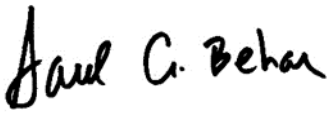
April 2020

We are pleased to present this analysis of the future workforce needs for the Greater Philadelphia region's Cell and Gene Therapy and Connected Health sectors. As you will read in the following pages, this work was produced with significant input from leaders representing industry, academia, and healthcare. That input shaped future scenarios upon which Econsult Solutions, Inc., developed estimates of future employment growth.

While this report was completed prior to the COVID-19 pandemic, the basic thrust of the findings remains valid. The Greater Philadelphia region is well positioned to be a leader in the cutting-edge research and development fueling the growth of the cell and gene therapy and connected health sectors, and to be home to new and expanding companies commercializing, manufacturing and bringing to market these incredible products and technologies.

While it is too early to know how the health, economic and fiscal crisis that the pandemic has created will ultimately play out, its impacts will drive innovation and continuing exploration for new answers to our health care challenges. We have seen the importance of connected health during times of quarantine and social distancing, and we have seen a light shine on the power of data analytics and the search for new cures and therapies.

As we look to rebuild our economy, these sectors are even more important as building blocks for a new future – not just for Greater Philadelphia but for the nation and the world. And while we are rebuilding, we can also connect employers to job seekers at multiple education and skill levels who will want to be a part of creating new therapies, new treatments, and new ways of delivering health to our citizens.



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THE GROWING CELL AND GENE THERAPY AND CONNECTED HEALTH INDUSTRIES

Future Workforce Needs Projection for the Greater Philadelphia Region

Why is this research necessary and how was it developed?

Cell and gene therapies can be described as innovative approaches to medical research and practice in which cell or gene modifications are used to treat disease. **Connected health**, broadly defined, is the application of technology to healthcare. Together, these two fields hold tremendous promise not just for patients, but for the regional economy as well.

In 2019, the CEO Council for Growth, University City Science Center, and University City District's West Philadelphia Skills Initiative convened a partnership to leverage their resources and networks on an initiative to support and grow the Philadelphia region's cell and gene therapy and connected health industries by taking a proactive approach to understanding the growth of, and gaps in, the cell and gene therapy and connected health workforce in Greater Philadelphia. Econsult Solutions, Inc. (ESI) was hired to provide an independent assessment of the future workforce and talent needs of the industries. The firm's work was guided by the aforementioned organizations and an advisory board of 20 industry experts that met three times during the course of the project: first to provide an overview of the project and understand the industries in a broad sense, next to participate in focus group discussions, and last to provide feedback on results and takeaways from the survey, focus groups, and interviews.

To understand the existing conditions and potential future talent needs and barriers to growth of the cell and gene therapy and connected health industries, ESI used a combination of primary sources, secondary sources, qualitative data and quantitative data. Secondary sources included the Bureau of Labor Statistics, LinkedIn Talent Insights and Burning Glass Labor Insights, among others. Primary research was conducted through surveys, interviews, and focus groups consisting of professionals with knowledge of the sectors, including academic researchers, industry and human resources experts, and workforce development organizations.

Key Takeaways

Cell and gene therapy and connected health startup growth in Greater Philadelphia is fueling the rapid development and maturation of the region's innovation ecosystem.

To attract talented workers, startups must be able to explain their distinct value proposition offered by working in an emerging, fast-growing industry.

The Philadelphia region's pharmaceutical companies are an exceptional source of resources, talent, and knowledge, but those with a pharma background still need some level of training in order to fully prepare for these positions.

Roles like manufacturing technicians, particularly within CMOs, may increase in demand as technological innovations allow for growth in therapy manufacturing.

Data science and data analytics are fields with significant potential for growth in the cell and gene therapy and connected health industries.

"In life sciences research, honestly, I don't know where else people would want to go besides Philadelphia."

CELL AND GENE THERAPY FOCUS GROUP PARTICIPANT

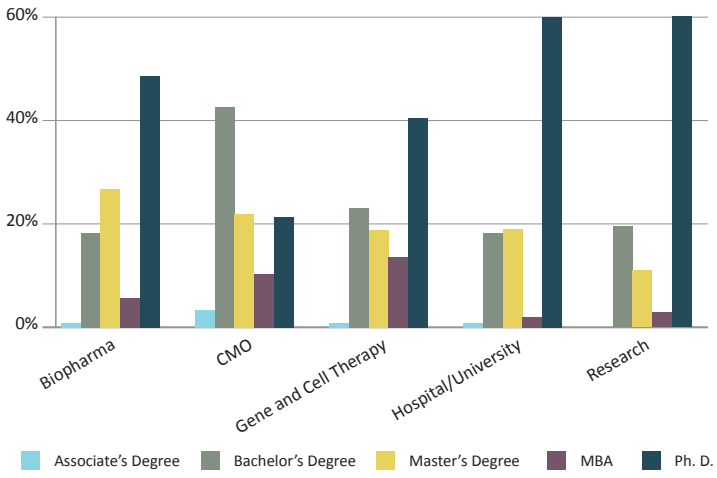
Is the current demand for workers in the cell and gene therapy and connected health industries being met?

At the end of 2019, there were approximately 4,900 total employees working in the Greater Philadelphia region at cell and gene therapy companies, CMOs, biopharma companies, research organizations, or research hospitals/universities in the cell and gene therapy fields. The average one-year growth of these companies or organizations is roughly 56 percent, with that average skewed heavily by the significant growth from cell and gene therapy companies (112 percent).

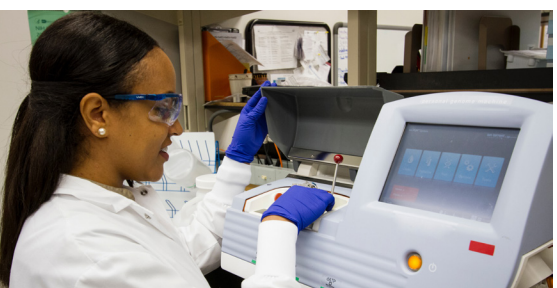
In 2019, there were 739 professionals with skills in *connected health, digital health, telehealth, or mobile health* in Greater Philadelphia, a 35 percent increase over the past year. The top programs of study among professionals with skills in connected health are Marketing, Biology, and Business Administration. Overall, professionals with connected health skills come from a variety of fields, with over 90 different programs listed among these professionals.

From the top ten skills in demand among the sample of cell and gene therapy companies, CMOs, and biopharma companies in the Greater Philadelphia region, ESI isolated the gaps in supply by comparing the demanded skills with the region's supply of those skills gathered from LinkedIn Talent Insights. For each skill identified as "in demand" by cell and gene therapy organizations, we used Burning Glass to collect data on the number of times that skill was mentioned in a job posting in the Philadelphia metro area in 2019. We also used Burning Glass to capture the total number of job postings in the same region over the same time period in order to get the proportion of overall demand for a particular skill.

Educational attainment of employees by organization type, 2019



Source: LinkedIn Talent Insights (2019)

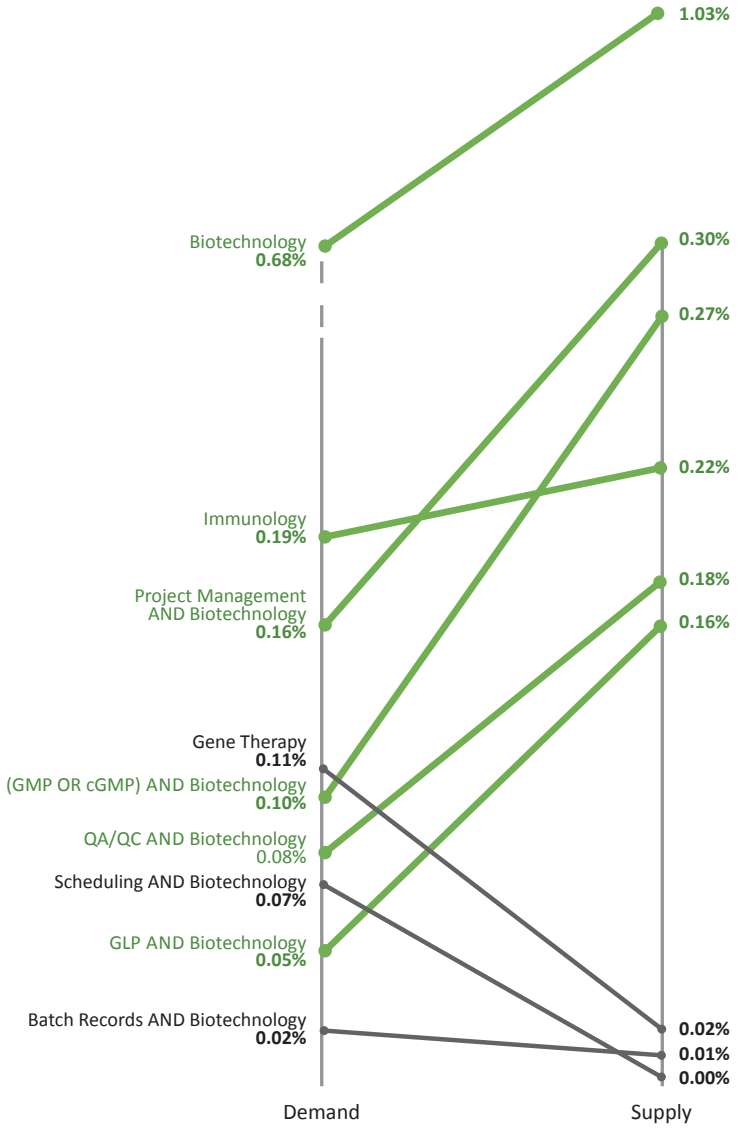


Total employees and average growth in the cell and gene therapy industry in Greater Philadelphia

	Number of Firms	Total Employees	Average 1Y Growth	Average 1Y Hires
Biopharma	6	1,815	-3.0%	32
CMO	14	1,059	8.5%	17
Cell and Gene Therapy Company	29	939	112.3%	11
University/Hospital	8	1,023	2.4%	13
Research Organization	2	96	19.9%	9
Total	**59**	**4,932**	**56.0%**	**15**

Source: LinkedIn Talent Insights (2019)

Skills supply/demand analysis among cell and gene therapy companies, CMOs, and universities/hospitals in Greater Philadelphia



Source: LinkedIn Talent Insights (2019), Burning Glass Technologies (2019), Bureau of Labor Statistics, Econsult Solutions (2019)

What are some likely scenarios for the growth of the industries?

From focus group discussions, interviews, and survey data, ESI developed four potential scenarios for the future of the cell and gene therapy industry. Focus group discussions probed participants about critical uncertainties of the growth potential of the industry; the range of those uncertainties was then used to frame the scenario matrix.

Our research identified two priority critical uncertainties: 1) contextual or environmental barriers to industry growth, including regulations, infrastructure, and funding, and 2) workforce development, attraction, and retention.

The projections discussed on the following page focus on the two scenarios framed by a diverse, sustainable talent pool: *Leading R&D Hub and Commercialization & Manufacturing Hub.*

Four scenarios for the cell and gene therapy industry in Philadelphia

LIMITED, SPECIALIZED TALENT POOL

HIGH BARRIERS

Shrinking Pie

Barriers to funding, stringent regulations

Industry fails to take off

Research activity at universities and hospitals continue but is limited to small opportunities

Employment opportunities benefit only those with college/graduate degrees

Status Quo—R & D Center

Strong research base

Slow business growth

The Greater Philadelphia region remains secondary market

Employment opportunities benefit only those with college/graduate degrees, with a few exceptions for workforce training and job placement

Leading R&D Hub

Philadelphia becomes a growing center for gene/cell therapy R&D

More VC investment

More federal funding for researchers

Higher levels of commercialization

Manufacturing happens elsewhere

Employment growth mostly benefit people with college/graduate degrees, with considerable exceptions for office support opportunities

Commercialization & Manufacturing Hub

Philadelphia is a capital for gene/cell therapy research and therapy production

High startup rate, existing companies grow, others relocate here

Manufacturing located in Philadelphia

Growth of business activity employs people of all educational levels

Collaboration among private firms, universities on workforce training and job placement

LOW BARRIERS

DIVERSE, SUSTAINABLE TALENT POOL

Source: Econsult Solutions (2019)

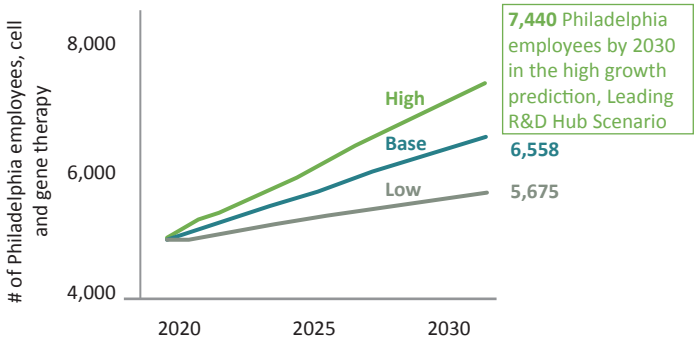
What is the projected growth of the cell and gene therapy industry in Greater Philadelphia?

The *Leading R&D Hub* scenario is proportionate with current levels of growth in the industry in Greater Philadelphia. Based on current levels of growth, the mid-range prediction yields a 35 percent growth in employment over the next ten years. The high estimate projects a 54 percent growth over the same time period while the low prediction anticipates a 16 percent increase in employment.

The *Commercialization & Manufacturing Hub* scenario envisions an environment in which there are few to no barriers for startups in terms of regulations, funding, or infrastructure, and the region has succeeded in attracting, developing, and retaining a diverse, well-qualified talent pool. In this scenario, the Greater Philadelphia region continues to grow as a dominant location for cell and gene therapy research and production in the U.S. This scenario results in a high startup rate, exponential growth for existing companies, and an abundance of firms as well as an accomplished workforce relocating to the region.

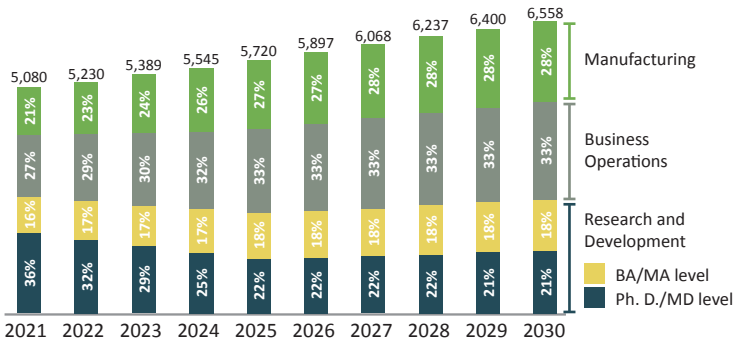
From these assumptions and calculations, the mid-range prediction yields a 94 percent growth in employment over the next ten years. The high estimate projects a 136 percent growth over the same time period while the low prediction anticipates a 56 percent increase in employment.

Projected Philadelphia employment growth, Leading R&D Hub scenario, 2020–2030



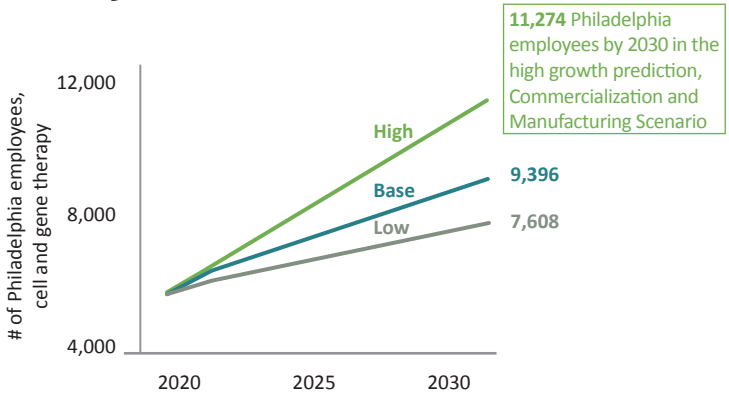
Source: Econsult Solutions (2019)

Projections by type of employment (base predicition), Leading R&D Hub scenario, 2020–2030



Source: Econsult Solutions (2019)

Projected Philadelphia employment growth, Commercialization and Manufacturing Hub scenario, 2020–2030



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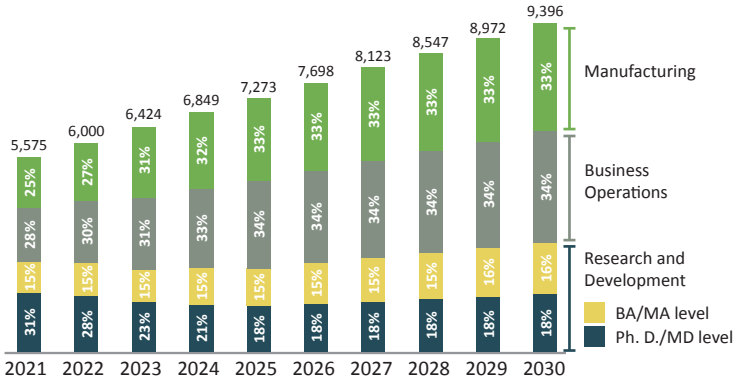
Projections by type of employment (base predicition), Commercialization and Manufacturing Hub scenario, 2020–2030



Source: Econsult Solutions (2019)

With support from the Lenfest Foundation, this study was produced in conjunction with

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About this Study

This executive summary is excerpted from a report on an analysis of the current and future workforce needs of the cell and gene therapy and connected health industries, produced by Econsult Solutions, Inc.

ESI ECONSULT SOLUTIONS INC.
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