



THE PRINCE EDWARD ISLAND BIOSCIENCE CLUSTER ECONOMIC IMPACT ANALYSIS

Prepared by:
Jupia Consultants Inc.

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EXECUTIVE SUMMARY

Theme:	Report findings:
Economic impact of capital investment (CAPEX) (Section 2.3)	<ul style="list-style-type: none"> • PEI's biosciences firms reported \$111 million in CAPEX in 2023. • This spending boosted the Island's GDP by \$54.5 million, supported 656 FTE jobs and increased employment income by \$32.9 million. • Governments received an estimated \$12.7 million from the CAPEX including \$6.9 million for provincial and local governments.
Economic impact of operational expenditures (OPEX) (Section 2.4)	<ul style="list-style-type: none"> • There are 73 firms and organizations in the cluster. • The firms employed 1,588 FTE workers in 2023, the other organizations another 525. With indirect and induced effects, the cluster supported 3,408 FTE jobs. • The OPEX boosted provincial GDP by \$416.8 million and employment income by \$226.8 million. • Governments received an estimated \$93.4 million from the OPEX including \$51.1 million for provincial and local governments.
Combined economic impacts (CAPEX & OPEX) (Section 2.5)	<ul style="list-style-type: none"> • Combining the economic impacts associated with CAPEX and OPEX, the PEI biosciences cluster boosted provincial GDP by an estimated \$471 million in 2023, employment income on the Island by \$259.6 million and tax revenue for governments of \$106 million. • Over 4,060 full-time equivalent jobs were supported by the cluster through direct, indirect and induced effects. • This represents considerable growth in the cluster's economic footprint across the province: <ul style="list-style-type: none"> ○ The cluster's GDP contribution is up 84% since 2018 and 22 percent between 2021 and 2023. ○ The number of jobs supported by the cluster is up 57% between 2018 and 2023. ○ The amount of employment income induced by the cluster is up 92% between 2018 and 2023. ○ Total taxes generated by the cluster has increased by 86% since 2018.
Consumer spending impacts (Section 2.6)	<ul style="list-style-type: none"> • The \$259.6 million in labour income induced by the PEI biosciences cluster boosted current household consumption by \$193 million including: <ul style="list-style-type: none"> ○ \$34 million on food ○ \$51.2 million on shelter-related costs ○ \$31.8 million on transportation ○ \$12.3 million on health and personal care, and ○ \$11.6 million on recreation.

EXECUTIVE SUMMARY (CONT.)

The impact of the biosciences cluster on PEI

Theme:	Report findings:
High value private sector economic driver (Section 3.1)	<ul style="list-style-type: none"> The cluster's \$471 million GDP contribution was equivalent to 8% of the entire private sector economy on the Island. The cluster's GDP per job is 48% higher than the average for all workers on the Island. The cluster's total GDP growth contributed an estimated 15% of all net private sector GDP growth over the past decade. The pharmaceutical and medicine manufacturing industry's real GDP contribution increased 3.8 times over the decade.
Catalyst for private sector investment (Section 3.2)	<ul style="list-style-type: none"> The \$111 million invested in 2023 was equivalent to 18% of all private sector capital expenditures on non-residential tangible assets across PEI.
Driver of export revenue (Section 3.3)	<ul style="list-style-type: none"> The \$600 million+ in cluster private sector revenue during 2023 came almost entirely from customers outside the province. PEI ranks 2nd among the 10 provinces for the value of international pharmaceutical and medicine manufacturing exports, relative to population size.
Provider of good paying jobs and careers (Section 3.4)	<ul style="list-style-type: none"> PEI ranks either #1 or #2 in Canada among the 10 provinces for the concentration of workers in multiple biosciences-related occupations including chemists, biologists, chemical technologists, biological technologists, veterinarians and animal health technologists and veterinary technicians. The average salary is 50% higher compared to all workers on the Island.
Leading catalyst for innovation on the Island (Section 3.5)	<ul style="list-style-type: none"> PEI biosciences firms reported spending \$28.6 million on research and development in 2023. To put this in context this spending was equivalent to 65% of all in-house R&D expenditures reported by all firms across the Island in 2022. In-house R&D per capita for the pharmaceutical and medicine manufacturing industry was the highest in the country by a wide margin in 2022.
Magnet for international talent (Section 3.6)	<ul style="list-style-type: none"> As of the 2021 Census, the workforce in biosciences-related industries on PEI included 30% immigrants/non-permanent residents. Since the 2021 Census, over 300 permanent residents have been admitted to PEI in biosciences-related occupations including chemists, chemical technologists and technicians as well as biological technologists and technicians.

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1. INTRODUCTION

This report provides an economic impact analysis of the Prince Edward Island biosciences cluster in 2023. It provides an estimate of the impact of capital spending (CAPEX) on buildings and related infrastructure on the Island as well as the annual impact of operational spending (OPEX) of the many firms, education providers and support organizations. The analysis includes sector output and gross domestic product (GDP) as well as employment, employment income, taxation and consumer spending. It also includes a broader review of the cluster in the national context.

The report compares the economic impact profile of the biosciences cluster in 2023 to previous reports analyzing 2018 and 2021 impacts.

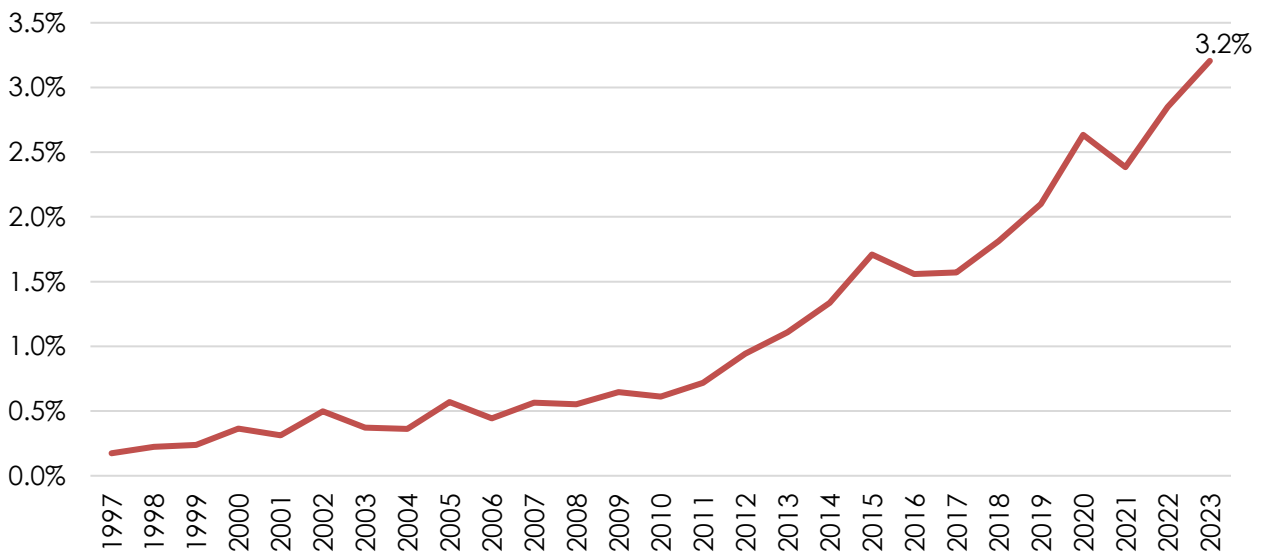
2. ECONOMIC IMPACT OF THE BIOSCIENCES CLUSTER IN 2023

2.1 Setting the context

In less than 20 years, Prince Edward Island has built an internationally recognized biosciences cluster. There are 60 private sector firms ranging in size from small startup companies to established multinational companies. The private sector is supported by government research, post-secondary education and sector development organizations.

One example of how the sector has prospered on the Island is the pharmaceutical and medicine manufacturing sector [NAICS 3254]. In the past decade, the sector's real, inflation adjusted gross domestic product (GDP) contribution has increased 3.8 times. As shown in Figure 1, this one industry now accounts for over three per cent of provincial private sector GDP (excluding indirect and induced impacts). Biosciences has joined food manufacturing as the two largest private sector drivers of the provincial economy.

Figure 1: Pharmaceutical and medicine manufacturing GDP contribution as a share of total private sector GDP, Prince Edward Island

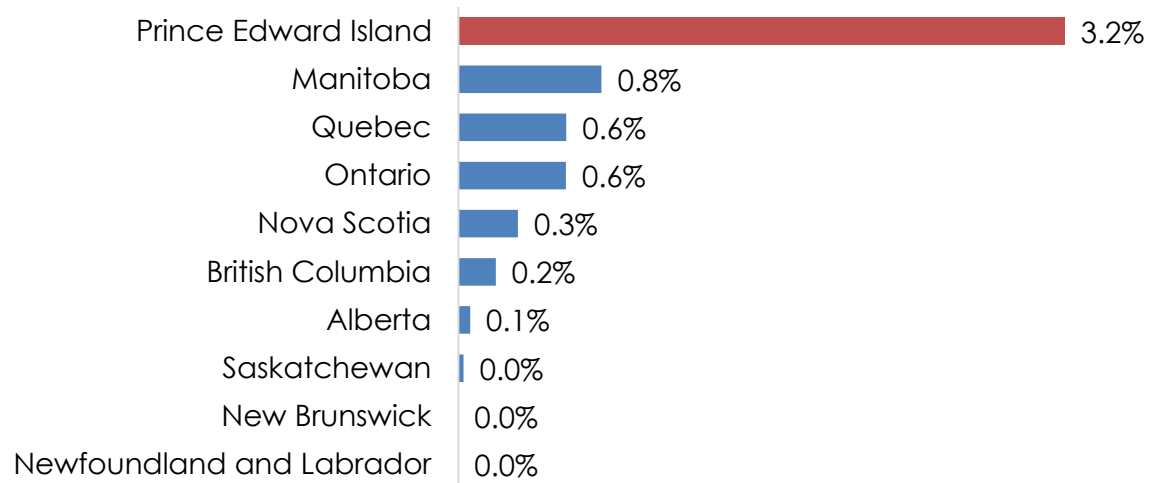


Source: Statistics Canada Table 36-10-0402-01.

Pharmaceutical and medicine manufacturing contributes a larger share to the GDP on Prince Edward Island than all other provinces (Figure 2). The industry generates four times more GDP than its closest competitor (Manitoba), relative to the size of the provincial economy.

The biosciences cluster is anchored by pharmaceutical and medicine manufacturing but includes companies and organizations in many different industries such as medical equipment and supplies manufacturing, aquaculture, scientific research and development services, engineering services, information technology and environmental services. The firms in the cluster are supported by a number of public sector and post-secondary institutions including UPEI, NRC, BioFoodTech, Innovation PEI, Holland College and Agriculture and Agrifood Canada.

Figure 2: Pharmaceutical and medicine manufacturing GDP contribution as a share of total private sector GDP, provincial comparison (2023)



Source: Statistics Canada Table 36-10-0402-01.

2.2 Economic impact methodology

The economic impact model used in this analysis is based on Statistics Canada's Input-Output (I-O) tables which provide a detailed profile of how expenditures in specific sectors flow through the provincial and national economy as well as via international trade. The I-O tables are developed using actual spending patterns within specific industries and provinces and therefore estimates of future economic activity assume the spending patterns will be similar to the past. Impacts derived from the I-O tables include output, gross domestic product (GDP), labour income, full-time equivalent (FTE) employment, imports, exports, operating surpluses and indirect taxes. The economic impact model evaluates the direct, indirect, and induced economic impacts, using the following parameters:

- *Direct impact* measures the value-added to the economy from the bioscience sector that is attributed directly from the employees, the wages earned, and the revenues generated. In certain cases, direct impacts are not published by Statistics Canada due to privacy considerations.
- *Indirect impact* measures the value-added the bioscience sector generates within the PEI economy through the firm and organizational demand for intermediate inputs or other support services (e.g. the supply chain).
- *Induced impacts* are derived when employees in the aforementioned industries spend their earnings and owners spend their profits. These purchases lead to more employment, higher wages, and increased income and tax revenues, and can be felt across a wide range of industries.

There are over 200 industries for which detailed I-O multipliers is available. Each firm and organization in the cluster was assigned to its most relevant industry classification (using the NAICS classification system¹) and the spending of those firms and organizations was analyzed to determine economic impact (Table 1 shows the industries included in the cluster). The aggregate impact represented how those firms and organizations collectively boosted the Prince Edward Island economy.

Statistics Canada economic multipliers include gross domestic product, employment income, employment (FTE), and indirect taxes on production and products. Jupia Consultants Inc. developed tax multipliers based on several Statistics Canada and provincial government sources.

Table 1: NAICS industries used in the impact model

- Pharmaceutical and medicine manufacturing [BS325400]
- Animal food manufacturing [BS311100]
- Aquaculture [BS112500]
- Business, professional and other membership organizations [BS813000]
- Cannabis production (licensed) [BS111CL0]
- Community colleges [GS611200]
- Engineering and related services [BS541300]
- Environmental equipment [BS335900]
- IT services [BS541500]
- Medical equipment and supplies manufacturing [BS339100]
- Other federal government services (except defence) [GS911A00]
- Other provincial and territorial government services [GS912000]
- Pharmaceutical and medicine manufacturing [BS325400]
- Scientific research and development services [BS541700]
- Universities [GS611300]

Similar reports have been prepared in previous years and are used to compare progress over time. See Appendix A for more details on the methodology and sources.

¹ North American Industrial Classification System (NAICS).

2.3 Economic impact of capital investment, 2023 (CAPEX)

To determine the economic impact of capital spending in the biosciences cluster, the PEI BioAlliance provided a total figure for capital spending in 2023. This amount was determined by surveying companies and organizations in the cluster. Further, based on discussions with the BioAlliance, it was assumed that 60 per cent of the total capital spending would be allocated to the construction of buildings and related costs and 40 per cent would be allocated to the importation of equipment and technology from off-Island. This is an important distinction as the GDP, employment and tax impacts in imported goods and services is relatively limited. In 2023, 24 different firms were involved in capital spending. The total amount was \$111 million.

Table 2 shows the economic impact from the cluster's capital spending in 2023. It was developed using the economic multipliers for the non-residential construction sector on the Island and only includes impacts in the province.

The capital spending from the biosciences cluster in 2023 boosted provincial GDP on the Island by an estimated \$54.5 million, supported 656 full-time equivalent (FTE) jobs and \$32.9 million in employment income. The economic activity from construction boosted government coffers by \$12.7 million including \$5.8 million to the federal government and \$6.9 million to provincial and local government.

Table 2: Economic impact summary, biosciences CAPEX spending in 2023

CAPEX	\$110,966,000
Provincial GDP contribution	\$54,462,000
Employment impact	
FTE employment	656
Employment income	\$32,890,000
Taxes: All levels of government	
Employment income-based	\$8,518,000
Indirect taxes	\$4,169,000
Total taxes	\$12,687,000
Taxes relative to GDP contribution	23%
Taxes: Federal government	
Employment income-based	\$4,297,000
Indirect taxes	\$1,459,000
Total taxes	\$5,801,000
Taxes relative to GDP contribution	11%
Taxes: Provincial/local government	
Employment income-based	\$4,221,000
Indirect taxes	\$2,710,000
Total taxes	\$6,886,000
Taxes relative to GDP contribution	13%

In-province impacts only. See Appendix A for methodology and sources.

2.4 Economic impact of operational expenditures, 2023 (OPEX)

To determine the economic impact of the annual operational expenditures associated with the biosciences cluster, each company and organization was assigned to its corresponding NAICS² industry and the multipliers for that industry were used to determine economic impact on the Island. Direct payroll, employment and other operating cost information was provided by the individual organizations for 2023. Using Statistics Canada multipliers, the total economic impact for each was determined and then aggregated to provide an overall economic impact for the cluster. As with the capital expenditures above, only in-province impacts are shown.

As shown in Table 3, there are 60 different companies in the cluster and 13 public organizations. The private companies range in size from one person startups to a company with over 400 employees. The public organizations include federal entities such as the NRC and AAFC, the Atlantic Veterinary College at UPEI, and catalyzing organizations such as the PEI BioAlliance, Bio Food Tech and CASTL.

The private sector firms generated an estimated \$650 million in revenue in 2023, almost all of which came from clients outside the province. The role of the cluster as a driver of export revenue is explored in Section 3.3.

The private sector firms employ a total of 1,720 full-time equivalent employees while the public organizations and related post-secondary education institutions employ another 530 full-time equivalent employees. With indirect and induced effects, total employment supported on the Island increases to 2,666 among the private sector firms and 742 among the public organizations for a total employment supported of 3,408 (or one out of every 26 workers across the province in 2023). The total employment income supported was an estimated \$227 million or \$1.00 out of every \$19.00 in total employment income induced from all industries across the province.

The biosciences cluster has a significant impact on the Island's economy as measured by its gross domestic product (GDP) contribution. The \$417 million in provincial GDP induced by the clusters annual operations represents an amount equivalent to six per cent of the total private and public sector GDP across the Island. Section 2.5 looks at the combined impact of capital spending and operations.

The operational spending generates a considerable amount of tax revenue for governments. The tax revenue induced by the cluster for all levels of government amounted to an estimated \$93.4 million in 2023. This included \$42.3 million for the federal government and \$51.1 million for provincial and local governments on the Island.

² North American Industrial Classification System.

Table 3: Economic impact summary, OPEX spending in 2023

	<u>Private Total</u>	<u>Public Total</u>	<u>Total cluster</u>
Firms/Organizations	60	13	73
Employment footprint			
Full-time	1,558	435	1,993
Part-time (half-year)	38	70	108
Students (one-third year)	34	166	200
Direct full-time equivalent (FTE)	1,588	525	2,114
Total FTE (with indirect/induced)	2,666	742	3,408
Jobs multiplier	1.7	1.4	1.6
Provincial GDP boost			
Direct payroll	\$124,418,000	\$43,177,000	\$167,595,000
Total employment income	\$173,867,000	\$52,895,000	\$226,762,000
Taxes: All levels of government			
Employment income-based	\$45,654,000	\$17,348,000	\$63,002,000
Indirect taxes	<u>\$24,782,000</u>	<u>\$5,570,000</u>	<u>\$30,351,000</u>
Total taxes	\$70,436,000	\$22,918,000	\$93,353,000
Taxes relative to GDP contribution	21%	29%	22%
Taxes: Federal government			
Employment income-based	\$22,512,000	\$9,110,000	\$31,622,000
Indirect taxes	<u>\$8,674,000</u>	<u>\$1,949,000</u>	<u>\$10,623,000</u>
Total taxes	\$31,186,000	\$11,059,000	\$42,245,000
Taxes relative to GDP contribution	9%	14%	10%
Taxes: Provincial/local government			
Employment income-based	\$23,141,000	\$8,238,000	\$31,379,000
Indirect taxes	<u>\$16,108,000</u>	<u>\$3,620,000</u>	<u>\$19,728,000</u>
Total taxes	\$39,249,000	\$11,858,000	\$51,108,000
Taxes relative to GDP contribution	12%	15%	12%

In-province impacts only. See Appendix A for methodology and sources.

2.5 Combined economic impacts, 2023 (CAPEX & OPEX)

Combining the economic impacts associated with the capital expenditures and the operational expenditures, the PEI biosciences cluster boosted provincial GDP by an estimated \$471 million in 2023, employment income on the Island by \$259.6 million and tax revenue for governments of \$106 million. Over 4,060 full-time equivalent jobs were supported by the cluster through direct, indirect and induced effects.

This represents considerable growth in the cluster's economic footprint across the province:

- The cluster's GDP contribution is up 84 percent since 2018 and 22 percent between 2021 and 2023.
- The number of jobs supported by the cluster is up 57 percent between 2018 and 2023.
- The amount of employment income induced by the cluster is up 92 percent between 2018 and 2023.
- Total taxes generated by the cluster has increased by 86 percent since 2018.

Table 4: Economic impact summary, CAPEX and OPEX spending in 2023

Provincial GDP (\$Million):		\$471.3
Jobs:	<u>Direct</u>	<u>Total</u>
Firm employment (FTE)	1,588	2,666
Cluster support (FTE)	525	742
CAPEX (FTE)		<u>656</u>
Total employment		4,064
Compared to 2021		+0.3%
Compared to 2018		+57%
Employment income (\$Million):	<u>Direct</u>	<u>Total</u>
Firms	\$124.4	\$173.8
Cluster support	\$43.2	\$52.9
CAPEX		<u>\$32.9</u>
Total employment income		\$259.6
Compared to 2021		+19%
Compared to 2018		+92%
Taxes (\$Million):		
Federal government		\$48.0
Provincial/local government		<u>\$58.0</u>
Total		\$106.0

In-province impacts only. See Appendix A for methodology and sources.

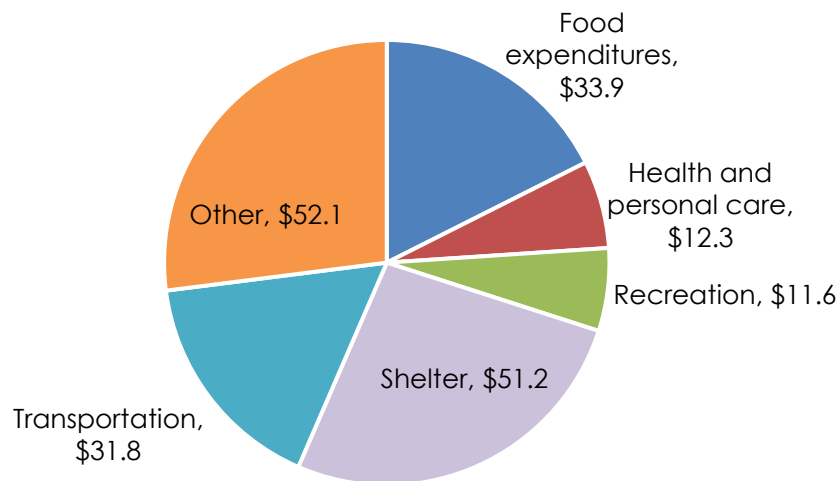
The cluster's \$471 million GDP contribution was equivalent to 8% of the entire private sector economy on the Island.

2.6 Consumer spending impacts

An important impact of the PEI biosciences cluster is the boost to household spending. Approximately 74 percent of all employment income in the province becomes current consumption, meaning it is spent in areas such as food, shelter, transportation and recreation. The rest goes to income taxes, savings and other non-current consumption. Table 5 shows how the \$259.6 million in labour income induced by the PEI biosciences cluster in 2023 became household spending across the province. This is based on typical household spending in the province.

In total, the PEI biosciences cluster boosted current consumption by \$193 million in 2023. This included over \$34 million on food, \$51.2 million on shelter-related costs, \$31.8 million on transportation, \$12.3 million on health and personal care, and \$11.6 million on recreation. The table shows additional examples of how the spending impacted the provincial economy.

Figure 3: Consumer spending induced by the biosciences cluster in 2023, major expenditure categories (\$Million)



Source: Derived by Jupia Consultants Inc. See Appendix A.

The amount of consumer spending induced by the cluster is up 92 percent between 2018 and 2023.

Table 5: Household spending induced by the PEI biosciences cluster, 2023

<u>Household spending category:</u>	<u>\$Million</u>
Total current consumption on PEI	\$192.9
Food expenditures	33.9
Food purchased from stores	\$26.8
Food purchased from restaurants	\$7.2
Shelter	\$51.2
Water, fuel and electricity	\$11.1
Insurance premiums	\$3.3
Household operations	\$19.0
Communications	\$10.2
Pet expenses	\$2.5
Household furnishings/equipment	\$10.3
Clothing and accessories	\$6.0
Transportation	\$31.8
Purchase of automobiles/vans/trucks	\$12.0
Automobile/van/truck operations	\$18.5
Vehicle insurance premiums	\$3.6
Gas and other fuels	\$10.3
Health and personal care	\$12.3
Medicines/pharmaceutical products	4.5
Private health/dental plan premiums	\$3.1
Recreation	\$11.6
Entertainment	\$2.5
Purchase of recreational vehicles	\$3.8
Financial services	\$1.9
Retirement and pension fund payments	\$27.1
Gifts of money/charitable contributions	\$4.4

Source: Derived by Jupia Consultants Inc. See Appendix A.

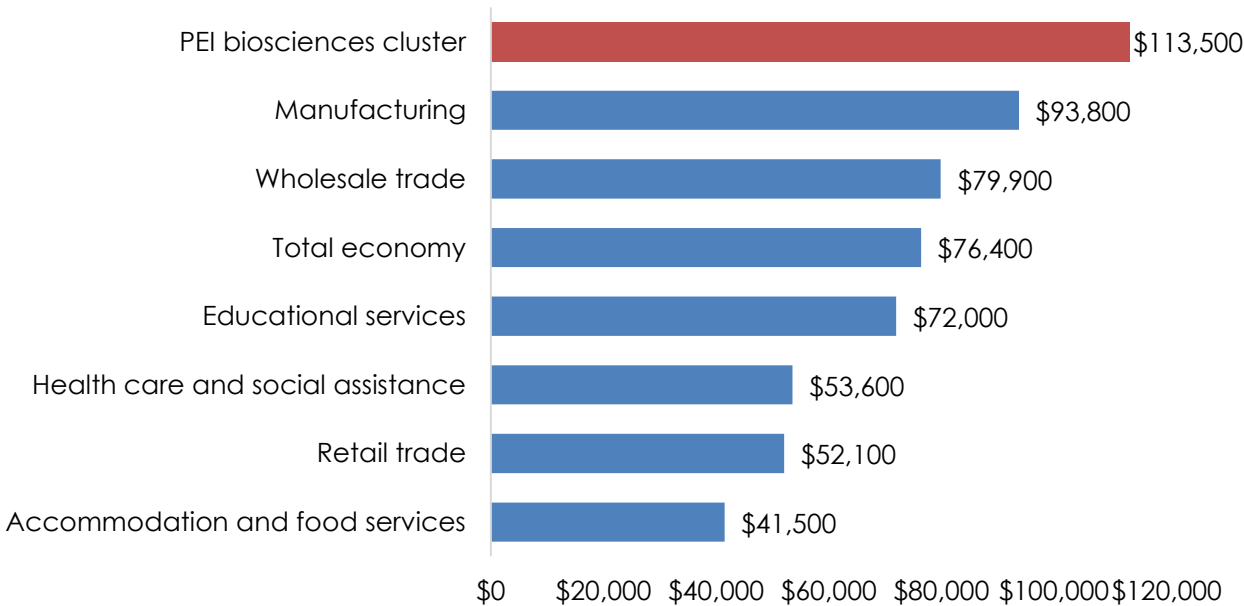
3. THE IMPACT OF THE BIOSCIENCES CLUSTER ON PEI

Section 2 calculated the economic impact of the biosciences cluster on Prince Edward Island. This section puts that impact into a broader context.

3.1 High value private sector economic driver

Prince Edward Island needs to see growth in high value industries. The provincial economy generates less GDP per capita than all other provinces, except Nova Scotia (as of 2023). The combined impacts of the biosciences sector represent a GDP powerhouse. In 2023, the cluster generated an average of \$113,500 worth of GDP for every worker in the sector. This was 48 percent higher than the average across all industries and higher than the vast majority of other industries. Figure 4 shows the comparison to a number of different industries in the province.

Figure 4: GDP per employee by selected industry, Prince Edward Island, 2023



Source: All except the biosciences cluster taken from Statistics Canada Tables 14-10-0023-01 and 36-10-0402-01.

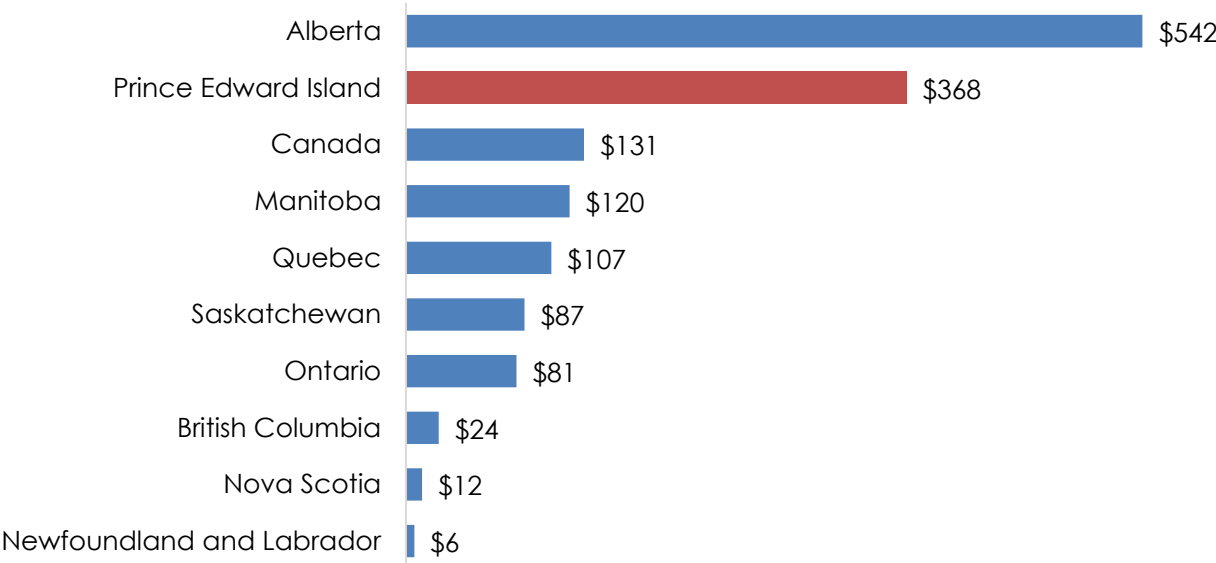
The biosciences industry is growing strongly. As one example, the pharmaceutical and medicine manufacturing industry's real GDP contribution on the Island increased 3.8 times between 2013 and 2023. In fact, this industry alone accounted for 10 percent of all net private sector GDP growth over the decade. The biosciences cluster in total accounted for an estimated 15 percent of all net private sector GDP growth over the decade.

3.2 Catalyst for private sector investment

The biosciences cluster is a top driver of private sector investment on the Island. The \$111 million invested in 2023 was equivalent to nine percent of all capital expenditures on non-residential tangible assets in the province during the year. Excluding public administration, health care and education, the biosciences cluster's \$111 million capital spending was equivalent to 18 percent of all private sector capital expenditures on non-residential tangible assets³.

According to Statistics Canada, the chemical manufacturing sector on the Island invested \$35 million in 2023 and another \$64 million in 2024. Chemical manufacturing includes pharmaceutical and medicine manufacturing along with other smaller biosciences-related sub-sectors. Adjusted for population size, this sector invested 2.8 times as much compared to the country overall. Only Alberta attracted more investment into this sector, adjusted for population size.

Figure 5: Capital expenditures per capita, chemical manufacturing sector, 2023



Source: Statistics Canada Table: 34-10-0035-01.

³ Because the data is taken from two different sources, it should be viewed with some caution. It is only meant to show relative impact.

3.3 Driver of export revenue

Like the rest of Canada, particularly smaller provinces, Prince Edward Island relies heavily on imports to meet household, government and business demand. In 2021, the province imported \$5.4 billion worth of goods and services ranging from \$99 million of imported electricity and \$30 million of margarine and cooking oils to \$154 million of vehicle gasoline and \$35 million worth of computers. The province's businesses, households and government also import a lot of services including \$26 million for online games and related, \$42 million for life insurance and \$58 million for information technology (IT) services.

Most of the economic impact associated with these imports occurs in the jurisdictions where the products and services are produced. To offset these imports, jurisdictions like Prince Edward Island need to develop export industries for which they have a strong value proposition.

The trade balance (exports compared to imports) has been weakening in recent years. The ratio of exports to GDP peaked in 2015 and has declined modestly since. In 2021, the province imported \$5.4 billion worth of goods and services but only exported \$3.7 billion.

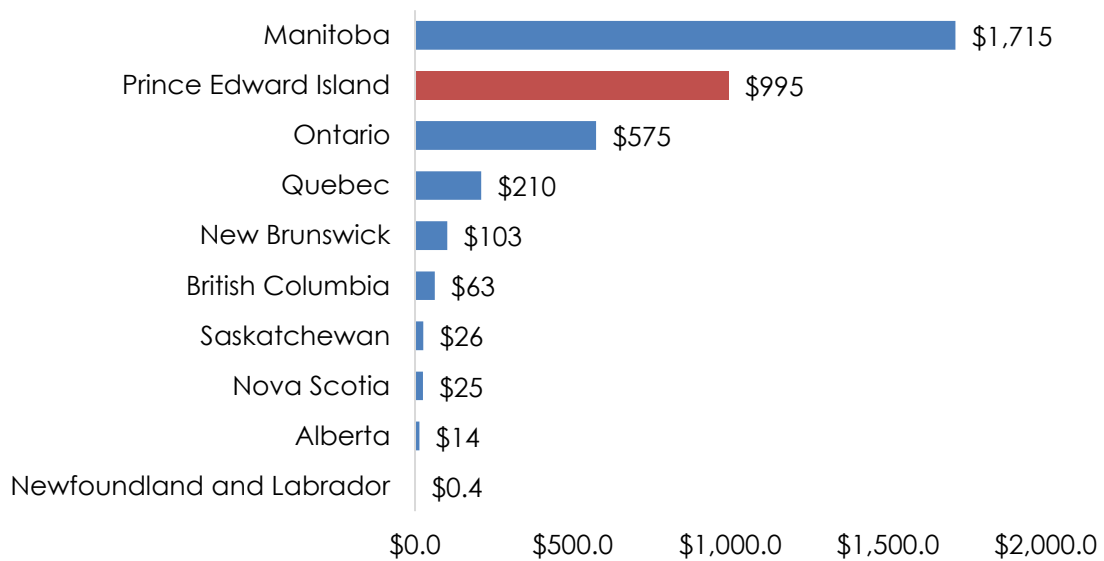
The biosciences cluster is a top source of export revenue for the Island economy. The \$600 million+ in revenue during 2023 was generated by customers elsewhere in Canada and around the world and came into the Island economy becoming wages, supplier payments, taxes and household spending.

A good example, again, is the pharmaceutical and medicine manufacturing industry. In 2023, the industry exported \$173 million worth of products outside the country. This was up from \$62 million in 2018. This does not include interprovincial exports. The interprovincial data is lagged due to how the data is collected, but according to Statistics Canada amounted to \$173 million in 2021.

Figure 6 compares the value of international pharmaceutical and medicine manufacturing exports in 2023 by province in Canada, adjusted for population size. The industry in Prince Edward Island ranks second among the 10 provinces behind only Manitoba. Quebec and Ontario are a distant third and fourth.

A 2024 survey of firms in the PEI biosciences cluster identified another \$140 million+ worth of international export revenue in 2023, in addition to the pharmaceutical and medicine manufacturing industry.

Figure 6: International exports revenue per capita, pharmaceutical and medicine manufacturing industry, 2023*



Source: Trade Data Online.

3.4 Provider of good paying jobs and careers

The PEI biosciences cluster is directly responsible for the creation of more than 2,200 jobs on the Island. Because of the cluster, the province ranks either first or second in Canada among the 10 provinces for the concentration of workers in the following biosciences-related occupations⁴.

- Chemists
- Biologists and related scientists
- Chemical technologists and technicians
- Biological technologists and technicians
- Veterinarians
- Animal health technologists and veterinary technicians

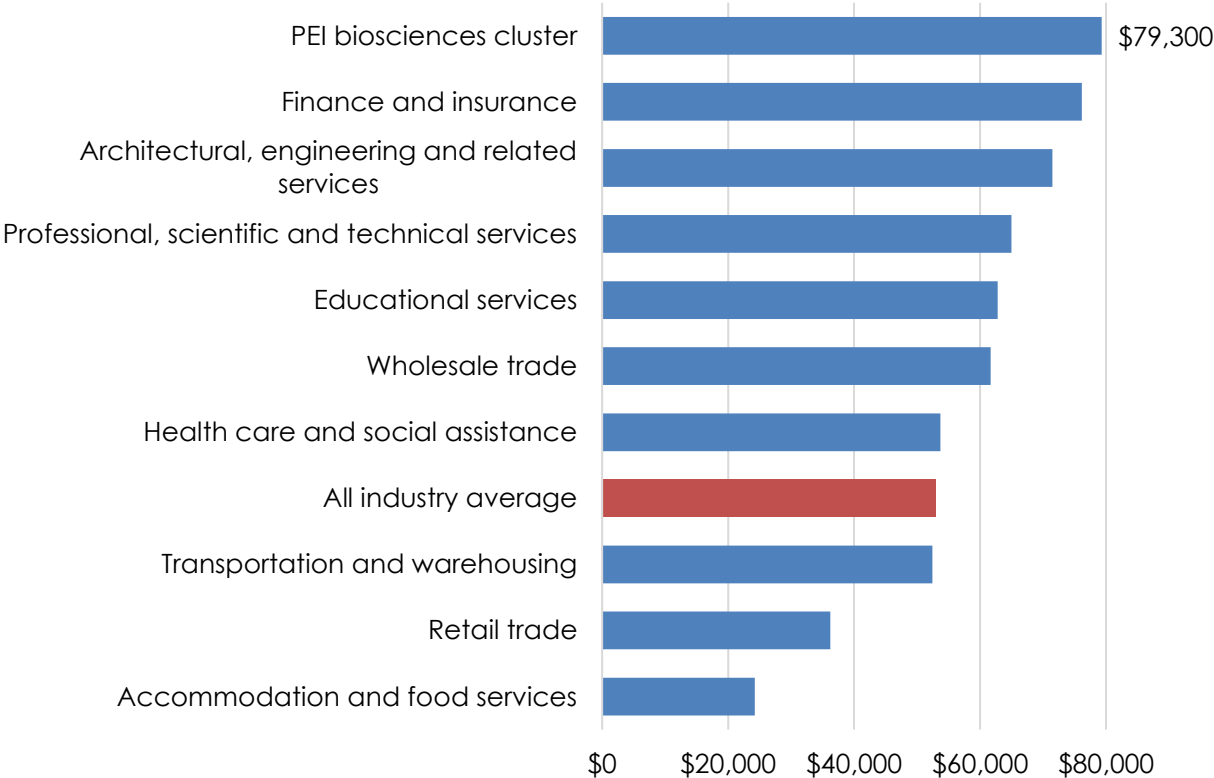
The PEI biosciences cluster induced \$259.6 million employment income on the Island in 2023. This income was paid by firms and organizations in the cluster, in the supply chain and from induced effects. To put this amount into context, it represented six percent of the entire employment income generated in the province during the year.

⁴ Based on the share of total provincial employment accounted for by these occupations. Source: Statistics Canada 2021 Census.

The bioscience cluster in 2023 employed 4.2 per cent of the provincial workforce (with indirect and induced impacts) - or an amount equivalent to one out of every 24 workers on the Island.

Further, the jobs in the cluster paid an average salary of \$79,300 in 2023. This was 50 percent higher than the average for the average full-time worker in the province. As shown in Figure 7, the biosciences cluster average employment income was higher than most other industries in the province. The average annual employment income was 22 percent higher than the professional, scientific and technical services sector, 26 percent higher than the educational services and 48 percent higher than the health care and social services sector.

Figure 7: Average annual employment income comparison, PEI, 2023*



*All industries except the biosciences cluster – Statistics Canada Table: 14-10-0204-01. Biosciences cluster based on a survey of firms and organizations.

3.5 Leading catalyst for innovation on the Island

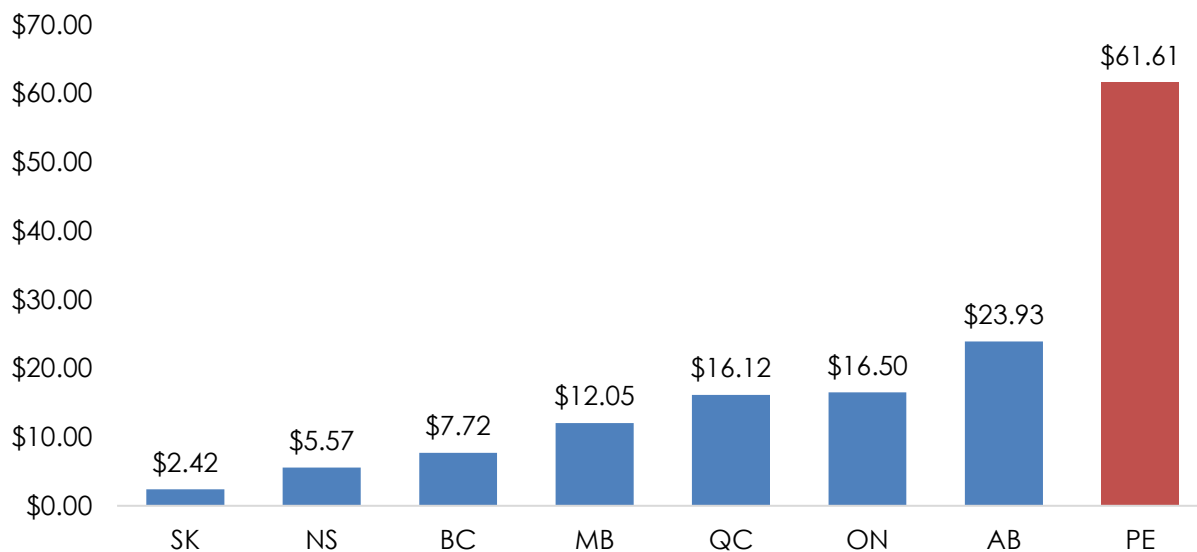
PEI biosciences firms reported spending \$28.6 million on research and development in 2023. To put this into perspective, using Statistic Canada data, in 2022 all firms on the Island reported \$44 million in in-house research and development expenditures. These two numbers come from different sources and the Statistic Canada figure is for 2022, but it is clear the biosciences cluster is driving R&D on the Island. The \$28.6 million is equivalent to 65 percent of all in-house research and development expenditures reported by companies in 2022.

This data does not include any related R&D spending by the public sector or the post-secondary education sector.

One of the most important industries within the biosciences cluster is pharmaceutical and medicine manufacturing. Statistic Canada reported PEI firms in this industry invested \$11 million on in-house research and development expenditures during 2022.

Adjusted for population size, that was the highest level of R&D spending in the country by a wide margin. As shown in Figure 8, pharmaceutical and medicine manufacturing R&D on PEI was 2.6 times higher compared to Alberta, adjusted for population size and 3.7 times higher than Ontario.

Figure 8: In-house research and development expenditures per capita, pharmaceutical and medicine manufacturing industry, 2022*

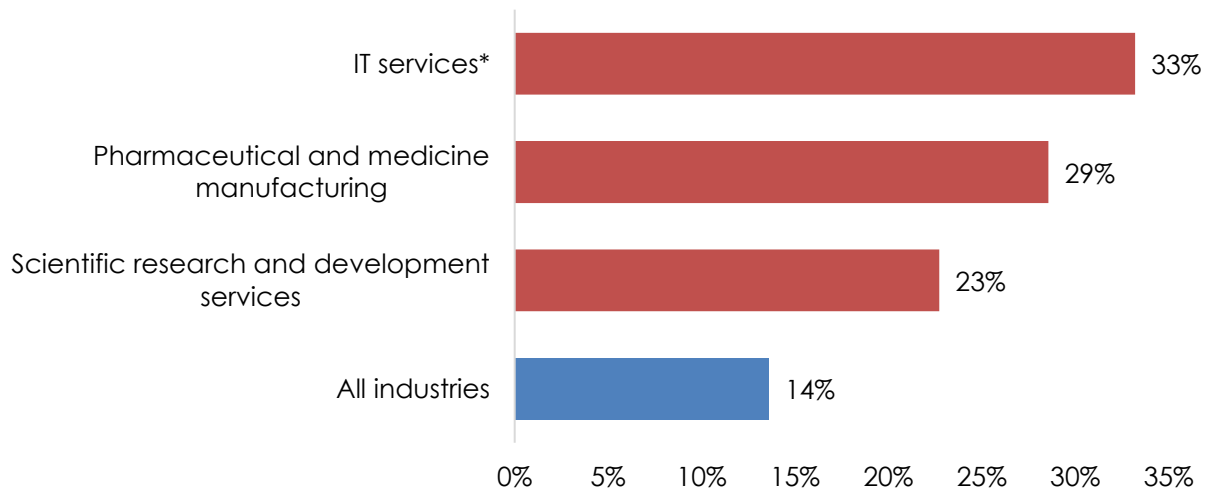


*Newfoundland and Labrador and New Brunswick firms reported no R&D expenditures in this industry during 2022. Source: Statistics Canada Table: 27-10-0341-01.

3.6 Magnet for international talent

The PEI biosciences cluster has been a magnet for international talent. As shown in Figure 9, industries related to the biosciences cluster have a much higher share of immigrants and non-permanent residents compared to the overall economy. Many of these are highly skilled professionals who came to the Island to advance their careers.

Figure 9: Immigrants and non-permanent residents, share of the total Island workforce, 2021



*Several of the biosciences firms are involved in health or bioscience-related IT services.

Source: Statistics Canada 2021 Census.

According to the Department of Immigration, Refugees and Citizenship Canada, since the 2021 Census, over 300 permanent residents have been admitted to the province in biosciences-related occupations including chemists, chemical technologists and technicians and biological technologists and technicians.

4. CONCLUSION

The PEI biosciences cluster is an excellent example of a jurisdiction leveraging core assets and natural resource industries to develop a high value cluster of economic activity. The PEI BioAlliance was at the centre of that effort, but there were many other partners in government, post-secondary education and industry.

The future looks bright for the industry. The significant capital investment being made by firms in the cluster now will lead to even faster growth in revenue in the coming years. Many of the smaller firms are close to breaking out.

It will be important to ensure the value proposition remains strong for the cluster on Prince Edward Island. While the biosciences industry is projected to grow strongly across the world in the coming years, the competition for investment will remain high. Ontario's recently released 'Taking Life Sciences to the Next Level' strategy is a case in point. They have set a short-term goal of attracting "five or more major investments of over \$100 million in order to drive that growth and expand Ontario's biomanufacturing footprint".

The Island's cluster has been successful in the past and is well positioned for the future.

APPENDIX A: METHODOLOGY AND SOURCES

Sources:

<u>Statistic:</u>	<u>Description:</u>
Employment and output forecasts for the industry (operations and capital spending)	Supplied by the PEI BioAlliance.
Indirect and induced GDP, employment and income estimates	Uses Statistics Canada Input-Output multiplier and impact estimates at the M industry level. Provincial Input-Output Multipliers, 2021. Catalogue no. 15F0046XDB. Industry Accounts Division. Statistics Canada. Output, GDP, employment income, taxes and consumer spending forecasts shown in nominal dollars (not adjusted for inflation).
HST paid	Based on the ratio of HST collected to total provincial personal income in 2023 (Source: provincial budget documents 2023).
Personal income taxes paid	Derived using several sources including Statistics Canada tables and PEI government data.
Property taxes paid (from employment income)	Derived using Statistics Canada's Survey of household spending (SHS) for 2022.
Indirect taxes	Source: Statistics Canada Input-Output tables. These indirect taxes are levied on the business activity (not employment income) and include such tax areas as: business property taxes, fuel taxes, vehicle license fees, land transfer taxes, and any sales taxes arising out of the corporate activity.
Estimated consumer spending impacts	Derived using Statistics Canada Survey of household spending (SHS) for 2023.
GDP comparisons	Source: Statistic Canada Table: 36-10-0402-01. Shown in chained (2017) dollars unless where noted.
Industry wage comparisons	All except the biosciences cluster, Statistic Canada Table: 14-10-0204-01 Average weekly earnings by industry.
Exports analysis	Sources: Trade data online, Statistics Canada Table 12-10-0101-01: Interprovincial and international trade flows.
Capital expenditures by industry	All except the biosciences cluster, Statistic Canada Table: 34-10-0035-01 Capital and repair expenditures, non-residential tangible assets, by industry and geography.

Statistic:

Employment income
(aggregate)

Employment income by
occupation

R&D spending comparison

Permanent resident
admissions by occupation

Immigrants by industry and
occupation

Description:

Except the biosciences cluster, Statistic Canada Table: 11-10-0007-01 Tax filers and dependants with income by source of income.

Source: Statistic Canada 2021 Census.

Source: Statistic Canada Table: 11-10-0007-01 Business enterprise in-house research and development characteristics, by industry group based on the North American Industry Classification System (NAICS).

Source: IRCC as published by Open Data Canada.

Source: Statistic Canada 2021 Census.