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Atlanta Eds & Meds: COLLABORATION OR COMPETITION

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This report is dedicated to the memory of A. D. “Pete” Correll, retired CEO of Georgia Pacific, who led the Saving Grady Task Force that privatized the hospital and became Chair of its Board of Directors, and raised \$325 million to make Grady one of the top safety net hospitals in the country.

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Executive Summary

Universities and hospitals (“Eds and Meds”), with over 340,000 jobs created, make a larger contribution to the metro Atlanta economy than all its Fortune 500 headquarters. Other Atlanta industry clusters including supply chain, hospitality, financial technology and film have a robust industry partnership where competitors work as a team (coopetition) to grow jobs and lobby for support. While there are important collaborative efforts underway, Atlanta Eds and Meds are not among best practice cities. Increased collaboration would greatly increase new research resulting in startup companies, improved health practices for citizens, more jobs and economic development making Atlanta a recognized innovative city.

The University System of Georgia encourages state universities to collaborate. The Georgia Research Alliance funds 72 eminent scholars at Georgia’s research universities who collaborate. Among major hospitals in metro Atlanta there is collaboration among some hospitals but between the larger ones, more competition. The National Institute of Health funds the Georgia Clinical and Translational Science Alliance, the largest collaborative group for hospital clinicians, but some of Atlanta’s best collaborative Eds and Meds projects struggle for funding.

The COVID-19 pandemic has made a significant impact, forcing Georgia’s public health agencies, hospitals and universities to work together during the crisis. Public health agencies were slow to coordinate testing, distribute protective equipment and ventilators to medical staff, track infections, and lead collaborative action plans. Among Georgia’s Eds and Meds, Emory University/Healthcare, Georgia Tech, Georgia State University, University of Georgia and other research professors supported by the Georgia Research Alliance were a part of Operation Warp Speed to help develop testing procedures and vaccines. Before the pandemic major hospital groups were very competitive but changed their isolation and began sharing treatment practices. The Georgia Hospital Association facilitated communication among hospitals, pharmacies and state agencies to track the disease. Unfortunately, delays in the coordination caused Georgia to become one of the lowest vaccinated per capita states. The historic separation of public health, impacting health for the public at large, versus medical healthcare treatment of individuals, has exposed weaknesses in responding to pandemics.

Best practice cities have a robust collaboration for specific research between universities and hospitals. Pittsburgh, St. Louis, Baltimore, Philadelphia, Indianapolis and other cities have created a “Grand Plan” where local governments and Eds and Meds have a written agreement among the parties, committing to investments, collaboration and creating innovation districts where Eds and Meds along with private companies have research and corporate buildings.

Based on our research and over 125 interviews, we offer several proposals that could significantly increase collaboration, and thus the value of the Eds and Meds sector to the Atlanta economy:

- ▶ Public health agencies, hospitals, public health schools and academic healthcare researchers must develop a strong working relationship, learning from the current pandemic and be prepared for the next crisis.
- ▶ State and local governments, and chambers of commerce should recognize Eds and Meds as a business cluster, and state investment to the Georgia Research Alliance should be increased significantly.
- ▶ Atlanta should learn from best practice cities and create a “grand plan” where the city and regional economic development entities have a formal agreement with the regions’ Eds and Meds leaders.
- ▶ Hospitals and universities who have not joined these collaborations should be invited without demands that they share research or clinical practices across the board.
- ▶ A highly respected organization, such as the Georgia Research Alliance, the Global Health Crisis Coordination Center or a new group should help Eds and Meds leaders develop a collective plan to significantly expand existing, or start mutually agreeable, collaborative projects.
- ▶ Major university and hospital research efforts should declare priority research for a few emerging issues such as brain health, immunology, pandemic viruses and bioelectric electroceuticals.

- ▶ Universities and hospitals, similar to private employers, can cooperate to recruit, train and hire citizens for entry-level jobs and purchase more goods and services from local vendors to reduce the income disparities in the region.

Foreword

Dr. Jonathan Lewin, President and CEO, Emory Healthcare

In my experience, the intersection of educational and healthcare institutions has been a catalyst for innovation, discovery and creativity. In over 30 years of working at leading academic health centers, I have seen this firsthand in three different cities. By definition, an academic health center (the combination of a school of medicine, with or without other health science schools, with a healthcare system of hospitals and other provider entities) creates a collaborative ecosystem that is quite powerful. The impact of an academic health center such as Johns Hopkins Medicine on the city of Baltimore, as I noted during my 12 years at that institution, is incredibly positive. The power of an even larger academic health center, such as Emory's Woodruff Health Sciences Center, is even greater. By combining the faculty and staff of schools of medicine, nursing and public health, a thriving and growing health system, the nationally recognized Comprehensive Cancer Center, research centers and outstanding collaborative partners such as Grady Memorial Hospital, Children's Healthcare of Atlanta, Georgia Tech and the Veterans Health Administration, I have seen an even more powerful positive impact on the Atlanta region through its combined economic development, employment, innovation, health professions education and care provision. By their very nature, academic health centers like ours are highly collaborative, highly complex and highly matrixed. While this can be confusing to the outside observer, the complexity and multiple intersections of the components of the academic health center are fundamental to the creative power that results.

Introduction

In 2012, a group of Atlanta college presidents and business leaders organized by the Metro Atlanta Chamber visited Pittsburgh, Pennsylvania, to understand how that city's economic recovery was driven by the collaboration of hospitals and universities after the steel and glass industries left. We learned from Rick Stafford, President of the Allegheny Conference, how the city partnered with universities and hospitals to create jobs and economic development. The Atlanta Regional Commission organized another Pittsburgh tour in 2019.

In 2006 Grady Hospital was on the verge of bankruptcy when business volunteers Pete Correll, Tom Bell and Michael Russell asked me as President of the Metro Atlanta Chamber to organize a bi-racial task force, including business and civic leaders, to help form the Saving Grady Task Force. In 2008 Grady was privatized with a citizen board of which I became a member. Pete Correll became chairman and led a campaign which raised over \$325 million that returned Grady to top-tier success. I was appointed to the Emory Healthcare Board in 2012 and began learning more about successful cities' Eds and Meds and how Atlanta could greatly increase innovative synergy by more collaboration.

Public health is governed primarily by federal, state and county agencies concerned with the overall health of large numbers of citizens. Public health officials have many responsibilities, from family and child care to state and county health policies, preventive practices and social determinates of health. It also serves in a regulatory role for restaurants, food sales, water purity and air quality. Medical care is grounded in private enterprise with hospitals and doctors who are concerned with the diagnosis and treatment of disease and accidents of individuals. Historically, university medical and clinical education are separate but somewhat parallel to public health. Today numerous initiatives are bringing these two fields of medicine closer together. The COVID-19 pandemic showed the critical responsibility of public health in partnering with hospitals and health care in states like Georgia, which is among the least vaccinated per capita in the nation.

Metro Atlanta is a global corporate hub with 15 Fortune 500 headquarters. However, hidden in plain sight is a cluster of universities and hospitals with over 340,000 jobs — highly educated and compensated. The metro Atlanta area has 62 colleges and universities with over 213,000 students, making it one of the top five college capitals in America. This study focused on the 15 universities with over 2,000 students. As a result of dozens of mergers and acquisitions in the last decade, the 10-county area now houses nine major hospital brands with 35 free-standing hospitals that accounted for 90 percent of the region's capacity and offered 10,144 beds and admitted 458,935 patients in 2020. More than \$4 billion of hospital construction is either currently underway or announced. Metro Atlanta Eds and Meds institutions received over \$600 million in federal health-related research grants in 2019.

Atlanta's medical collaborative projects identified in this paper have resulted in breakthroughs for global health issues including COVID-19, Ebola, HIV/AIDS, cancer, infectious diseases and transplants. This was accomplished by less than half the area's hospitals and universities. This paper does not include individual professors and doctors from different institutions pursuing joint research. It does not include Midtown Atlanta's Innovation District attached to Georgia Tech.

Eds and Meds Are Anchor Institutions

Universities and hospitals, many a century old, along with sports facilities, performing arts and other cultural facilities like museums and libraries, public utilities and some large churches, are anchor institutions, rooted in place, relatively immune to a recession and unlikely to relocate (Ehlenz, Birch & Agness, 2014; Daughters, 2017). In Atlanta they help define the city's culture, economy and brand. Their workforce is highly educated and many participate in a global network of professional specialists who share information stimulated by the CDC.

In most metro cities, universities and hospitals form the largest but least-acknowledged cluster industry compared to supply chain, financial technology, film and other sectors of Atlanta's economy. Nationally, healthcare is the fastest-growing sector of the U.S. economy. Increasing jobs, wages, human capital and local export bases can also be attributed to the Eds and Meds sector (Bartik & Erickcek, 2008). Healthcare employment in the U.S. has increased every year since 1940 (Daughters, 2017).

SYMBIOTIC RELATIONSHIP OF ANCHOR INSTITUTIONS

Universities and hospitals in Atlanta are interdependent in a number of ways. Universities educate and train doctors, nurses, pharmacists, physical therapists, public health specialists, IT professionals, hospital administrators and other hospital workers. Universities and hospitals who collaborate have innovative professors, researchers and clinicians conducting cutting-edge research to save lives, fight diseases, discover new clinical processes and spawn startups in biomedicine, technology, pharmaceuticals and other areas.

This study focuses on the 15 largest universities and the nine largest hospital groups within the metro Atlanta area, plus the University of Georgia since it is strongly linked to collaborative research. For this study, universities were included if they had an enrollment of more than 2,000 students and/or a medical, nursing or pharmacy school.¹ Detailed data and relevant healthcare-related information on each university and hospital are contained in Figures 1, 2 and 3. Obtaining consistent data across the institutions was very difficult. Our research did not attempt to evaluate the quality of care provided by hospitals.

Emory University Medical School, the largest medical school in Georgia, and the Morehouse School of Medicine are significant leaders in fostering collaboration among hospitals. Emory Health Care is staffed by Emory Medical School doctors, many of whom are professors and manage research projects. Emory and Morehouse Medical School doctors and residents provide care for Grady Memorial Hospital, Atlanta Veterans Affairs Medical Center (VAMC) and Children's Healthcare of Atlanta (CHOA). The CDC is also a major research partner. These hospitals and

¹ This report does not include private, for-profit universities or technical colleges.

medical schools constitute academic health centers providing patient care, resident training, medical research and institutional collaboration. Georgia Tech and Georgia State are also significant research partners. The Georgia Research Alliance funds 75 eminent scholars at six universities, three-fourths of whom are focused on health issues.

In addition to academic health centers, there are 11 collaborative projects where medical and academic leaders have made significant commitment to work together around specific medical, clinical or research projects. Only a few have the full backing of their host organizations.

Several Atlanta universities created the Atlanta Regional Consortium for Higher Education in 2005 to promote a collective purchasing system and hiring entry workers, but it was closed five years later for lack of support.

EDS AND MEDS IN OTHER METRO AREAS

Pittsburgh experienced an economic crisis from 1970 to 1990: 158,000 people lost their jobs and 289,000 people moved out of the city due to the collapse of the steel and plate glass industries.² According to Carnegie Mellon Professor Rick Stafford, “The University of Pittsburgh, Carnegie Mellon and the University of Pittsburgh Medical Center in partnership with the Allegheny Conference built upon the strength of their research universities, medical schools and healthcare facilities to grow their economy.” Universities and hospitals obtained funding from philanthropic, local, state and federal grants for projects that created tens of thousands of jobs. The city of Pittsburgh began investing in biotechnology and built a research center on the city’s steel mill property (Adams, 2003). According to the University of Pittsburgh, today Pittsburgh’s Eds and Meds sector accounts for approximately 22 percent of the total salaries in the region.³

St. Louis city government partnered with businesses to create the Cortex Innovation Community, a 200-acre innovation and technology district surrounded by nationally ranked universities and medical centers. Washington University, Washington University Medical Center, St. Louis University, Barnes Jewish Hospital and 415 private companies with over 5,000 employees are members. They have a collective board of directors including top leaders of universities and healthcare institutions plus some private companies. Uniquely Cortex has a “grand plan” with the city and receives substantial financial support from local, state and federal sources.⁴

San Diego after World War II was a major naval base and became home to many government and privately funded research institutes. In the 1980s, these large institutes helped create startup companies. The Salk Institute for Biological Studies and Scripps Research Institute attracted pharmaceutical companies while the University of California San Diego partnered with hospitals to create a robust applied medical industry around biotechnology. These partnerships were only the beginning of the economic impact universities, hospitals and research institutes have made on the San Diego community (Walshok & Shragge, 2013).

Houston’s MD Anderson Foundation helped establish the Texas Medical Center (TMC) (Keller, 2014). Today, collaboration among 59 different healthcare institutions and universities takes place at TMC, and organizations such as the Gulf Coast Consortia provide shared laboratory space and equipment for TMC researchers through NIH and NSF grants and philanthropic funding. The TMC Innovation Institute provides workspace, educational support and mentoring for startup companies and their leadership.

The **Baltimore** Integration Partnership is an example of a grand plan that connects anchor institutions including universities, hospitals, and local business and community partners to promote economic growth in the community. Through partnerships, they increase local purchasing from minority groups, use real estate assets to benefit the community and recruit, hire and train entry-level staff. The June 2018 report, “Collectively We Rise,” details the benefits of this collaborative effort to the Baltimore community.

² Carnegie Mellon University, Center for Economic Development, The Root of Pittsburgh’s Population Drain.

³ University of Pittsburgh History, www.225.pitt.edu/story/eds-meds-thrive-former-steel-city.

⁴ www.cortexstl.com; Grand Plan, NationalResourceNetwork.org September 29, 2015

Philadelphia's University City is an Innovation District driven by the University of Pennsylvania and Drexel University in a live-work special tax zone where students, professors, entrepreneurs, venture capitalists and hospital doctors collaborate to make new discoveries and take them to market. One of their startup companies, Spark Therapeutics, successfully completed a \$1 billion initial public offering.

Indianapolis's Indiana University Health, formerly known as Clarian Health, is the largest health system in Indiana with 16 hospitals. It is served by the Indiana University School of Medicine, which works with other hospitals in collaborative research. The Indiana Biosciences Research Institute is a partnership among research universities like Indiana University-Purdue University Indianapolis, medical schools, life sciences companies and the state. The Institute specializes in solutions to chronic diseases, including diabetes, cardiovascular disease and obesity. The result of these collaborations is the 2018 creation of the I6 Tech Innovation District, a 60-acre complex supported by a \$38 million three-year Lilly Endowment grant. I6 Tech is expected to generate more than 2,600 jobs over the next 10 years.⁵

New York's Regional Plan Association (RPA) encompasses 31 counties in New York, New Jersey and Connecticut. RPA is conducting an extensive study that includes 340 healthcare and higher education institutions in their area to determine efforts in: local hiring and workforce development, local purchasing, investment in quality housing and coordinated capital investments. Its objective is to achieve greater equity, shared prosperity, better health and sustainability for the region through a coordinated plan including anchor institutions, municipalities and local communities.⁶

Grand plans for these best practice cities vary but generally include written commitments from the host city, universities and hospitals about physical assets, personnel, real estate and annual financial commitments for specific collaborative projects with an inclusive board for policy and operations. See Pittsburgh and St. Louis grand plans cited in footnotes for these cities.

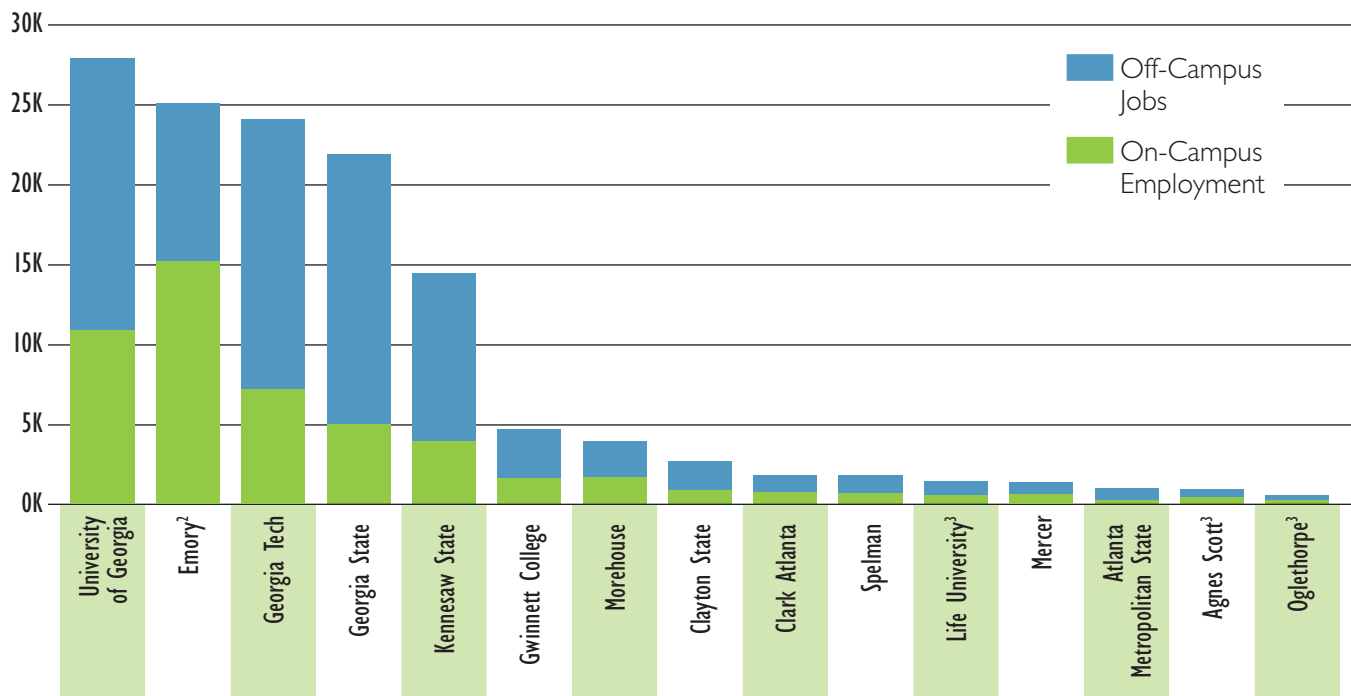
However, some critics predict the decline of Eds and Meds. Richard Longworth, Distinguished Fellow on Global Cities at the Chicago Council on Global Affairs, critiques Midwestern cities' reliance on Eds and Meds after their manufacturing dwindled.⁷ Citing recent slower growth for Eds and Meds and their reliance on government funding while budgets tighten, he suggests that this cluster industry cannot support these cities, especially without an industrial economy. Atlanta's ability to combine a high-impact Eds and Meds sector with several other vibrant economic sectors suggests that an overreliance on Eds and Meds would not be a problem here.

Atlanta Eds: Colleges and Universities

Of the more than 62 public, private and for-profit universities and colleges in the metro Atlanta area, we examined those with an enrollment of 2,000 students or more. The University of Georgia was added due to its significant collaboration with metro Atlanta universities. Employment impact for these 15 institutions is shown in Figure 1, with 56,000 faculty and other workers on campus, creating 145,000 on- and off-campus jobs for the academic year 2020. Figure 2 shows each university's enrollment, with a grand total of 227,000 students enrolled. The Metro Atlanta Chamber reports that metropolitan Atlanta is among the top five largest university centers in the nation by student enrollment.

METRO ATLANTA UNIVERSITIES: TOTAL 145,000 JOBS

FIGURE I: UNIVERSITY TOTAL EMPLOYMENT IMPACT¹



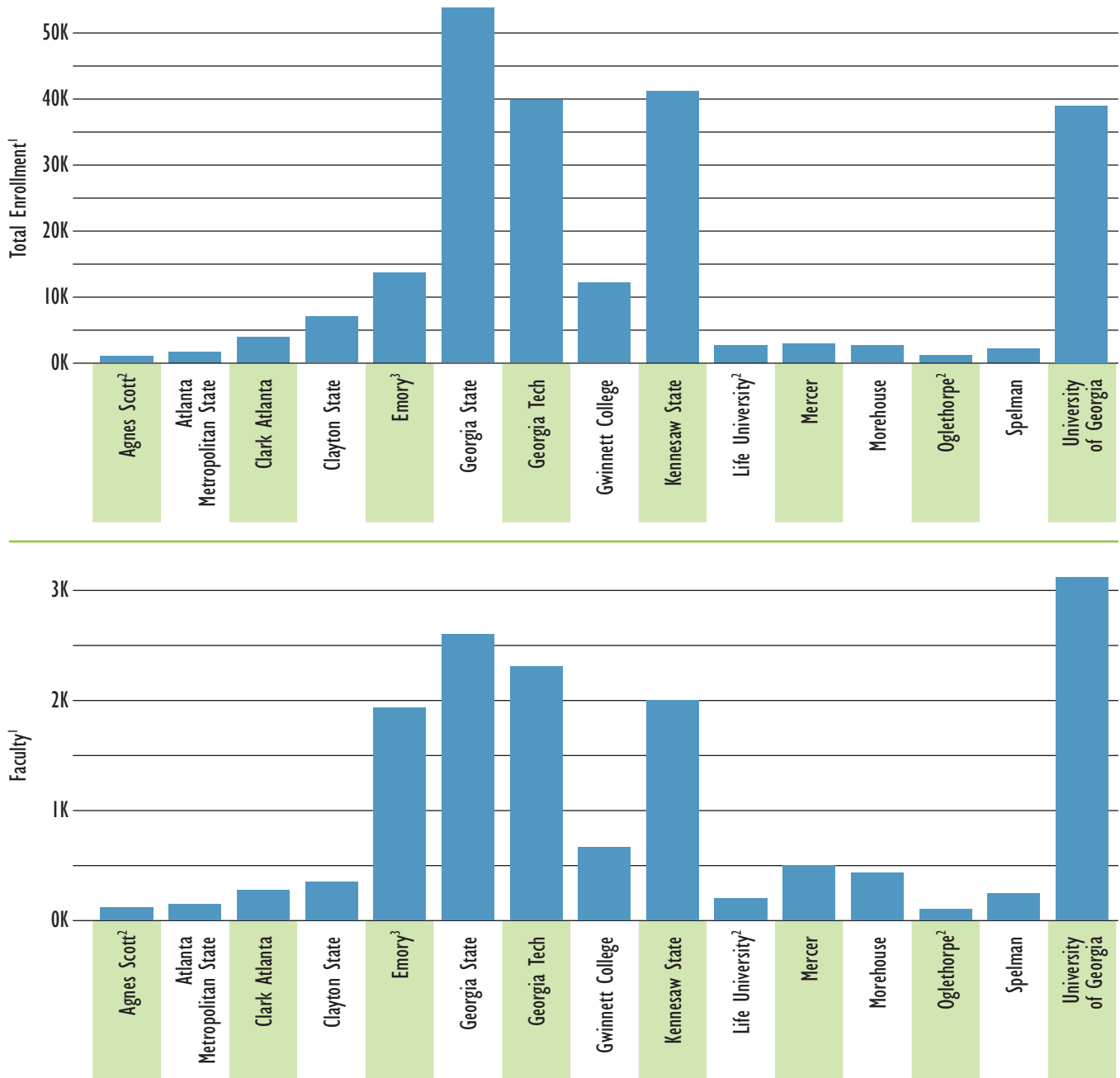
Sources

¹ University System of Georgia (USG) Institutions Economic Impact Report 2018-2019 and HBCUs Make America Strong: The Positive Economic Impact of Historically Black Colleges and Universities, FY 2014; on-campus employment includes full-time and part-time staff.

² Emory University Economic Impact Report, 2019.

³ Total Employment Impact computed based on the output-input model from IMPLAN software using IPEDS Finance Survey 2016 data and Consumer Expenditure Survey, 2015-2016 data from the Bureau of Labor Statistics.

FIGURE 2: TOTAL UNIVERSITY ENROLLMENT AND FACULTY – 2020



Sources:

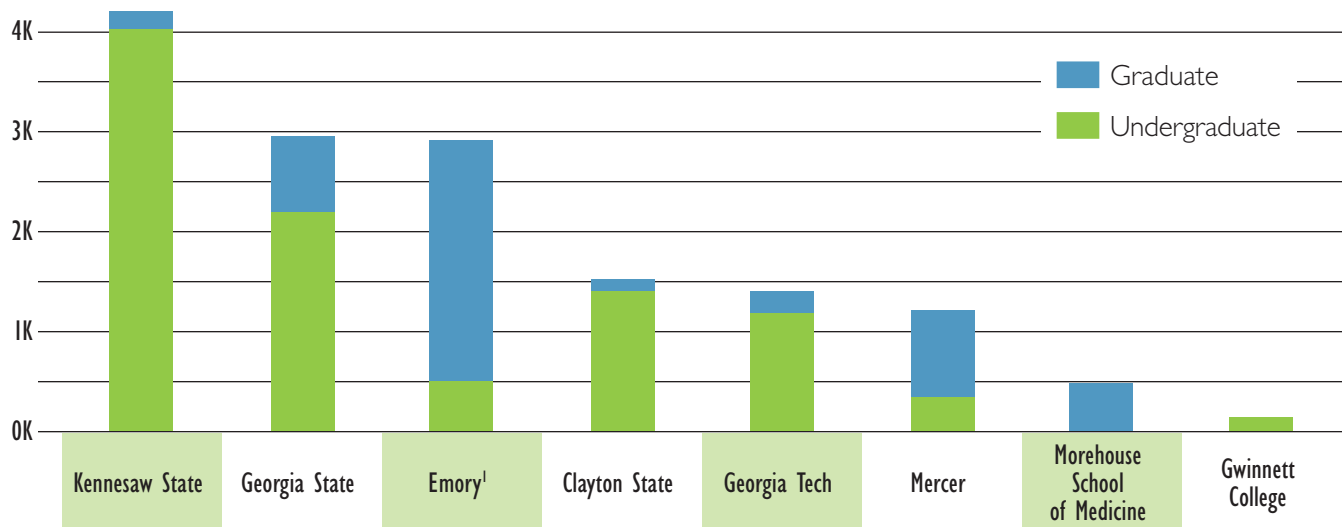
¹ Integrated Postsecondary Education Data System (IPEDS) Fall 2019 and University Fact Books for U.S.G. Institutions, 2020.

² Total Employment Impact was computed based on the output-input model from IMPLAN software using IPEDS Finance Survey 2016 data and Consumer Expenditure Survey, 2015-2016 data from BLS.

³ The Economic Impacts of Emory University, 2020.

UNIVERSITIES TRAINING MEDICAL PROFESSIONALS

FIGURE 3: UNIVERSITY HEALTH DEGREE ENROLLMENT BY INSTITUTION



Source: 2018 and 2019 Information taken from school fact books, Fast Facts, academic profiles and direct contacts.

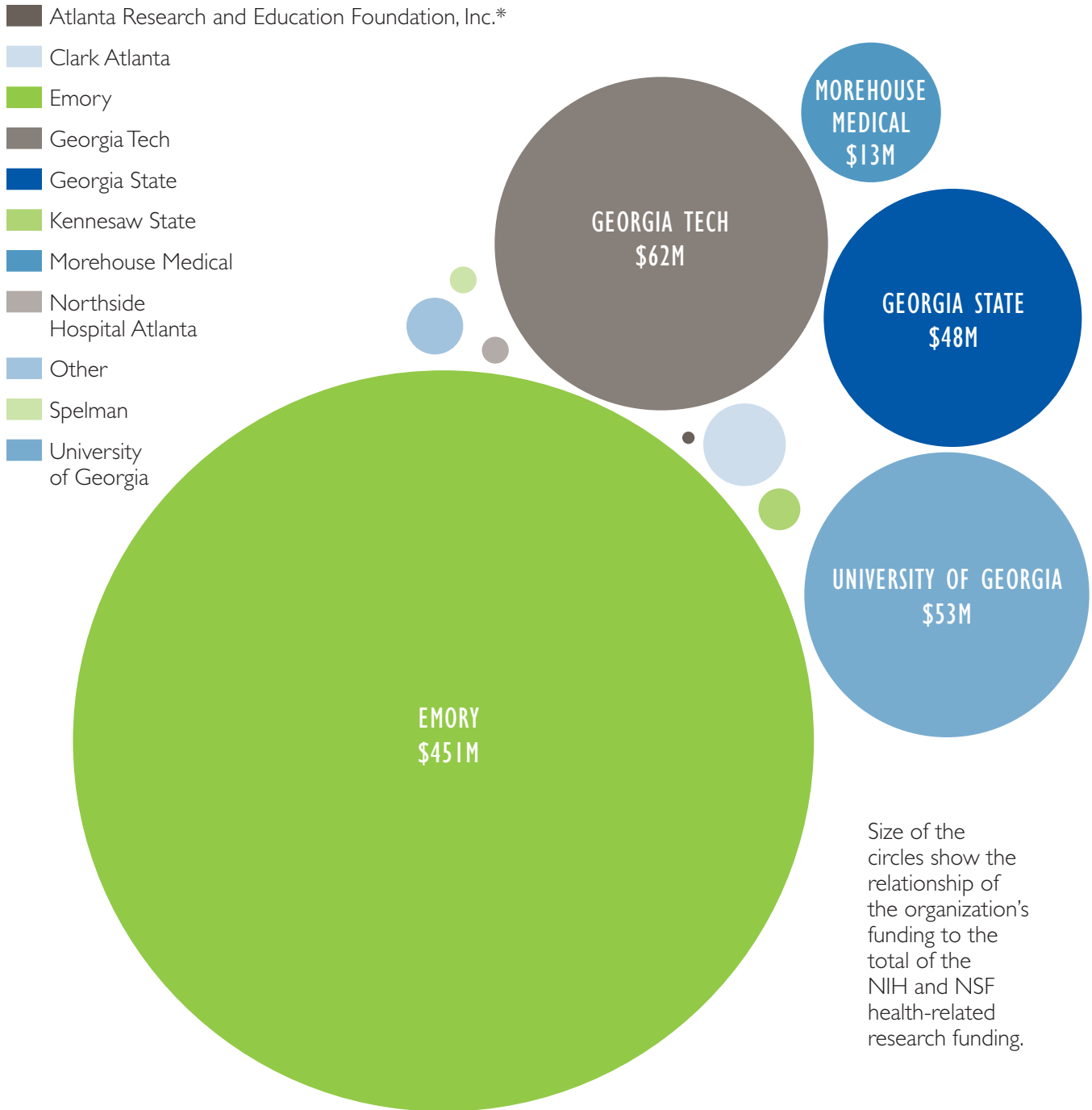
¹ Agnes Scott's and Spelman's Dual-Degree Programs in Nursing are included in Emory University's data.

Of these schools' total enrollment, we focused on medical, nursing, pharmacy, health professionals and degrees directly related to healthcare. These universities are a significant source of professional employees for over 60 hospitals in Georgia.

CAPTURING RESEARCH FUNDS

NIH and NSF health-related research grants to Atlanta Eds and Meds totaled \$627 million in 2019. CDC's public affairs office says their total grants to universities and hospitals in Georgia totaled \$198 million in 2019. Total NIH and NSF grants for engineering, medical and other purposes exceeded \$2.3 billion in 2019 according to University Fact Books. Philanthropy and other sources such as the Defense Advanced Research Projects Agency (DARPA) are important, but no database could be found including all these institutions.

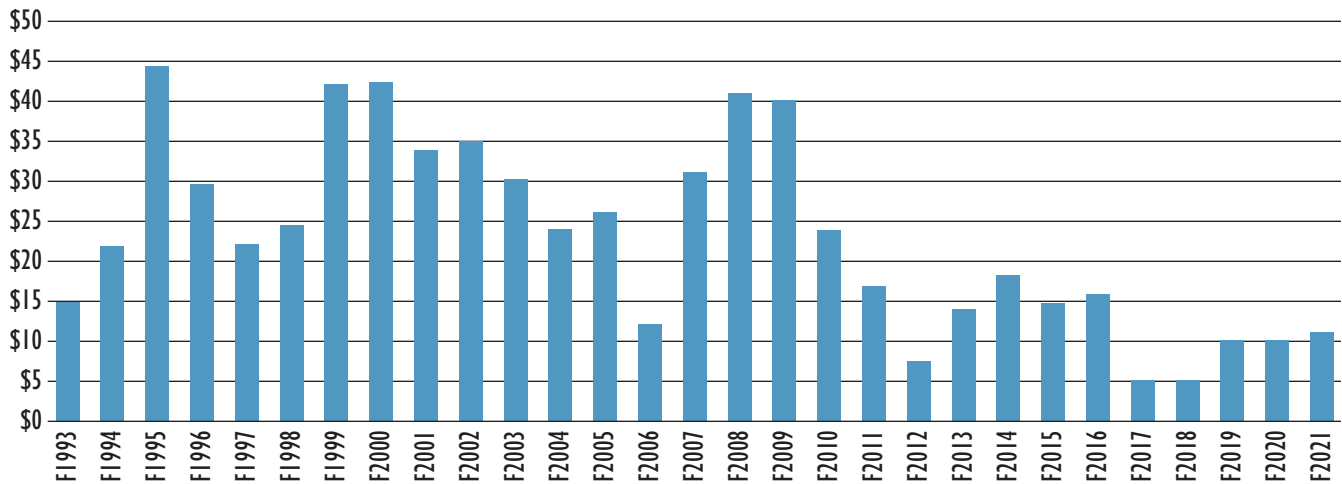
FIGURE 4: TOTAL NIH AND NSF RESEARCH FUNDING (HEALTH RELATED) – 2019 – \$627 MILLION



Source: NIH and NSF Life Science website, FY 2019, does not include other federal, state or private research grants.

*Name changed Feb. 1, 2019, to Foundation for Atlanta Veterans Education and Research, Inc. (FAVER).

FIGURE 5: STATE INVESTMENT IN GEORGIA RESEARCH ALLIANCE PROGRAMS FROM 1993 TO 2021 (MILLIONS OF DOLLARS)



This bar graph indicates Georgia's yearly investment in the GRA Core Programs and GRA Venture Fund, LLC, in millions of dollars. (Totals do not include previous funding for the Cancer Program.) The total state investment from fiscal year 1993 to fiscal year 2020 was over \$660 million.⁸

UNIVERSITY-TO-UNIVERSITY COLLABORATIONS

GEORGIA RESEARCH ALLIANCE (GRA)

The GRA, the catalyst for many collaborative projects, was created in 1990 as a result of Atlanta losing a national competition for the Micro-Electronic and Computer Center to Austin because Texas universities were more collaborative than those in Georgia.⁹ The GRA was founded by state and philanthropic groups in partnership with Georgia's research universities. Since its inception, GRA has secured over \$660 million in state funding which has been leveraged to generate a total return of more than \$7 billion to fuel university-based research and launch startups formed around university discoveries. In 2020, GRA had 75 Eminent Scholars at its member universities who were conducting long-term research in scientific, medical and technical fields. GRA's eight member universities (The University of Georgia, Augusta University, Emory University, Clark Atlanta University, Georgia Institute of Technology, Georgia State University, Mercer University, Morehouse) have access to each other's core laboratories to promote collaboration and avoid duplication of resources. Three-fourths of this research is devoted to health-related issues including Emory and University of Georgia vaccine centers, which were significant research and clinical trial leaders with Operation Warp Speed in testing COVID-19 vaccines. Unfortunately, state funding for the GRA has significantly decreased in recent years as shown in Figure 5. GRA's financial return of \$7 billion with a cumulative state investment of \$660 million certainly merits an increase in state funding to prior year levels.

BIOMEDICAL ENGINEERING (BME) PARTNERSHIP

GRA Eminent Scholar at Georgia Tech Don Giddens and Executive Vice President for Health Affairs at Emory Healthcare Michael Johns, who previously worked together at Johns Hopkins, led the creation of the partnership, which was funded by a \$25 million grant in 2001¹⁰ by the Coulter Foundation. Initially a university-to-university collaboration, it has now expanded to include hospitals. (See the Biomedical Engineering (BME) Partnership section on page 18.)

⁸ GRA 2020 Economic Impact Report

GEORGIA TECH & CHOA, GLOBAL CENTER FOR MEDICAL INNOVATION AND PEDIATRIC TECHNOLOGY CENTER

The Global Center for Medical Innovation, an affiliate of Georgia Tech created in partnership with CHOA, has 60 employees who enable medical device commercialization and conduct pre-clinical studies focusing on pediatrics. It also serves private companies researching and testing drugs and biologics.

The Pediatric Technology Center at CHOA brings clinical experts together with Georgia Tech scientists and engineers to research and develop technological solutions to health care for children. This partnership creates a new field of study using multiple disciplines to bring discoveries to the clinic and bedside. Children's bodies uniquely may not respond to adult clinical practices, requiring doctors to adapt many devices, tools and medicines to improve pediatric care.

GEORGIA STATE UNIVERSITY'S INSTITUTE FOR BIOMEDICAL SCIENCES

Georgia State University's Institute for Biomedical Sciences researches immunity, inflammation and infection in partnerships with the CDC, Emory University, Mercer University and Georgia Tech. The GRA has multiple Eminent Scholars working in the Georgia State University Institute for Biomedical Sciences. The research facility has one of seven Biosafety Level 4 facilities in operation to allow research on dangerous pathogens.

UNIVERSITY OF GEORGIA-EMORY CENTERS OF EXCELLENCE FOR INFLUENZA RESEARCH AND SURVEILLANCE

Emory's Vaccine Center (EVC), founded in 1996 by a GRA Eminent Scholar, is regarded as the largest university-based vaccine research enterprise in the world. EVC has brought in more than \$1.2 billion in research funding.

The University of Georgia and GRA funded an Eminent Scholar in 2015 for basic and translational research about infectious diseases. In 2019, NIH awarded a contract to develop a new flu vaccine to protect against multiple strains of the flu virus using a single dose. The NIH contract could grow to \$130 million, the largest research award in UGA's history. Both vaccine research centers now collaborate and have been significantly involved with Operation Warp Speed vaccine research, testing and clinical trials.

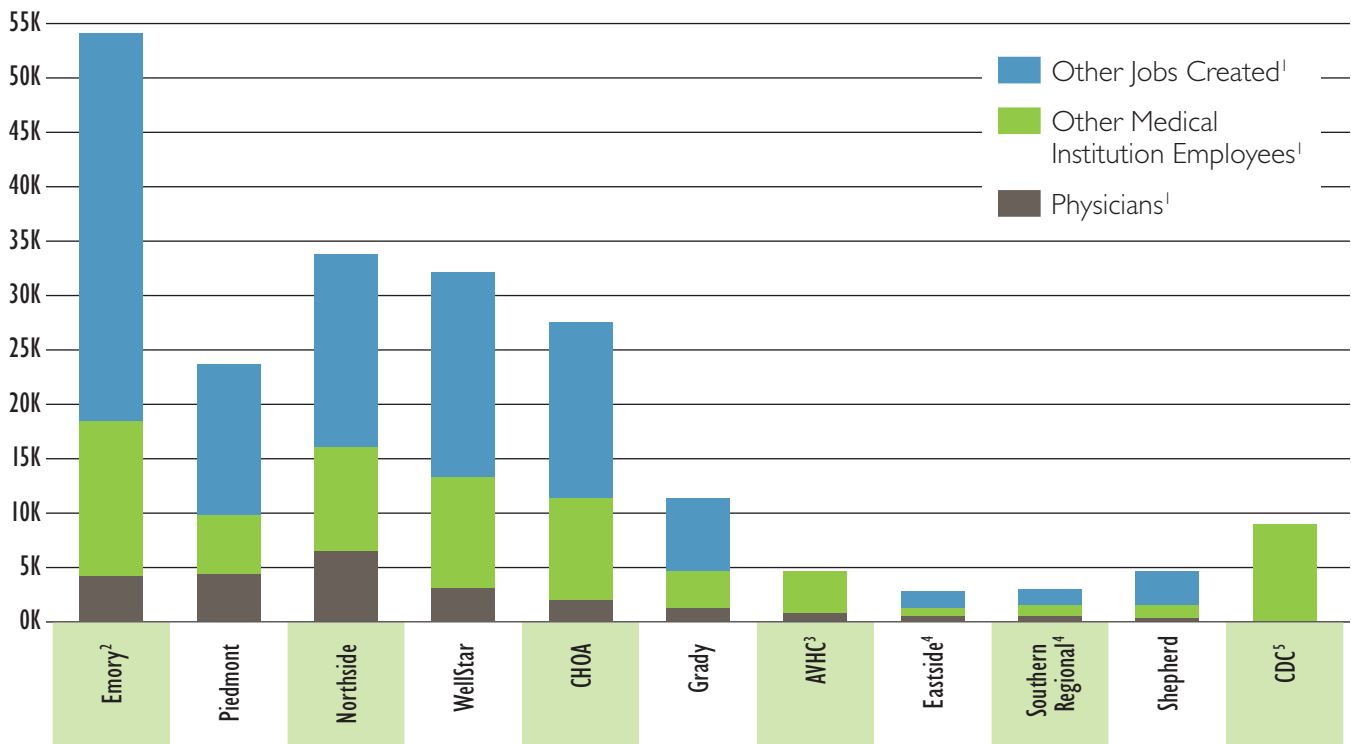
These two centers are also members of GCTSA and as such they collaborate with Grady, VAMC, CHOA and Emory Healthcare hospitals.

Atlanta Meds: Hospitals-to-Hospital Collaboration

In 2019, Figure 6 shows employment impact of hospitals located in the 10-county metro area plus the CDC. They directly employed 101,000 doctors, nurses and other staff, and created 198,000 jobs within the region. Table 1 details the staffed beds within the metro area by hospital totaling 10,144 beds with 458,935 patients admitted.

Atlanta's hospitals are dominated by four brand names: Emory, Piedmont, Northside and Wellstar. Each has many hospital locations which were primarily acquired over the last 15 years. CHOA was formed through a merger of Egleston, Scottish Rite and Hughes Spalding Children's Hospitals. Grady Health and the Atlanta Veterans Affairs Health Care systems are large, single-campus facilities. Two smaller hospitals, Eastside Medical Center and Southern Regional, are subsidiaries of larger health systems, respectively Hospital Corporation of America and Prime Healthcare. These nine hospital groups plus the CDC directly employed over 90,000 people and led to over 198,000 jobs created in 2019,¹¹ as detailed in Figure 6. These hospital systems account for over 90 percent of the inpatient beds in metro Atlanta, according to the Georgia Hospital Association.

FIGURE 6: 2019 HOSPITAL TOTAL EMPLOYMENT IMPACT – TOTAL 198,000 JOBS



Sources:

¹Total doctors, nurses, and other employees from 2019 Georgia Department of Community Health, Annual Hospital Questionnaires, hospital websites hospital community reports, hospital fact books and hospital interviews

²Emory Healthcare Economic Impact Report 2020

³Open Records Request from AVHC

⁴Estimated figures from 2014 Community Impact Report

⁵CDC 2019 Annual Report, no estimate of other jobs created

TABLE I: HOSPITAL DATA

Hospitals	Staffed Beds ¹		Hospital Locations ²		Admissions ¹	
	Metro	Non-Metro	Metro	Non-Metro	Metro	Non-Metro
Emory Healthcare	2,325	0	11	0	107,886	0
Piedmont Healthcare	1,458	1,291	5	6	84,263	46,656
Northside Hospital System	1,510	88	4	1	80,442	5,355
Wellstar Health System	2,138	640	8	2	99,759	15,988
Children's Healthcare of Atlanta	617	0	3	0	25,627	0
Grady Health System	989	0	1	0	34,592	0
Atlanta Veterans Affairs Health Care System ³	466	0	1	0	8,055	0
Eastside Medical Center	310	0	1	0	11,497	0
Southern Regional Medical Center	331	0	1	0	6,814	0
TOTALS	10,144	2,019	35	9	458,935	67,999

Sources:

¹ Georgia Department of Community Health, 2020 Annual Hospital Questionnaire

² Hospital websites, 2020

³ Open Records Request, 2017

Uncompensated care varies widely in metro Atlanta, with Grady having the highest ratio of uninsured patients at 25 percent. Other major hospitals were in the 3- to 10-percent range in 2019 according to the Georgia Department of Community Health. The total of all uncompensated care for metro Atlanta's hospitals exceeds \$750 million per year.

Four major hospitals serve special needs in metro Atlanta. Grady is the region's only indigent care safety-net facility with neighborhood clinics, a large HIV/AIDS clinic and the state's largest nursing home. The Atlanta Veterans Affairs Health Care System serves the military community, and CHOA is the only children's hospital. The Shepherd Center is primarily a rehabilitation hospital for spinal and neurological injuries.

In addition to mergers and acquisitions, new construction expanded the big hospitals even more. Current, recent and announced construction totals over \$4 billion: CHOA, \$1.5 billion; Emory Healthcare, \$800 million; Piedmont, \$600 million; Grady, \$400 million; Northside, \$500 million; and Wellstar, \$206 million according to hospital websites.

Many hospitals have specialty clinics, urgent care facilities and primary care centers that offer access to patients with medical conditions that are not serious enough to require hospital admission. The 11 hospitals shown in Figure 6 support 104 urgent care and 447 primary care practices.¹² Many of these clinics and treatment centers are generally remote from hospitals and treat outpatients who do not require overnight stays.

GRADY HEALTH SYSTEM'S SHARED SERVICES

Grady's Marcus Stroke and Neuroscience Center, Burn Center, Georgia Poison Center and HIV Clinic are unique in serving patients referred from dozens of hospitals, thus eliminating duplication of complex and capital-intensive practices. Grady coordinates the Atlanta Metro Emergency System for all hospital emergency rooms. Grady was near bankruptcy in 2008 when the Metro Atlanta Chamber created a task force of civic leaders for a year-long public examination of problems and how to restore the hospital to sound operation. The resulting privatization of Grady from Fulton and DeKalb Counties' responsibility resulted in over \$325 million being invested from foundations and private philanthropy. Grady recently was recognized as one of the top charity essential hospitals in the nation.

ATLANTA'S VETERANS AFFAIRS HEALTH CARE SYSTEM (VAMC)

The Atlanta VAMC is a government-based healthcare system for veterans. It provides personal care physicians, treatment for traumatic brain injuries, post-traumatic stress and suicide prevention, and other services. The system contains 14 primary care clinics and conducts research and training to improve healthcare delivery. Doctors and residents from Emory and Morehouse schools of medicine provide medical care. The Wounded Warrior project is a partnership with Emory Medical School, offering rehabilitation and specialized treatment for traumatic injuries. VAMC is a primary training facility for nursing, social work, pharmacy, physical therapy, psychology and chaplaincy students from the Emory School of Medicine, Clark Atlanta University, Clayton State College, Georgia State University, Kennesaw State University, Mercer University and Morehouse School of Medicine.

SHEPHERD CENTER

The Shepherd Center is a 152 bed hospital focusing on the medical treatment, research and rehabilitation of people with spinal cord injuries and disease, acquired brain injury, multiple sclerosis, chronic pain and other neuromuscular problems. It is affiliated with Piedmont Hospital and accepts patients from hospitals across the country. The Shepherd Center is nationally ranked as one of the top 10 best rehabilitation hospitals in the U.S. by U.S. News & World Report. Like Grady, it has a unique niche and works with other hospitals for extensive rehabilitation treatment.

¹² This data was obtained from hospital websites and was self-reported by the hospitals.

CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)

While not a hospital, the CDC, headquartered in Atlanta, is the pre-eminent global organization for detecting, tracking and finding solutions for most infectious diseases. It leads national public health policy and response, most notably to the COVID-19 pandemic. The CDC contributes both high-level employment and financial benefits to Atlanta. As a top employer in Georgia, the CDC employs 8,600 doctors, scientists and administrators, the bulk of which reside and work in the Atlanta region. The CDC further represents a \$1 billion payroll in the state and \$103 million in purchases from Georgia businesses.¹³ Additionally, the CDC provided \$198 million in grants to Georgia organizations, universities and public health departments in fiscal year 2019.¹⁴ Emory's Rollins School of Public Health and Georgia State University's Global Health Institute and the Health Policy Center have many faculty who collaborate with the CDC. Being the only federal agency outside of Washington D.C., the CDC is the catalyst for infectious disease research in Atlanta.

Atlanta Eds and Meds: Collaboration among Universities and Hospitals

EMORY UNIVERSITY'S WINSHIP CANCER INSTITUTE, YERKES NATIONAL PRIMATE RESEARCH CENTER, EMORY VACCINE CENTER AND ROLLINS SCHOOL OF PUBLIC HEALTH

Emory University's Winship Cancer Institute is the only comprehensive cancer center in the state as designated by the National Cancer Institute. Winship physicians work at Emory Healthcare facilities, Grady Memorial Hospital, VAMC and CHOA. They also partner with other cancer research centers and lead the state of Georgia in clinical trials. Winship operates the \$200 million Proton Therapy Center in Midtown Atlanta, one of only 60 therapy centers of its kind worldwide.

Emory's Yerkes National Primate Research Center, founded in 1930, is an NIH-funded facility in which infectious diseases are studied with 3,000 non-human primates. Emory's Brain Health Center, Center for AIDS Research and Yerkes partner with the CDC, Emory Healthcare, Georgia Tech and the University of Georgia.

Emory's Vaccine Center, led by a GRA Eminent Scholar, partners with the University of Georgia, CDC, Georgia Tech, Georgia State University, Emory Healthcare and Grady. It is one of the largest infectious disease centers in the world. The Hope Clinic is the clinical arm of Emory's Vaccine Center, conducting extensive clinical evaluation trials for COVID-19 vaccines and researching human immunology.

Emory's Rollins School of Public Health is a major research partner with the CDC on global health, epidemics, disease causes and solutions for public health. The Rollins School provided staff support to the Georgia Department of Public Health during the pandemic. Georgia State University's School of Public Health is also a significant partner in infectious disease study.

The Communicable Disease Unit at Emory Healthcare is a partner with the CDC where highly infectious diseases like Ebola can be received, diagnosed and treated. Its particular construction and personnel training were anticipated in 2002 when it was developed as an emergency service facility for scientists at the CDC working on communicable disease outbreaks around the world.

¹³ CDC's Impact on Georgia, 2019.

¹⁴ www.cdc.gov/FundingProfilesApp/#summaryreports.

GEORGIA CLINICAL AND TRANSLATIONAL SCIENCE ALLIANCE (GCTSA)

GCTSA is the largest collaborative network in Georgia. The Georgia Research Alliance and NIH committed a six-year grant to start a collaborative alliance in 2006 at Emory University. It has now grown to include Emory University, Georgia Tech, Morehouse School of Medicine and the University of Georgia collaborating with VAMC, CHOA, Grady Health System and Emory Healthcare. Its annual meeting in March 2021 included 150 presentations from academic and clinical investigators and was attended by 375 specialists from the above institutions plus Florida State University, Medical University of South Carolina, University of Alabama at Birmingham and the University of Miami.

The Alliance's mission is to create a collaborative exchange for faculty research in clinical-based healthcare and medical training. GCTSA staff members assist academics in preparing grant applications, share a database of research underway at member institutions, foster academic partnerships and offer legal support for intellectual property rights of similar organizations across the nation.

BIOMEDICAL ENGINEERING (BME) PARTNERSHIP

The BME partnership started by Georgia Tech and Emory Healthcare has expanded to include Emory University, CHOA and Grady Health System. This partnership is ranked in the top three for both undergraduate and graduate biomedical engineering programs by US News & World Report with over 1,300 undergraduate and 2,000 graduate students. Its research includes Parkinson's, Alzheimer's, cancer, arthritis, cardiovascular disease, and neurological and immune disorders. CHOA has invested in many pediatric research projects and the construction of facilities on Georgia Tech's campus. Georgia Tech and Emory conduct more collaborative research than any other universities in Georgia. They also operate a free shuttle bus for faculty and students who take courses at both universities.

MARCUS AUTISM CENTER

The Marcus Autism Center, a CHOA subsidiary, partners with the Emory University Department of Pediatrics, Georgia State University, the CDC and community-based organizations. The Center is led by a GRA Eminent Scholar and offers early detection and clinical treatment for autistic children, and was the first to assess infant eye movement for very early detection of autism.

PEDIATRIC RESEARCH ALLIANCE

The Pediatric Research Alliance conducts research on children's diseases and includes Emory School of Medicine, Georgia Tech, Morehouse School of Medicine, CHOA, the CDC and GRA. It now consists of 16 centers for research, including the Center for Childhood Infections and Vaccines and the Aflac Cancer and Blood Disorders Center. A major part of the alliance is the Pediatric Research Center founded in 2012 with a \$20 million grant from the NIH.

GEORGIA STATE UNIVERSITY'S GEORGIA HEALTH POLICY CENTER

The Georgia Health Policy Center at Georgia State University is very unique as an academic center working at the intersection of research and real world practice. It has consulting agreements with local, state and federal public health organizations to help develop policies related to healthcare inequities and access to care and broader socioeconomic determinants of well-being. Its work with the Robert Johnson Foundation helps public health agencies anticipate how to use potential federal funds to significantly improve their work in the aftermath of COVID-19. With a staff of over 100, it partners with Georgia Tech, Emory University and colleges beyond Georgia. The Center works in more than 200 communities in all 50 states with 70 projects underway. The center collects and analyzes data for local hospitals' Community Health Needs Assessment reports. Georgia State University professors from public health and other degree programs participate. The Atlanta Regional Collaborative for Health Improvement (ARCHI) is part of the Center. ARCHI's goal is to work "upstream" from hospitals with over 100 community organizations to keep less fortunate citizens healthy.

GEORGIA CENTER FOR ONCOLOGY RESEARCH AND EDUCATION (CORE)

Georgia CORE is an independent nonprofit that works with local hospitals and organizations to improve cancer care across Georgia. Founded in 2003 with tobacco litigation funds, the organization helps individuals obtain cancer screenings in their communities, coordinates cancer treatment teams and educates patients about the most current clinical trials available to them. Currently, there are almost 11,000 clinical trials in Georgia and 100 investigators at eight hospitals.¹⁵ Georgia CORE, according to Nancy Paris, executive director, has its roots in the Georgia Cancer Coalition and GRA. It also conducts educational community programs and currently has a research network with 26 organizations, hospitals and universities, including Winship Cancer Institute at Emory University, Georgia Cancer Center for Excellence at Grady, Gwinnett Medical, Emory Decatur Hospital, Northside Hospital Cancer Institute, Morehouse School of Medicine, Piedmont Cancer Institute, Wellstar Health System and Southern Regional Medical Center. It is affiliated with Georgia State University's Georgia Health Policy Center.

GLOBAL HEALTH CRISIS COORDINATION CENTER (GHC3)

GHC3 is a new organization created by a coalition including the Metro Atlanta Chamber, CDC Foundation, Task Force for Global Health, Emory University and Georgia Tech, with \$1 million in seed money from Microsoft and the CDC Foundation. GHC3 is a division of the Center for Global Health Innovation, a nonpartisan convener and catalyst to create compelling and equitable solutions for the world's greatest public health issues. GHC3's aim is to make Atlanta known as a hub for global public health. Its purpose is to connect academic, healthcare and business groups in global public health. Under discussion for several years, the COVID-19 pandemic hastened its launch according to Judy Monroe, president of the CDC Foundation.

The initiative's participants are organized into teams of specialists brought together to work on specific issues, such as disease eradication, economic development and disaster response.¹⁶ According to David Hartnett, senior vice-president of economic development for the Metro Atlanta Chamber, "CDC, Task Force for Global Health, Carter Center, CARE and American Cancer Society are the national and global leaders in public health headquartered in Atlanta. They have been relatively unrecognized for their collective impact, which arguably makes Atlanta the global center for public health."

KENNESAW STATE UNIVERSITY AND WELLSTAR HEALTH SYSTEM

Kennesaw State University's College of Health and Human Services has a comprehensive partnership with Wellstar Health System and has the largest undergraduate health-related enrollment of any metro college. Through their partnership, nursing students train with Wellstar nurses during clinical practicums. Wellstar also manages and staffs the university's three student health centers. In addition, Wellstar Health System has sponsored the university's athletics department with a \$2.75 million sponsorship over 15 years.¹⁷

NORTHSIDE HOSPITAL-GWINNETT COLLEGE

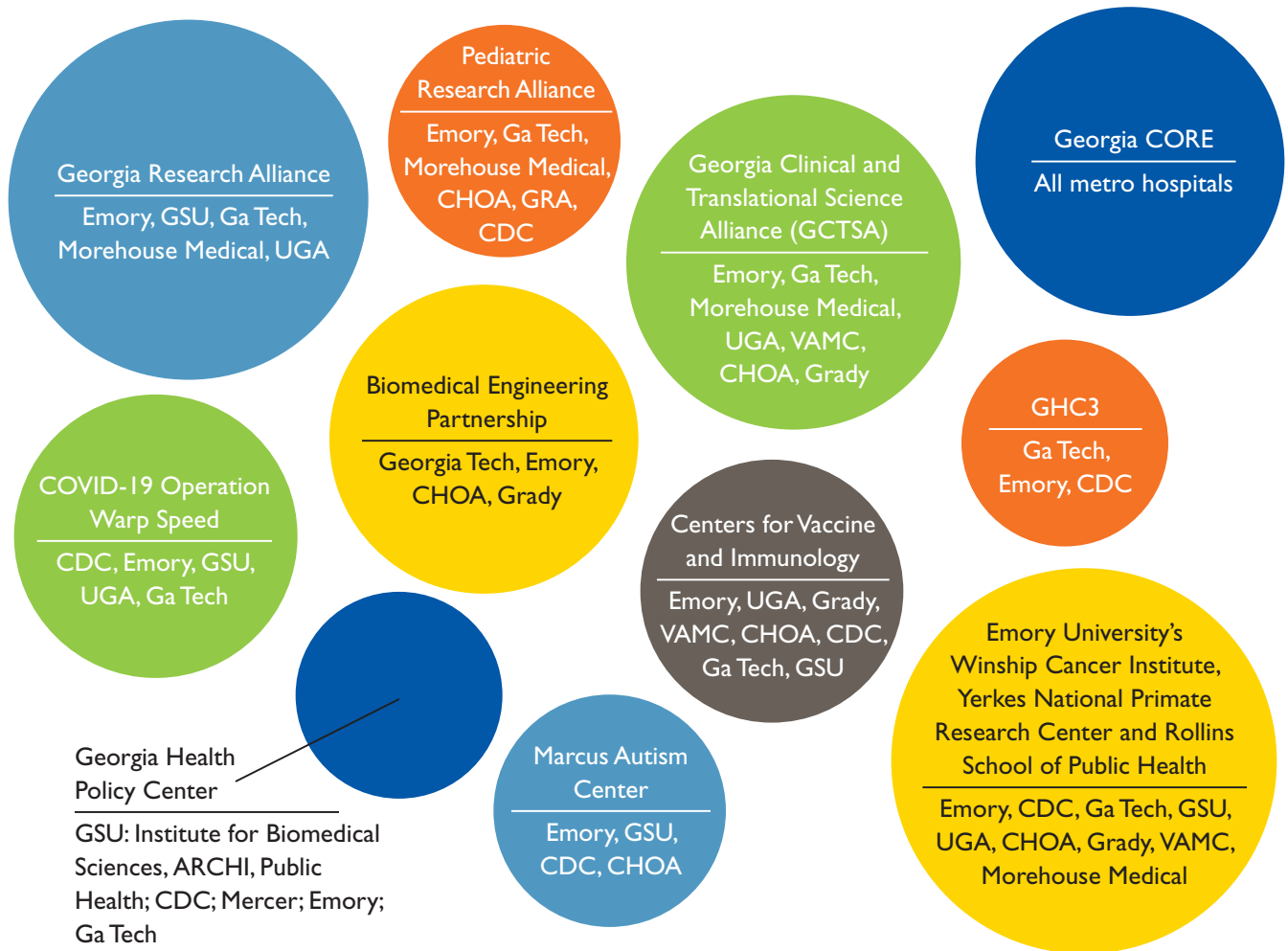
Gwinnett Medical Center, now a part of Northside Hospital, is partnering with Gwinnett College, now a part of the University System of Georgia, on several research projects. They also have a nursing externship program and a graduate medical education residency program.

¹⁵ Based on data from CenterWatch website

¹⁶ www.globalhealthatl.com

¹⁷ news.kennesaw.edu/stories/2014/Kennesaw-State-Names-WellStar-as-Official-Health-System-Partner.php

FIGURE 7: COLLABORATIVE PROJECTS CREATED BY UNIVERSITIES AND HOSPITALS¹⁸



Notes: Emory is both a university and hospital organization. CDC is neither a university or hospital, but it does have collaboration with many of these. Kennesaw State-Wellstar, Georgia Tech-Piedmont and UGA (Gwinnett)-Northside are important partnerships but do not have the size or outside partners as the 11 shown above. The Sickle Cell Disease collaboration was just formed in 2021 without comparable data for this diagram.

PIEDMONT HOSPITAL-GEORGIA TECH

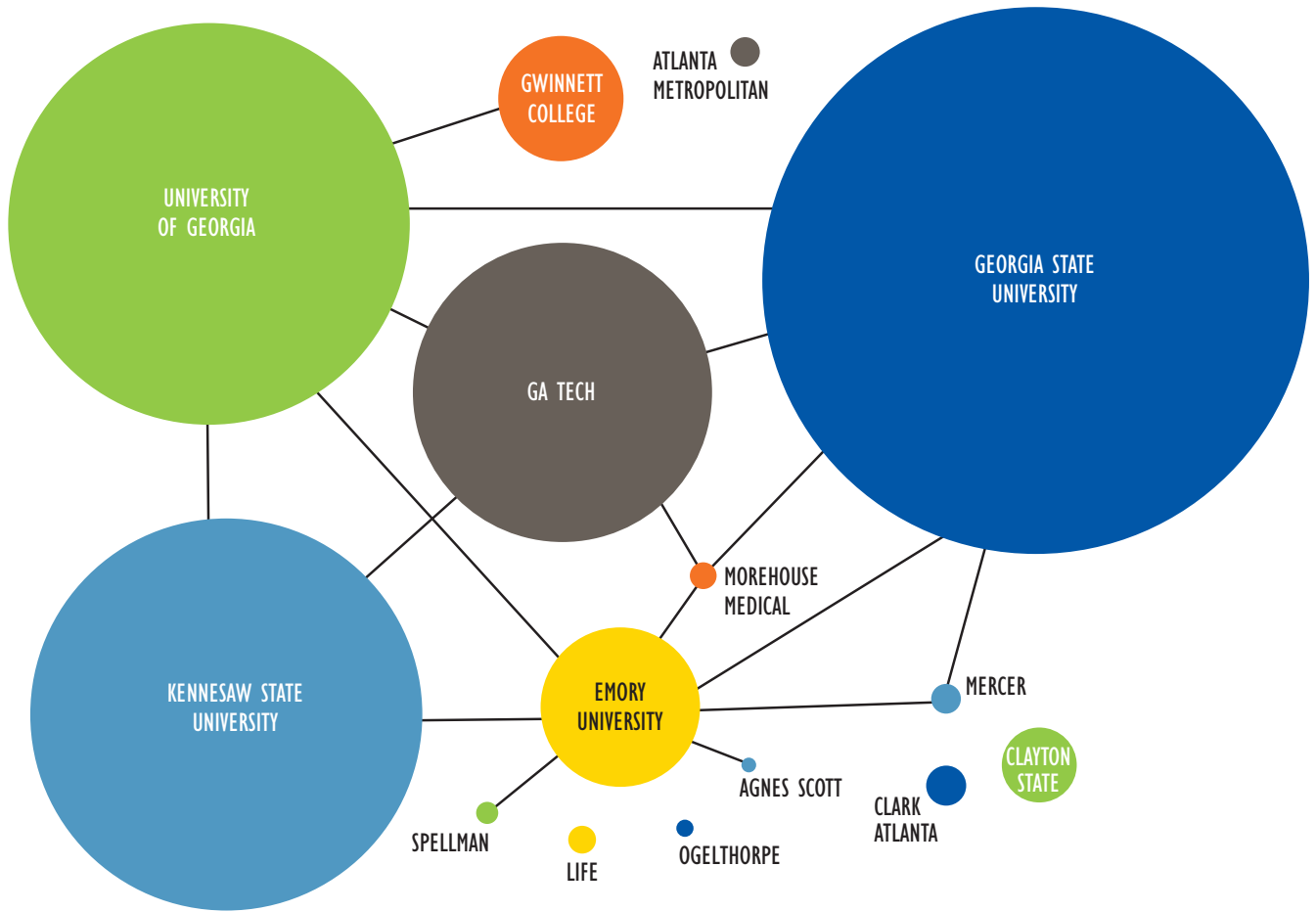
Georgia Tech and Piedmont Hospital created the Global Center for Medical Innovation. The Center is a biomedical pre-clinical service group with a staff of 62 creating and/or testing medical device prototypes and helping commercialize innovations. One of the Center’s best known successes, CardioMEMS, the only FDA approved device to remotely monitor heart functions, was sold to Abbot Laboratories.

GRA-CHOA-MOREHOUSE SCHOOL OF MEDICINE-EMORY SICKLE CELL DISEASE INITIATIVE

In 2021, a partnership led by the Georgia Research Alliance announced a \$15.8M initiative to expand Georgia’s research capacity and clinical care for sickle cell disease. Two new endowments for GRA Eminent Scholars and other research infrastructure are included in this five-year plan.

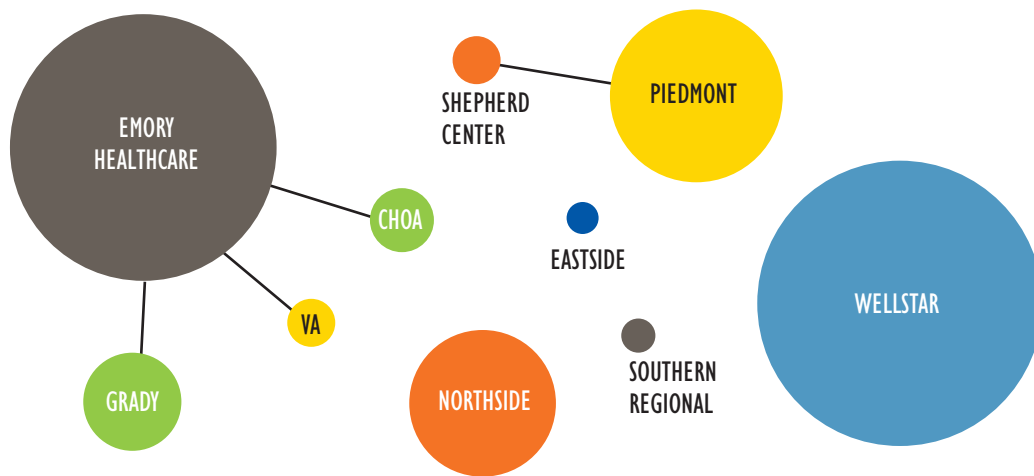
¹⁸ Size of bubble represents the number of employees, budget and relative age of collaborative projects.

FIGURE 8: UNIVERSITY-TO-UNIVERSITY MEDICAL COLLABORATIONS



Size of university bubbles represent total enrollment.

FIGURE 9: HOSPITAL-TO-HOSPITAL MAJOR COLLABORATIONS



Size of hospital bubbles represent total number of beds.

Note, Shepherd conducts research and accepts rehab patients from hospitals nationwide.

Innovation and Discovery

As a result of university and hospital collaboration, metro Atlanta can boast several discoveries that have significantly improved healthcare, extended lifespans and spawned startup companies.

COVID-19 VACCINE RESEARCH AND CLINICAL TRIALS

Emory University's Vaccine Center conducted clinical trials as a part of Operation Warp Speed to test potential vaccines. Its Hope Clinic was one of the premier labs to verify the efficacy of several leading vaccines. The University of Georgia's Vaccine Center partnered with Emory on this project.

EBOLA TREATMENT

Emory University and the CDC successfully treated EBOLA patients in a special isolation unit, the only one of its kind in 2014. Lessons learned by the team became standard practice in treating this highly contagious disease worldwide.

HIV/AIDS DRUG TREATMENTS

HIV/AIDS treatments in use worldwide were perfected through research at Emory. Three Emory scientists invented the leading treatments for HIV: Ray Schinazi, Dennis Liotta and Woo-Baeg Choi. According to Jonathan Lewin, president and CEO of Emory Healthcare, today 90 percent of HIV-infected patients worldwide use these treatments. The licensing of this drug resulted in \$525 million to Emory and its partners. The CDC continues as a major monitor of this disease. Grady's HIV/AIDS clinic is the largest in the Southeast. "The HIV/AIDS epidemic is still a major public health crisis, and metro Atlanta is one of the top three cities in the nation for this disease," said John Hauptert, the president and CEO of Grady Health System.

INFANT DETECTION OF AUTISM

The Marcus Autism Center discovered a method of detecting infant autism by testing eye movement with special lighting. This test, invented by a GRA Eminent Scholar, is now standard practice globally for early autism detection.

MICRONEEDLES

Georgia Tech and Emory University developed "microneedles," which have been hailed by the NIH as a scientific breakthrough. These tiny needles are contained in a Band-Aid type adhesive that is painlessly applied to the skin in lieu of an injection. For the flu and other vaccines, the research team perfected dried serum, which does not require refrigeration and thus allows for remote application.

NEUROSTAR TMS THERAPY®

NeuroStar TMS Therapy® was invented by a collaboration between Emory and Georgia Tech and is used to detect and treat depression with transcranial magnetic stimulation. The device provides doses of electromagnetic pulses to certain areas of the brain while the patient relaxes in a chair. Treatment of depression usually requires taking different medications to see which ones work to improve symptoms. This device is noninvasive and has provided results for patients when medications were ineffective.

Conclusion and Recommendations

Metro Atlanta's Eds and Meds have 11 major collaborative partnerships that give hospitals and universities the basic infrastructure for the region to become a world-class center for better healthcare treatment, research and new ventures if more collaboration occurs between our universities and hospitals. Despite this relative lack of collaboration compared to best practice cities, six nationally recognized medical breakthroughs have been achieved giving Atlanta significant recognition.

Emory Medical School/University/Healthcare, Morehouse School of Medicine, Georgia State University, Georgia Tech, University of Georgia, Grady, VAMC, CHOA and the CDC are the most actively engaged collaborators among the hospitals and universities in this study.

The NIH provides grants for research collaboration as evident by the creation of the GCTSA. Its partnership includes more universities and hospitals than any other enterprise bringing research to practical clinical applications.

The Georgia Research Alliance, funded by the state and philanthropists, is a mature academic collaborative partnership of Georgia's leading research universities. The state has invested over \$660 million since it's founding but annual investments have fallen from a high of \$49 million to \$11 million this year.

The 11 independently funded collaborative partnerships cited in this report create a network between academic professionals, medical clinicians and researchers. While their parent institutions are not partnering across the board, these collaborative entities tend to focus on specific research areas. New research projects may be more appealing to potential partners who have previously been competitive than joining existing mature collaborations.

COVID-19 has forced collaborative research, testing and vaccinations among many Eds and Meds, but it has also shown the weakness of public health agencies and their lack of working relationships with academic and medical professionals. The result is Georgia's placement as having one of the lowest per-capita vaccination records in the nation.

Based on over 125 interviews, the study of other cities and research on best practices, we offer several proposals that could significantly increase collaboration, and thus the value of the Eds and Meds sector to the Atlanta economy:

- ▶ Public health agencies from the CDC, state and local government need to have a robust communication system to avert many of the problems experienced during the COVID-19 pandemic.
- ▶ Public health agencies, hospitals, public health schools and academic healthcare researchers must develop a strong working relationship, learning from the current pandemic and be prepared for the next crisis as well as societal challenges to improve community health.
- ▶ State and local governments, and chambers of commerce should recognize Eds and Meds as a business cluster similar to supply chain, film, financial technology and others.
- ▶ State investment in the GRA needs to be increased significantly.
- ▶ Hospitals and universities who have not joined these 11 collaborations should be invited without demands that they share research or clinical practices across the board.
- ▶ Atlanta should learn from best practice cities and create a "grand plan" where the city and regional economic development entities have a formal agreement with the regions' Eds and Meds leaders.
- ▶ A highly respected organization, such as the Georgia Research Alliance, the Global Health Crisis Coordination Center or a new group should help Eds and Meds leaders develop a collective plan to significantly expand existing collaborative projects and solicit commitments from key leaders for commitments to work together.
- ▶ Major university and hospital research efforts should declare priority research for a few emerging issues such as brain health, immunology, pandemic viruses and bioelectric electroceuticals.

- ▶ An annual symposium of metro Atlanta Eds and Meds should be created so that collaborative leaders can share their work with potential participants from uninvolved universities and hospitals. Trips to best practice cities could be a priority of this symposium.
- ▶ Universities and hospitals can cooperate to recruit, train and hire citizens for entry-level jobs and purchase more goods and services from local vendors to reduce the income gap between rich and poor in the region.
- ▶ Hospitals must be more transparent in making financial, bundled patient data and annual operating reports available to the public.

Further Studies Recommended

ARCHI, part of the Georgia Health Policy Center, has a broad objective of helping to improve the health of low-income, uninsured and transportation-limited people. ARCHI is strongly motivated by research showing that one's zip code is a more significant determinant of health and lifespan than DNA. They host meetings with hospitals, churches, and various community groups to advance community health. Federal regulations require each hospital to publish a Community Health Needs Assessment (CHNA) for their service area, but recommendations for action are not audited. Food deserts, availability of healthy food and understanding the cause of diseases like type 2 diabetes are important agenda items. This work should become a priority for local and state government as federal assistance for the uninsured increases. It could easily provide collaborative opportunities for universities and hospitals.

The Annie E. Casey Foundation has sponsored studies in several cities that show how some anchor institutions, including hospitals and universities, are creating recruiting and training programs to hire low-skilled urban residents. They have also recommended that anchor institutions purchase more of their products from local suppliers. (See the following link, www.aecf.org/work/economic-opportunity/work-education-and-income.) The Atlanta Federal Reserve Bank is also researching anchor institutions that have policies of training and hiring local workers as well as purchasing goods and services from local sources.

The Brookings Institution and New York University's Wagner School have published extensive research about Eds and Meds. They have focused on specific cities where a "grand plan" was created between city governments, universities and healthcare facilities to form innovation districts for collaborative research, job training for entry-level positions in Eds and Meds institutions, helping neighboring disadvantaged communities with affordable housing, local purchasing and fostering extensive research leading to private investment and startup companies.¹⁹

The Federal Reserve Bank of Atlanta conducted a 2018 study of anchor institutions in Miami, New Orleans and Atlanta and their role in community development, local purchasing, recruiting and training entry-level workers. They continue to be potential partners on anchor institution opportunities.

Harvard Business School Professor Michael Porter met with then Bell South CEO Duane Ackerman and other Atlanta business and academic leaders beginning in 1989 to promote economic development along industry clusters.²⁰ These studies about clusters and innovation districts were used to identify successful cities where local leadership connected and expanded the relationships between anchor institutions.

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Appendix: More than 125 Individuals from These Organizations Were Interviewed

- ▶ The Annie E. Casey Foundation
- ▶ Atlanta CareerRise – CHAMP
- ▶ Atlanta Regional Commission
- ▶ Atlanta Regional Consortium for Higher Education (ARCHE)
- ▶ Brookings Institution
- ▶ Carnegie University
- ▶ CDC Foundation
- ▶ Children's Healthcare of Atlanta
- ▶ Cincinnati Chamber of Commerce
- ▶ Community Foundation For Greater Atlanta
- ▶ Drexel University
- ▶ Emory Healthcare
- ▶ Emory School of Medicine
- ▶ Federal Reserve Bank of Atlanta
- ▶ Georgia Clinical and Translational Science Alliance
- ▶ Georgia CORE
- ▶ Georgia Department of Community Health
- ▶ Georgia Department of Public Health
- ▶ Georgia Hospital Association
- ▶ Georgia Research Alliance
- ▶ Georgia State University
- ▶ Georgia Tech
- ▶ Georgia Tech and Emory University Biomedical Institute
- ▶ Grady Memorial Hospital
- ▶ Harvard Business School
- ▶ Kaiser Permanente
- ▶ The Kendeda Fund
- ▶ Kennesaw State University
- ▶ Metro Atlanta Chamber of Commerce
- ▶ Morehouse School of Medicine
- ▶ New York University Wagner School
- ▶ Newmark Knight Frank Real Estate
- ▶ Northside Hospital
- ▶ Piedmont Hospital
- ▶ Pittsburgh Allegheny Conference
- ▶ Robert W. Woodruff Foundation
- ▶ St. Louis Innovation District
- ▶ University of Georgia
- ▶ United States Senate Committee on Health and Human Services
- ▶ Veterans Health Administration
- ▶ Wellstar Health System

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