



Economic Contributions

of the Anschutz Medical Campus



FY 2013 | JUNE 2014



University of Colorado
Anschutz Medical Campus

Executive summary



The Anschutz Medical Campus is a critical engine to Colorado's economy, directly and indirectly supporting jobs, earnings and spending.

The campus includes six University of Colorado schools and colleges, the affiliated University of Colorado Hospital, Children's Hospital Colorado, and University Physicians, Inc., the faculty practice plan for the University of Colorado School of Medicine. Contributions to the Colorado economy include the education of future health care professionals, training, research, clinical health care and community service activities. For the fiscal year ending June 30, 2013, the following are highlights of the economic contributions of the university portion of the Anschutz Medical Campus (CU Anschutz) and University Physicians, Incorporated (UPI):

- ▶ **A state economic impact of \$2.6 billion**, which includes direct expenditures of payroll, operations and student spending plus indirect earnings and expenses. For every \$1 in direct expense by CU Anschutz, there is up to an additional \$1.10 in purchased goods and services in Colorado.
- ▶ CU Anschutz employment of 9,706 jobs created 12,248 additional jobs for a **total employment impact of 21,954 jobs in Colorado**. On average, each faculty and staff position at CU Anschutz supported another 1.26 additional jobs in the state.
- ▶ **A total payroll impact of \$1.5 billion in Colorado** based on \$893 million in direct wages, salaries and benefits. For every \$1 in compensation to campus employees, there were up to 68 cents in additional income generated in the state.
- ▶ Annual campus **operating revenue of \$1.3 billion**. Revenue from clinical health services represented 44 percent of the total, and governmental grants and contracts accounted for 23 percent. Meanwhile, state appropriated funds in FY 2012-13 contributed 5 percent of total revenue.
- ▶ The state received **\$60 million in individual income tax and sales tax revenue** from CU Anschutz direct and indirect payroll, operations and spending.

Campus Impact with Clinical Care Partners

- ▶ The Anschutz Medical Campus, including CU Anschutz, University Physicians, Inc. and the affiliated University of Colorado Hospital and Children's Hospital Colorado, is responsible for 18,949 jobs and supports **up to 41,305 jobs statewide**.
- ▶ **The total state economic impact of the campus is up to \$5.4 billion**, which includes all campus direct expenditures of payroll and operations plus indirect earnings and spending.

Introduction

The University of Colorado Denver | Anschutz Medical Campus is a Colorado educational and research institution offering comprehensive undergraduate, graduate and professional programs for students on two campuses—CU Denver in downtown Denver and CU Anschutz on the Anschutz Medical Campus in Aurora. The university offers over 135 degree programs in 13 schools and colleges and is home to nearly 100 centers and institutes.

This report estimates the economic contributions to the statewide economy by CU Anschutz and University Physicians Incorporated (UPI), the faculty practice plan for the CU School of Medicine. These contributions include jobs and income for Colorado residents, investments in human and physical capital, health research and clinical trials, support for private sector businesses through purchases of goods and services, and tax revenue accruing to state and local governments. Based on the fiscal year ending June 30, 2013 (FY 2012-13), the report examines annual contributions associated with current operations such as payroll, campus expenditures and student spending over and above tuition. This report also analyzes the impact of one-time and multi-year investments in current and planned facility construction.



CU Anschutz and its faculty practice plan UPI, provide an estimated \$2.6 billion in economic impact to Colorado.



Campus profile

► Each year, CU Anschutz graduates approximately:

160 doctors

75 physical therapists

40 physician assistants

90 dentists

360 nurses

200 pharmacists



The Anschutz Medical Campus is the largest academic health center in the Rocky Mountain region. The campus combines teaching, research and clinical facilities to prepare the region's future health care professionals, provide the best available health care and help fuel its economy. Physicians at the University of Colorado Hospital and Children's Hospital Colorado, located on the campus, are CU School of Medicine faculty focused on the latest in research and best medical practices—knowledge they share with students and patients. The Anschutz Medical Campus provides care for more than 1,500,000 patients visits a year¹ and is awarded approximately \$400 million in research grants annually.

As the only public academic health center in the state, Anschutz Medical Campus is vital to the people of Colorado and its economy. It is home to five professional schools in the health sciences as well as the Graduate School (serving both CU Anschutz and CU Denver) and offers 40 degree programs.

- The **School of Medicine** is Colorado's first and only allopathic medical school. It ranks among the top 10 public institutions for grant awards from the National Institutes of Health,² and among the top 10 medical schools for family medicine, pediatrics, and rural medicine.³
- The **School of Dental Medicine** is nationally recognized for the quality of its inter-professional education and its broad range of clinical services.
- The **College of Nursing** is ranked among the top nursing schools in the country, particularly its pediatric nurse practitioner program.⁴
- The **Skaggs School of Pharmacy and Pharmaceutical Sciences** ranks third in the nation for grant awards from the National Institutes of Health.
- The **Colorado School of Public Health** leverages the expertise of three universities (Colorado State University, University of Northern Colorado, and CU Anschutz) to provide training in public health topics and is a national leader in Native American health research, as well as known for diabetes and cancer prevention activities.

Supporting the health care workforce

Each year, CU Anschutz graduates approximately 160 doctors, 75 physical therapists, 40 physician assistants, 90 dentists, 360 nurses, and 200 pharmacists. At a time when the state is facing dramatic shortages in health care professionals, the need for academic programs in these fields has reached a critical level. While demand for selected health care professionals is predicted to increase 22 percent nationally in the next 10 years, the Colorado Department of Labor and Employment projects a 30 percent increase in state demand. The combined impact of openings due to occupational growth and replacement creates a need for over 3,700 new Colorado health professionals each year for the next 10 years. The table below illustrates the estimated employment growth and need for health care practitioners in the state.



Table 1. Colorado Occupational Employment Projections, 2012 – 2022⁵

Health Practitioners Occupation Detail	2012 Estimated Employment	2022 Projected Employment	Percent Change	Annual Average Openings due to Growth	Annual Openings due to Growth and Replacement
Dentists	2,683	3,103	15.7%	42	122
Medical Science Professionals	764	1,111	45.4%	35	39
Pharmacists	4,496	5,738	27.6%	124	238
Physical Therapists	4,161	5,782	39.0%	162	211
Physician Assistants	1,909	2,477	29.8%	57	93
Physicians and Specialists	9,930	12,321	24.1%	239	436
Nurses	51,119	67,268	31.6%	1,615	2,597
Subtotal, Selected Occupations	75,062	97,800	30.3%	2,274	3,736

CU Anschutz is the single largest educational institution in the state graduating future health care professionals. Graduates meet a significant portion of the state's need for health care providers. In FY 2012-13, the campus conferred 1,158 degrees, the most ever, up 24 percent from FY 2008-09. The table below shows the recent history of degrees awarded.

Table 2. History of CU Anschutz Degrees Awarded⁶

	Bachelor's	Master's	Doctoral	Professional	Total
FY 2008-09	246	210	57	423	936
FY 2009-10	211	190	69	456	926
FY 2010-11	215	227	64	447	953
FY 2011-12	206	280	58	529	1,073
FY 2012-13	233	308	68	549	1,158



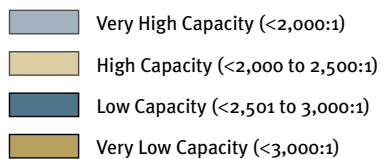
A recent study found that Colorado faces challenges in meeting its health care workforce needs, particularly in rural primary care. Several counties in the central eastern plains (Cheyenne, Elbert, Kit Carson, and Lincoln counties) and the central mountains (Clear Creek, Gilpin, Park, and Teller counties) are significantly below average in their primary health care workforce needs. The map below illustrates the ratio of population to primary care physicians by region.⁷

The nursing profession, including registered nurses and advanced practice nurses, is the largest component of health care practitioners in the state. In rural areas of the state, nurses serve a critical need where physicians are in short supply. Nurse practitioners and physician assistants provide a substantial contribution to health care, representing nearly half of the providers in rural federally qualified community health centers. However, a recent survey indicated that over a third of all Colorado's nurse practitioners are over the age of 55.⁸

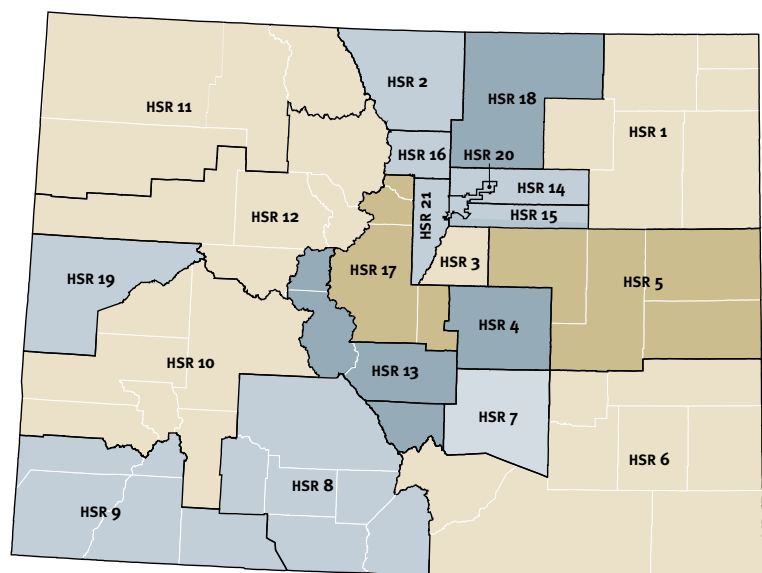
The field of dental medicine is also facing a statewide shortage, particularly in rural areas. There are nine Colorado counties with no licensed dentists and 43 counties or parts of counties have been designated as Dental Health Professional Shortage Areas. While the number of all workers age 55 or older is on the rise, the aging workforce is most pronounced in dental medicine where approximately 40 percent of dentists practicing in Colorado are age 55 or older.⁹

CU Anschutz helps meet these workforce needs. While many graduates provide care throughout the Rocky Mountain region and the United States, most remain in state. Of the 32,362 CU Anschutz reported alumni, 54 percent reside in Colorado.¹⁰

Ratio of Population to Primary Care Physician Full-Time Equivalents (FTEs), by Health Statistics Region, 2013



Colorado Average Ratio
1,873 population : 1 physician FTE



Revenue

Revenue supports the complex set of campus operations and illustrates the diverse set of resources required to successfully operate an academic health center. As measured by revenue, CU Anschutz and the affiliated University Physicians Incorporated are a major economic enterprise in the state, with annual revenues of \$1.3 billion.

In FY 2012-13, state appropriated funds provided \$64.7 million, or five percent, of total campus operating revenue. State appropriated resources exclude annual certificate-of-participation payments for capital financing of campus construction, as these payments go directly to certificate holders and are not received by the campus. State sources of financial aid awards (\$2.7 million in FY 2012-13) were recognized in net student tuition.

Table 3. CU Anschutz FY 2012-13 Revenue¹¹

	Amount	Percent
Non-State Appropriated Resources	\$1,226,602,717	95.0%
Health Care Service Clinical Revenue	\$561,249,358	43.5%
Governmental Grants and Contracts	\$298,768,956	23.1%
Sales of Educational Services	\$124,850,213	9.7%
Nongovernmental Grants & Contracts	\$69,744,465	5.4%
Student Tuition and Fees, including Scholarships	\$76,701,791	5.9%
Gifts, Bequests, etc.	\$38,039,113	2.9%
Auxiliary Enterprises	\$16,156,708	1.3%
Investment Income	\$10,585,166	0.8%
Other Revenue	\$30,506,947	2.4%
State Appropriated Resources	\$64,706,912	5.0%
State Appropriations from Tobacco Settlement	\$14,171,456	1.1%
State Fee-for-Service Contracts	\$49,688,134	3.8%
State College Opportunity Fund Stipend	\$847,322	0.1%
CU Anschutz Revenue	\$1,291,309,629	100.0%

► While many graduates provide care throughout the Rocky Mountain region and the United States, most remain in state. Of the **32,362** CU Anschutz reported alumni, **54 percent** reside in Colorado.



- If the Anschutz Medical Campus was compared to publicly traded companies with a headquarters in Colorado, the Campus would rank in the **top 25 companies** based on 2012 sales.



For every \$1 appropriated by the state in FY 2012-13, another \$19 in revenue came to CU Anschutz from other sources. Colorado recently ranked 48th among all states in higher education funding per capita.¹² But despite the small percentage of state funds relative to total revenue, state funding represents the financial foundation of the campus. While other types of institutions of higher education may be able to backfill low state funding with increased enrollment and tuition rates, CU Anschutz enrollment growth faces unique constraints. Growth must be limited because of both a lack of available clinical rotation settings and senior faculty instructors. Moreover, the campus cannot subsidize campus functions with revenue from grants and contracts, which are earmarked for specific purposes. Likewise, clinical revenue represents reimbursement for health care services provided at affiliated hospitals and is not intended for general campus operations. While the campus has a diverse revenue stream, it depends on state funds to conduct daily operations for the academic health center.

Although a nonprofit entity, an academic health center is unique among higher education institutions because of the diverse set of services provided beyond instruction. Clinical care, research, and service activities, in addition to instruction, combine to represent an enterprise that rivals companies with top sales in the state. Compared with Colorado publicly traded companies, the nearly \$1.3 billion annual revenue of CU Anschutz would place the campus among the top 25 companies based on 2012 sales. Note that this is based on companies that have headquarters, not just a presence, in Colorado.

Table 4. CU Anschutz Revenue Comparison to Colorado Public Companies¹³

2012 Rank	Name	2012 Sales (\$ millions)
21	IHS Inc.	\$1,529.87
22	SM Energy Co.	\$1,505.10
23	TW Telecom Inc.	\$1,470.26
24	MarkWest Energy Partners LP	\$1,451.77
	CU Anschutz	\$1,291.31
25	MDC Holdings Inc.	\$1,203.02
26	Teletch Holdings Inc.	\$1,162.98
27	Crocs Inc.	\$1,123.30
28	Apartment Investment & Management	\$1,033.20

Jobs, payroll and expenses

CU Anschutz has a significant impact on the state economy from employment and purchasing goods and services. Expenditures, including payroll and campus operations, provide the basis for campus direct and indirect economic impacts on the state. CU Anschutz and its affiliated University Physicians Inc. annually contribute up to \$2.6 billion in total economic activity in Colorado. In comparison, the Colorado ski industry adds nearly \$3 billion to the state economy each year.¹⁴

Table 5. CU Anschutz Economic Impacts and Multipliers

	Direct Impact	Economic Impact Range		Multiplier Range	
		Low	High	Low	High
Jobs	9,706	19,384	21,954	2.00	2.26
Payroll	\$892,738,400	\$1,359,188,800	\$1,502,985,100	1.52	1.68
Expenses	\$1,241,038,300	\$2,132,215,500	\$2,606,570,100	1.72	2.10



CU Anschutz expenses in FY 12-13 totaled more than \$1.2 billion, including payroll and operations. In addition to payroll and benefits, the campus reported operating expenditures of \$348 million, or 28 percent of all expenses, for goods and outside services in FY 2012-13. Each \$1 in campus expense generates between \$0.72 and \$1.10 in additional economic activity to Colorado. The direct spending by the campus supports up to \$2.6 billion within the state.

Jobs

CU Anschutz not only plays an important role in educating the state workforce, but also provides the state with thousands of direct and indirect jobs. As of June 2013, the campus employed 9,706 people including faculty, staff, research assistants, medical residents and student workers. CU Anschutz employment supports up to 21,954 direct and indirect jobs throughout the state. Every job at the campus indirectly creates up to 1.26 additional jobs in the state.

The tables on the next page illustrate how CU Anschutz employment compares to other public and employers in the Denver metropolitan area. CU Anschutz was among the top 10 public sector employers and was comparable with the top 10 private employers in the metropolitan Denver area.

CU Anschutz employs nearly 10,000 people in Colorado including faculty, staff, research assistants, medical residents and student workers.



Table 6a. Denver Area Public Sector Employers ranked by Number of Employees¹⁵

Rank	Public Sector Employer	Colorado Employees
1	U.S. Government	40,213
2	State of Colorado	33,000
3	University of Colorado System	17,356
4	Denver Public Schools	14,489
5	Jefferson County Public Schools	12,000
6	City & County of Denver	10,890
	CU Anschutz	9,706
7	Aurora Public Schools	5,616
8	Denver Health	5,600
9	Adams 12 Five Star Schools	5,169
10	Boulder Valley School District RE-2	4,133

Table 6b. Denver Area Private-Sector Employers Ranked by Number of Employees¹⁶

Rank	Denver-Area Private Sector Company	Product/Service	Colorado Employees
1	Wal-Mart Stores	Retail	24,869
2	Centura Health	Health care	15,800
3	Xcel Energy	Energy utility	11,942
4	HCA HealthONE	Health care	10,200
	CU Anschutz		9,706
5	Safeway	Grocery	8,869
6	SCL Health System	Health care	8,868
7	CenturyLink	Telecommunications	6,960
8	Wells Fargo	Financial services	6,620
9	University of Denver	Higher education	6,012
10	Comcast Corporation	Telecommunications	6,000
10	Kaiser Foundation Health Plan of Colorado	Health care	6,000

CU Anschutz was among the top 10 public sector employers and was comparable with the top 10 private employers in the metropolitan Denver area.

Payroll

CU Anschutz had a total payroll of \$893 million in FY 2012-13. Each \$1 in direct payroll at the campus, including student spending, generates between \$0.52 and \$0.68 in additional wages, salaries and other labor income in Colorado. The direct and indirect payroll supports an estimated \$1.5 billion within the state—an average of over \$68,000 per job supported.

Graduates of the medical campus are likely to contribute more to the state economy in payroll taxes and personal expenditures than those with other degrees. The salary of health care occupations associated with degree programs offered by the campus is nearly twice the average of all occupations. The table below illustrates the average annual salaries for selected professional health occupations.

Table 7. Annual Salary by Occupation in Colorado¹⁷

Occupation	Entry Level	Average	Median	Experienced
Dentists	\$56,250	\$133,300	\$121,273	\$171,825
Orthodontists	N/A	\$251,842	N/A	N/A
Pharmacists	\$85,565	\$113,700	\$117,776	\$127,768
Family and General Practitioners	\$76,940	\$167,510	\$158,367	\$212,795
Internists, General	\$131,032	\$209,058	N/A	\$248,072
Obstetricians and Gynecologists	\$134,393	\$199,226	\$185,573	\$231,643
Pediatricians	\$70,609	\$146,858	\$134,590	\$184,983
Psychiatrists	\$89,025	\$186,937	\$186,517	\$235,893
Surgeons	N/A	\$226,972	N/A	N/A
Physicians, Other Specialties	\$111,257	\$202,775	N/A	\$248,533
Physician Assistants	\$67,241	\$89,791	\$89,369	\$101,066
Physical Therapists	\$54,141	\$73,080	\$71,315	\$82,550
Registered Nurses	\$51,514	\$67,922	\$67,013	\$76,125
Selected Health Care Occupations		\$90,700		
All Occupations in Colorado	\$21,047	\$48,035	\$37,093	\$61,528

- The salary of health care occupations associated with degree programs offered by the campus is **nearly twice** the average of all occupations.





Student Expenses

Student spending is not reflected in campus expenses. However, significant spending is attributable to those enrolled in the academic programs at the medical campus which generates secondary impacts in the economy. In addition to tuition, CU Anschutz students spent an estimated \$50.1 million in FY 2012-13 for rent, food, entertainment, books, transportation, utilities and other goods and services. This consumer spending was treated as a direct input for purposes of the economic impact estimate.

Campus Impact with Clinical Care Partners

Located on the Anschutz Medical Campus are University of Colorado Hospital and Children's Hospital Colorado—the University of Colorado School of Medicine's primary adult and pediatric clinical partners. Nearly 2,000 CU faculty provide patient care at these hospitals. Based on the economic multipliers of the hospital industry sector, the combined impact of the entire campus, including CU Anschutz, UPI, University of Colorado Hospital, and Children's Hospital Colorado is estimated below:

- ▶ Direct employment of 18,949 for a total impact of up to 41,305 jobs in the state; each job indirectly creates up to 1.18 additional jobs in the state
- ▶ Direct payroll of \$1.6 billion for a total state personal income impact of up to \$2.8 billion; each \$1 in direct payroll and student spending generates up to another \$0.68 in additional labor income in Colorado
- ▶ Direct expenses of \$2.7 billion for a total economic impact of up to \$5.4 billion to the state; each \$1 in expense generates up to another \$1 in additional economic activity to Colorado.

Table 8. Economic Impacts of the Anschutz Medical Campus, Including the University and Hospital Affiliates

	Direct Impact	Economic Impact Range		Multiplier Range	
		Low	High	Low	High
Jobs	18,949	37,575	41,305	1.98	2.18
Payroll	\$1,642,140,400	\$2,605,840,000	\$2,757,861,000	1.59	1.68
Expenses	\$2,711,216,300	\$4,581,549,000	\$5,435,553,000	1.69	2.00

The total Colorado economic impact of the Anschutz Medical Campus is estimated to exceed \$5.4 billion.

Development and construction

In 1998, the U.S. Department of Defense conveyed 230 acres of the former Fitzsimons Army Medical Garrison in Aurora to the University of Colorado, and the University moved its campus from location at Ninth Avenue and Colorado Boulevard in Denver to Aurora over the next 12 years. In recognition of the role played by the largest gifts from an individual donor, businessman Philip Anschutz, Fitzsimons was renamed the Anschutz Medical Campus. The total Colorado economic impact of the Anschutz Medical Campus is estimated to exceed \$5.4 billion.

Development has maintained a fast pace in recent years. Since 2011 the campus invested in nearly \$130 million on large construction projects including the Skaggs School of Pharmacy and Pharmaceutical Sciences building, an additional floor in the School of Dental Medicine building, and the Anschutz Health and Wellness Center. In 2012, Children's Hospital Colorado completed an expansion of 124 beds in a new tower. In 2013, University of Colorado Hospital completed its expansion of a new inpatient tower adding 288 beds.

The other half of the former Fitzsimons Army Medical Base was conveyed to the Fitzsimons Redevelopment Authority (FRA), a quasi-governmental organization created by the University and the City of Aurora. To date, the FRA has attracted 46 companies to the adjacent Fitzsimons Life Science District north of the campus.¹⁸ Due to the increased visits to the area, a new interchange located at I-225 and Colfax Avenue became necessary to improve traffic flow. The project received over \$30 million in combined funding from the federal government and the city of Aurora.

Planned Construction Impact

In addition to ongoing annual contributions to the economy, additional stimulus is provided by periodic construction of new facilities. A new bioscience building broke ground in April 2014 and is slated for completion in 2015. This new building accommodating research and instruction in bioengineering will offer 112,054 gross square feet at a total cost of \$36.7 million. It is estimated this project will provide up to 455 construction jobs and \$26.1 million in wages and salaries to the state of Colorado. Including all spending, the project will support \$64.9 million in additional economic activity in the state over the period of construction.

The campus expansion continues to draw clinical care partners and transportation improvements. A new U.S. Department of Veteran Affairs Medical Center, adding an estimated 182 beds, is expected to be completed adjacent to the Anschutz campus by 2016. The Regional Transportation District is nearing plan completion for a new light rail stop just north of the Anschutz Medical Campus, also expected to be complete by 2016. Already a unique health sciences city in the United States, once the redevelopment of the 578-acre site is complete, the University of Colorado Anschutz Medical Campus, the three hospitals, and adjacent industry partners will rank among the most substantial health and research complexes in the world.

- The investment by the university in facilities at the new campus has totaled over **\$1 billion** between 1998 and 2013, while the university and affiliated hospitals completed \$2.9 billion in construction and renovation.



Tax revenue

- ▶ Compared with the state appropriated resources of \$64.7 million to the CU Anschutz in FY 2012-13, the state received as much as **92 percent** back estimated income and sales tax revenue.



Payroll and spending generate significant tax revenue to the state. Included in the total economic activity is \$59.7 million in state taxes, including both the direct payments by university employees and students and the indirect multiplier effects. Below is a table of estimated individual income tax revenue and sales tax revenue to Colorado. The state received up to \$41.5 million in individual income tax and \$18.2 million in sales tax. Compared with the state appropriated resources of \$64.7 million to the CU Anschutz in FY 2012-13, the state received as much as 92 percent back in estimated income and sales tax revenue.

Table 9. Estimated State Income and Sales Tax Receipts

	Direct	Low Impact	High Impact
Individual Income Tax			
Direct by Employees	\$24,690,800		
Indirect through Multiplier		\$12,839,300	\$16,789,800
<i>Subtotal State Income Tax</i>		<i>\$37,530,100</i>	<i>\$41,480,600</i>
Sales Tax			
Direct by Employees and Students	\$9,910,600		
Indirect through Multiplier		\$5,516,500	\$8,274,200
<i>Subtotal State Sales Tax</i>		<i>\$15,427,100</i>	<i>\$18,184,800</i>
Total State Tax Revenue		\$52,957,200	\$59,665,400

Other contributions

The CU Anschutz schools and colleges offer a broad array of initiatives that amplify and expand the economic contributions outlined in this report. These programs enrich the health, economic well-being and overall quality of life of Colorado residents and beyond. While some of the economic impact of these activities is captured in the payroll and operating expenditures, it is important to recognize the non-monetary contribution of these enterprises upon the business sector, health care, scientific discovery, public service, community outreach, and issue advocacy.

Technology Transfer

While the expenses from research funding were incorporated into the economic impact, technology development and discovery creates a value that extends far beyond economic multipliers. These discoveries can lead to new medical devices, pharmaceuticals, diagnostics, treatment of debilitating conditions, and wellness and an improved quality of life for patients and consumers worldwide. In FY 2012-13, 203 patent applications were filed, 17 patents were granted, and 11 license/option transactions were executed by CU Anschutz research enterprises. In addition, 114 inventions were disclosed and four start-up companies were formed utilizing campus intellectual property. Since 2002, startup companies based on technology from the entire Anschutz Medical Campus have attracted over \$914 million in venture capital, public and private equity investment and grants, thereby creating a substantial economic footprint. As of June 30, 2013, over half of technology licenses for Anschutz Campus technology were granted to companies in Colorado.¹⁹



In FY 2012-13, 17 patents were granted, 114 inventions revealed and four start-up companies were formed due to CU Anschutz research and innovation.





Research

Research at CU Anschutz is a cornerstone of the university mission. In FY 2012-13, sponsored awards totaled nearly \$400 million. Of note, the School of Medicine Department of Pediatrics was the top ranked award recipient in National Institutes of Health (NIH) research grants in the area of pediatrics. The School of Medicine is among the top ten public institutions for NIH research grant awards. The Skaggs School of Pharmacy ranked among the top three in the nation for NIH research grant awards.²⁰

CU Anschutz has been particularly successful in attracting federal research dollars, despite recent cuts to the federal research budget—the campus received \$235 million in awards from federal agencies in FY 2012-13. Of that, \$188.5 million, or 80 percent of all campus federal awards, came from the NIH. While the federal budget for NIH programs declined by 5.4 percent in the last year, the awards to the campus declined only 4.3 percent, indicating the strength of the campus research enterprise. Over the last five years, the campus brought \$1.2 billion in federal research funding to Colorado and nearly \$2 billion in total research awards.

Table 10. CU Anschutz History of Research Grant Awards (\$ millions)²¹

	2008-09	2009-10	2010-11	2011-12	2012-13	Five year Total
Federal Awards	\$203.9	\$261.8	\$248.6	\$252.5	\$234.9	\$1,201.7
Nonfederal Awards	\$138.4	\$137.4	\$151.6	\$159.2	\$155.9	\$742.5
Total	\$342.3	\$399.2	\$400.2	\$411.7	\$390.8	\$1,944.2



Partnerships for improving health care access

The University of Colorado School of Medicine supports about 2,000 faculty who provide care to patients at the two primary teaching hospitals on campus – the University of Colorado Hospital and Children’s Hospital Colorado. Patients come from every county in Colorado to seek the specialty care provided on the Anschutz Medical Campus. Both hospitals are nationally recognized as providing high quality of care, and consistently are ranked strongly among hospitals in Colorado. CU School of Medicine faculty also provide clinical services at Denver Health, the VA hospital, and National Jewish Health. In addition, the School of Dental Medicine provides dental care services to the community, accommodating more than 70,000 patient visits in 2012-13.



Nevertheless, CU Anschutz health professional programs face constraints to expansion due to the difficulty of securing experienced faculty and clinical rotations and placements as well as qualified preceptors (physicians to train medical students and nurses to train nursing students). Despite these constraints the CU School of Medicine will expand its MD program to Colorado Springs in 2015 through partnerships with the University of Colorado Health System that now includes Memorial Hospital in Colorado Springs and Poudre Valley Hospital in Fort Collins. These sites will allow campus programs to expand and keep up with the growing clinical care needs of the state. Here are examples of other campus programs that improve health care access.

- ▶ The School of Medicine, College of Nursing and Skaggs School of Pharmacy and Pharmaceutical Sciences have partnered with King Soopers grocery stores to operate “**Little Clinics**” within grocery stores. There are currently 13 clinical sites along Colorado’s front range where individuals, with or without health insurance, can access treatment for everything from common everyday illnesses to cardiovascular care. This partnership helps promote and deliver accessible health care while also offering clinical training for students.
- ▶ The School of Dental Medicine’s **Advanced Dental Clinical Training** and Service program is a service-learning operation in which fourth-year dental students provide dental services for eight months in an underserved community, either in brick-and-mortar clinics or through the **Colorado Smilemakers Mobile**

Clinic. Under the supervision of practicing dentists, students provide dental care to children and adults whose access to services is constrained by financial, geographical, physical or medical factors. There are over 25 clinical sites, including community health centers and rural communities where the mobile clinic travels.

- ▶ **Sheridan Health Services** is a multi-site, nurse-managed health care center that has operated in Sheridan schools with College of Nursing providers since 1995. Two clinic sites provide full range comprehensive primary care, oral health, behavioral health, substance abuse treatment, and preventive services to adults and children, including access to discounted medications through an on-site pharmacy. These sites offer a health care safety net for a medically underserved, low socioeconomic

urban area in western Arapahoe County, serving 2,088 patients with 6,854 visits in the past year.

- ▶ **The Center for Midwifery and the University Nurse Midwives** provides full-scope care in the Anschutz Outpatient Pavilion for women including prenatal, childbirth, postpartum and wellness services. All midwives are faculty at the College of Nursing, are board-certified by the American College of Nurse Midwives, and are licensed as Advanced Practice Nurses in the state of Colorado. Both midwifery practices work collaboratively in affiliated hospital OB/GYN departments and can offer women and families many services including individualized care, group prenatal classes, childbirth education, lactation services, mental health services, and referrals to physician groups.

Centers, institutes and laboratories

CU Anschutz has more than 55 centers and institutes conducting research, and providing health care, public service, professional development, outreach and advocacy. While the expenses associated with these units were incorporated into the economic impact, centers and institutes illustrate additional contributions of the campus to the Colorado, national and global communities:

- ▶ The **Colorado Area Health Education Center** program supports four core missions, particularly in underserved rural and urban locations: workforce diversity in health careers, health professions career development, health professionals continuing education, and public health and community education. During FY 2012-13, more than 1,500 K-12 students participated in health care career educational programs that engage students, parents and their communities. During this same period, CU health professions students served over 28,000 days of clinical rotations in high-need regions.
- ▶ The **Health Professions Workforce Initiative** is a grant funded by The Colorado Trust to encourage rural and underserved high school students to explore health profession careers. The initiative supports a multidisciplinary curriculum and training program for rural track health professions students. This initiative also administers a health care scholars program to students in health professions who opt to practice in rural or other underserved sites.
- ▶ **Aurora LIGHTS** provides comprehensive programs that assist students from elementary school through health professional school to succeed in their education and achieve their goals of becoming health professionals. The program provides health career pathway guidance, academic content sessions, peer monitoring and on-site shadowing.
- ▶ The **Barbara Davis Center for Childhood Diabetes** in the School of Medicine is one of the largest programs specializing in type 1 diabetes research and care (both for children and adults) in the world. The Center provides state-of-the-art clinical diabetes care to 80 percent of the children with diabetes in Colorado and 2,000 adults within the Rocky Mountain Region, and receives national and international referrals. The center also provides diabetes-specific diagnostic services to national and international clinical studies and trials, evaluates new therapeutic agents and devices for patient care, and patents and licenses new diagnostics.
- ▶ The **Center for American Indian and Alaska Native Health** in the Colorado School of Public Health is engaged with every Native American reservation in the U.S. The center promotes the health and well-being of Native Americans by pursuing research, training, continuing education, technical assistance and information dissemination within a framework that recognizes the unique cultural contexts of this population. Its research includes developing culturally acceptable and effective strategies to prevent infectious oral diseases and planning, designing and assessing the feasibility of implementing a culturally appropriate mental health service model for Native American children with serious emotional and/or behavioral disturbances and their families. The center also implements research of major scientific and programmatic importance to health status and conducts research on the health of elder Native Americans who are at greater risk for numerous acute as well as chronic illnesses.
- ▶ The **Center for Pharmaceutical Biotechnology** in the Skaggs School of Pharmacy and Pharmaceutical Sciences partners with pharmaceutical biotechnology companies to form a unique program emphasizing multi-disciplinary scientific education as well as training in non-scientific disciplines critical to the success of this industry: regulatory affairs, health care policy, technology transfer, finance and marketing. The center originated from a collaborative relationship between the PhD programs in pharmaceutical sciences and chemical engineering.
- ▶ The **National Resource Center for Health and Safety in Child Care and Education (NRC)** at the College of Nursing contributes to the improvement of the quality of care for children in early care and education programs. NRC provides up-to-date resources and technical assistance to families, child care providers, health professionals, policy makers, state and local health departments, and child care regulatory agencies. Most recently, the NRC has developed a training program for child care providers that prepares them to include children with special needs in child care and preschool programs.
- ▶ The **Biomaterials Research Laboratory** in the School of Dental Medicine provides materials-based research opportunities to undergraduate students, dental students and dental residents at CU

Anschutz. The laboratory supports a wide range of dental materials, biomaterials and bioengineering research work including the development of new materials and analytical techniques. In addition to several NIH-funded projects, a variety of local and national industry-contract research projects are conducted in the laboratory. Most recently, the laboratory has created a new composite resin material for use in posterior dental fillings that is changing the practice of dentistry.

- **The University of Colorado Cancer Center** is the only National Cancer Institute-designated comprehensive cancer center in the region. Some of the nation's foremost experts in lung cancer, melanoma, prostate cancer, breast cancer, blood cancers, colorectal and gastrointestinal cancers, ovarian cancer, childhood cancers and companion animal cancer are center members. The center also runs the region's largest clinical trials program. With six programs, 17 shared core resources and more than 400 members from three state universities and five institutions, this center is the hub for cancer research in Colorado. The Cancer Center extends care into rural communities, bringing access to quality cancer care in Grand Junction, Alamosa, Glenwood Springs, Montrose and Vail/Edwards through its Community Engagement Program. CU doctors whose specialties range from oncology to neurosurgery and cardiology travel to rural hospitals to bring specialty care and access to clinical trials to patients who would not access this care without the program.
- **The Gates Regenerative Medicine and Stem Cell Biology Program** at the School of Medicine seeks to

understand the biology of stem cells in order to pioneer new therapies in the areas of cancer, childhood skin diseases, cardiology, immunological disorders, neuronal disease and injury, and safer delivery of solid organ and bone marrow transplants. The Gates Center is partnering with the University of Colorado, the CU School of Medicine, Children's Hospital Colorado, University of Colorado Health and the Gates Frontiers Fund to launch the first biomanufacturing facility in the Rocky Mountain Region. This cutting-edge facility will enable the clinical and academic partners on the Anschutz Medical Campus to expedite bench to bedside translation and facilitate the commercialization of emerging technologies in Colorado.

- **The Rocky Mountain Prevention Research Center** in the Colorado School of Public Health is one of 37 Prevention Research Centers in the United States funded by the Centers for Disease Control and Prevention. The center works as an interdependent network of community, academic and public health partners to conduct prevention research and promote the wide use of practices proven to promote good health. The center focuses efforts on identifying local health priorities in the San Luis Valley. Researchers from the Anschutz Medical Campus have worked with this rural, low-income population to support community-based intervention programs regarding type 2 diabetes for nearly 30 years.
- **The Colorado Clinical and Translational Sciences Institute** transforms the way communities and researchers work together to design and conduct research by building bridges between health research, clinical practice and community health initiatives to improve the health of the people

of Colorado and the Rocky Mountain Region. This institute funds the Partnership of Academicians and Communities for Translation that work in Colorado to: solicit and sponsor pilot grants; help communities and researchers find ways to effectively use existing data; sponsor community exchanges and trainings to increase communication between communities and researchers; and help communities become more aware of emerging information in health research.

- **The Center for Public Health Practice** at the Colorado School of Public Health offers consultative services in areas such as organizational development, grant writing, asset-based community development, program evaluation, health disparities, evidence-based approaches, cultural competence/confidence, sustainability and community engagement. Services are delivered through a variety of methods, including face-to-face meetings, phone consultations and web-based technical assistance. The center has key partnerships to help deliver its services with the Colorado Department of Public Health and Environment, local public health agencies, LiveWell Colorado, local foundations and the Colorado Clinical and Translational Sciences Institute.
- **The Center for Women's Health Research** in the School of Medicine boasts an innovative research enterprise model that studies the causes and treatments of diseases that affect women to improve women's health, longevity, and well-being. By training the next generation of scientists and physician-scientists in the study of women's health, the Center educates healthcare providers, policymakers, and the public about research findings for the benefit of women everywhere, their families, and communities.

Methodology

The CU Anschutz economic impact analysis is based on the fiscal year 2012-13 expenditures of the university, as well as expenditures of students. Expenditures were taken from the university's financial records, while estimated student spending was based on annual housing, transportation and living expenses provided by the university's Office of Financial Aid. These data were analyzed, adjusted to net out social security taxes, retirement contributions and other payroll deductions that do not result in current expenditures, and consolidated into categories compatible with the economic impact model's requirements.

Economic Impact Analysis

This analysis was conducted using IMPLAN, an economic impact model that predicts how changes in one industry affect all other industries within the same region. The model estimates how the impact of one dollar or one job impacts the local economy by creating additional expenditures or jobs (the multiplier effect). The campus "purchases" goods and services from other organizations in order to operate.

Direct impact refers to the initial value of these goods and services. Indirect impact measures the value of labor, capital and other inputs of production needed to produce these goods and services required, while induced impact measures the change in spending by local households due to increased earning by employees who produce these goods and services. In this presentation the indirect and induced impacts are combined as "secondary" impacts.

Economic activity is the total value of goods and services produced, both directly and indirectly, by campus operations and spending. It includes the value added, as well as the profits, payrolls, taxes, costs of materials and other inputs associated with meeting increased consumer demands and changes in demands by vendors and suppliers.

The economic impact multipliers indicate there is a range of secondary impacts on the economy. The range of the total impacts and multipliers reflects different assumptions about the extent to which purchases of goods and services are made in-state. The low range assumes fewer goods and services produced in-state while the high range assumes more goods and services are produced in Colorado.



Expenditures versus Revenues

Revenues provide one measure of the economic stimulus associated with campus operations. Revenues, however, relate only to the direct economic stimulus, failing to capture the secondary impacts, including indirect impacts (e.g., goods and services consumed by the campus) and induced effects (e.g., additional income generated and spent by those providing goods and services to the campus) associated with the economic linkages between various sectors of Colorado's economy. Each link increases the overall economic contribution, even as portions of subsequent iterations of expenditures are lost to the local economy. To capture these secondary effects, it is necessary to focus instead on the amount and type of expenditures.

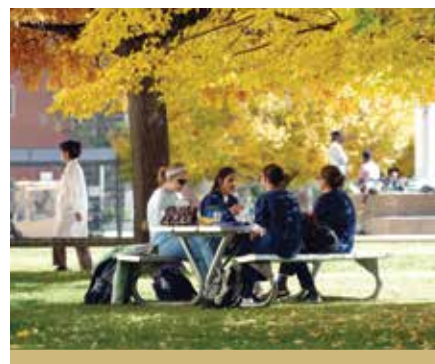
Inputs to the Model

CU Anschutz payroll and benefits totaled \$892.7 million in FY 2012-13. Of that amount, \$695.8 million is the basis for estimating the secondary economic effects. The remainder is treated as "leakage" from the state in the form of federal taxes and other non-current expenditures or is the non-cash component of the reported benefits. CU Anschutz reported total operating expenditures of \$348.3 million for goods and outside services in FY 2012-13. A portion of this total (\$63 million) represented interdepartmental transfers or research collaborations with entities located outside Colorado, and was excluded from the impact analysis.

The remaining expenses were assigned to one or more of IMPLAN's 440 industrial sectors (e.g., legal services, office supplies, computer equipment or utilities). Each sector has different labor, capital, transportation, material and subsequent multipliers. In the case of student expenditures, an adjustment was made to student spending to avoid double counting the expenditures of students who were employees or received cash aid. Below is a table illustrating the total expenses and inputs to the model.

Table 11. Summary of Direct Expenditures and Input to Model

	Direct Expenditures	Input to IMPLAN	Remainder
Wage Salary and Benefits	\$892,738,400	\$695,792,900	\$196,945,500
Other Operating Expenses	\$348,299,900	\$285,255,100	\$63,044,800
Student Spending	--	\$50,101,000	
Total	\$1,241,038,300	\$1,031,149,000	\$259,990,300





Construction

Construction cost detail was provided by the university facility projects office and aggregated into several categories corresponding to IMPLAN sectors—such as professional fees, hard construction, furniture and equipment, utilities and other public fees. These direct expenditures were inputs to the IMPLAN model. The model estimates secondary impacts, including indirect and induced impacts, using the sector multiplier associated with the nature of the expense. The IMPLAN model considers all construction activity to be local and therefore no range is provided in this analysis. Construction projects occur during a number of years; therefore, the impacts of these projects are distributed throughout the years in which they occur. Given the nature of construction work with many trades working for a short period of time, the actual number of individuals employed will be greater than the number of jobs estimated.

Campus Impact Including Affiliate Hospitals

In the combined impact with clinical care partners, direct payroll and spending figures came from hospital annual financial reports. Direct expenses excluded expenses such as depreciation, amortization, and interest expenses. The number of employed staff was based on figures provided by hospital human resources departments and reflected those employees located at the Anschutz Medical Campus. The economic impact of jobs, payroll, and total spending was based upon IMPLAN's hospital sector multipliers.

Tax Revenue

The calculation of state tax collections was built upon the inputs and results of the IMPLAN economic analysis, but with specific assumptions based on university records and data from the Colorado Department of Revenue. For individual income taxes, the amount withheld from wages and submitted to the state was used as a reasonable measure of the taxes eventually paid, and the labor income multiplier was used to generate an indirect income tax impact. In the case of sales taxes two separate calculations were made. For students it was possible to estimate the portion of the expenditures that was likely to be taxable and the current state sales tax rate was applied to this taxable base. For the employees and other labor income, the relationship of statewide income and sales tax collections from the Department of Revenue was used to establish the effective share of income that went to taxable sales. Other tax revenues were recognized in the total economic impact, such as business income tax, vehicle registration, and licensing fees. However, these sources are small relative to income and sales tax revenue and were not highlighted in this report.

Endnotes

¹ University of Colorado Hospital Government and Corporate Relations and Children's Hospital Colorado Community Relations, April 2014. Includes patient admissions, outpatient visits and emergency or clinic visits.

² Blue Ridge Institute for Medical Research, National Institutes of Health Awards 2013, Higher Education Institutions only, retrieved April 2014.

³ U.S. News and World Report, U.S. Medical School 2014 Rankings. <http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-medical-schools>, retrieved April 2014.

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⁵ Colorado Department of Labor and Employment, Labor Market Information, 2012-2022 Employment Projections by Occupation.

⁶ University of Colorado Denver | Anschutz Medical Campus Office of Institutional Research and Effectiveness, Degrees Awarded Report, Fiscal Year 2008-2013.

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⁹ Colorado Health Institute, The Practice of Dentistry in Colorado, March 2010.

¹⁰ University Office of Alumni Relations and University of Colorado Foundation, March 2014.

¹¹ University of Colorado Denver | Anschutz Medical Campus Finance Office, Economic Contribution Statement, November 2013; Excludes revenue from administrative indirect cost recoveries, inter-departmental or inter-campus sales, internal service centers, and gain (loss) on disposal of fixed assets.

¹² State Higher Education Executive Officers Association, State Higher Education Finance FY 2013, April 2014. <http://www.shceo.org/shef13>, retrieved May 2014.

¹³ Denver Business Journal 2013-14 Book of Lists, Colorado Public Companies, December 2013.

¹⁴ Colorado Ski Country USA, <http://www.coloradoski.com/associate-member-information>, retrieved March 2014.

¹⁵ Denver Business Journal 2013-14 Book of Lists, Denver Area Public Sector Employers, December 2013. The University of Colorado System figure includes the Anschutz Medical Campus.

¹⁶ Denver Business Journal 2013-14 Book of Lists, Denver Area Private Sector Employers, December 2013. Prior year top ranked employers such as King Soopers/City Market and Lockheed Martin did not provide information for the report.

¹⁷ Colorado Department of Labor and Employment, Labor Market Information, Colorado Occupational Employment Statistics Wage Survey, released May 2013. Average salary of selected health care occupations is weighted by occupational employment.

¹⁸ Fitzsimons Life Science District Directory, <http://www.fitzscience.com/media/docs/PDFs/Directory%20Report-new.pdf>, retrieved February 2014.

¹⁹ University of Colorado Technology Transfer Office, data provided June 2014.

²⁰ Blue Ridge Institute for Medical Research, National Institutes of Health Awards 2013, Higher Education Institutions only, retrieved April 2014.

²¹ University of Colorado Denver | Anschutz Medical Campus Office of Grants and Contracts Annual Reports FY2009-2013.

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