	(103.731)	3319.099	3156.064	163.035	(137.756)
Typical Hours Worked (if employed during past yea	35.635	35.344	0.291	(0.348)	36.922	36.73	0.192	(0.44)
Typical Wage (if employed during past year)	5.062	5.078	-0.017	(0.033)	5.167	5.194	-0.027	(0.042)
Received AFDC	0.316	0.316	-0.001	(0.009)	0.244	0.242	0.002	(0.01)
Received Food Stamps	0.437	0.446	-0.009	(0.009)	0.37	0.378	-0.008	(0.011)
Received Any Welfare	0.578	0.585	-0.007	(0.009)	0.511	0.518	-0.007	(0.012)
Ever Used Drugs	0.386	0.376	0.01	(0.009)	0.43	0.423	0.007	(0.011)
Ever Arrested	0.264	0.266	-0.001	(0.008)	0.337	0.326	0.011	(0.01)
Non-residential Job Corps Participant	0.137	0.141	-0.004	(0.006)	0.067	0.072	-0.005	(0.005)
Obs	8813	5514	14327		5036	3610	8646	

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Data source is baseline data for Job Corps program from Schochet et al. (2008). If employed during past year is measured as the individual worked for at least 2 weeks in the previous year.

Appendix Table 8: The Effect of Service Duration for Machine-Matched Sample

VARIABLES	(1) No Controls	(2) Add Birth, County-qtr Dummies	(3) Add Indiv Controls	(4) Add Camp Chars	(5) Add Peer Chars	(6) Add Camp FE	(7) CO Only
Panel A: Longevity from CCC for the machined-matched sample							
Duration of service (yrs)	0.013***	0.011***	0.010***	0.010***	0.011***	0.010**	0.017***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)
Observations	8,833	8,833	8,833	8,833	8,833	8,833	5,904
R-squared	0.003	0.186	0.192	0.194	0.195	0.212	0.220
Mean Dep	72.64	72.64	72.64	72.64	72.64	72.64	72.41
Panel B: Longevity from DMF for the matchine-matched sample							
Duration of service (yrs)	0.013***	0.011***	0.010***	0.010***	0.012***	0.012***	0.019***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)
Observations	9,175	9,175	9,175	9,175	9,175	9,175	6,071
R-squared	0.003	0.181	0.186	0.188	0.189	0.205	0.214
Mean Dep	72.65	72.65	72.65	72.65	72.65	72.65	72.42
Panel C: Does duration predict whether they are machine-matched to DMF?							
Duration of service (yrs)	0.015***	0.024***	0.026***	0.026***	0.024***	0.022***	0.020**
	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.009)
Observations	22,964	22,964	22,964	22,964	22,964	22,964	14,116
R-squared	0.000	0.110	0.153	0.153	0.154	0.161	0.165
Mean Dep	0.41	0.41	0.41	0.41	0.41	0.41	0.44

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. In Panel A, we use death age calculated from CCC birth year and death age from hand-matched sources. In Panel B we use death age calculated from DMF birth date and death date from the machine match. Sample is restricted only to those that died after age >= 45 for Panels A and B.