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University of Maine Alumni Economic and Community Impact Report

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University of Maine Alumni Economic and Community Impact Report

October 2020
(Revised December 2020)

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Prepared for and Property of
University of Maine Alumni Association

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Executive Summary

Since 1940, the University of Maine (UMaine) has educated more than 125,000 people, helping them launch careers, start businesses, and contribute to communities near and far. The benefits of the learning and experiences that take place in Orono ripple across the state, reaching nearly every community, persisting for decades. This report presents the expansive economic and societal impacts of UMaine alumni in Maine. We surveyed thousands of former UMaine students at every stage of life. Here is what we learned.

UMaine transforms lives.

“The University of Maine changed my life forever for the better.”

The experiences of UMaine alumni, captured over seven decades, confirm the power of a UMaine education to open doors, increase earnings, and provide economic security. In 2018, the reported median earnings of working-age alumni in Maine was \$56,000, more than double the statewide median for all residents (\$25,000). Stories of transformation and opportunity are especially poignant for the 38% of alumni who were the first in their families to pursue a degree.

UMaine alumni are talented.

“I had a great and rewarding career with a high-tech company and worked alongside MIT/Harvard/Stanford/etc. people, held my own, and progressed to Director of Advanced Space Optical Systems.”

UMaine alumni represent a significant share of Maine’s workforce, and a disproportionately high percentage of individuals working in some of the state’s best paid fields. For instance, they account for more than one in four Mainers in the occupational categories of *Architectural and Engineering; Life, Physical, and Social Science; and Management*. An estimated 85% of working-age alumni who live in Maine are participating in the workforce, compared to 75% of the general population.

UMaine alumni are entrepreneurs, often brought together by UMaine.

“UMaine was a great experience and set me on the path to starting my forestry business, which I’ve run for 22 years.”

We conservatively estimate that over 20,000 living UMaine alumni have founded a combined 30,000 businesses since the 1940s, and the majority of them have a presence in Maine. UMaine helped these entrepreneurs develop the skills and networks to launch their businesses. Twenty-eight percent of alumni who reported co-founding a business did so with another UMaine graduate. Of those, a majority (69%) co-founded their first business with a fellow alum.

UMaine alumni are innovators.

“My experience at the University of Maine prepared me for an enjoyable and rewarding career leading innovation in emerging computing and telecommunications technologies.”

Beyond entrepreneurship, UMaine alumni contribute to innovation throughout Maine's economy, supporting the survival and growth of established Maine businesses. Two-thirds (66%) have engaged in innovative activities such as developing new products, creating new production processes, publishing research, and filing patents.

UMaine alumni entrepreneurs and innovators are often in high-wage industries.

“I enjoyed my time at the University of Maine, and feel that my education led me into a very successful career path, first in banking and then into self-employment as an HR Consultant, which has been more successful and satisfying than I could have envisioned.”

In 2018, companies founded by UMaine alumni represented an estimated 22% of all *Management of Companies and Enterprises* businesses in Maine, 20% of all *Information* businesses, 15% of all *Manufacturing* businesses, and 11% of all *Professional, Scientific, and Technical Service* businesses. These industries represent some of the best-paying sectors of Maine's economy, with average weekly wages that exceeded the overall average. An estimated 14,000 UMaine-alumni-founded companies across the United States employed over 200,000 people and generated \$4 billion in revenues in 2018.¹

UMaine alumni are community leaders.

“UMaine prepared me well for my business career and volunteer leadership roles in local government, i.e., 3 term selectman (out of state) 3 term city mayor (in Maine).”

UMaine alumni are active in their communities, volunteering at a rate 50% higher than Maine's overall population. More than half (58%) of alumni say their UMaine experience prepared them well or very well to be an active member of their community, and to assume leadership and membership positions on boards and committees.

UMaine alumni live across Maine and work in every sector of Maine's economy.

“The [UMaine] Intermedia program opened my mind to a whole new way to see art, activism, and community building, three of my favorite topics, as I live out my life in Aroostook County.”

The survey results show UMaine alumni contributing to prosperity and innovation in every corner of Maine, and every sector of the economy. They are medical professionals battling COVID-19, teachers developing Maine's next generation of leaders, and entrepreneurs creating jobs and building global brands to drive economic growth in Maine. UMaine alumni are vital to some of the state's most important industries. For example, they represent 1 in 6 Maine educators (18%) and 1 in 7 Maine workers in Professional, Scientific, and Technical Services (16%).

¹ Due to low response rates for certain questions in the survey, we are unable to identify the proportion of revenue that is generated in Maine.

UMaine alumni contribute to society

“My time at the University of Maine has had nothing but a positive effect on my future career and private life.”

UMaine alumni make generous financial contributions in their communities. Three-fourths (76%) of survey respondents living in Maine reported donating to charitable causes in the past year, compared to an estimated 60% of all Maine residents. They also contribute to society through the fiscal system. Extra tax revenues that UMaine alumni living in Maine are about \$151 million per year.² Put another way, the extra tax revenues to Maine far exceed the state’s annual \$84 million appropriation to the University.³

UMaine is a vital economic development asset for Maine.

“UMaine gave my husband, me, and two of our three children a wonderful educational experience and we will be forever grateful.”

Alumni stories, featured throughout this report, show UMaine’s ability to help individuals increase their skills and knowledge, and contribute to Maine’s economy. They are powerful examples of how talent and innovation, the pillars of Maine’s new economic strategy⁴, can lead to increased prosperity for individuals, their communities, and their state.

² Conservatively, UMaine alumni living in Maine pay \$453 million in state and local taxes, and one-third of this can be attributed to their college education.

³ University of Maine, UMaine Budget Model Primer, 2020.

⁴ State of Maine, Department of Economic and Community Development, [Maine Economic Development Strategy 2020-2029: A Focus on Talent and Innovation](#), 2019.

Introduction

This study quantifies the economic and societal contributions made by UMaine alumni in their communities and across the state. It focuses on four impact categories.

- *Individual Impacts* are the well-documented economic benefits of having a college education that accrue to individuals. These include lower unemployment, higher earnings, and better access to employment benefits such as health insurance and retirement contributions.
- *Business and Innovation Impacts* reflect the gains to Maine's economy from entrepreneurship and innovation by alumni. These include starting businesses that create new jobs, and introducing innovations at established companies that help them improve their business practices, develop new products, find new markets, and grow.
- *Community and Cultural Impacts* reflect the disproportionately high contributions of alumni within their communities—volunteering, leading civic organizations, contributing to philanthropic causes, and supporting arts and cultural activities and events.
- *Fiscal Impacts* are the financial benefits to governments from increased earnings and economic activity by college graduates. Higher paychecks create more income, sales, and property taxes for Maine, and alumni-founded businesses generate additional corporate income taxes as well as additional taxes paid by their employees.

This study also looks at alumni *Connections to (U)Maine*. As highlighted throughout this report, UMaine alumni contribute to the economic, civic, and cultural fabrics of their communities here in Maine and in every state across the U.S. And their connections to Maine, its Flagship University, and experiences and lessons learned remain long after their time in Orono.

To be clear, this study examines the economic and community impact of UMaine alumni, and not the impact of UMaine itself. The university contributes to Maine's economy through additional pathways not addressed in this report. Most notably, this study does not address the direct employment and earnings impacts of UMaine's operations in and around Orono and across the state. Nor does it consider the positive impact of research and technical assistance provided to Maine companies by UMaine. Those contributions are extensive and have been quantified in previous studies.

Who Are UMaine Alumni?

As at most other universities around the nation, anyone who attended UMaine for at least two semesters is automatically a member of the University of Maine Alumni Association (UMAA). They could have attended either undergraduate or graduate courses, or both. Therefore, the association's members represent a broad array of individuals with diverse educational experiences at UMaine. They include individuals who earned a degree and those who did not; people who earned credentials at other institutions after attending UMaine, and people who earned graduate degrees at UMaine after receiving undergraduate degrees elsewhere; people who earned multiple degrees at UMaine; and individuals living in Maine and in other states and countries.

This study reports findings for UMaine alumni in six groups.

- *All UMaine Alumni* is the broadest category. It includes all alumni, with all levels of educational attainment (those with degrees and those without degrees), living anywhere in the world.
- *All UMaine Bachelor's* includes alumni living anywhere in the world with a bachelor's degree, either from UMaine or another institution, but not with a graduate degree.⁵
- *All UMaine Graduate* includes alumni with an advanced degree, either from UMaine or another institution, living anywhere in the world.⁶
- *All UMaine Alumni in Maine* includes alumni, with all levels of educational attainment (those with degrees and those without degrees), living in Maine.
- *All UMaine Bachelor's in Maine* includes alumni living in Maine with a bachelor's degree, either from UMaine or another institution, but not with an advanced degree.
- *All UMaine Graduates in Maine* includes alumni with an advanced degree, either from UMaine or another institution, living in Maine.

This study conservatively estimates that there are at least 103,500 living UMaine alumni (see Appendix 1 for details on how this was estimated), and more than 55,000 of them live in Maine.⁷ Thus, more than five percent of voting-age Maine residents are UMaine alumni, and this does not even count current UMaine students.

⁵ An estimated 6.6% of these UMaine alumni earned their bachelor's degree from other institutions.

⁶ An estimated 76.1% of these UMaine alumni earned their highest degree from other institutions, although in some cases alumni earned a master's degree at UMaine before obtaining a doctorate elsewhere.

⁷ This estimate is close to, but about 6% lower, than the number of living alumni estimated by UMAA. Thus, the total impacts estimated in this report are probably understated by about 6%.

Impact of UMaine Alumni

Since 1940, UMaine has educated an estimated 125,000-130,000 students. We heard from nearly 5,300 of them, representing all decades of attendance, all 16 Maine counties, and every U.S. state. More than half of respondents currently live in Maine, and a slight majority received their highest degree from UMaine. Their survey responses reveal the university's far-reaching influence on them, their workplaces, and their communities.

Individual Impact

"As a first generation college student from rural Maine, I see UMaine as one of the biggest reasons I was able to increase my position in life.... Without it, I'd [have] a low-paying job and no benefits."

It is widely known that individuals who attend college earn more than those who do not.⁸ Having a college education also garners better employment benefits such as health insurance and retirement contributions. It corresponds to better health and longer life expectancy, and lower unemployment and poverty. There is overwhelming data on these effects nationally, internationally, and in Maine. The survey results show these trends are true for UMaine alumni.

Income

In 2018, the mean household income of UMaine alumni (\$126,524) exceeded both the Maine and U.S. means (\$85,954 and \$96,155, respectively).^{9,10} This measure includes the income of all household members (including non-UMaine-alumni) from all sources, including employment earnings, transfer payments, interest, and rental income. About half of UMaine alumni live in Maine. Their average household income (\$114,868) also exceeded that of other Maine households. By comparison, the average household income of all Maine residents with at least some college education (many of whom are UMaine alumni) was \$98,588, about 14% lower. The incomes of Maine householders with a bachelor's or graduate degree was slightly higher than similarly credentialed UMaine alumni.

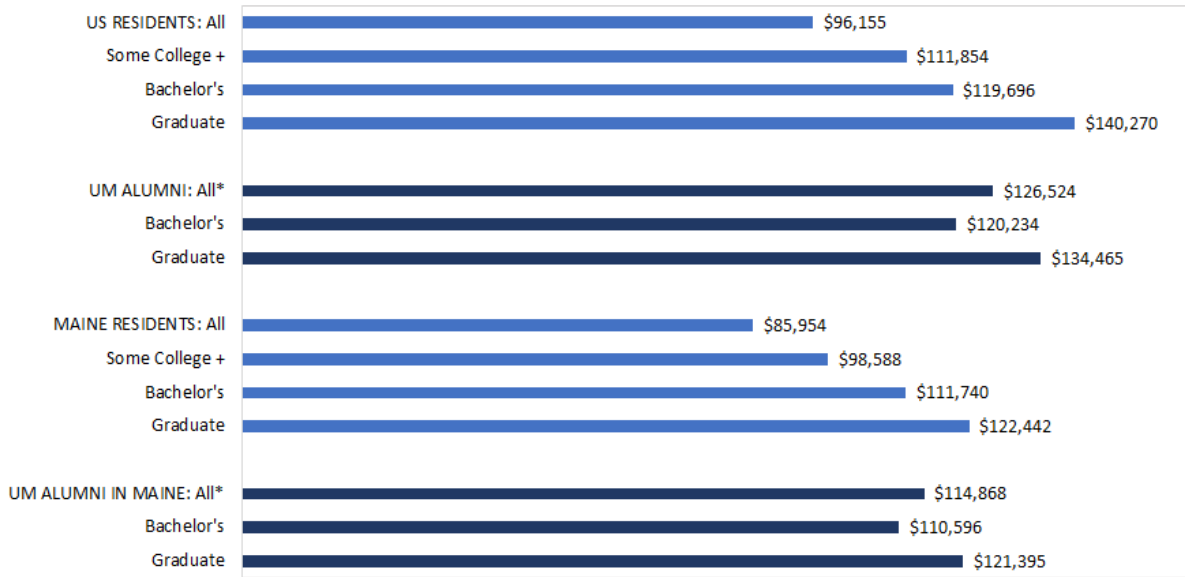
Diving deeper into Maine's population, we find that half (50%) of UMaine alumni in the state had a household income of at least \$100,000 in 2018, compared to 37% of all Maine residents, and 29% of those with some college education. Conversely, just 4% of UMaine alumni had household incomes below \$25,000, compared to 14% of all Maine residents and 10% of those with some college experience.

⁸ Daly, M. C., & Bengali, L. (2014). Is it still worth going to college? *FRBSF Economic Letter*, 13, 2014.

⁹ Survey respondents reported their household income by category (\$25,000-\$49,999, \$50,000-\$74,999, etc.). The mean is calculated using the midpoints of these ranges. It is not possible to calculate a meaningful median using incomes reported by category.

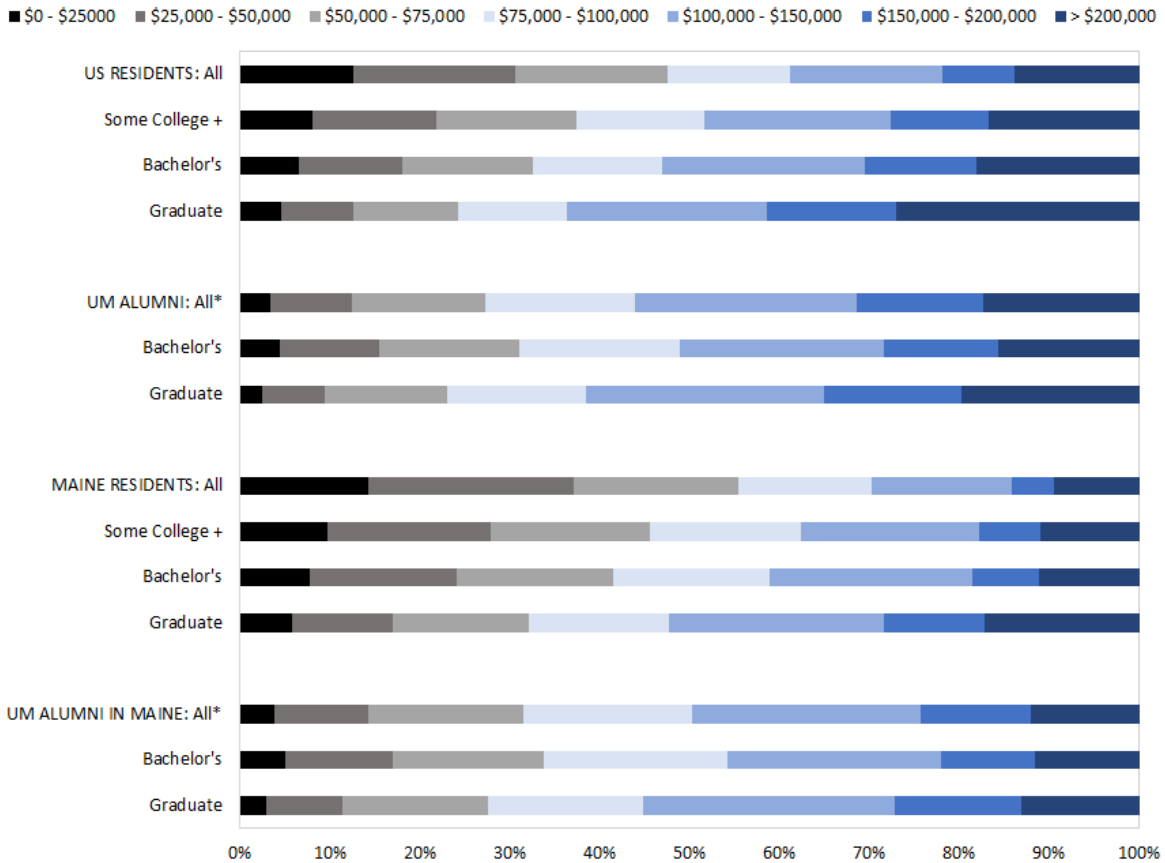
¹⁰ The 2018 Maine and U.S. household mean incomes reported here differ from those published by the U.S. Census Bureau for two reasons. First, to provide the most appropriate comparisons we look at only householders age 22 and older (because other than two 21-year-olds, all of the survey respondents were age 22 and older), which excludes younger householders who tend to have lower incomes. Second, we apply a much simpler weighting method to both the UMaine alumni survey data and the Census Bureau data.

Mean household income, 2018



Source: Authors' calculations using survey results and U.S. Census Bureau, 2018 American Community Survey, Public Use Microdata Sample
 *Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

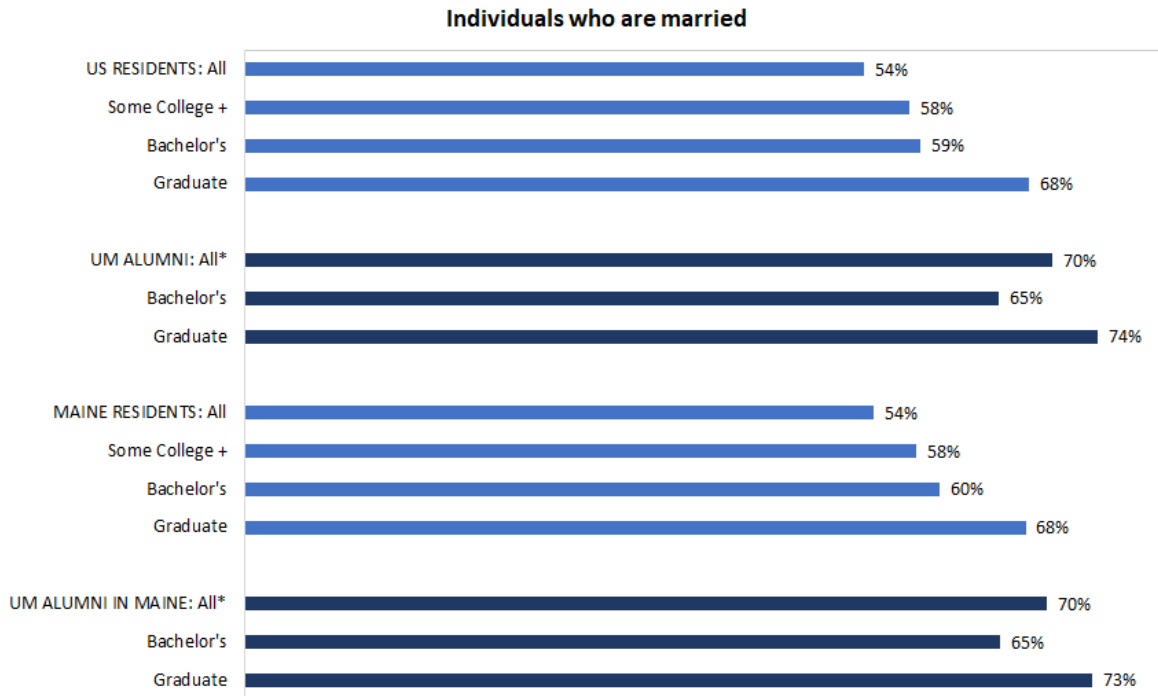
Distribution of household income, 2018



Source: Authors' calculations using survey results and U.S. Census Bureau, 2018 American Community Survey, Public Use Microdata Sample
 *Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

These distributions suggest that the mean incomes of Maine residents with bachelor's and graduate degrees, which exceed those of similarly credentialed Maine-based alumni, may be influenced by a relatively small number of very high-income households.

The higher incomes of alumni households may also be due in part to higher marriage rates, which can reflect dual-income households. An estimated 70% of UMaine alumni living in Maine are married, compared to 54% of all Maine residents over age 22. The marriage rates of Maine-based alumni with bachelor's and graduate degrees are five percentage points higher than all Maine residents with similar credentials.

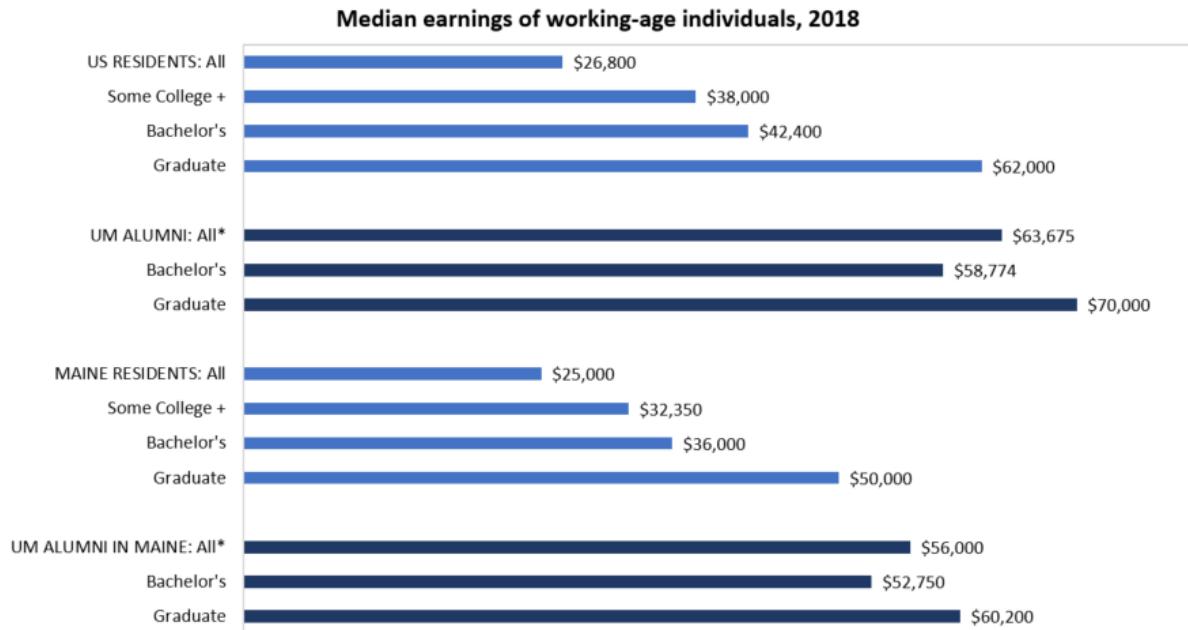


Source: Authors' calculations using survey results and U.S. Census Bureau, 2018 American Community Survey, Public Use Microdata Sample, individuals age 22 and older

*Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

Earnings

Employment earnings account for a high percentage of income for most working-age individuals. Isolating this income category illuminates the value of a UMaine education, both to alumni and their employers. In 2018, the median earnings of alumni ages 22 to 69 (\$63,675) greatly exceeded both the Maine and U.S. medians (\$25,000 and \$26,800, respectively). This measure includes income from salaries and wages, and self-employment income. The median earnings of alumni living in Maine (\$56,000) greatly exceeded that of other Maine workers. For instance, the median earnings of all Maine residents with at least some college education was \$32,350, about 42% lower. Alumni with graduate degrees earned even more. Their median earnings were \$60,200.



Source: Authors' calculations using survey results and U.S. Census Bureau, 2018 American Community Survey, Public Use Microdata Sample
 *Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

The difference in average earnings from college attendance is commonly referred to as the college earnings premium. Analysis of Census Bureau data (public use microdata from the American Community Survey)¹¹ indicates that the average annual earnings of Mainers who never attended college was \$24,894, which is only 35.4% as much as UMaine alumni living in Maine. The average UMaine earnings premium is more than \$45,000 annually. Moreover, the total of this premium over the more than 55,000 alumni living in Maine is more than \$2.5 billion a year, which is about 3.7% of the entire state economy. And that is only the extra earnings from attending UMaine.

The estimated total, not just the additional, annual earnings of alumni living in Maine is \$3.89 billion. While UMaine alumni comprise 6% of total employment in Maine, they earned 12% of the estimated \$32.4 billion in total dollars earned annually by all workers within the state.¹² In other words, UMaine alumni earn \$1 out of every \$8.33 earned in Maine.

Employment

For many UMaine alumni, higher earnings are directly linked to having a degree. Eighty percent of employed alumni say their current job requires a college degree. Ten percent are in positions that do not require a degree but say their UMaine education has created opportunities they would not have had otherwise. One respondent says, "I grew up in poverty in Maine and was the first in my family to attend college....I feel fortunate that I was able to get a degree, work at a job that I loved upon graduating, and make a decent living while doing important work as an educator of young children." "I went to Navy [Officer Candidate School] after graduating and

¹¹ Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas and Matthew Sobek. *IPUMS USA: Version 10.0 [dataset]*. Minneapolis, MN: IPUMS, 2020. <https://doi.org/10.18128/D010.V10.0>

¹² This number is derived from the 2018 American Community Survey.



Source: Authors' calculations using survey results and U.S. Census Bureau, Jan - March 2020 Current Population Survey, Public Use Microdata Sample
 *Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

finished in the top 10 out of 130 people in my class,” says another graduate. “I attribute that success and my business success over the last 50 years to the education I received at Maine.”

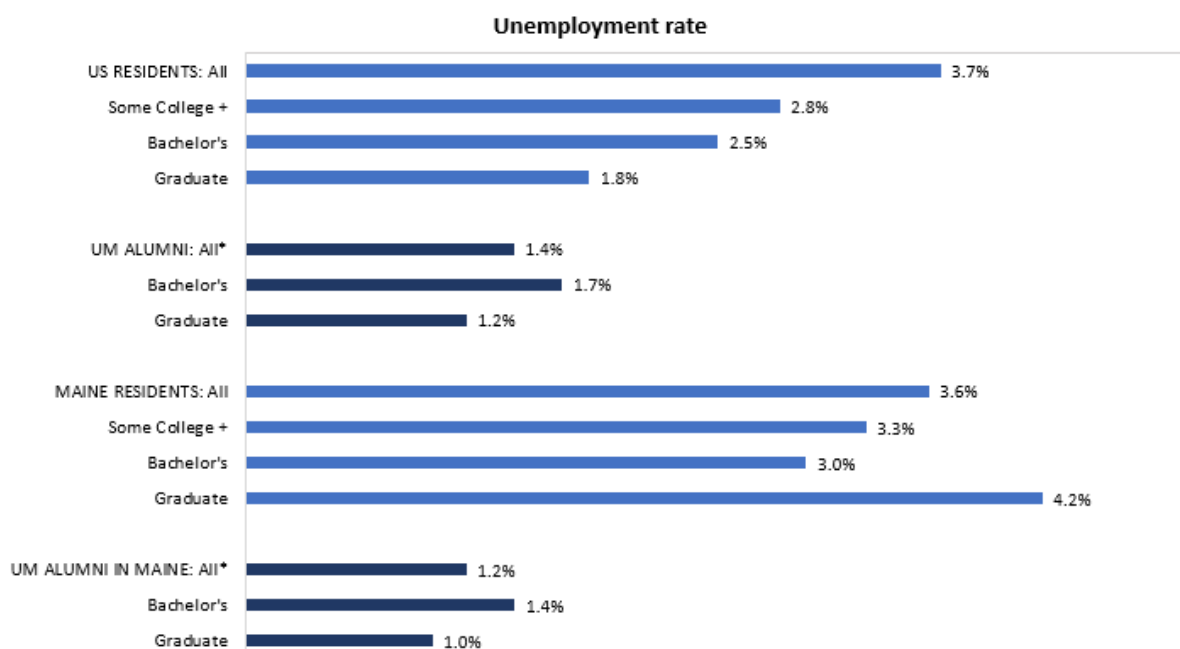
Based on survey responses, we estimate that more than 70,000 UMaine alumni are employed (including self-employed), and over 40,000 work in Maine.¹³ This is about 6% of the roughly 670,000 people employed in Maine in 2019.¹⁴ Like college graduates nationwide, UMaine alumni are highly active in the workforce. During the survey period, an estimated 85% of alumni ages 22 to 69 living in Maine were participating in the workforce, which was significantly higher than the state’s average participation rate of 75% during the first three months of 2020.¹⁵

In addition to being more active in Maine’s labor force, UMaine alumni report less unemployment than other individuals in Maine and the U.S. At the time of the survey, the unemployment rate of Maine-based alumni in the workforce was 1.2%, about 60% lower than the 3.6% unemployment rate of all Maine workers. Unemployment among Maine-based alumni with a bachelor’s degree, 1.4%, was about 50% lower than the 3% unemployment rate of all Maine workers with a bachelor’s degree.

¹³ The survey was conducted between January and April of 2020. About fifteen percent of survey responses came after the March 13 National Emergency Declaration due to the coronavirus (COVID-19). See Appendix I: Employment for details.

¹⁴ Maine Department of Labor, Center for Workforce Research and Information, Annual Average Labor Force Estimates, accessed September 3, 2020.

¹⁵ Calculated using microdata from U.S. Census Bureau, Current Population Survey: *IPUMS-CPS*, University of Minnesota, www.ipums.org.



Source: Authors' calculations using survey results and U.S. Census Bureau, Jan - March 2020 Current Population Survey, Public Use Microdata Sample
 *Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

In all, we estimate that UMaine alumni account for about 6% of all Maine employees, and a much higher portion in some industries. Notably, UMaine alumni represent 1 in 6 Maine educators (18%) and 1 in 7 Maine workers in *Professional, Scientific, and Technical Services* (16%).

Table 1. Maine-based UMaine Alumni Employment by Industry

Industry*	Estimated UMaine alumni employees working in Maine	Maine average employment**	Percentage of Maine employees that are UMaine alumni ***	Average weekly wage**
Utilities	549	2,929	19%	\$1,383
Educational Services	10,737	59,031	18%	\$837
Agriculture, Forestry, Fishing and Hunting	1,212	7,057	17%	\$780
Professional, Scientific, and Technical Services	4,536	28,437	16%	\$1,431
Finance and Insurance	2,158	23,536	9%	\$1,495
Information	642	7,645	8%	\$1,062
Mining, Quarrying, and Oil and Gas Extraction	14	217	6%	\$1,145
Public Administration	1,286	27,157	5%	\$1,039
Arts, Entertainment, and Recreation	518	11,824	4%	\$493
Healthcare and Social Assistance	4,414	111,257	4%	\$964
Other	5,678	342,099	2%	\$902
Total	31,742	621,189	5%	\$908

* North American Industry Classification System, two-digit sectors

** Source: U.S. Bureau of Labor Statistics, 2019 Quarterly Census of Employment and Wages

*** Authors' calculations

Table 2. Rates of Employment by Employment Category

	Percentage of employed UMaine alumni	Percentage of all Maine employees*	Percentage of US employees*
Private sector	65%	84%	85%
For-profit	70%	82%	90%
Nonprofit	30%	18%	10%
Public sector	35%	16%	15%

*Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Business Employment Dynamics

The majority of respondents are employed in the private sector, with 70% of respondents employed in the private sector working at for-profit companies. Thirty-five percent of respondents are employed in the public sector. Of those working in the public sector, a large proportion are workers in education (40%), management occupations (21%), engineering (6%) and community and

social services (4%). These public sector workers have varied college degrees and majors including focuses on education (31%), natural sciences and forestry (14%), engineering (8%), business/finance/management (5%), and economics (3%).

UMaine alumni are contributing to Maine's economy in diverse fields that reflect the university's varied offerings. The most common occupations were in *Management* (31% of employed alumni) and *Educational Instruction and Library Services* (19%). Within certain professions, UMaine alumni represent a large and important segment of Maine's workforce. For instance, UMaine alumni constitute approximately:

- 31% of Maine workers in *Architectural and Engineering* occupations;
- 31% of Maine workers in *Life, Physical, and Social Science*;
- 29% of Maine workers in *Management*; and
- 15% of Maine workers in *Education and Library Services*.

Table 3. Maine-based UMaine Alumni Employees by Occupation

Occupation*	Estimated UMaine alumni employees working in Maine	Maine average employment**	Percentage of Maine employees that are UMaine alumni***	Average annual wage**
Architecture and Engineering Occupations	3,061	9,940	31%	\$77,880
Life, Physical, and Social Science Occupations	1,400	4,590	31%	\$67,880
Management Occupations	10,062	35,130	29%	\$97,900
Educational Instruction and Library Occupations	6,173	41,880	15%	\$49,050
Farming, Fishing, and Forestry Occupations	246	1,750	14%	\$40,880
Legal Occupations	424	3,650	12%	\$82,750
Business and Financial Operations Occupations	2,840	25,240	11%	\$69,010
Community and Social Service Occupations	1,235	11,300	11%	\$48,450
Arts, Design, Entertainment, Sports, and Media Occupations	762	7,690	10%	\$47,570
Computer and Mathematical Occupations	721	12,380	6%	\$79,100
Other	4,816	153,550	3%	\$42,299
Total	31,741	611,160	5%	\$48,470

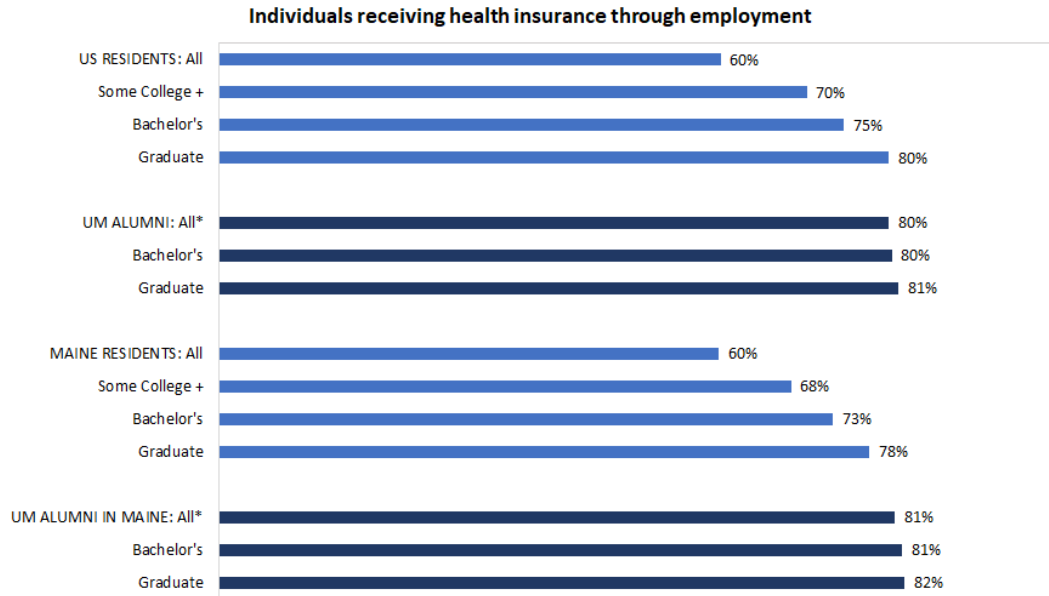
*Standard Occupational Class System, two-digit codes

**Source: Bureau of Labor Statistics, 2019 Occupational Employment Statistics

***Authors' calculations

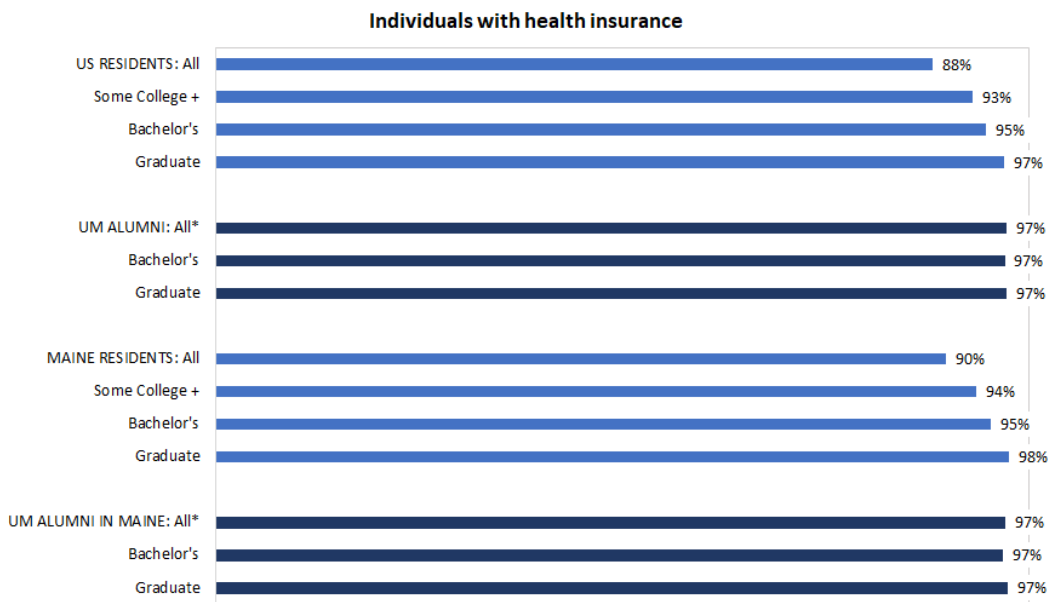
Health insurance

In addition to income, health insurance is one of the primary benefits of employment in the U.S. Eighty-one percent of alumni in Maine reported receiving health insurance through their employer, compared to 60% of all Maine residents. This contributed to the overall coverage rate of alumni exceeding the Maine rate by seven percentage points (97% versus 90%, respectively).



Source: Authors' calculations using survey results and U.S. Census Bureau, 2018 American Community Survey, Public Use Microdata Sample; individuals age 22-69

*Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.



Source: Authors' calculations using survey results and U.S. Census Bureau, 2018 American Community Survey, Public Use Microdata Sample; individuals age 22-69

*Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

Business & Innovation Impact

The benefits of a UMaine education extend beyond individuals and their households. Survey responses show that UMaine alumni have created thousands of businesses and tens of thousands of jobs, boosting Maine’s economy and creating opportunities for other Maine residents. They have also helped to advance the state’s economy through innovation.

Entrepreneurship

“UMaine was a great experience and set me on the path to starting my forestry business, which I’ve run for 22 years.”

Twenty-one percent of UMaine alumni have founded at least one business or organization. Of these alumni, a majority (64%) have founded one business, 24% founded two, and 12% founded three or more. Extrapolating to the entire alumni population, we conservatively estimate that over 20,000 living UMaine alumni have founded a combined 30,000 businesses since the 1940s. These numbers will grow as large cohorts of younger alumni age into their most entrepreneurial years. (Thirty-eight percent of alumni entrepreneurs reported starting their first business in their thirties, and another 38% started in their forties or later.) Most alumni businesses (83%) are for-profit; 17% are nonprofit.

Survey responses suggest that attending UMaine helps entrepreneurial students and alumni connect with like-minded peers. Twenty-eight percent of alumni who co-founded a business did so with a fellow UMaine graduate. Of first businesses, an even higher proportion (69%) were co-founded with another UMaine graduate.

Table 4. Percentage of Co-founded Businesses with UMaine Co-founders

Business Started	Percentage
First	69%
Second	23%
Third	7%
Fourth	1%
Fifth	<1%

The types of businesses started by UMaine alumni reflect the full diversity of the university’s academic offerings. More than one in five businesses (22%) are in *Professional, Scientific and Technical Services*. This represents over 5,000 businesses. *Real Estate, Rental, and Leasing* (9%) and *Agriculture, Forestry, Fishing, and Hunting* (8%) are the next most common industries, collectively accounting for over 4,500 businesses. Overall, 66% are in a service industry, 5% are in manufacturing, and 29% are in another industry.

Table 5. Estimated Businesses Started by UMaine Alumni by Industry, 1940–2018

Industry*	Estimated UMaine-alumni-founded businesses	Percentage
Professional, Scientific and Technical Services	6,830	22%
Real Estate and Rental and Leasing	2,919	9%
Other Services (except Public Administration)	2,516	8%
Agriculture, Forestry, Fishing and Hunting	2,368	8%
Educational Services	2,273	7%
Arts, Entertainment and Recreation	2,206	7%
Retail Trade	2,172	7%
Health Care and Social Assistance	1,877	6%
Information	1,646	5%
Manufacturing	1,630	5%
Other	4,467	14%
Total	30,903	100%

*North American Industry Classification System, two-digit sectors

Much of this entrepreneurial activity is happening in Maine, although it can be seen in states across the U.S. and in countries around the world. Sixty percent of alumni businesses have a physical presence in Maine. Massachusetts (10%), New Hampshire (6%), and New York (5%) are the next most common business locations.

Active businesses

Forty percent of reported alumni businesses were active in 2018. This represents more than 10,000 Maine businesses. Comparing this to the total number of businesses in the state shows the importance of these companies to Maine's economy. In Maine, in 2018, companies founded by University of Maine alumni made up:

- 22% of all *Management of Companies and Enterprises* businesses,
- 20% of all *Information* businesses,
- 15% of all *Manufacturing* businesses,
- 11% of all *Professional, Scientific, and Technical Service* businesses, and
- 11% of all *Mining, Quarrying, and Oil and Gas Extraction* businesses.

These industries represent some of the best-paying sectors of Maine's economy, with a range of average weekly wages that exceeded the overall average by 16% (*Information*) to 77% (*Management of Companies and Enterprises*) in 2018.¹⁶

¹⁶ U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Average Weekly Wage

Table 6. Estimated UMaine Alumni-Founded Businesses Active in 2018 with Physical Presence in Maine

Industry*	Estimated UMaine alumni-founded businesses in Maine	Maine businesses**	Percentage of Maine businesses founded by UMaine alumni	Average weekly wage**
Management of Companies and Enterprises	183	818	22%	\$1,543
Information	458	2,303	20%	\$1,010
Other Services (except Public Administration)	709	14,928	18%	\$655
Educational Services	743	4,585	16%	\$812
Manufacturing	629	4,269	15%	\$1,127
Agriculture, Forestry, Fishing, and Hunting	1,193	10,577	11%	\$779
Mining, Quarrying, and Oil and Gas Extraction	13	116	11%	\$1,090
Professional, Scientific, and Technical Services	2,209	20,879	11%	\$1,376
Real Estate and Rental and Leasing	1,414	14,389	10%	\$826
Arts, Entertainment, and Recreation	743	8,743	8%	\$481
Other	2,217	99,074	2%	\$887
Total	10,511	169,596	6%	\$873

*North American Industry Classification System, two-digit sectors

**Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Average Weekly Wage and Bureau of Labor Statistics Nonemployer Statistics

Table 7. UMaine Alumni-Founded Businesses by Employee Size, 2018

Employees	Percentage of UMaine alumni-founded businesses by employee size	Percentage of all Maine businesses by employee size*	Percentage of all United States businesses by employee size*
0 to 4	79%	89%	90%
5 to 9	7%	5%	4%
10 to 19	6%	3%	3%
20 to 49	3%	2%	2%
50 to 99	1%	1%	1%
100 to 249	<1%	<1%	<1%
250 to 499	1%	<1%	<1%
500 to 999	<1%	<1%	<1%
1,000 +	<1%	<1%	<1%
Prefer not to answer	2%		

*Source: Census Bureau County Business Patterns and Bureau of Labor Statistics, Nonemployer Statistics

Table 7 shows that, overall, most alumni-founded companies (79%) are small businesses that employ 0-4 people, about 5% employ 20 or more, and a few employ over 1,000 workers.

Alumni were asked to report the approximate percentage of their employees that were based in Maine in 2018. Using these estimates, UMaine alumni-founded businesses employed approximately 26,000 people in Maine, which was about 4% percent of Maine’s 2018 workforce.

Extrapolating survey results to all UMaine alumni, we conservatively estimate there were around 14,000 UMaine alumni-founded active businesses across the United States in 2018, employing more than 200,000 individuals, and generating an estimated \$4 billion in revenue.

Innovation

“My experience at the University of Maine prepared me for an enjoyable and rewarding career leading innovation in emerging computing and telecommunications technologies. My success is due largely to the personal engagement by key faculty members in my development, for which I am deeply grateful.”

UMaine alumni contribute to innovation throughout Maine’s economy. Survey responses show that even those who do not start businesses contribute in tangible ways. “My Communications degree and the experience I had playing for, and managing, the UMaine Women’s Club Hockey Team gave me the skills I needed in order to be successful in my career at the director level in high tech,” says one alumna. “I believe that UMaine helped foster my entrepreneurial spirit to build new things.”

Over half (56%) of UMaine alumni have engaged in at least one innovative activity, such as developing a new product, creating a new production process, publishing research, or filing a patent.

Table 8. UMaine Alumni Contributions towards Innovation

	Patents	Production processes	Business model	Business practice	New products	Publications	Trade-marks	Other	None
Alumni contributions	4%	10%	11%	5%	15%	18%	4%	5%	44%

Table 8 above describes direct, hands-on innovation by UMaine alumni. Other activities foster innovation indirectly by supporting the businesses and individuals doing innovative work. UMaine alumni are active in these ways as well. More than one in four (28%) have served on the board of a nonprofit organization. Rarer, but equally valuable, activities including service on a scientific advisory board (5%), for-profit business boards (4%), angel investing (4%), being a venture capitalist (2%), and investing in a UMaine alum startup (1%).

Table 9. UMaine Alumni Participation in Innovation Related Activities

	For-profit board	Nonprofit board	Scientific advisory board	Invested in startup with UMaine alum	Angel investor	Venture capitalist
Alumni contributions	4%	28%	5%	1%	4%	2%

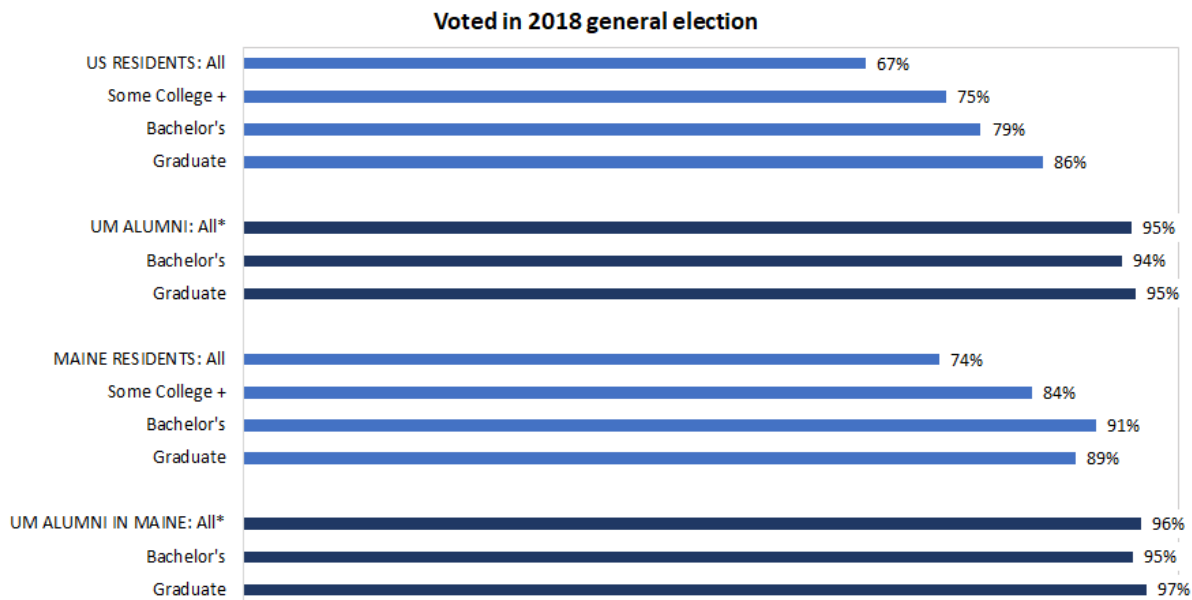
Civic and Cultural Engagement Impact

“My wife and I both got PhDs from UMaine and are now retired from long, successful, and rewarding careers... We are in the process of making a commitment for a financial gift to UMaine to help other students gain the benefits that the university provided to me as someone who grew up in rural Maine.”

There is substantial evidence that individuals who attend college are more active participants in their communities than those who do not.¹⁷ They are more likely to participate in civic groups, vote, and volunteer their time, and they contribute higher proportions of their income to philanthropy. In Maine’s small communities, the extra contributions of college alumni may be even more important than they would be in larger communities in other states.

Political participation

Survey results show that UMaine alumni are highly active community members. Beginning with voting, we find that 96% of alumni in Maine voted in the 2018 general election, compared to 74% of the general population. Maine-based alumni are also more likely to vote in local elections (96%) than are Maine residents overall (74%). Thus, not only are UMaine alumni (not counting current students) more than 5% of Maine’s voting age population, they are considerably more than 5% of all Maine voters.

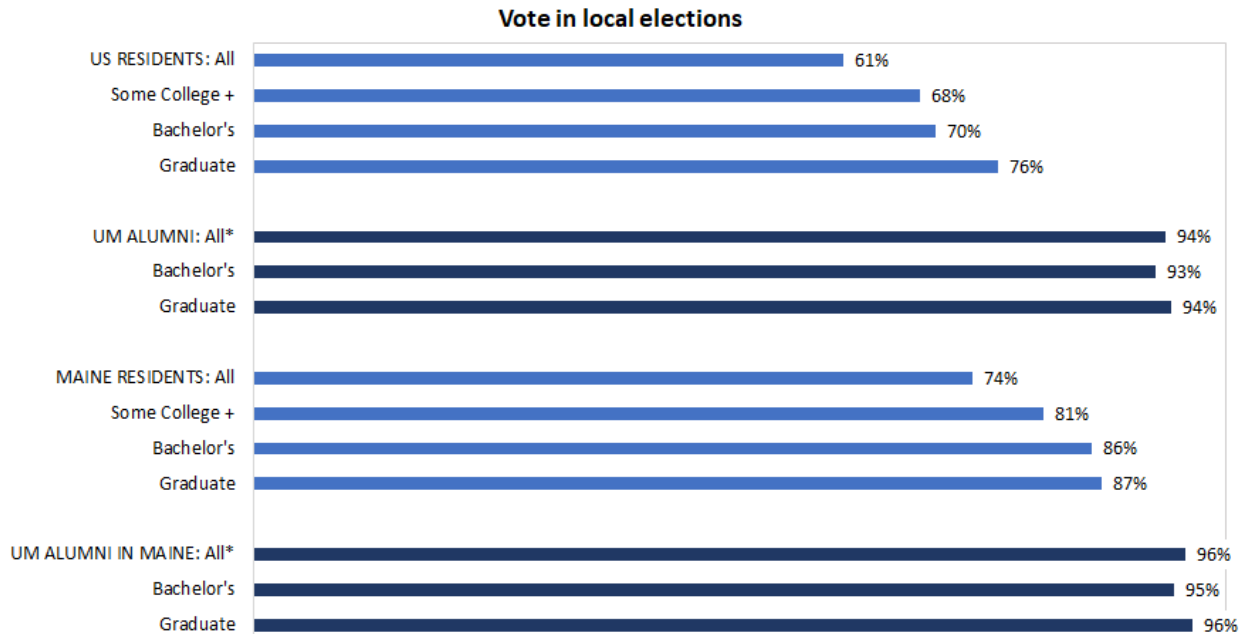


Source: Authors' calculations using survey results and U.S. Census Bureau, November 2018 Voting & Registration Supplement of the Current Population Survey

*Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

UMaine alumni not only vote, but also are active in other realms of civic life. One respondent notes, “Without any question, I feel my education and college experience greatly contributed to

¹⁷ Trostel, P. (2015). *It's not just the money: The benefits of college education to individuals and to society*. Margaret Chase Smith Policy Center and School for Economics (University of Maine) and Lumina Issue Papers, Retrieved from <https://www.luminafoundation.org/resources/its-not-just-the-money>.



Source: Authors' calculations using survey results and U.S. Census Bureau, November 2013 Civic Engagement Supplement of the Current Population Survey
 *Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

my work in the Legislature, party politics, the legal field, and most recently as an executive assistant to a Commissioner running a Maine department in state government.” Another describes how UMaine prepared them well for both a “business career and [for participation in] volunteer leadership roles in local government.”

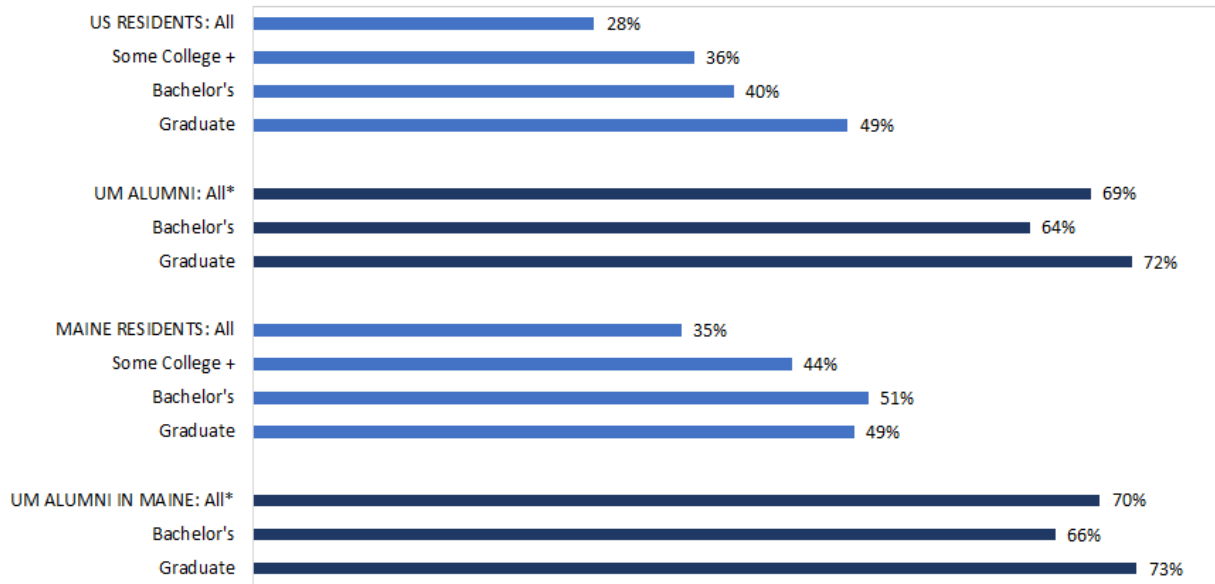
Volunteerism

Beyond the voting box, nearly 70% of alumni living in Maine reported volunteering within the past year, which is twice the volunteerism rate of Maine’s overall population (35%).¹⁸

Of those alumni who volunteer, the median (mid-point) number of hours spent giving back to their communities in the past year was 95. That is more than double the U.S. rate of 40 hours per year. During this time, alumni served as mentors, tutors, and coaches. They collected, prepared, and distributed food; they fundraised and provided volunteer protective services. Survey respondents highlighted two ways in which UMaine helped them grow as community members. The first was through leadership opportunities. One individual says, “The most critical growth for me at UMaine came from living and helping to manage our fraternity, ATO. That experience taught me how to lead, organize, get along with others, manage projects, mediate, accept diversity.” The second way was through awareness building. “Coming from a very small town in Maine, attending UMaine opened my eyes and my mind to many new and diverse people, opinions, and ideas,” says one respondent.

¹⁸ Derived from the 2017 Current Population Survey Volunteer Supplement.

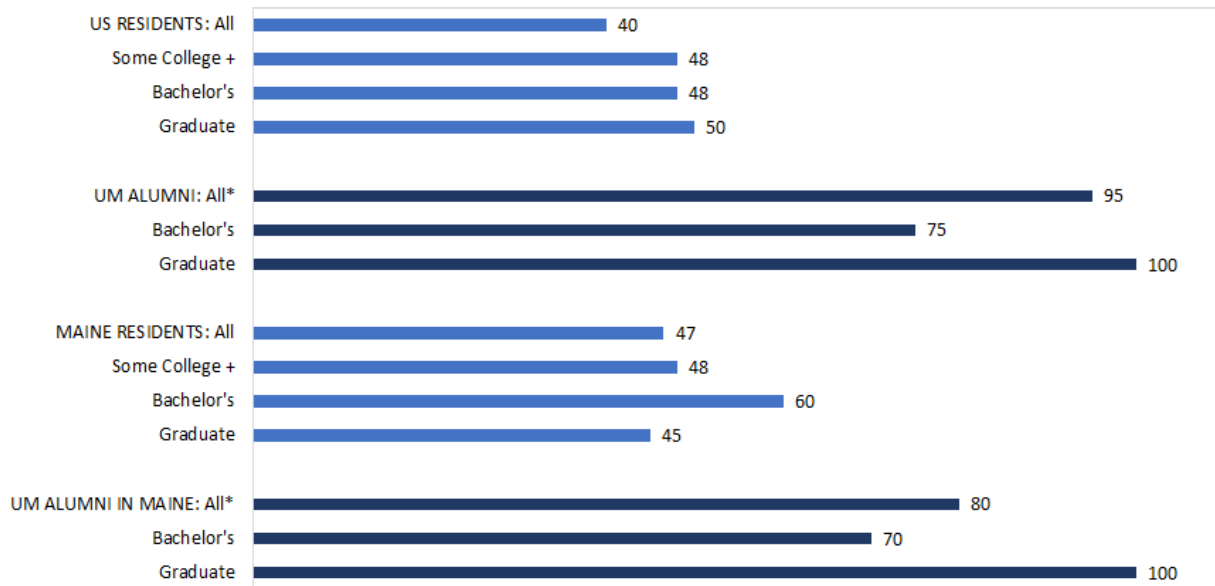
Volunteered in past year



Source: Authors' calculations using survey results and U.S. Census Bureau, September 2017 Volunteer Supplement of the Current Population Survey, age 22 and older

*Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

Median hours spent volunteering in past year



Source: Authors' calculations using survey results and U.S. Census Bureau, September 2017 Volunteer Supplement of the Current Population Survey, age 22 and older

*Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

Table 10. UMaine Alumni Volunteer Organizations—Maine Comparison

Type of organization	All UMaine alumni	All U.S. residents*	UMaine alumni living in Maine	All Maine residents*	Maine residents with some college*	UMaine alumni with a bachelor's degree
School or community	16.2%	14.1%	17.5%	14.0%	16.8%	16.0%
Service or civic	11.0%	7.0%	12.2%	10.5%	10.9%	10.7%
Religious	21.6%	19.8%	19.4%	17.7%	21.6%	21.3%
Sports or recreational	19.3%	9.6%	18.6%	12.1%	17.2%	21.6%
Other	15.6%	5.2%	15.1%	10.7%	13.9%	15.0%

*Source: Authors' calculations from the November 2013 Current Population Survey, Civic Engagement Supplement

Table 11. UMaine Alumni Volunteer Organizations—Detailed

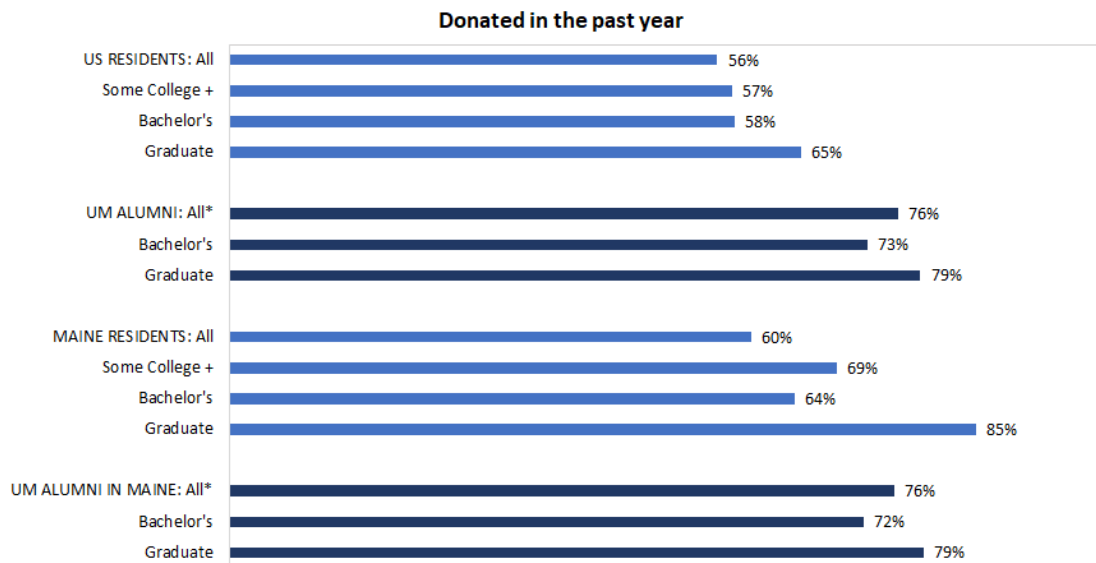
Type of organization	UMaine alumni			UMaine alumni in Maine		
	All	With bachelor's degree	With graduate degree	All	With bachelor's degree	With graduate degree
Social and community service	18.3%	17.4%	19.4%	19.5%	18.1%	21.9%
Religious	18.2%	15.9%	19.7%	16.8%	15.4%	18.2%
Children's programming	14.9%	15.2%	14.5%	16.4%	17.2%	15.6%
Cultural	11.6%	10.2%	12.7%	12.7%	11.1%	14.5%
Educational	11.6%	8.5%	13.7%	12.3%	9.5%	14.2%
Civic	8.8%	8.5%	8.9%	10.2%	9.7%	10.5%
Youth service	8.1%	8.0%	8.2%	8.5%	8.4%	8.5%
Environmental	10.0%	9.2%	11.0%	8.5%	8.2%	9.5%
Political	7.3%	6.3%	8.4%	7.9%	6.4%	9.9%
Healthcare (e.g., clinic)	5.7%	5.4%	6.0%	6.1%	5.5%	6.8%
Professional	4.5%	4.1%	4.7%	5.1%	4.8%	5.5%
International	3.7%	2.8%	4.3%	3.5%	2.3%	4.3%
Health research or education	3.3%	2.7%	4.0%	2.8%	2.7%	3.2%
Immigrant assistance	2.5%	1.7%	3.0%	2.4%	1.7%	3.2%
Public safety (e.g., fire dep't)	2.3%	2.6%	1.7%	2.3%	3.1%	1.1%
Sports or hobby	12.4%	13.4%	11.3%	1.4%	1.5%	12.3%
Other	12.3%	11.5%	12.5%	12.2%	12.1%	11.7%

Nearly one out of five (19.5%) UMaine alumni living in Maine volunteer with a social and community service organization, such as Rotary Club or United Way. This was the most common type of community service, followed by volunteering with religious groups (16.8%); children’s educational, sports, or recreational programs (16.4%); cultural organizations such as libraries, theaters, and museums (12.7%); and educational organizations (12.3%).

A 2015 study constructed a rough measure of the value of volunteered labor by valuing volunteer hours by the average wage rate in employment for different levels of education attainment.¹⁹ Using the average hourly wage rate for college graduates,²⁰ and the average number of volunteer hours, we estimate that each UMaine alumnus who volunteers contributes \$4,113 per year in volunteer labor. Collectively, the total value of the time that UMaine alumni volunteer is more than \$426 million. This estimate is based on an imperfect measure of the opportunity cost of the time donated to volunteer, which is not necessarily the value of the work to the organization (society). Thus, this estimate should only be interpreted as suggestive.

Charitable contributions

In addition to donating their time, UMaine alumni make generous charitable contributions in their communities and across the nation. Three-fourths (76%) of survey respondents living in Maine reported donating to charitable causes in the past year, compared to an estimated 60% of all Maine residents.



Source: Authors' calculations using survey results and U.S. Census Bureau, September 2017 Volunteer Supplement of the Current Population Survey, age 22 and older

*Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

¹⁹ Trostel, P. (2015). It's not just the money: The benefits of college education to individuals and to society. Margaret Chase Smith Policy Center and School for Economics (University of Maine) and Lumina Issue Papers, Retrieved from <https://www.luminafoundation.org/resources/its-not-just-the-money>.

²⁰ Derived from the 2019 Annual Social and Economic Supplement of the Current Population Survey.

UMaine alumni report high levels of charitable giving, even by national standards. A few survey respondents had made very high, multi-million-dollar gifts within the past year. Setting aside those very large donations, the total average annual charitable contribution of UMaine alumni was \$3,527, over three times the national average of \$1,127. UMaine alumni living in Maine contributed an estimated \$2,662 on average.

Table 12. All UMaine Alumni Charitable Contributions, 2019

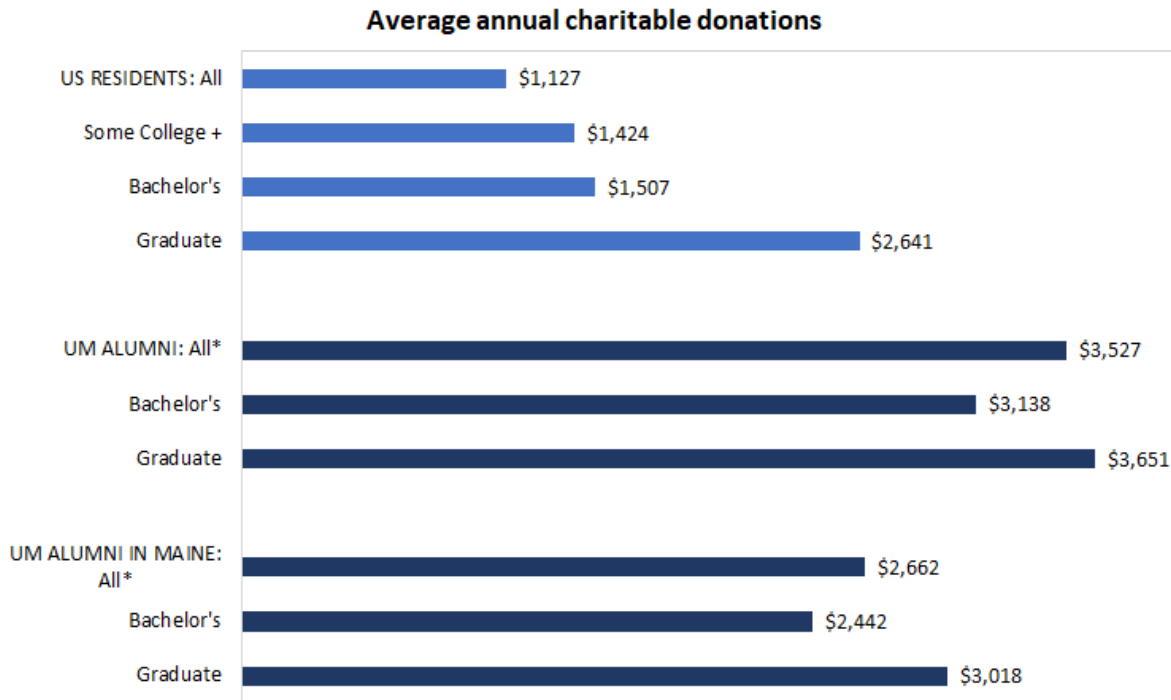
Organization	U.S. residents				UMaine alumni		
	All	Some college+	With bachelor's degree	With graduate degree	All	With bachelor's degree	With graduate degree
Charities	\$274	\$364	\$336	\$920	\$1,249	\$1,047	\$1,366
Religious Organizations	\$806	\$997	\$1,123	\$1,547	\$1,046	\$1,072	\$1,051
Educational Institutions	\$46	\$63	\$48	\$174	\$883	\$778	\$811
Other Organizations					\$341	\$237	\$416
All	\$1,127	\$1,424	\$1,507	\$2,641	\$3,527	\$3,138	\$3,651

*Source: Authors' calculations using the September 2017 Volunteer Supplement of the Current Population Survey, adjusted for inflation.

Table 13. UMaine Alumni in Maine Charitable Contributions, 2019

Organization	UMaine alumni in Maine		
	All	With bachelor's degree	With graduate degree
Charities	\$1,005	\$877	\$1,175
Religious Organizations	\$763	\$681	\$862
Educational Institutions	\$664	\$716	\$669
Other Organizations	\$221	\$166	\$294
All	\$2,662	\$2,442	\$3,018

*Source: Authors' calculations using the September 2017 Volunteer Supplement of the Current Population Survey, adjusted for inflation.



Source: Authors' calculations using survey results and U.S. Census Bureau, 2018 Consumer Expenditure Survey Public-Use Microdata, age 22 and older

*Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. residents.

Cultural engagement

A vital component to a thriving community is the presence of local arts and culture. The creative economy has shown to be a platform for community resilience and the mobilization of social capital, addressing the often-intangible factors leading to a successful community.²¹ UMaine alumni help support the arts (and the social fabric the arts help knit) throughout their communities by attending cultural events and activities. These include visiting historic sites (72%), art museums, galleries, or exhibits (56%), and attending live stage performances and craft or art fairs/festivals (50%).

²¹ Kelkar, N. P. y Spinelli, G. (2016). Building social capital through creative placemaking. *Strategic Design Research Journal*, 9 (2), 54-66

Table 14. UMaine Alumni Attendance at Cultural Activities in Past Year*

Activity	UMaine alumni			UMaine alumni in Maine		
	All	With a bachelor's degree	With a graduate degree	All	With a bachelor's degree	With a graduate degree
Dance performance						
Percentage attending	17.8%	16.1%	19.0%	17.6%	16.4%	18.6%
Median times	1.0	1.0	1.0	1.0	1.0	2.0
Mean times	2.3	2.3	2.2	2.3	2.4	2.1
Classical music performance						
Percentage attending	30.6%	26.1%	34.4%	29.7%	26.2%	32.4%
Median times	2.0	2.0	2.0	2.0	2.0	2.0
Mean times	3.3	2.8	3.6	3.2	2.4	3.9
Sporting event						
Percentage attending	48.1%	49.7%	47.8%	48.4%	51.0%	46.8%
Median times	3.0	3.0	3.0	3.0	3.0	3.0
Mean times	6.2	6.1	6.2	6.3	6.2	6.4
Live stage performance						
Percentage attending	50.1%	47.1%	52.7%	49.9%	48.1%	51.4%
Median times	2.0	2.0	2.0	2.0	2.0	2.0
Mean times	3.2	2.9	3.5	3.3	3.0	3.6
Other music or theater performance						
Percentage attending	45.6%	46.3%	44.9%	46.9%	46.2%	46.6%
Median times	2.0	2.0	2.0	2.0	3.0	2.0
Mean times	4.1	4.4	3.9	4.4	4.7	4.1
Art museum, exhibit, or gallery						
Percentage attending	56.0%	51.5%	61.0%	52.5%	48.6%	56.2%
Median times	2.0	2.0	3.0	2.0	2.0	3.0
Mean times	4.0	3.6	4.3	3.5	3.4	3.6
Craft or art fair/festival						
Percentage attending	50.3%	49.0%	51.0%	52.6%	50.9%	52.5%
Median times	2.0	2.0	2.0	2.0	2.0	2.0
Mean times	2.9	3.0	2.8	3.0	3.2	2.7
Historic sites						
Percentage attending	71.7%	70.7%	72.9%	68.9%	68.3%	69.2%
Median times	4.0	3.0	4.0	3.0	3.0	3.0
Mean times	6.6	6.2	6.9	6.0	6.0	5.6

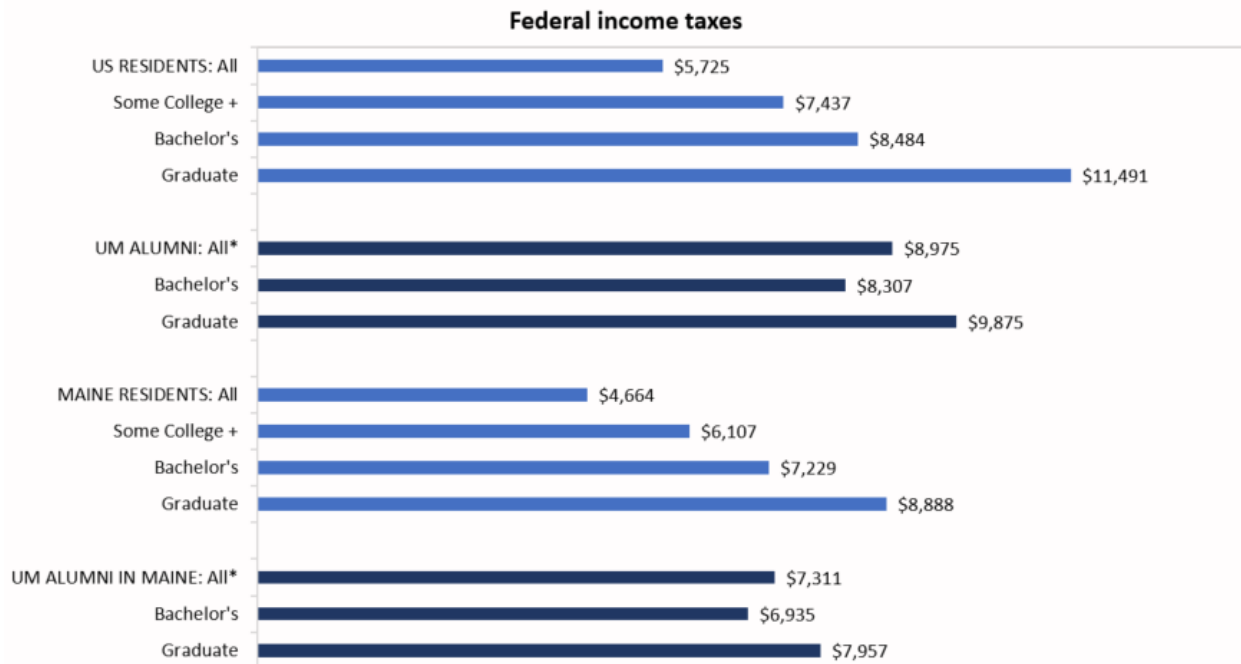
*Excludes K-12 school performances and events

Fiscal Impact

UMaine alumni also contribute to society through the fiscal system. The higher earnings associated with higher education create additional tax revenues, and these additional tax revenues benefit others by financing public services. The lower incidences of poverty, unemployment, etc. associated with college attainment also reduce government expenditures on public assistance and social insurance, which benefit others by freeing government resources for other public services and/or reducing taxes. This report is only able to approximately estimate the taxes that UMaine alumni pay, although previous research suggests that there are also significant fiscal benefits from reduced government spending on Medicaid, public assistance, various forms of social insurance, public healthcare, and corrections. Previous research indicates that including the reduced government spending would increase the estimated fiscal benefits by about 18%.²²

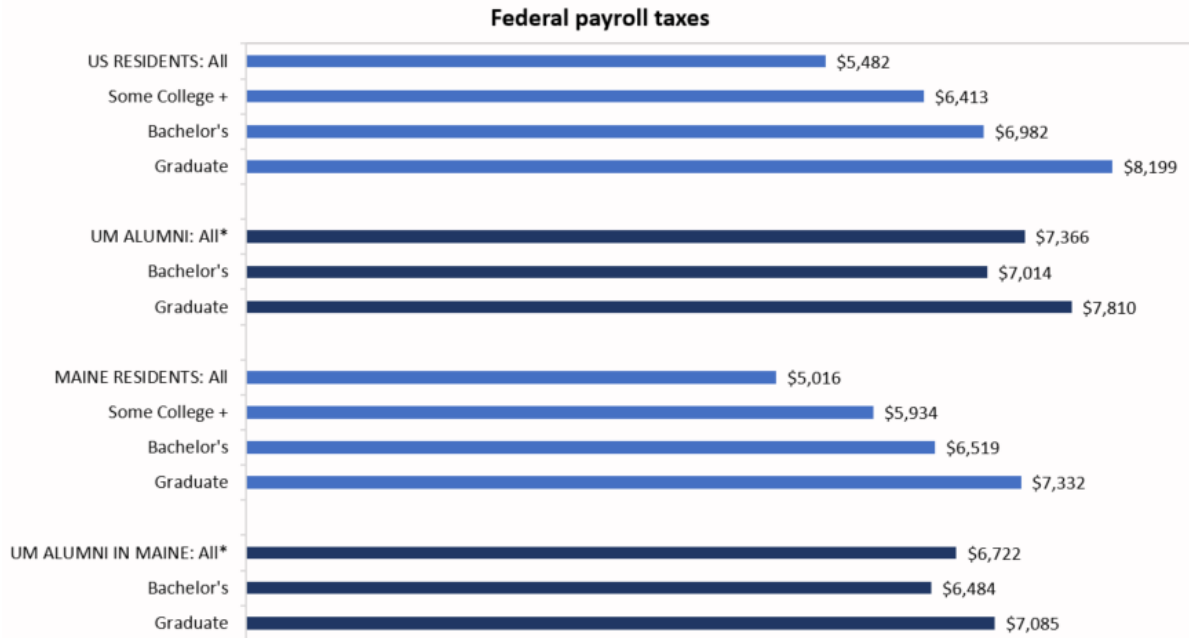
Federal taxes

UMaine alumni households pay an average of \$8,975 and \$7,366 in federal income and payroll taxes respectively. Those alumni living in Maine pay an average of \$6,722 in federal payroll taxes (compared to \$5,016 for all Maine residents) and \$7,311 in federal income taxes (compared to \$4,664 for all Maine residents).



Source: Authors' calculations using survey results and the 2017-2019 Social and Economic Supplement of the Current Population Survey (in constant dollars)
 *Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

²² Trostel, P. (2010). The fiscal impact of college attainment. *Research in Higher Education*, 51 (3), 220-247



Source: Authors' calculations using survey results and the 2017-2019 Social and Economic Supplement of the Current Population Survey (in constant dollars)
 *Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds most closely with the "Some College +" categories for U.S. and Maine residents.

State and local taxes

In total, Maine receives \$453 million in state tax revenues from alumni households. Comparing state and local taxes paid by UMaine alumni to the taxes paid by Mainers without a college education suggests that the extra tax revenues generated in Maine by the education received at UMaine is \$151 million annually. Put another way, the premium UMaine alumni households pay in state and local taxes far exceeds the \$84 million state appropriation to the University.²³

The total taxes (federal, state, and local) paid by UMaine alumni across the United States is nearly \$2.6 billion annually.

This contribution should be seen as conservative as it does not include federal taxes and fiscal impacts from businesses founded by UMaine alumni or the employees of those businesses, volunteer labor, charitable contributions, innovation and public service activities. It also does not include reduced government spending on Medicaid, public assistance, social insurance, public healthcare, and corrections.

²³ University of Maine, UMaine Budget Model Primer, 2020

Table 15. State and Local Taxes

	State Income Taxes	State & Local Property Taxes	State & Local Sales Taxes	Total State & Local Taxes
US RESIDENTS: ALL	\$1,421	\$2,258	\$2,995	\$6,674
Some College +	\$1,784	\$2,495	\$3,293	\$7,573
Bachelor's	\$2,007	\$2,665	\$3,463	\$8,134
Graduate	\$2,659	\$2,997	\$3,788	\$9,444
UM ALUMNI: ALL*	\$2,300	\$3,063	\$3,230	\$8,593
Bachelor's	\$2,117	\$2,986	\$3,117	\$8,220
Graduate	\$2,544	\$3,170	\$3,354	\$9,068
MAINE RESIDENTS: ALL	\$1,491	\$2,420	\$2,572	\$6,483
Some College +	\$1,890	\$2,684	\$2,867	\$7,441
Bachelor's	\$2,173	\$2,786	\$3,016	\$7,975
Graduate	\$2,599	\$3,007	\$3,229	\$8,835
UM ALUMNI IN MAINE: ALL*	\$2,222	\$2,852	\$3,110	\$8,184
Bachelor's	\$2,116	\$2,754	\$3,034	\$7,904
Graduate	\$2,399	\$2,979	\$3,217	\$8,595

Source: Authors' calculations using survey results, the 2017–2019 Social and Economic Supplement of the Current Population Survey (in constant dollars) and data from Wiehe et al "Who Pays? A Distributional Analysis of the Tax Systems in all 50 States" 6th Ed, the Institute of Taxation & Economic Policy, 2018.

* Since all UMaine alumni have some college education, even those who did not complete a degree, the "All" alumni category corresponds more clearly to the "Some College +" categories for U.S. and Maine residents.

Connection to (U)Maine

"More than 50 years ago, the people of Maine took a chance on me by providing me with an educational opportunity that continues to bear fruit. I shall always be grateful. UMaine is the college in my heart always."

As highlighted throughout this report, UMaine alumni go on to contribute to the economic, civic, and cultural fabrics of their communities here in Maine and in every state across the U.S. And their connections to Maine, its Flagship University, and lessons learned remain long after their time in Orono.

UMaine students hail from across the U.S. and around the world. Their paths after Orono reflect this diversity. Almost half of alumni (47%) stayed in-state after their time at UMaine. Females are more likely than males to report staying in Maine immediately after their college experience (52% versus 41%, respectively), as are younger alumni from the 2010s (57% versus 47% for all alumni).

Alumni who currently live in Maine cited friends/family (79%), spouse/partner (60%), and recreational activities (52%) as important reasons for living here. Almost three-fourths (73%) report planning to stay in Maine for the rest of their lives. Younger alumni from the 2010s are less likely (57%) to report planning to stay in Maine. This may be because they are still establishing themselves in their careers, following job and educational opportunities, and finding partners.

The Opportunity Maine tax credit plays a role in alumni's decisions to stay in Maine. This credit for college graduates began in 2008. Of UMaine alumni who graduated after 2007 and live in

Table 16. Factors Influencing UMaine Alumni to Live in Maine

Reason	Not Important	Neutral	Important	Not Applicable
Career opportunities	15%	36%	45%	4%
Pay back student loans	43%	14%	13%	30%
Pay/benefits	24%	46%	24%	6%
Cost of living	20%	42%	35%	3%
Weather	29%	42%	25%	4%
Educational opportunities	33%	39%	20%	8%
Recreational activities	12%	33%	52%	3%
Friends/family	5%	14%	79%	2%
Cultural/social	15%	40%	42%	3%
Spouse/partner	14%	14%	60%	12%

Maine, 30% reported taking advantage of Opportunity Maine. About half (53%) of these individuals said the tax credit was at least part of their reason for staying in Maine.

Alumni who currently live outside of Maine reported career opportunities (80%) and pay/benefits (60%) as important reasons for leaving. However, 18% of them say they plan to return to Maine someday. Younger alumni from the 2010s are more likely to report a willingness or plan to move back to Maine eventually than those who left several decades ago (19% compared to 4%-12%, respectively). Presumably, older alumni have established deeper professional and personal ties in their current location.

Table 17. Factors Influencing UMaine Alumni to Live Outside of Maine

Reason	Not Important	Neutral	Important	Not Applicable
Career opportunities	6%	8%	80%	6%
Pay back student loans	41%	12%	17%	30%
Pay/benefits	15%	17%	60%	8%
Cost of living	46%	26%	15%	13%
Weather	45%	23%	20%	12%
Educational opportunities	36%	21%	27%	16%
Recreational activities	39%	28%	20%	13%
Friends/family	33%	25%	31%	11%
Cultural/social	28%	29%	32%	11%
Spouse/partner	31%	12%	35%	22%

Students gain more than just the technical skills and qualifications that may come with a degree, certificate, or completion of a course during their college experience. Employers are often looking for workers with technical abilities alongside so-called soft skills. These include leadership, interpersonal, time management, and problem-solving skills.

The top skills alumni reported cultivating or strengthening during their time at UMaine include working as a team member (37%), effective time management, identifying and solving problems, and writing with clarity and purpose (34%), and self-confidence (33%).

Table 18. Top Ten Skills UMaine Alumni Cultivated or Strengthened at UMaine

Skill	Percentage of alumni who reported cultivating or strengthening each skill at UMaine
Interpersonal skills, cooperation, and working as a team member	37%
Effective time management and organization	34%
Identifying and solving problems	34%
Writing with clarity and purpose	34%
Self-confidence	33%
Setting objectives, priorities, and standards	33%
Planning and working towards long-term goals	32%
Listening actively with purpose and comprehension	31%
Communicating ideas clearly	31%
Decision making	31%

On top of these “soft skills”, alumni reported that their UMaine experience helped them develop social and global awareness (77%), understand moral and ethical issues (83%), become an active member of their community (73%), and assume leadership positions on boards and committees (74%). One alum noted, “While attending the University of Maine, I became aware of my actions. I learned to be good and kind.”

Table 19. How Well Their UMaine Experience Prepared UMaine Alumni

	Not at All	Very Poorly	Not Well	Moderately Well	Very Well	Unsure
Develop social/global awareness	3%	2%	13%	50%	27%	5%
Understand moral and ethical issues	2%	1%	8%	51%	32%	6%
Acquire broad knowledge in the arts and sciences	2%	1%	9%	49%	35%	4%
Be an active member of your community	5%	1%	14%	49%	24%	7%
Maintain a healthy lifestyle	7%	2%	19%	45%	21%	8%
Assume leadership positions on boards and committees	5%	1%	13%	46%	28%	7%

Looking back, 89% of UMaine alumni believe that the benefits they received from attending the University of Maine outweighed the financial costs and 84% feel that their UMaine experience positively influenced their career development.

Conclusion

This report highlights some of the ways that UMaine alumni—as citizens, employees and employers—contribute to their communities and the state. A UMaine education not only leads to substantially higher incomes for alumni, it raises others' incomes through business creation and benefits the rest of society through innovation and increased tax contributions for public services. UMaine alumni also contribute to the greater good through their substantial philanthropic contributions, civic engagement, and support of cultural amenities.

While the many measurable impacts outlined here are impressive, they still fail to reveal the full extent that the UMaine experience benefits its students and the state. No survey can capture all of the numerous immeasurable ways that a college education affects lives for the better. For instance, although the cultivation of creativity and critical thinking are clearly huge parts of a university mission, measuring the value of these important contributions is impossible. Moreover, this survey also did not capture some of the important benefits of a college education that have been shown in broader datasets. For example, college education leads to substantially longer life expectancies and better health generally. It also reduces reliance on social services and hence the burden on taxpayers.

This report also did not attempt to measure the direct contribution of UMaine as an institution – typically defined as the revenue generated by the University, and the spending of its employees, students and visitors. These typically emphasized economic contributions of universities are important, but they really are only the tip of the iceberg. The value below the surface is many times larger than what is visible on the surface. Hopefully this report has illuminated some of what all too commonly gets overlooked.

Appendix I: Methodology

The University of Maine Margaret Chase Smith Policy Center designed this survey in collaboration with the University of Maine Alumni Association, and implemented it between January and April of 2020. Surveys were sent via email to 38,980 alumni for whom the University of Maine Alumni Association had email addresses. Of those for whom no email address was on file, a random sample of 10,000 received an invitation to participate via mail. At the close of the survey in April, the survey had garnered 5,228 responses. The response rate was about 14% and is similar to the response rates seen in recent MIT and Stanford alumni surveys.

To infer the impact of the entire UMaine alumni population requires “scaling”²⁴ the observations in the sample. Each sample observation implicitly represents some number of people in the relevant population. If a sample of 1,000 observations comes from a population of 10,000 people, then each observation implicitly represents 10 people. Scaling the observations is assigning the number of people that each observation represents. Although simple in principle, scaling is potentially complicated and problematic for two reasons.

First, the population size is often not known precisely. The number of living UMaine alumni is unknown. Thus, it is not immediately obvious how many alumni are represented by the 5,228 survey responses.

Second, the sample is often not completely representative of its population. The responses to the survey of UMaine alumni may be disproportionately high or low in various dimensions. This could be due to some subgroups of alumni being more/less likely to be contacted for the survey and/or being more/less likely to complete the survey request. For these reasons not all of the survey observations should have the same scaling/weighting factor.

Previous studies for MIT and Stanford dealt with the second issue by estimating different scaling factors across gender-college-decade subgroups.²⁵ Their analyses found that their survey response rates depended the most on gender, college within the university, and decade of attendance. Thus, they calculated roughly 100 scaling factors for each gender-college-decade cell. Each scaling factor is computed as the inverse of the response rate for each cell.

This study follows the general MIT/Stanford approach. Based on their UMaine major, alumni are grouped into seven “colleges”:²⁶ College of Education and Human Development; College of Engineering; College of Liberal Arts and Sciences; College of Natural Sciences, Forestry, and Agriculture; Graduate School; Maine Business School; and Other. The “Other” college contains various subgroups that were individually too small to draw reliable inferences on their scaling/weighting factors. It includes UMaine alumni not graduating with a degree, obtaining an associate’s degree or certificate, obtaining a bachelor’s degree in the former University College, etc.

Alumni are also grouped into six decades from the 1960s through the 2010s. Everyone completing their education before 1970 is placed into the 1960s decade. The numbers of students in the 1940s and 1950s in some colleges, such as women in engineering and business, are far too few to draw

²⁴ In other contexts the term “weighting” is usually used to describe this procedure.

²⁵ Edward B. Roberts, Fiona Murray and J. Daniel Kim, “Entrepreneurship and Innovation at MIT Continuing Global Growth and Impact,” Massachusetts Institute of Technology Sloan School of Management, 2015.

²⁶ Some majors, such as economics, have been housed within different colleges and some of the college names have changed over the years. The categorization here follows the current UMaine college structure.

reliable inferences about their scaling factors. Thus, this report computes inverse response rates for 84 gender-college-decade subgroups ($2 \times 7 \times 6$).

The previous studies for MIT and Stanford did not address the first issue above. Evidently, those institutions had contact information for essentially all of their living alumni. If this is indeed the case, their alumni databases can be used to infer their population sizes, and their scaling is as straightforward as noted above. But this is not the case for UMaine.

The UMaine Alumni Association has contact information for 93,177 alumni, but this is probably only about 85% of the living alumni population.²⁷ This database suggests that each of the 5,228 survey responses represents about 17.8 people, on average. But this understates the appropriate average scaling factor for the number of UMaine alumni and their economic and community impacts. Moreover, in this instance the inverse response rates computed from the alumni database are not necessarily representative of the population subgroups. That is, some subgroups of alumni might be more/less likely to be contacted for a survey request, hence creating an additional possibility that the unweighted sample is not representative of all alumni.

Thus, the inverse response rates for the 84 gender-college-decade subgroups computed from the UMAA database only serves as a starting point for scaling the observations. To infer the total population of alumni the UMAA database is compared to UMaine records on degrees awarded (from the Office of Institutional Research and Assessment). Since not all recipients of degrees awarded decades ago are still alive, the degree data are adjusted downward based on average death rates. The latest average death rates are reported in the most recent life tables for American women and men from the National Center for Health Statistics.²⁸ The degree data do not have the ages of the recipients, though. Hence, it assumed that graduation ages are for “traditional” full-time students. That is, bachelors students are assumed to graduate at age 22, and graduate students at age 26.²⁹ This produces an estimated population of UMaine degrees, but there are several complicating factors.

First, UMaine records on degrees awarded only go back to 1985, but there are living UMaine alumni (and survey completers) going back to the 1940s. There are UMaine Library records, however, that report enrollment by college year going back to the 1940 academic year. That is, there are data on enrollment of seniors (and juniors, sophomores, etc.) that can be used to proxy degrees awarded that academic year. Examination of data on enrollment and degrees after 1985 suggests that senior enrollment is nearly identical to degrees awarded in earlier decades.

Second, college graduates have significantly longer life expectancies than average Americans.³⁰ Thus, the estimated population of UMaine degrees based on average death rates is on the low side. This is partially offset by some students obtaining degrees later than the traditional ages. Moreover, this report uses life tables for white American women and men because their death rates are noticeably lower than for Americans overall (and also because Maine has relatively little racial diversity). Nonetheless, the estimated population of UMaine degrees appears to be on the conservatively low side.

²⁷ Our calculations suggest that about 21,000 UMaine alumni since 1940 are now deceased (the majority of which graduated before 1970).

²⁸ “United States Life Tables, 2017” National Vital Statistics Reports, vol. 68, no. 7, 2019.

²⁹ Comparing graduate degrees to graduate enrollment at UMaine over the past 35 years indicates that the average graduate degree takes about 4.0 years. Moreover, this ratio has been steady over this period, and the less precise data from 1940 to 1985 suggest the same ratio.

³⁰ Lleras-Muney (2005), Meara, Richards, and Cutler (2008), Hummer and Lariscy (2011), Eide and Showalter (2011), Everett, Rehkopf, and Rogers (2013), and Clark and Royer (2013).

Despite this, the estimated number of “live” degrees awarded by UMaine since 1985 is 13.0% greater than the number of degrees reported in the UMAA database. Since 1985, UMaine has awarded 70,196 degrees (not including the relatively small number placed in the “Other” college category). The actuarial adjustment suggests that 67,864 of these degrees are held by living alumni. But the UMAA database indicates that its members possessed 60,070 degrees (not including those in the Other category) from UMaine since 1985.

The extent that degrees awarded by UMaine exceeds the number of degrees in the UMAA database was roughly constant since 1985. It is also essentially the same for women and men. But it varies noticeably across colleges. Graduates from the College of Engineering, the College of Natural Sciences, Forestry, and Agriculture, and the Maine Business School are relatively more likely to be in the UMAA database (the average yearly underestimate of degrees is, respectively, 8.9%, 9.3%, and 9.9%), while those from the College of Education and Human Development and the Graduate School are less likely to be included in the UMAA database (17.8% and 23.4%, respectively). Thus, the inverse response rates for the 84 gender-college-decade subgroups computed from the UMAA database are adjusted upwards by the estimated average yearly underestimation percentage for each college.

The third complicating factor is that there are no UMaine records on the numbers of students not eventually earning degrees. Thus, the inverse response rates for the Other college category are not adjusted upward as for the other colleges, and the scaling factors for this category err on the conservatively low side.³¹

Fourth, the comparison of the UMAA database and UMaine degree records are for degrees, not people. Numerous alumni have earned more than one degree from UMaine. In these instances of multiple UMaine degrees the scaling factor for each alumnus/alumna is their average scaling factors for each of their degrees.

Finally, the last complication arises because response rates are not independent of having multiple UMaine degrees. Alumni with multiple degrees are more likely to complete the survey, on average. The UMAA database indicates 1.128 degrees per alumni, but those completing the survey have 1.190 degrees per alumni. Hence, the above comparison of degrees awarded by UMaine to degrees in the UMAA database is 5.5% too low $[(1.128-1.190)/1.128]$. The scaling factors/weights are thus adjusted accordingly.

While the scaling factors are clearly important for estimating total impacts, these implicit weights have little impact on the estimated proportions and averages. For example, the tables below show the unweighted and weighted percentages of alumni businesses by industry group.

Similarly, when appropriate the scaling factors are adjusted upward to offset instances of unanswered questions within the survey. For example, if 2% of the survey respondents did not answer a question, then to correctly calculate the estimated total effect for that question each response for the 98% who did answer needs to be scaled up by an additional 2%.

³¹ This is unlikely to make a substantial difference to the results because the Other college category is not large. If this group is as underrepresented in the UMAA database as the average of the six colleges, then the estimate of the number of living UMaine alumni would increase by about 750.

Table A1.2. Businesses Started by UMaine Alumni by Industry

Industry	Percentage	
	Unweighted	Weighted
Accommodation and Food Services	3%	3%
Administrative and Support and Waste Management and Remediation Services	0%	0%
Agriculture, Forestry, Fishing, and Hunting	7%	8%
Arts, Entertainment, and Recreation	7%	7%
Construction	4%	4%
Educational Services	7%	7%
Finance and Insurance	3%	3%
Healthcare and Social Assistance	6%	6%
Information	6%	5%
Management of Companies and Enterprises	2%	2%
Manufacturing	5%	5%
Mining, Quarrying, and Oil and Gas Extraction	<1%	<1%
Other Services (except Public Administration)	8%	8%
Professional, Scientific, and Technical Services	23%	22%
Public Administration	1%	1%
Real Estate and Rental and Leasing	9%	9%
Retail Trade	7%	7%
Transportation and Warehousing	1%	1%
Utilities	<1%	<1%
Wholesale Trade	1%	2%

Income

All comparison data for annual income are from the 2018 (the latest available) Public Use Microdata Sample of the American Community Survey (ACS) conducted by the U.S. Census Bureau.³² It has detailed information for nearly 2.4 million adults at least 22 years of age.³³ More than 10,000 of these observations are from Maine residents.

To maintain comparability, instances of top-coded values in the ACS are applied to the survey data (for example, annual employee wages in Maine are top-coded at \$356,000; and this is applied in the survey data). Instances of categorical data in the survey data are applied to the ACS to create an apples-to-apples comparison.

Employment

The survey was conducted between January and April of 2020. This means that a portion of survey responses came after the March 13, 2020 Declaration of a National Emergency concerning the novel coronavirus (COVID-19) outbreak.

³² Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek. *IPUMS USA: Version 9.0* [dataset]. Minneapolis, MN: IPUMS, 2019. <https://doi.org/10.18128/D010.V9.0>.

³³ The sample is restricted to those at least 22 years old to be more strictly comparable to the Survey data where all but two respondents are at least 22 (both are age 21, but only one reported household income).

About fifteen percent of our respondents completed the survey on, or after, this national emergency declaration. For most of the questions in our survey which targeted economic information (income, earnings, or businesses status, etc.) respondents were asked to provide information for 2018 (to enable comparison to national datasets). However, our question about employment asked respondents about their 'current' employment status.

Employment figures throughout the report include results from both before and after March 13. UMaine alumni labor force participation and unemployment rates are compared to estimates calculated from the 2020 Current Population Survey (January through March). The first quarter (January through March) Bureau of Labor Statistics data on employment by industry and occupation at the state level were not available at the time of this report. Therefore, we used 2019 Bureau of Labor Statistics Quarterly and Annual Industry Employment and Wages data and 2019 Occupational Employment Statistics Program Occupational Employment and Wage Estimates data to arrive at a general estimate of the proportion of UMaine alumni working in various industries and occupations in Maine. This indicates that our results on the share of alumni working across all industries and occupations in Maine are conservative, as our data on alumni include some information on the employment of alumni after the lockdowns began, and we are comparing to datasets (from 2019) which do not capture this tumultuous time. Our results should be taken as conservative estimates of the magnitude of UMaine alumni working across various industries and occupations in Maine prior to the coronavirus outbreak.

Industry and Occupation

Business owners were asked to answer questions as they related to the year 2018. All comparison data for industries and occupations of employment are from the 2018 County Business Patterns and Bureau of Labor Statistics Nonemployer Statistics.

Fiscal Impacts

It was not possible to collect direct information on taxes paid, value of Medicaid and public assistance, etc., as it would have been too invasive. Therefore, inferences were made about taxes paid by household income category. These effects are computed using the 2017-2019 Social and Economic Supplement of the Current Population Survey (in constant dollars) and applying the results to the survey data. Estimates for state sales tax are formulated utilizing data from Wiehe et al (2018).³⁴ The survey data and Current Population Survey data were treated in a consistent manner to enable comparison.

³⁴ "Who Pays? A Distributional Analysis of the Tax System in all 50 States" 6th ed, The Institute on Taxation and Economic Policy, 2018.

Appendix II: Survey Respondents

The survey methodology described in Appendix I yielded 5,228 responses from a broad spectrum of UMaine graduates living across the U.S. The tables below show their demographic and geographic distribution.

Table A2.1. Demographics of Survey Respondents

Category	Percentage
Male	54%
Female	46%
White Alone	90%
Race Other than White Alone	10%
Currently live in Maine	49%
Currently not live in Maine	51%
First Generation College Student	38%
Obtained Highest Degree at UMaine	58%

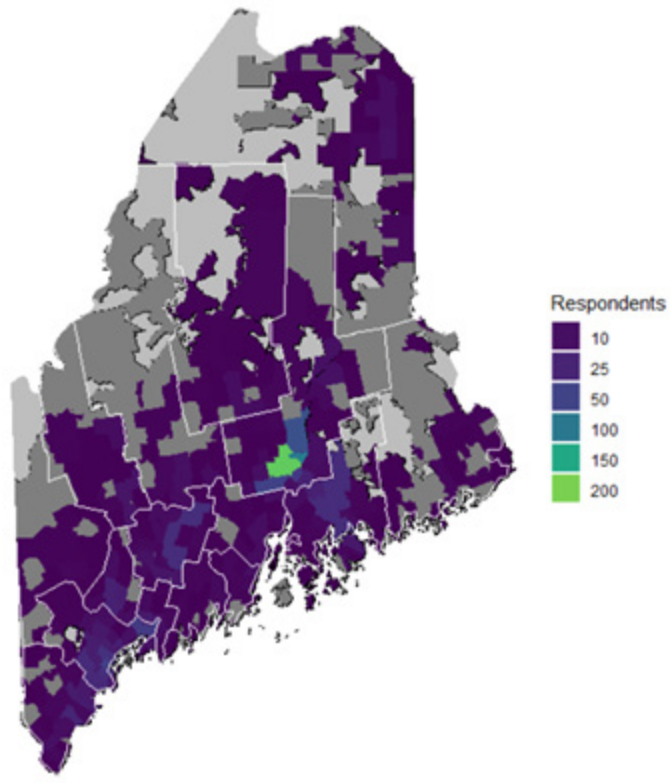
Table A2.2. Survey Respondents by Graduation Decade

Decade	Number	Percentage total respondents
1940s	5	<1%
1950s	155	3%
1960s	564	12%
1970s	941	20%
1980s	885	18%
1990s	633	13%
2000s	716	15%
2010s	919	19%

Table A2.3. UMaine Degrees Obtained by Survey Respondents

Degree	Percent
Associate's	3%
BA	29%
BS	43%
MA/MS	20%
PhD	3%
Certificate	3%

UM Alumni Maine Survey Respondents by Zip



Appendix III: Differences by Gender

The occupations and industries of employment reported by UMaine alumni vary significantly by gender. Most notably, female alumnae, who accounted for 46% of survey respondents, account for 74% and 72%, respectively of alumni working in Education Services and Healthcare and Social Assistance. Women account for a disproportionately low percentage of alumni working in Manufacturing (27%) and Professional, Scientific, Management, and Administrative Services (35%). Women are also notably underrepresented in Computer and Mathematical occupations (33%).

Compared to their male counterparts, a larger proportion of female alumnae are employed in the public sector (63%) and nonprofit companies (68%). A relatively lower percentage (37%) are employed by a private for-profit company. This is consistent with the industry and occupation results, since many institutions that provide education and healthcare, such as schools and hospitals, fall into these sectors. Female alumnae entrepreneurs were also slightly more likely than males to have founded a nonprofit business rather than a for-profit enterprise (20% versus 15%, respectively).

Consistent with national trends, 35 UMaine female alumnae are less likely than males to have founded a business. Twenty percent of alumnae have started at least one business, compared to 27% of their male counterparts. Similarly, females are less likely to have engaged in activities that support innovation. Of those who have served on for-profit and scientific advisory boards, only 19% are women. However, women make up a higher proportion of alumni who have served as angel investors (46%) and members of nonprofit boards (44%).

³⁵ Sari Pekkala Kerr, William R. Kerr and Tina Xu (2018), "[Personality Traits of Entrepreneurs: A Review of Recent Literature](#)", *Foundations and Trends in Entrepreneurship*: Vol. 14: No. 3, pp 279-356.

Appendix IV: Differences by Age

UMaine alumni of all ages have become entrepreneurs. While the popular conception of an entrepreneur may be a young 20-something, research shows that older individuals often have more skills, resources, and time to support entrepreneurial activities.³⁶ The responses of UMaine alumni entrepreneurs confirm this trend. Thirty-eight percent of alumni entrepreneurs reported starting their first business in their thirties, and another 38% started in their forties or later.

Table A4.1. UMaine Alumni Age at Founding First Business

Age	Percentage
Twenties	24%
Thirties	38%
Forties	21%
Fifties	12%
Sixties	5%
Seventies	<1%

As a result of this trend, rates of entrepreneurship range from 26% to 30% for alumni who completed their education before founding a business through the 1980s, and from 11% to 23% for more recent alumni. In time, it is likely that younger alumni will eventually reach the higher entrepreneurship rates of older alumni.

Table A4.2. Percentage of Alumni Entrepreneurs by Decade

Decade	Percentage of alumni who have founded at least one business	Percentage of all alumni entrepreneurs
Prior to 1970s	26%	14%
1970s	30%	21%
1980s	26%	22%
1990s	23%	19%
2000s	17%	15%
2010s	11%	9%

Although younger UMaine alumni have lower entrepreneurship rates, their class sizes are larger, so they make up a greater proportion of total alumni entrepreneurs. About one-fourth (24%) of all alumni entrepreneurs completed UMaine after 1999.

³⁶ Sari Pekkala Kerr, William R. Kerr and Tina Xu (2018), "[Personality Traits of Entrepreneurs: A Review of Recent Literature](#)", Foundations and Trends in Entrepreneurship: Vol. 14: No. 3, pp 279-356.

Appendix V: Additional Findings

Table A5.1. UMaine Alumni Employment by Occupation, 2018

Occupation*	Percentage all UMaine alumni employees	Percentage all Maine employees**	Percentage all United States employees**
Management Occupations	31%	6%	5%
Business and Financial Operations Occupations	9%	4%	6%
Computer and Mathematical Occupations	3%	2%	3%
Architecture and Engineering Occupations	10%	2%	2%
Life, Physical, and Social Science Occupations	6%	1%	1%
Community and Social Service Occupations	4%	2%	2%
Legal Occupations	2%	1%	1%
Educational Instruction and Library Occupations	19%	7%	6%
Arts, Design, Entertainment, Sports, and Media Occupations	3%	1%	1%
Healthcare Practitioners and Technical Occupations	6%	7%	6%
Healthcare Support Occupations	<1%	6%	4%
Protective Service Occupations	<1%	2%	2%
Food Preparation and Serving Related Occupations	<1%	10%	9%
Building and Grounds Cleaning and Maintenance Occupations	<1%	4%	3%
Personal Care and Service Occupations	<1%	2%	2%
Sales and Related Occupations	2%	9%	10%
Office and Administrative Support Occupations	5%	13%	13%
Farming, Fishing, and Forestry Occupations	1%	<1%	<1%
Construction and Extraction Occupations	<1%	5%	4%
Installation, Maintenance, and Repair Occupations	<1%	4%	4%
Production Occupations	<1%	6%	6%
Transportation and Material Moving Occupations	<1%	8%	9%
Total	100%	100%	100%

*Standard Occupational Class System, two-digit codes

**Source: Bureau of Labor Statistics, Occupational Employment Statistics

Table A5.2. Reasons UMaine Alumni Entrepreneurs Started First Business

	Not Important	Neutral	Important
To address need I faced	38%	29%	33%
To address others problems	42%	29%	29%
Found great technology	77%	13%	10%
Wanted to be own boss	23%	24%	54%
Could make most money	38%	36%	26%
Desire to change the industry/world	51%	25%	24%
Major IPO/acquisition showed opportunity	88%	8%	4%