

CENTER FOR SOCIAL POLICY



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Assessment of Impacts of the Biomedical Careers Program – Just-a-Start Corporation of Cambridge, MA Executive Summary

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By

Center for Social Policy

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Executive Summary

In 2015, Just-a-Start (JAS) Corporation of Cambridge, MA asked the UMass Boston Center for Social Policy to conduct an assessment of the impacts of the Biomedical Careers Program on the region and the state, examining individual impacts for graduates as well as the economic contributions of program graduates to the biomedical industry.

The Biomedical Careers Program (hereafter “BioMed”) is described by JAS as an eight month program designed to enable local residents to complete “a Certificate in Biomedical Sciences to prepare them for entry level jobs at local biotechnology companies, universities, research institutions, clinical laboratories and hospitals. The program includes a comprehensive laboratory skills course, as well as career counseling and job placement assistance.” Participants of the program are eligible to apply for 8 college credits from Bunker Hill Community College

The primary questions addressed by this study concern several dimensions and vantage points:

- a) What has happened to BioMed Careers program graduates in terms of employment?
- b) What has been the impact on worker earnings and benefits over time while working in the biomedical field?
- c) What have been the fiscal impacts? That is, the impacts on state and federal income tax revenue.
- d) What has been the impact on the receipt of public assistance? This question was raised because some program participants were on public assistance at time of entry.
- e) How do employers and recruiters assess BioMed program graduates?
- f) How do graduates assess the BioMed program and its contributions to their career?
- g) What is the future of biomedical careers for graduates from the BioMed program?

To answer these questions, the Center for Social Policy research team conducted several inquiries over a 12 months period:

- An on-line survey of BioMed program graduates publicized with assistance from the BioMed program team. The survey was sent to three groups of graduates: Recent year cohorts (2011-14); graduates out for about 5-years (2008-10); and graduates out for about 10 years (2004-07). The survey was sent to 274 graduates and had a 52 percent response rate. (To answer questions a), b), f) and contribute to analysis for c)).
- Interviews with five graduates from the 10-year cohort to complete information from the survey. (For question f)).
- Interviews with six representatives of biomedical firms and recruiters. (For question e)).
- Analysis of secondary sources and survey population for the estimation of fiscal impacts of the program graduates’ earnings in biomedical industries. (For questions b) and c))
- Interviews with the program team, representatives of the Cambridge Economic Development unit, Metro North Regional Employment Board, and Skilled Careers in Life Sciences (SCILS) Initiative with the Boston Private Industry Council to gain familiarity with the history of the program.
- Analysis of occupation and industry employment projections to identify trends of most relevance to certificate holders in the state. (For question g)).

Survey of Biomedical Careers Program Graduates

CSP collected 143 responses between April and September 2015. We devised a sample stratified by cohort. The first cohort consists of recent graduates (2011-14), the second cohort are those that had graduated about five years ago (2008-10), and the third cohort are those that graduated about 10 years ago (2004-07). The survey had an overall response rate of 52%, which provides enough statistical power for estimation of the population of participants.

Overall, relative to the program graduates as a whole, survey respondents are slightly more successful: 79% got a job in the biomedical field versus 72% among graduates as a whole. They are slightly less likely to be minority: whites account for 19% of respondents versus 16% among graduates. They are significantly older than BioMed Careers graduates as a whole: 67% are aged over 30 versus 56% of all graduates (Appendix A table provides details). The differences in success after graduation and in age likely affect our assessment of economic impacts because our sample of graduates may also earn more on average. We took this into consideration in our assessment of earnings and fiscal impacts by providing more conservative estimations.

Three paths for surveyed graduates

- Path A: 79% of respondents got a job in the biomedical field upon graduation: n=95
- Path B: The graduates who have not gotten a job in the biomedical field, but are currently employed in another industry: n=16, 13% of respondents
- Path C: The graduates who have not gotten a job in the biomedical field and are currently not working: n=9, 8% of respondents

Path A: Respondents who attached to the biomedical field – the typical path for graduates

- ▶ Nearly half of the Path A respondents got their first job through a recruiter
- ▶ On average, it took 3.1 months for a Path A graduate to find a job in the biomedical field
- ▶ 61% of Path A respondents worked for drug development and manufacturing employers
- ▶ Median annual salary in respondents' first job is \$39,403 in 2015 dollars and 65% of these workers report receiving employer provided benefits
- ▶ Path A respondents worked in their first biomedical job for 3.5 years, on average (across the three cohorts surveyed, which have different seniority)

Current employment of Path A respondents

At time of survey, 52% (n=37) of Path A respondents are working for the same company as when they started; 31% (n=22) are working for a new company; and 17% (n=12) are not working (in school, at home, or unemployed). Of those working in a new company, 9 out of 10 (86%) are in still in the biomedical field.

The median annual earnings of Path A respondents currently employed have increased to \$45,550, up 16% from earnings in their first job.

Respondents who did not enter the biomedical field

Twenty-one percent, or 25, of respondents did not enter the biomed field after graduation. Among those currently working, jobs include: technicians, drivers, concierges, clerks, food service workers and supervisors in these fields. Their median annual earnings are \$35,000 (in 2015 dollars) and 67% reported receiving at least one employer-sponsored benefit. Among those not currently working —9 cases or 36%-- 3 are in school and 6 are unemployed.

Estimated compensation of all graduates who have worked in the biomedical field

The survey answers did not yield complete information for everyone over the past 10 years, but the survey provides enough information to make a reasonable estimate on how much BioMed graduates who entered the field after graduation have earned.

- ▶ Over the past ten years, BioMed Careers graduates have earned **\$42 million** (\$41,927,019) by working in the biomedical field.
- ▶ This means that *in total* these graduates earned an additional **\$16 million** (\$16,359,747) when compared to their estimated 10-year earnings based on their last job prior to the BioMed program training.
- ▶ On average, each graduate made an additional **\$14,778 per year** when compared to their previous, non-biomedical job, across the three cohorts and bearing in mind that graduates have varied seniority in the field.
- ▶ At time of survey,
 - ▶ recent graduates had increased their earnings to an average of \$42,656 a year;
 - ▶ the five year cohort had increased their earnings to \$46,087 a year; and
 - ▶ the ten year cohort had increased their earnings to \$52,712 a year.

Working in the biomedical field also had a positive impact on benefit coverage. Prior to graduating from the BioMed program, 25% of respondents (Path A) had employer provided health insurance. That grew to 62% once in the first biomedical job, and grew again to 75% in current jobs.

Impact of graduates working in biomed on state and federal income taxes

To estimate the program's fiscal impact, we extrapolated income tax contributions for all program graduates who have entered the biomedical field, based on the earnings trajectory of survey respondents (weighed by the number of cases in each group of graduates surveyed).

- ▶ Over the past ten years, BioMed Careers graduates have paid **\$4.4 million** (\$4,410,486 in 2015 dollars) in federal and state taxes combined by working in the biomedical field.

- ▶ This means they paid an additional **\$1.9 million** (\$1,920,843) in state and federal taxes when compared to their estimated 10-year tax payments based on their last job prior to BioMed Careers.
- ▶ On average, each graduate paid an additional **\$1,735 per year in taxes** when compared to their previous, non-biomedical job.

Shared perspectives of employers, recruiters and graduates

The following observations are shared by company representatives, recruiters and graduates who participated in interviews:

- The shift from direct hiring to reliance on recruiters for entry-level positions has grown apace. According to interviewed informants, 80-90% of biologics manufacturing entry-level hiring is conducted through staffing companies.
- All see the value of a certificate as providing practical preparation targeted to industry needs.
- The value of the BioMed Careers program training *per se* is reported to rest in the quality of the preparation of graduates to the work environment. It enables workers to start with limited on-the-job training relative to graduates with general degrees, even 4-year degrees. The partnership with Bunker Hill Community College is seen as valuable.
- Respondents emphasized the fact that the BioMed program selects for the right personality, meaning choosing committed and careful workers who are willing to learn. The program's emphasis on participants who have an orientation to detail and a strong sense of responsibility—because mistakes are expensive in the field—is valued.
- A particular type of soft skills, the orientation to team work, and adaptation to varied work styles is deemed important by companies and graduates. As one put it “loving science is not enough.” These skills affect the performance of production units and enable the group to avoid errors.

Interviewed respondents concur that the BioMed Careers program needs the following: continuous updating of laboratory equipment and instruction in new techniques; enhanced computer and documentation training; and more connections in industry for jobs as well as greater visibility in this growing industry. Also, all note that entry-level hiring is expected to be steady but increasingly competitive.

Program graduates have a very favorable view of the program itself; 96% of survey respondents would recommend it to a friend. Many wish the program were larger scale so that more students could benefit. Some also wish that internships were available for entry-level workers; as of now, companies only offer them to candidates from higher level degree programs.

The Future of Biomedical Jobs

In chemical manufacturing (which biologics manufacturing is a subset), there were a total of 16,740 workers employed in 2012. Of those workers, about 10% were employed in occupations for which

BioMed Careers graduates compete. These occupations include “biological technicians” and “inspectors, testers, sorters, samplers, and weighers.” Both of these occupation groups are expected to experience above average growth through 2022 (16.9% and 20.5%, respectively). In professional, scientific and technical services (which are a broad industry category but include research and development and where entry-level and mid-level biomedical jobs are present) the following occupations have above average growth rates: inspectors, tester, sorters, samplers, and weighers. In hospitals, medical and clinical laboratory technicians also have above average growth rates.

Additionally, there is evidence from our survey and our interviews with graduates and employers that BioMed graduates tend to advance their education during their career and complete an undergraduate or graduate degree. One common trajectory is to complete additional training (either employer-provided training or additional certificate or degree) and move into a production supervisor and manager position within biologics manufacturing. There is a moderate number of these positions currently and they are expected to grow at a rate of 4 to 5% between 2012 and 2022. When Biomed graduates complete a bachelor’s degree in the biomedical field, numerous opportunities open up for them. Positions in chemical manufacturing, research and development, as well as hospitals that require a Bachelor’s degree, and relate to a biomedical technicians’ work experience, include: biomedical engineers and medical and clinical laboratory technologists. Both of these occupations have a positive outlook with biomedical engineering occupations experiencing above average growth from 2012 to 2022.

Conclusions

The Biomedical Careers program significant *achievements* include: high rates of employment in biomed; positive fiscal impacts (which may be useful to compare with public investments in the program costs); and the fact that graduates and the program have good reputations *where known*. There is a high degree of satisfaction among graduates and current employers interviewed.

Expectations in the biomed field are that there is an on-going need to keep up with technique updating and new equipment in order for workers to be well prepared.

Going forward, the program will face an increasing need to adapt its outreach activities in support of graduates’ access to jobs due to the shift to recruiters (staffing firms and placement agencies) in lieu of direct hiring. Approaches to publicizing the program and its graduates may need to be amended, combining greater breadth of contacts with recruiters while maintaining strong relationships with current employers, program alumni and alumnae and being able to track the latter as they change jobs, this in order to keep a roster of active contacts over time.