Economic Contributions of the
FLORIDA ACADEMIC CANCER CENTER ALLIANCE

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Photo Credit: H. Lee Moffit Cancer Center.

EXECUTIVE SUMMARY

This study evaluated the economic contributions of hospital clinical and research operations as well as capital improvement expenditures for the three large cancer hospitals in the Florida Academic Cancer Center Alliance (FACCA) during fiscal years 2016-2019, to evaluate the economic contributions and social return on investment associated with funding provided by the State of Florida in support of the Florida Consortium of National Cancer Institute (NCI) Center Program.

The health care industry is a major driver of economic activity in the United States (U.S.) and can be a source of economic development and job growth for local communities. Demand for health care services is increasing in Florida due to its rapidly growing population and significant share of the total population that is over the age of 65, who potentially requiring relatively greater amounts of services from health care. The health care sector has grown faster than the overall economy both in Florida and the U.S.

Across the three institutions during this period, the scope of cancer-related activities increased in terms of number of hospital beds (8.6%), building area (16.5%), patient volume (29.5%), employment (20.3%), and annual revenues (55.9%). Total revenues over the four-year period were $6.241 billion, or an average of $1.560 billion annually, while total employment averaged 11,034 FTE jobs. Revenues included $246.9 million in special funding received from the State of Florida under the Florida NCI Program, and $29.2 million in matching research grants and other revenues. Capital expenditures totaled $430.6 million, used mainly for new building construction, existing building renovations, and major medical equipment.

The broad economic contributions of the FACCA institutions in the State of Florida were evaluated with a regional economic model constructed using licensed IMPLAN© Pro software and associated state-level data for 2019 (IMPLAN Group, LLC), which enables estimation of multiplier effects of industry activities in the local economy arising through industry supply chain purchases (indirect effects) and spending by employee households (induced effects).

Total employment contributions for the FACCA institutions over four years were estimated at 94,659 job-years, or an annual average of 23,665 jobs for all fulltime and part-time/seasonal positions supported throughout the economy. Contributions to labor income (wages, salaries, benefits, business owner income) averaged $1.303 billion annually, value added contributions to Gross State Product (GSP) averaged $1.911 billion annually, and output contributions to business revenues averaged $3.551 billion annually. In addition to the health/social services sector, economic contributions occurred broadly throughout the state economy in Educational services, Accommodation and food services, Professional, scientific, and technical services, Real estate and rentals, Finance and insurance, Retail trade, Construction, Wholesale trade, Transportation and warehousing, and Other services. Total tax contributions of FACCA averaged $390 million annually, including $100 million in state-local taxes and $290 million in federal taxes.

The ratio of total value added to direct output contributions of FACCA institutions represented a social rate of return on investment of 118 percent.

Photo Credit: UF Health

Cancer & Genetics Research Complex;
Photo Credit: UF Health

INTRODUCTION

Demand for health care in the United States (U.S.) and Florida is rapidly growing in part due to the ageing population. According to U.S. Census data, within the U.S., Florida had the largest percentage of residents aged 65 and older (17.3%) in 2010 and is projected to grow to 27.1% by 2030 (Werner, 2011). The incidence of cancer in the global population is also increasing and represents a great public health challenge. Cancer causes over 500,000 deaths annually in the U.S. and is second only to heart disease as a cause of mortality (AACR). Florida has the second highest incidence of cancer in the U.S., with over 117,000 cases diagnosed annually, and it is the leading cause of death in the state (American Cancer Society). Fortunately, cancer treatment is also rapidly involving, now encompassing more specialized care that takes the complex, unique genetic and lifestyle factors of individual patients into account. Many forms of cancer have become more survivable due to scientific and clinical advances; for example, in 2018 cancer mortality rates dropped by 2.4 percent (AACR, 2021).

Florida is home to three prestigious institutions specializing in cancer care that comprise the Florida Academic Cancer Center Alliance (FACCA): H. Lee Moffitt Cancer Center and Research Institute (Moffitt), University of Florida Health Cancer Center (UF-Health CC), and University of Miami Sylvester Comprehensive Cancer Center (UM-Sylvester). The Florida Consortium of National Cancer Institute Centers Program was created under Florida statute 381.915 to enhance the quality and competitiveness of cancer care in Florida, to further statewide biomedical research, capitalize on educational opportunities, and bring the economic benefits of high-paying jobs and increased retention of top talent within the state.

This study evaluated the economic contributions of hospital clinical and research operations as well as capital improvement expenditures for FACCA during fiscal years 2016-2019. The study was commissioned to specifically evaluate the economic contributions and social return on investment associated with the Florida Consortium of National Cancer Institute Centers Program (FCNCICP) funding provided by the State of Florida in support of an application for designated Cancer Centers under the National Cancer Institute (NCI) within the National Institutes of Health (NIH). Moffit and UM-Sylvester are already NCI designated Cancer Centers, while UF-Health CC is seeking the prestigious NCI designation that brings global recognition, greater access to federal funding, an advantage in recruiting top scientists and physicians, and greater opportunities for interdisciplinary collaboration, all of which are key for more effective cancer treatment and better patient outcomes. Nearly all the 50 top-ranked cancer hospitals in the U.S. are NCI designated Cancer Centers (U.S. News and World Report). Eligibility for NCI designation requires a minimum of $10 million in annual peer-reviewed grant funding. The application and approval process for NCI designation involves an extensive written application as well as a site visit with numerous peer reviewers. Applicants must demonstrate a history of multi-disciplinary collaboration and education, impacts on professional practice and policy, and benefits to the community. Attainment of an additional NCI Cancer Center in Florida could enhance the economic competitiveness of the state and bring it into the top ranks among other states, including California, New York, Pennsylvania, Texas and North Carolina (Florida Department of Health, 2020).

University of Miami Sylvester Comprehensive Cancer Center.

Following are some examples of specific cancer research and clinical projects undertaken by FACCA institutions.

University of Miami Sylvester Comprehensive Cancer Center. Lung cancer is the leading cause of cancer death in the U.S., with more than 200,000 cases diagnosed annually (American Cancer Society, 2022). The results of a clinical trial showed that lung cancer patients treated with immunotherapy pembrolizumab (Keytruda) lived longer and had fewer side effects than patients on standard chemotherapy. This study contributed to the practice-changing FDA approval of the targeted therapy for lung cancer.

Prostate cancer is the most common cancer for men, with 34,500 men estimated to die from the disease this year (American Cancer Society, 2022). Extending radiation therapy to the pelvic lymph nodes in combination with short-term hormone therapy had clear benefits over radiation of the prostate bed and hormone treatment after prostate removal, with 89.1% of patients free of disease after 5 years (Gardner and White, 2018). The study results have changed practice patterns internationally.

UM-Sylvester's service area is a four-county region that spans over 10,000 square miles and is located within the Southeast "corner" of the Florida peninsula. Access to healthcare is, in part, challenged by the unparalleled diversity in race/ethnicity, ancestry, and culture that is increasingly the hallmark of South Florida. Since 2018, Sylvester has participated in over 2,100 community health events with its *Game Changer* mobile clinic, providing cancer screenings for over 3,300 individuals in underserved communities.

H. Lee Moffitt Cancer Center and Research Institute. The Florida Pancreas Collaborative is a FACCA-funded project to develop a biospecimen and imaging bank for study of racial and ethnic disparities in pancreatic cancer research, and to date has 378 participants from vulnerable populations at 15 sites throughout the state (Permuth et al., 2019).

An innovative data science training grant funded by NCI provides advanced training for postdoctoral associates through mentoring, structured coursework, including instruction on artificial intelligence and machine learning, as well as other career development activities over five years (National Cancer Institute Grant T32 CA233399).

Translation of discoveries into innovative clinical studies included a phase 1 trial that found cell therapy with autologous TILs (Tumor infiltrating Lymphocytes) is generally safe & clinically active & may constitute a new treatment strategy in metastatic lung cancer (Creelan et al., 2021).

University of Florida Health Cancer Center. New anticancer agents were developed to promote age-related breakdown (senescence) of proteins in leukemia cells (Prasanna et al., 2021; Kim et al., 2021). Advances in understanding the role of RNA biology in cancer have led to better protection against DNA damage during stress (Sheng et al., 2021), and targeting of gene expression to regulate childhood leukemia (Fields et al., 2021).

A new therapeutic vaccine was developed to promote T-cells against brain tumors (Flores et al., 2019), and an RNA nanoparticle-based vaccine technology was developed to promote T-cells against melanoma, osteosarcoma (bone), head/neck, pancreatic and ovarian cancers (Grippin et al., 2021).

A virtual human support system was developed to administer colon cancer screening in rural and minority patient populations (Krieger et al, 2021).

The *OneFlorida+* research consortium, funded by Florida NCI Cancer Centers Act, supports 19 cancer-related epidemiological studies, including development of geocoded database of deidentified health records of 17 million Florida residents.

Photo Credit: UF Health.

HEALTHCARE INDUSTRY IN FLORIDA

In addition to providing care and saving lives, the health care industry is a major driver of economic activity in the U.S. and can be a source of economic development and job growth for local communities. Hospitals are an important component of the health care industry, providing acute care, trauma, psychiatric, and rehabilitation services, and contributing to the improvement of overall health and well-being in their local communities. While the existence of and access to health care services are essential for any population, the demand for these services is increasing in Florida due to its large, rapidly growing population, especially persons aged 65 and over.

Broadly defined, health care and allied manufacturing and support services industries in Florida in 2019 had total employment of 1.22 million fulltime and part-time jobs, $165.69 billion in business revenues, $95.85 billion in value added, and $80.45 billion in labor income or employee and small business owner earnings (Table 2.1). The health care industries represented 9.6 percent of overall direct employment in the state, 8.7 percent of value added or Gross State Product (GSP), and 12.3 percent of statewide labor income. Hospitals and offices of physicians were the largest individual sectors of the healthcare industry, with direct employment of more than 300,000 jobs each.

Table 2.1. *Profile of healthcare and allied industries in Florida, 2019.*

Industry	Employment (Fulltime, Part-time Jobs)	Output (M$)	Value Added (M$)	Labor Income (M$)
Hospitals	308,556	55,189	27,750	23,226
Offices of physicians	307,640	41,957	27,913	26,301
Nursing and community care facilities	177,850	13,739	7,623	6,852
Home health care services	94,203	5,461	4,261	4,399
Outpatient care centers	71,826	7,324	3,923	4,186
Offices of dentists	71,820	8,347	5,841	4,326
Offices of other health practitioners	67,927	7,519	5,673	3,500
Residential mental retardation, mental health, substance abuse and other facilities	33,288	2,283	1,444	1,339
Medical and diagnostic laboratories	30,404	4,716	3,211	1,996
Other ambulatory health care services	20,358	2,254	1,401	1,212
Surgical and medical instrument manufacturing	10,473	3,360	1,401	949
Pharmaceutical preparation manufacturing	6,188	8,605	3,231	731
Surgical appliance and supplies manufacturing	5,510	1,715	618	401
Ophthalmic goods manufacturing	4,731	1,417	797	504
Dental laboratories	3,823	444	273	266
Medicinal and botanical manufacturing	1,471	774	228	104
Dental equipment and supplies manufacturing	910	253	114	79
In-vitro diagnostic substance manufacturing	495	218	82	50
Biological product (except diagnostic) manufacturing	166	114	61	25
Total All Sectors	**1,217,640**	**165,688**	**95,845**	**80,448**
Share of Florida Total	**9.6%**	**8.4%**	**8.7%**	**12.3%**

Source: IMPLAN© *model for State of Florida (Implan Group, LLC).*

Photo Credit: H. Lee Moffit Cancer Center.

Activity in the health care sector has grown dramatically compared to many other sectors of the economy. Total value added (or GSP) for health care sectors in Florida grew at an average annual rate of 4.46 percent from 1997 to 2019 in inflation-adjusted terms, as shown in Figure 2.1, compared to 3.34 percent for the economy as a whole. At the national level, health care grew by 3.93 percent versus 2.96 percent for the broader economy during this time (USDOC-BEA). Recent GSP growth for Florida hospitals during 2016-19 averaged 2.45 percent annually. The most recent data for Florida hospital GSP in 2020 showed a 2.31 percent decline from 2019 likely due to the COVID-19 pandemic, and is considered an anomaly in the long term trend.

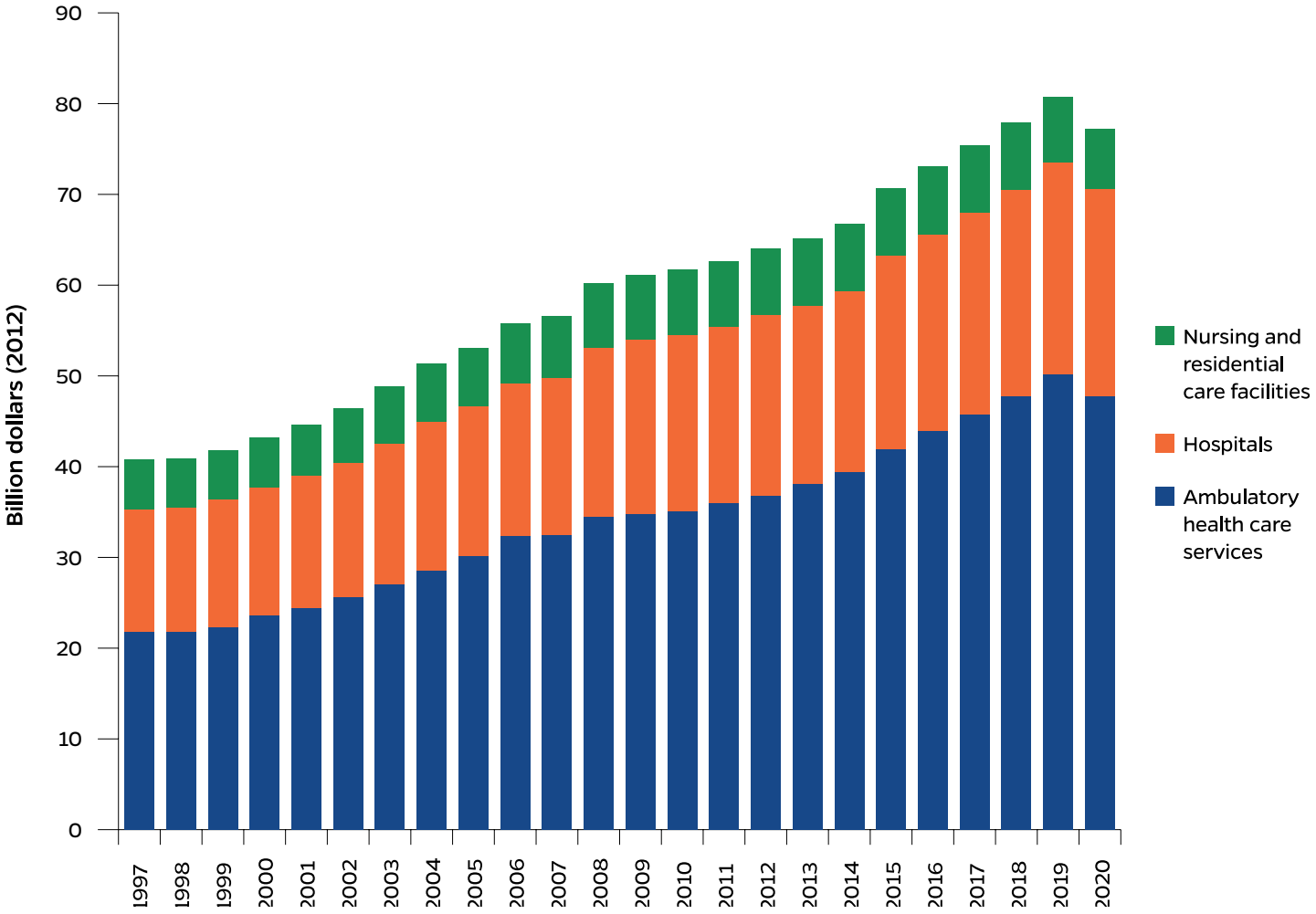

Figure 2.1. *Trend in Florida health care industry GSP, 1997-2020.*
Source: U.S. Commerce Department, Bureau of Economic Analysis.

DATA AND METHODOLOGY

FACCA Data

Data on number of hospital beds, building area, patient volumes, employment, revenues, and capital expenditures were obtained from the three FACCA institutions for the four-year period of fiscal years 2016 through 2019. The data were supposed to represent only cancer-related activity, and in some cases institution staff estimated the share of overall activity attributable to cancer-related activity based on patient volumes or other metrics. All data were aggregated for the three institutions to avoid disclosure of confidential information. The data provided are summarized in Table 3.1 and Figures 3.1 to 3.4.

Table 3.1. *Summary of primary data on hospital beds, patient volumes, employment, revenues, and capital expenditures by fiscal year for the Florida Academic Cancer Center Alliance.*

Item	FY 2016	FY 2017	FY 2018	FY 2019	Total Four Years
Hospital beds	1,392	1,432	1,578	1,512	
Building area (sq.ft.)	7,278,064	7,633,623	8,454,618	8,476,081	
Cancer patient volume					
Inpatient	28,644	31,999	47,244	48,166	156,053
Outpatient	734,032	811,332	878,824	939,843	3,364,031
Total	**762,676**	**843,331**	**926,068**	**988,009**	**3,520,084**
Cancer Center employment by function (FTE-years)					
Patient care (doctors, nurses, therapists, medical technicians)	5,192	5,465	6,141	6,476	23,274
Teaching (professors, lecturers, graduate teaching assistants)	174	171	162	181	688
Research (professors, scientists, lab technicians, graduate research assistants)	3,212	3,172	3,357	3,368	13,108
Support (clerical, administrative, food service, physical plant, foundation, etc.)	1,473	1,657	1,863	2,070	7,064
Total	**10,051**	**10,465**	**11,523**	**12,095**	**44,134**
New hires on special state funding	37	86	61	58	242
Cancer Center annual revenues by function					
Clinical patient care (insurance, Medicaid/Medicare, self pay, etc.)	$929,843,900	$1,067,429,958	$1,344,704,878	$1,451,651,183	$4,793,629,919
State Appropriations	$56,022,162	$53,007,974	$71,805,911	$71,318,031	$252,154,078
Research grants (incl. indirect funding)	$202,377,662	$218,169,343	$242,842,576	$274,942,247	$938,331,829
Other (donations, gift shop, cafeteria, parking, non-operating, etc.)	$26,472,352	$35,701,035	$99,082,884	$95,546,146	$256,802,416
Total	**$1,214,716,076**	**$1,374,308,310**	**$1,758,436,249**	**$1,893,457,607**	**$6,240,918,241**
Florida NCI program funding received from State of Florida	$61,725,000	$61,725,000	$61,725,000	$61,725,000	$246,900,000
Research grants and other matching revenues to special state funding	$5,696,574	$7,511,781	$6,674,619	$9,278,996	$29,161,970

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Table 3.1. (continued) *Summary of primary data on hospital beds, patient volumes, employment, revenues, and capital expenditures by fiscal year for the Florida Academic Cancer Center Alliance.*

Item	FY 2016	FY 2017	FY 2018	FY 2019	Total Four Years
Cancer Center capital expenditures					
New building construction	$28,690,881	$1,939,725	$66,642,623	$24,698,942	$121,972,171
Existing building renovation	$19,089,749	$19,290,099	$23,441,632	$21,211,762	$83,033,243
Information Technology	$13,329,540	$8,932,363	$5,637,956	$4,515,008	$32,414,868
Major medical equipment	$8,992,851	$24,856,559	$15,708,281	$25,109,481	$74,667,172
Research Equipment	$4,078,476	$5,869,718	$3,822,826	$3,153,192	$16,924,213
Vehicles	$100,068	$60,100	$207,921	$266,765	$634,854
Land	$0	$11,793,900	$0	$0	$11,793,900
Other	$24,187,322	$21,952,693	$14,549,263	$28,513,739	$89,203,017
Total	**$98,468,888**	**$94,695,157**	**$130,010,503**	**$107,468,889**	**$430,643,437**

Note that Fiscal year for UM-Sylvester ends in May 31, fiscal years for Moffitt and UF-Health end June 30.
Source: Moffitt, UF-Health CC, UM-Sylvester.

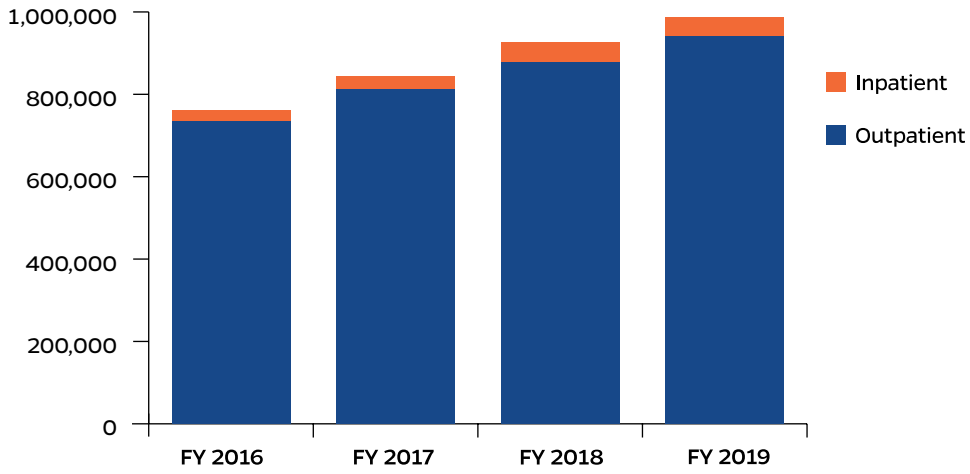

Figure 3.1. *Trend in annual patient volumes for the Florida Academic Cancer Center Alliance, FY 2016-2019.*

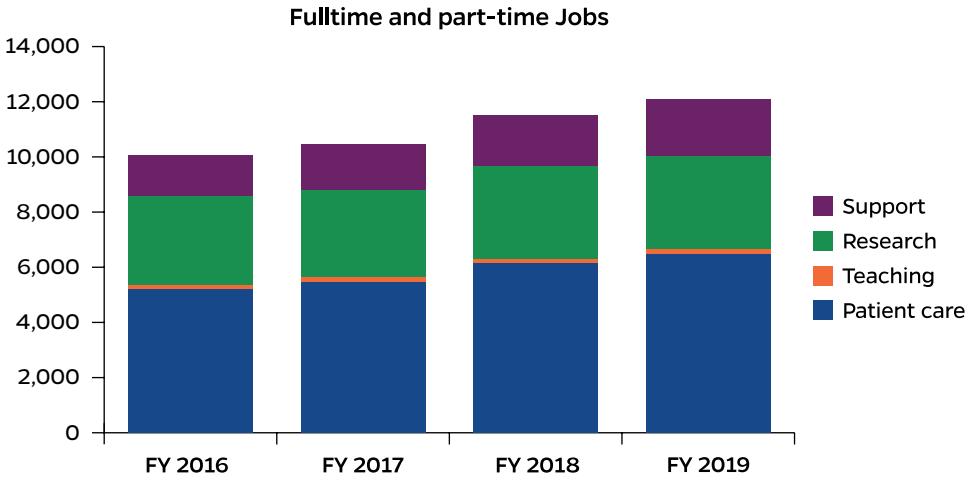

Figure 3.2. *Trend in annual employment for the Florida Academic Cancer Center Alliance, FY 2016-2019.*

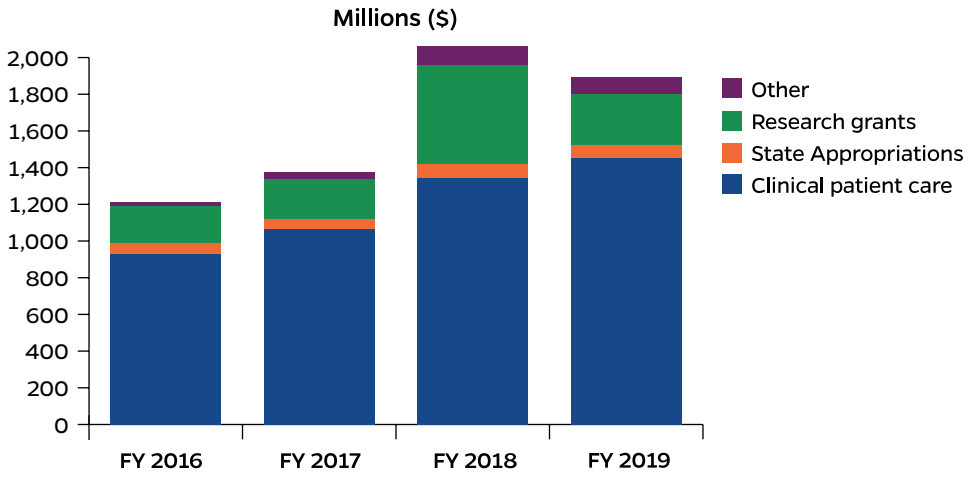

Figure 3.3. *Trend in annual revenues for the Florida Academic Cancer Center Alliance, FY 2016-2019.*

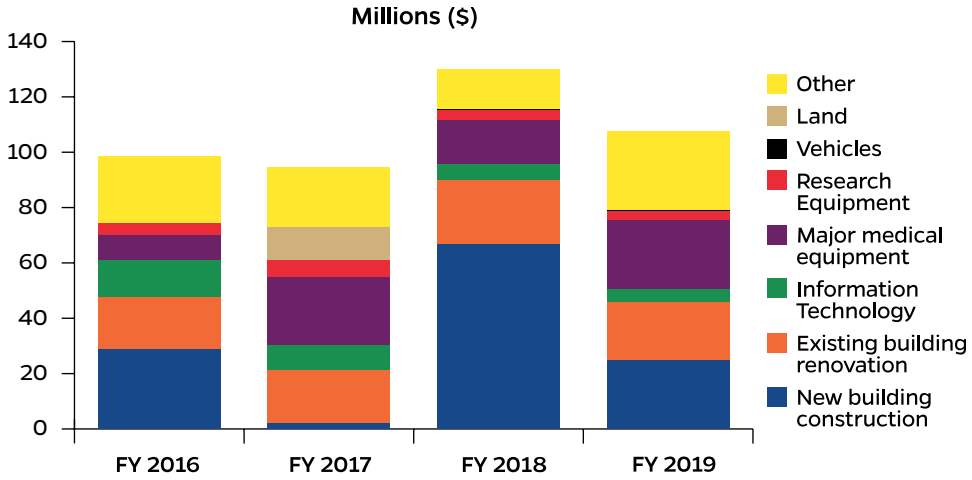

Figure 3.4. *Trend in annual capital expenditures for the Florida Academic Cancer Center Alliance, FY 2016-2019.*

Across the three institutions, the number of hospital beds increased from 1,392 in fiscal year (FY) 2016 to 1,512 in FY 2019 (Figure 3.1), representing an increase of 8.6 percent, while total building area increased from 7.3 to 8.5 million square feet (+16.5%). Cancer patient volume increased by 29.5 percent, from 762,676 in FY 2016 to 988,009 in FY 2019. Overall cancer patient volume during this period was over 95 percent outpatients, however, inpatient volumes increased substantially (+68.2%).

FACCA institution employment rose by 20.3 percent from 10,051 fulltime equivalents (FTE) in FY 2016 to 12,095 in FY 2019 (Figure 3.2). Employment by function over the four-year period was highest for patient care (doctors, nurses, therapists, medical technicians) at 52.7 percent, followed by researchers (professors, scientists, lab technicians, graduate student research assistants) at 29.7 percent, support personnel (administrative, clerical, food service, physical plant, foundation, etc.) at 16.0 percent, and teaching (professors, lecturers, graduate teaching assistants) at 1.6 percent.

FACCA annual revenues increased from $1.215 billion in FY 2016 to $1.893 billion in FY 2019, totaling $6.241 billion over the four-year period (Figure 3.3). The revenue trend represented a 55.9 percent increase over the period, or an 18.6 percent average annual increase, which was significantly greater than the 8.49 percent average annual growth in direct output (or sales revenue) for all Florida hospitals. Revenues by function included $4.794 billion (76.8%) for clinical patient care and $938.3 million (15.0%) for research grants, with lesser amounts for state appropriations ($252.1 million, 4.0%) and miscellaneous other revenues ($256.8 million, 4.0%) such as donations, retail sales, food service, parking, and non-operating (Table 3.1). These revenues included $246.9 million in special funding received from the State of Florida under the Florida NCI program over the four years, and $29.2 million in research grants and other revenues matching this state funding.

Capital expenditures by FACCA institutions over the four year period totaled $430.6 million, comprised of $122.0 million (28.3%) for new building construction, $83.0 million

(19.3%) for existing building renovations, and $74.7 million (17.3%) for major medical equipment, plus lesser amounts of $32.4 million (7.5%) for information technology, $16.9 million (3.9%) for research equipment, $11.8 million (2.7%) for land, and $0.6 million (0.1%) for vehicles, as well as $89.2 million (20.7%) for other unclassified investments (Figure 3.4).

Regional Economic Analysis Methodology

The broad economic contributions of the FACCA institutions in the State of Florida were evaluated with a regional economic model constructed using licensed IMPLAN© Pro software and associated state-level data for 2019 (IMPLAN Group, LLC). In addition to reporting direct revenues or expenditures and direct jobs (i.e., direct effects), Input-Output/Social Accounting Matrix-based modeling platforms, such as IMPLAN©, enable the estimation of the multiplier effects of industry activities in the local economy arising through industry supply chain purchases, known as indirect effects, and spending by employee households, or induced effects, (Miller and Blair, 2009). The economic model for this study was constructed using the gravity model trade flows assumption, with household social accounts internalized, as is common practice for studies with IMPLAN©.

Operating revenues and capital expenditures were analyzed separately in the IMPLAN© model under the appropriate industry sectors as indicated in Table 3.2. Operating revenues for clinical care, appropriations, and other activities were analyzed in the Hospital sector (490) while teaching and research activities were analyzed under the Junior colleges, colleges, universities, and professional schools sector (481). The Junior colleges, colleges, universities, and professional schools sector, rather than the State government-education sector, was selected to better reflect the activities of large research institutions, even though UF-Health CC and Moffitt are technically state government entities. Direct employment numbers provided by FACCA institutions were entered into the model to override imputed job numbers. The analysis was specified as a multiple industry economic contribution analysis, which assumes ongoing industry activity rather than new final demand (Watson et al, 2007), with revenue and employment data adjusted downward by about 3 percent overall to net-out feedback effects that occur within the hospital and colleges and universities sectors throughout the multiple rounds of spending, according to the method described by Cheney (2016).

Capital expenditures were entered in the model for seven different industry sectors that most closely matched each specific type of expenditure, including sectors for new or renovation construction (50, 60), equipment manufacturing (300, 311, 317), wholesale trade (392), and hospitals (490). The share of capital expenditures made within the state was accounted for by local purchase percentages in the model that represent the average share of goods and services purchased from in-state sources; note that computers, medical, and laboratory equipment manufacturing sectors had local purchase percentages of less than two percent. Expenditures for vehicles that were assigned to the wholesale trade sector were subject to a margin of 21.1 percent to account for the expenditures in producer price terms. Values were entered into the model separately for each year to apply industry-specific deflators to maintain the proper relationship with employment multipliers, and results were expressed in 2019 dollars using output and GDP Implicit Price deflators.

University of Miami Sylvester Comprehensive Cancer Center.

Table 3.2. *Summary of annual revenues and capital expenditures analyzed for economic contribution analysis by industry sector for the Florida Academic Cancer Center Alliance.*

Datum/IMPLAN industry sector	FY 2016	FY 2017	FY 2018	FY 2019	Total Four Years
Revenues ($)					
490-Hospitals	$978,204,931	$1,117,156,894	$1,464,491,700	$1,563,943,128	$5,123,796,652
481-Junior colleges, colleges, universities, and professional schools	$201,940,260	$217,697,810	$242,317,716	$274,348,009	$936,303,795
Total	**$1,180,145,190**	**$1,334,854,703**	**$1,706,809,416**	**$1,838,291,137**	**$6,060,100,447**
Employment (jobs)					
490-Hospitals	6,440	6,882	7,734	8,258	29,315
481-Junior colleges, colleges, universities, and professional schools	3,379	3,336	3,511	3,541	13,767
Total	**9,819**	**10,217**	**11,246**	**11,799**	**43,081**
Capital Expenditures ($)					
50-Construction of new health care structures	$28,690,881	$1,939,725	$66,642,623	$24,698,942	$121,972,171
60-Maintenance and repair construction of nonresidential structures	$19,089,749	$19,290,099	$23,441,632	$21,211,762	$83,033,243
300-Computer terminals and other computer peripheral equipment manufacturing	$13,329,540	$8,932,363	$5,637,956	$4,515,008	$32,414,868
311-Electromedical and electrotherapeutic apparatus manufacturing	$8,992,851	$24,856,559	$15,708,281	$25,109,481	$74,667,172
317-Analytical laboratory instrument manufacturing	$4,078,476	$5,869,718	$3,822,826	$3,153,192	$16,924,213
392-Wholesale - Motor vehicle and motor vehicle parts and supplies	$100,068	$60,100	$207,921	$266,765	$634,854
490-Hospitals	$24,187,322	$21,952,693	$14,549,263	$28,513,739	$89,203,017
Total	**$98,468,888**	**$82,901,258**	**$130,010,503**	**$107,468,889**	**$418,849,537**

Note: revenues and employment were adjusted for economic contribution analysis in the IMPLAN© *software.*

Photo Credit: University of Miami Sylvester.

ECONOMIC CONTRIBUTIONS ANALYSIS RESULTS

Economic contribution analysis results for FACCA over these four years (FY 2016-19) are summarized in Table 4.1 by activity and are distinguished by multiplier effect (direct, indirect, induced). Total employment contributions were estimated at 94,659 job-years, including 90,900 job-years for clinical and research operations, and 3,759 job-years for capital expenditures. Note that the jobs for operating activities are normally ongoing, while employment related to capital improvement projects is likely short term. The total employment contribution over four years represents average annual contributions of 23,665 jobs (dividing job-years by four, bottom of Table 4.1). Employment contribution numbers represent all fulltime and part-time/seasonal positions in the economy arising from FACCA operations and capital spending (direct effects), plus industry supply chain activity (indirect effects) and employee household spending (induced effects). Labor income contributions from employee wages, salaries, and benefits and business owner income amounted to $5.210 billion over the four years or an annual average of $1.303 billion. Value added contributions for the same period amounted to $7.646 billion, or $1.911 billion annually. Value added is a measure of personal and net business income that is comparable to the macroeconomic indicator of Gross Domestic Product (GDP) or GSP. Output contributions to business revenues for this period amounted to $14.205 billion or $3.551 billion annually. Contributions to business taxes on production and imports amounted to $430 million for FY 2016-19, or $107 million annually. Total output contributions were 2.19 times the direct output contribution, implying an overall imputed multiplier effect of 2.19.

Table 4.1. *Summary of economic contributions of the Florida Academic Cancer Center Alliance in the State of Florida, FY 2016-2019.*

Activity	Multiplier Effect	Employment (Job-Years)	Labor Income (million $)	Value Added (million $)	Output (million $)	Tax on Production and Imports (million $)
Clinical, research, and other operations revenues	Direct	43,081	$2,682	$3,348	$6,191	$73
	Indirect	22,751	$1,155	$1,793	$3,563	$118
	Induced	25,069	$1,168	$2,186	$3,857	$220
	Total	**90,900**	**$5,005**	**$7,327**	**$13,611**	**$411**
Capital expenditures	Direct	1,936	$114	$157	$296	$2
	Indirect	794	$43	$72	$140	$7
	Induced	1,029	$48	$90	$158	$9
	Total	**3,759**	**$205**	**$319**	**$594**	**$18**
All Activities	Direct	45,017	$2,797	$3,506	$6,487	$75
	Indirect	23,545	$1,198	$1,865	$3,703	$126
	Induced	26,097	$1,216	$2,275	$4,015	$229
	Total	**94,659**	**$5,210**	**$7,646**	**$14,205**	**$430**
Annual average over four years		**23,665**	**$1,303**	**$1,911**	**$3,551**	**$107**

Values in million 2019 dollars. Employment represents fulltime and part-time job-years.
Source: IMPLAN *Pro software, 2019 data for State of Florida (Implan Group, LLC)*

Economic contributions of FACCA by major industry groups defined according to the North American Industry Classification System (NAICS) are shown in Table 4.2. The largest industry groups in terms of employment contributions were Health and social services (35,448 job-years), Educational services (14,406), Accommodation and food services (5,101), and Profession, scientific, and technical services (5,081), Real estate and rentals (4,734), Finance and insurance (4,341), and Retail trade (4,236), as well as several other industries with over 1,000 job-years supported including Construction, Wholesale trade, Transportation and warehousing, and Other services. Again, note that these results should be divided by four to represent the annual average number of jobs contributed. In terms of value added contributions, the largest industry group was Health and social services with $3.071 billion representing 40.2 percent of total value added, followed by Real estate and rentals ($778 million, 10.2%), and Educational services ($749 million, 9.8%). It is expected that the Health and social services and Educational services industry groups would be among the largest economic contributors since hospitals and universities, respectively, are classified within these two groups.

Table 4.2. *Economic contributions by major industry group for the Florida Academic Cancer Center Alliance in the State of Florida, FY 2016-2019.*

NAICS Industry Group	Employment (Job-Years)	Labor Income (million $)	Value Added (million $)	Output (million $)	Tax on Production and Imports (million $)
11 Agriculture, forestry, fishing & hunting	188	$5.54	$9.96	$18.43	$0.20
21 Mining	23	$0.58	$2.36	$8.90	$0.21
22 Utilities	168	$25.82	$105.57	$198.45	$21.79
23 Construction	1,847	$99.46	$152.66	$291.94	$2.03
31-33 Manufacturing	604	$35.49	$64.58	$203.27	$2.99
42 Wholesale trade	1,337	$131.64	$274.86	$467.41	$56.69
44-45 Retail trade	4,236	$142.81	$237.37	$394.66	$46.76
48-49 Transportation & warehousing	2,975	$111.35	$142.40	$277.10	$7.78
51 Information	766	$76.17	$177.16	$387.46	$11.84
52 Finance & insurance	4,341	$292.38	$480.15	$1,242.46	$23.33
53 Real estate & rental	4,734	$108.89	$778.40	$1,391.46	$87.02
54 Professional, scientific & tech services	5,081	$375.20	$480.93	$767.42	$27.56
55 Management of companies	826	$88.92	$103.19	$178.48	$1.75
56 Administrative & waste services	7,367	$288.15	$338.50	$595.07	$2.72
61 Educational services	14,406	$507.58	$749.00	$1,006.62	$22.01
62 Health & social services	35,448	$2,579.38	$3,070.67	$5,974.97	$59.21
71 Arts, entertainment & recreation	983	$28.84	$46.93	$76.87	$7.30
72 Accommodation & food services	5,101	$131.83	$205.96	$361.33	$28.77
81 Other services	4,004	$162.77	$183.29	$285.10	$24.34
92 Government	223	$17.28	$41.56	$77.38	-$4.53
Total	**94,659**	**$5,210.09**	**$7,645.50**	**$14,204.79**	**$429.79**

Values in million 2019 dollars. Employment represents fulltime and part-time job-years. Estimates include operations and capital investment activities over four years. Source: IMPLAN software, IMPLAN Pro, 2019 model data for State of Florida (Implan Group, LLC).

State-local and federal tax contributions of FACCA over FY 2016-19 are shown in Table 4.3. Note that this is a more comprehensive accounting of all personal taxes as well as the business taxes on production and imports (TOPI) shown in the tables above. Total tax contributions amounted to $1.560 billion, representing an average of $390 million annually, including state-local tax contributions of $401 million, or $100 million annually, and federal tax contributions of $1.159 billion ($290 million annually). The largest state-local tax items were sales tax ($198 million) and property tax ($135 million), while the largest federal tax items were personal income tax ($499 million), and social insurance or "social security" payroll tax, including both the employee contribution ($324 million) and employer contribution ($285 million).

Table 4.3. *State-local and federal tax contributions by the Florida Academic Cancer Center Alliance in the State of Florida, FY 2016-2019.*

Tax type	Amount (million $)
Dividends	$0.00
Social Ins Tax- Employee Contribution	$0.51
Social Ins Tax- Employer Contribution	$0.78
TOPI: Sales Tax	$198.45
TOPI: Property Tax	$135.22
TOPI: Motor Vehicle Licenses	$2.76
TOPI: Severance Tax	$0.16
TOPI: Other Taxes	$26.40
TOPI: S/L Non-Taxes	$14.73
Corporate Profits Tax	$0.00
Personal Tax: Income Tax	$0.00
Personal Tax: Non-Taxes (Fines-Fees)	$16.34
Personal Tax: Motor Vehicle License	$4.12
Personal Tax: Property Taxes	$1.11
Personal Tax: Other Tax (Fish/Hunt)	$0.27
Total State and Local Tax	**$400.86**
Social Ins Tax- Employee Contribution	$323.60
Social Ins Tax- Employer Contribution	$284.54
TOPI: Excise Taxes	$27.43
TOPI: Custom Duty	$22.23
TOPI: Fed Non-Taxes	$2.42
Corporate Profits Tax	$0.00
Personal Tax: Income Tax	$499.03
Total Federal Tax	**$1,159.24**
Total State-Local and Federal Tax	**$1,560.10**

Values in 2019 dollars. Includes operations and capital investment over four years.
Source: IMPLAN *Pro software, 2019 data for State of Florida (Implan Group, LLC).*

Special state funding received from the Florida Consortium of National Cancer Institute Centers Program by the three FACCA institutions during FY 2016-2019 amounted to $246.9 million, and research grants and other revenues obtained by FACCA for new hires and programs that matched this state funding amounted to $29.2 million, giving a total of $276.1 million in revenues leveraged by the state funding (Table 4.4). The ratio of total value added contributions to direct output contributions of FACCA ($7.646 billion/$6.487 billion, Table 4.1) was 1.18. This means that for every dollar of revenue received, $1.18 in personal and business income was generated throughout Florida's economy, representing a Social Rate of Return on Investment (SROI) of 118 percent, which is an extremely high rate of return for public investment. We can calculate that the total revenues leveraged by special state funding to FACCA generated $325.4 million in personal and business net income in Florida (Table 4.4).

Table 4.4. *Social Return on Investment to the Florida Consortium of National Cancer Institute Centers Program in the State of Florida, FY 2016-2019.*

	Return (million $)
Florida NCI program funding from State of Florida, 2016-19	$246.9
Research grants and other matching revenues to state funding	$29.2
Total funding leveraged from state funding	$276.1
Social Return on Investment to the Florida NCI Program	$325.4
Ratio of total value added contribution to direct revenues received (Social Rate of Return on Investment)	**1.18**

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