# An Investment in the Health and Economy of Mississippi and the Gulf Coast

The Socioeconomic Impact of a Healthcare Research Cluster at Tradition, Mississippi

*A joint study by Arduin, Laffer, and Moore Econometrics, The University of Southern Mississippi, and Southern Mississippi Planning and Development District*

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# Introduction

## The Task

Arduin, Laffer, and Moore Econometrics (ALME), in conjunction with The University of Southern Mississippi, were engaged by Southern Mississippi Planning and Development District to create a report that:

1. Establishes a baseline narrative describing the condition of the economies of Mississippi and the Gulfport-Biloxi-Pascagoula region (the Metropolitan Statistical Area used by the Census Bureau and the Bureau of Economic Analysis) relative to the United States,

2. Analyzes the range and depth of the growing issue of diabetes and obesity in Mississippi, and

3. Forecasts the economic impact of several known future developments in the master planned community of Tradition, Mississippi.[1]

These developments include the College of Medicine and School of Pharmacy at William Carey University, an expansion and location of the Mississippi Gulf Coast Community College Nursing Simulation Center, the National Diabetes and Obesity Research Institute (NDORI) which is affiliated with Cleveland Clinic, Gulfport Memorial Clinic, and Coastal Family Health Clinic (CFHC). This impact analysis additionally required an evaluation of the potential for other businesses to move to the area and create mutually beneficial life science clusters that would work in a symbiotic fashion with these future developments.

[1] See full definition of Tradition on page 31.

## Summary of Findings

The state of Mississippi is full of untapped potential. According to the most recent edition of the American Legislative Exchange Council's (ALEC) ALEC-Laffer Economic Competitiveness Index, Mississippi has many of the components necessary to perform much better than it has historically. Its overall economic performance over the last 10 years was ranked 44th in the nation, but its forward looking outlook, which is based on 15 state and local policy indicators, is ranked 24th in the nation. That's a lot of room to grow. For instance, Mississippi has the 10th lowest corporate income tax rate at 5%. There is no estate or inheritance tax, it's a right-to-work state, and it has a relatively low ratio of debt service costs to tax revenue. It does not appear that there are many policies that would stand in the way of growth.

Nevertheless, the state's economic growth has been stagnant, and recent natural and unnatural disasters along the Mississippi Gulf Coast have maimed the local economies in that region. Industry concentration is sparse in high-productivity "jobs of the future" in technology, healthcare, information, and education. Instead, it has grown more specialized in the tourism, casino, and food service industries. In the Gulfport-Biloxi-Pascagoula region, jobs are concentrated in the lowest wage sector relative to the United States. Furthermore, Education and Health Services is 3rd from the bottom—there's about one employee for every two in the U.S. as a whole.

In addition to lack of industry diversity, productivity (GDP per employee) in Mississippi is the lowest in the nation. Weak productivity growth is closely related to weak growth in wages. Gulfport-Biloxi-Pascagoula's productivity growth rate is shrinking in an accelerated fashion compared to both the state and the U.S. A rebound in 2012 was thought to be a sign that the local economy had finally broken out of its downswing; the title of a 2012 report by the Atlanta Federal Reserve Board read, "Biloxi-Gulfport Economy Keeps Coming Back."[2] This upturn was short-lived.

The self-destructive nature of the public health in Mississippi is also working against its prospects for growth. The state has the highest rates of diabetes and obesity in the country, and these statistics appear to be linked to weak productivity growth, higher poverty rates, and lower labor force participation rates. The burden on the state is not small. The most recent estimates place the direct and indirect costs of diabetes in Mississippi as high as $3.4 billion annually, and these costs are expected to become greater with time given the current long term path of the diabetes rate. If Mississippi's diabetes patients recovered their lost income due to their lower productivity in 2013, and assumed a normal spending pattern, Mississippi would have gained nearly $600 million in economic activity on an annual basis.

Mississippi is ready for a rebound, and while tax cuts for the state that began in 2017 should help pave the way, more could be done for the state to live up to its potential. Higher wage industries, such as higher education and life science, could be better fostered, and productivity could be improved—particularly by reducing obesity and diabetes rates.

Tradition's planned community and medical city, according to our estimates and past research, should address the barriers to economic growth from two sides—business and health. Our forward looking economic results are based on the success of a very similar planned community in Orlando, Florida. We have projected that a new College of Medicine combined with the other current projects under way could add over 7,000 jobs and over $800 million in wages to the local economy of Gulfport-Biloxi-Pascagoula over the next ten years. The cumulative impact on the local area economic activity over that time is estimated to be about $1.3 billion.[3] Should Tradition become a full-fledged research cluster, the economic impact could increase to $2 billion. The business activity that will ripple across the economy will alter the local economy's industry mix to a combination that is much more geared towards a stable economic future—no longer as dependent on the changing tides of tourism. Furthermore, should NDORI be able to contribute to a decrease in the state diabetes and obesity rates, we can expect the labor force participation rate to rise and poverty rates to fall, *ceteris paribus*.

[2] "Biloxi-Gulfport Economy Keeps Coming Back," Federal Reserve Board of Atlanta, 2012. https://www.frbatlanta.org/-/media/documents/regional-economy/econsouth/12q2grassroots.pdf

[3] This is a cumulative number. Full model results are summarized in Table 5.

# Defining the Local Economy

For this study, we will use the Gulfport-Biloxi-Pascagoula Metropolitan Statistical Area (MSA) as our local economy.[4] The main reason for this is that the ALME economic impact model relies heavily on contribution to local area GDP, which is readily available from the Bureau of Economic Analysis (BEA) for metropolitan statistical areas, as opposed to the county level, for which the BEA does not calculate GDP. Additionally, also due to data availability, we will be addressing industries at the highest NAICS level.[5]

# Benchmark Areas:

We've chosen Florida and North Carolina as *aspirational* benchmark comparison states, and the Orlando-Kissimmee-Sanford, Raleigh, and Durham-Chapel Hill MSA's as *aspirational* benchmark comparison local economies. We've chosen these states and areas for their exemplary economic growth, and the presence of strong research campuses. Throughout the study, we use these states and areas as benchmarks of success and to show what kind of growth Mississippi and Gulfport can aspire to.

# Looking Backward: the United States, Mississippi, and Gulfport-Biloxi-Pascagoula

Mississippi's economy has been on quite the roller coaster. The volatility of economic growth in the state is largely associated with its proximity to the Gulf of Mexico. In August of 2005, Hurricane Katrina rocked the Gulf Coast with southern Louisiana and Mississippi being hit the hardest, which is evidenced in the significant dips witnessed in output, employment, and productivity in these areas. The storm crippled the region for years. Then, just when Mississippi was beginning to return to pre-Katrina levels, the Great Recession of 2009 and the Deepwater Horizon oil spill of April 2010 (also on the Gulf) dealt more heavy blows to the state. Recovery from these events has prevented the state from reaching some of its economic goals.

## Hurricane Katrina

A study conducted by the Commerce Department on the economic impact of Katrina in 2005, the year following the storm, revealed that Mississippi Gross State Product (GSP) growth fell 2.9% in 2004 to 1.2% in 2005.[6] The share of households on public assistance and food stamps increased by over 50%, and personal income per capita fell by 5%. Business on the Gulf Coast was also decimated, as 3,000 of the 39,000 geocoded businesses in Mississippi were located within designated FEMA damage zones. State tax collections fell by 25% from Q2-2005 to Q3-2005.

## Deepwater Horizon BP Oil Spill

In the wake of the Deepwater Horizon oil spill of April 2010, there was an immediate uptick in initial jobless claims, but the lasting impact was the decrease in tourism, which contributed to an estimated $11 million in lost tax revenue to local government over the four months following the oil spill, based on the results from a study by The University of Southern Mississippi.[7] Over that same four month period, the study estimated that the revenue loss to businesses was about $120 million.[8] So far, the total damages that BP is liable for is greater than $60 billion.[9] BP is compensating the State of Mississippi with $750 million for economic damages, in addition to what it is required to pay for environmental remediation. Mississippi's government has the discretion to spend the Deepwater Horizon oil spill economic damage (RESTORE) funds and is debating how to obtain the highest economic impact with the funds, primarily in its coastal communities.[10]

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[4]The United States Office of Management and Budget (OMB) delineates metropolitan and micropolitan statistical areas according to published standards that are applied to Census Bureau data. Source: U.S. Census Bureau.

[5] The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. Source: U.S. Census Bureau.

[6] "The Gulf Coast: Economic Impact and Recovery One Year after the Hurricanes," U.S. Department of Commerce, October, 2006. http://www.esa.doc.gov/sites/default/files/oct2006.pdf

[7] David L. Butler, "Economic Impact of the Deepwater Horizon Oil Spill on South Mississippi: Initial Findings on Tax Revenue," The University of Southern Mississippi, June 21, 2010. https://www.usm.edu/sites/default/files/groups/research/pdf/whitepaperbutersayretax.pdf

[8] David L. Butler, "Economic Impact of the Deepwater Horizon Oil Spill on South Mississippi: Initial Findings on Revenue," The University of Southern Mississippi, June 14, 2010. https://www.usm.edu/sites/default/files/groups/research/pdf/oilspillimpactwhitepaper100609.pdf

[9]Kelly Gilbom and Amanda Jordan, "BP Still Paying Gulf Oil Spill Claims as Court Battles Wind Down," Insurance Journal, January 16, 2018. https://www.insurancejournal.com/news/national/2018/01/16/477216.htm

[10] "MISSISSIPPI REACHES LANDMARK AGREEMENT IN DEEPWATER HORIZON OIL SPILL DISASTER CASE," Office of the Attorney General State of Mississippi, July 2, 2015. http://www.ago.state.ms.us/releases/mississippi-reaches-landmark-agreement-in-deepwater-horizon-oil-spill-disaster-case/

## State of the State

It is important to first understand the "state of the state" of Mississippi and the state of Gulfport-Biloxi-Pascagoula relative to the rest of the country. This section examines their relationship with national trends in output, employment, and production.

According to a report by Standard and Poor's last year, the agency maintained its negative outlook on Mississippi's credit-worthiness due to the following:

> *"…Relatively limited economy, which trails many national median indicators and has a higher dependency on federal government spending compared to other states, stagnant population growth, above-average unemployment, some concentration in manufacturing, below-average wealth and income indicators, and one of the nation's highest poverty rates and lowest educational attainment levels; and moderately high debt burden across several measures as well as relatively low and declining average pension-funding ratio."*[11]

### Output

There are many indicators and metrics of just how well or poorly an economy is doing. The most comprehensive economic measure of performance is gross domestic product (GDP). Gross domestic product, or as it is sometimes called when referring to a state, "gross state product" (GSP), is the full measure of the total production of all goods and services within that state's boundaries over a given period of time, usually a year. Whether making historical comparisons or cross-sectional comparisons, GSP is the ultimate arbiter.

For Gulfport-Biloxi-Pascagoula, we've opted to examine only private industry GDP as there is a very large federal government presence in the form of Keesler Air Force Base, which can distort what is really happening to economic growth. Private industry output from Gulfport-Biloxi-Pascagoula has grown at half the rate of the state of Mississippi.[12] Moreover, the economies of Mississippi and Gulfport-Biloxi-Pascagoula represent much smaller shares of the United States than their peak in 2008, with Gulfport-Biloxi-Pascagoula shrinking at a much more dramatic rate since 2012. This does not bode well for state finances as economic growth is the most important driver for tax revenue growth.

On the next page, Figure 1 shows how the private sector in Gulfport-Biloxi-Pascagoula and the entire state of Mississippi have grown relative to the United States. Figure 1 is indexed to 100 in 2006 for pre-Katrina/post-Katrina comparison purposes. The way to read Figure 1 is to look at the path of the line, and its value relative to 100 (its position in 2006). A rising line means that the share of the U.S. is increasing, and a value greater (less than) than 100 means the share of the U.S. is larger (smaller) than it was in 2006.

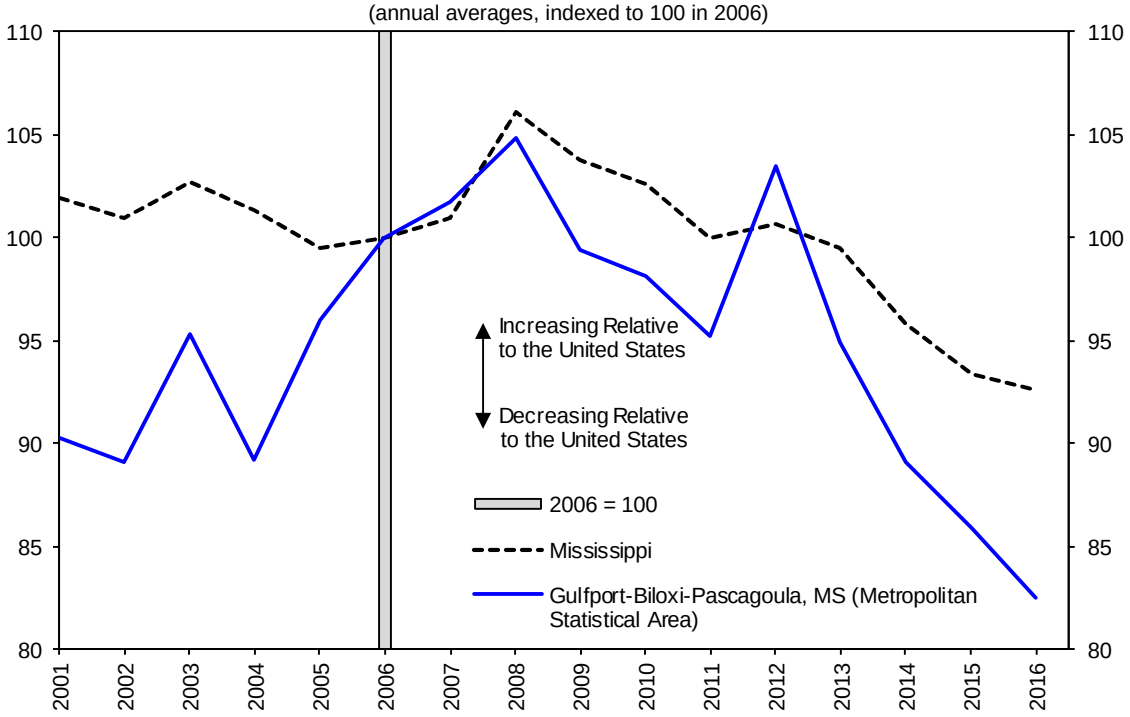
[11] Sussan S Corson, "Mississippi; Appropriations; General Obligation; Non-School State Programs; School State Program," S&P Global Ratings, May 1 2017. http://www.treasurerlynnfitch.ms.gov/Information/Documents/SPGlobalRatings_Mississippi%20050117.pdf

[12] Bureau of Economic Analysis

Figure 1

**Mississippi and Gulfport-Biloxi-Pascagoula Private GDP as a Share of U.S. Private GDP Relative to its Positon in 2006**

(annual averages, indexed to 100 in 2006)




Source: Bureau of Economic Analysis, Laffer Associates Calculations

If Mississippi were to have grown at the same rate as the United States since 2006, its private GDP would have been $7.1 billion dollars higher in 2016. If Gulfport-Biloxi-Pascagoula would have grown at the same rate as the United States, its private GDP would have been $2.7 billion higher in 2016.

## Employment

While Mississippi's unemployment rate of 4.5% is its lowest since at least 1976, it remains higher than the national rate of 3.9% (Apr-18), with Gulfport-Biloxi-Pascagoula faring slightly worse at a rate of 4.7% (Feb-18).[13] Additional employment opportunities will continue the momentum that Governor Bryant's policies have started, continuously improving Mississippi's labor market.

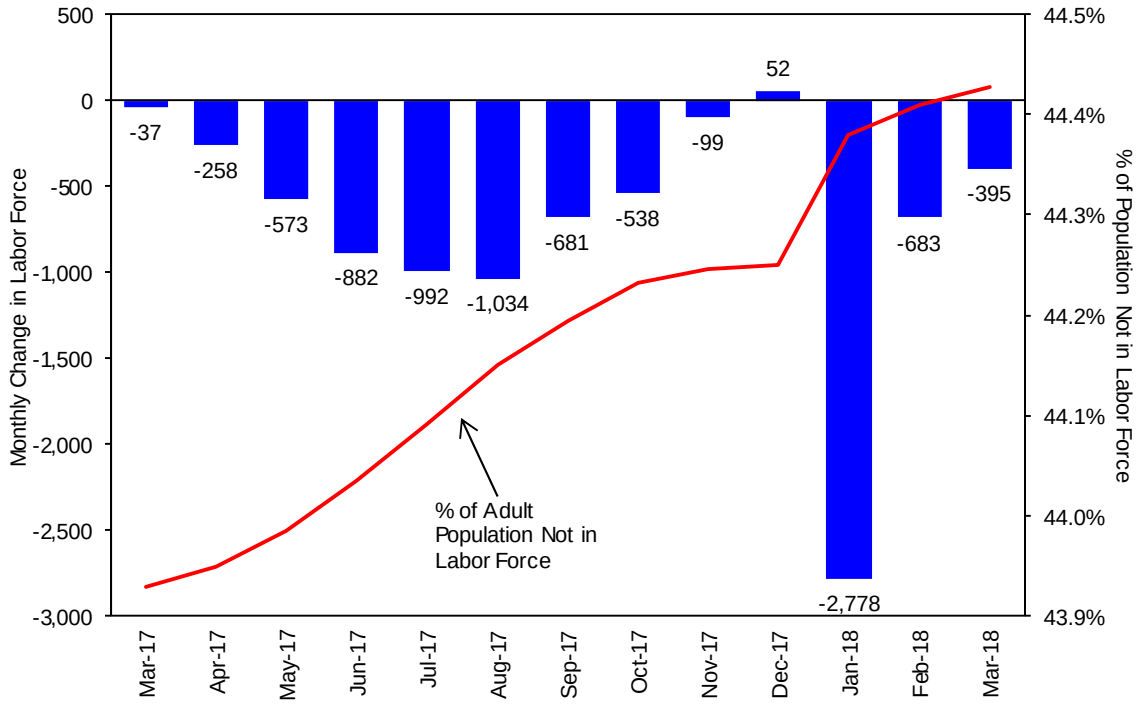
Mississippi's unemployment is especially high for a state given that Mississippi also has the second lowest labor force participation rate of all 50 states at 55.6% (March-18). Labor Force Participation is comprised of the total employed population plus the total unemployed population that is actively seeking work divided by the civilian non-institutionalized population.[14]

In the last year, Mississippi's unemployment rate has fallen substantially (from 5.3% to 4.5%). However, Mississippi's labor force is also significantly smaller than it was one year ago. In Figure 2, we show that Mississippi's labor force decreased in all but one month (December-2017).

Figure 2

**Mississippi: Change in Labor Force and Share of Adult Population not in Labor Force**

(Monthly, SA, Mar-17 through Mar-18)




Source: Bureau of Labor Statistics

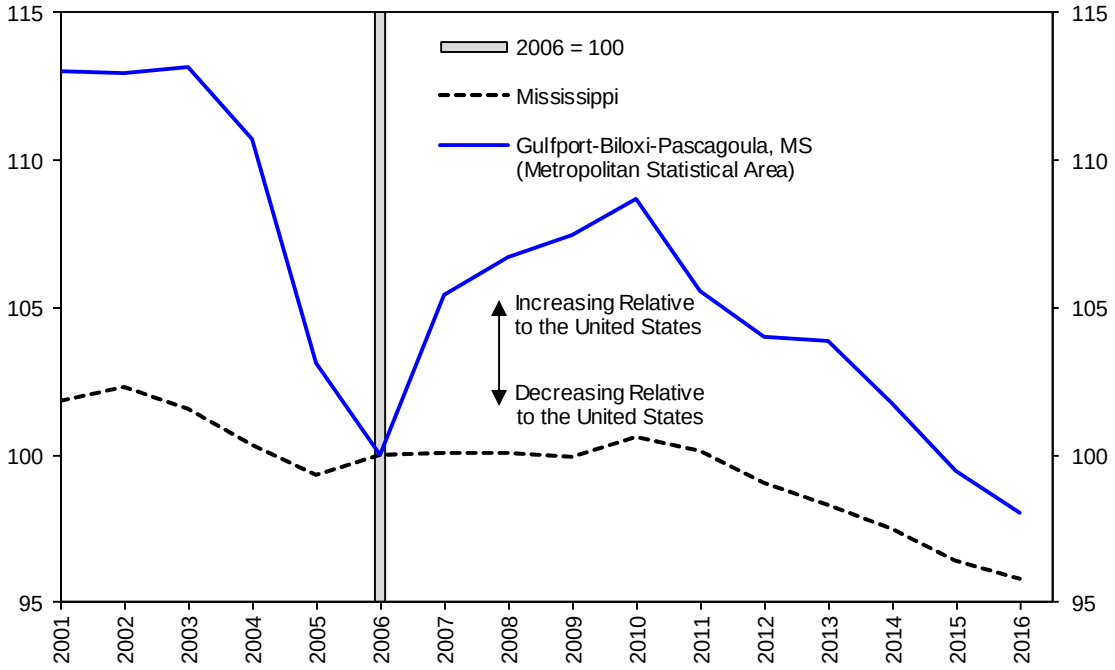
[13] Bureau of Labor Statistics: https://www.bls.gov/eag/eag.us.htm
https://www.bls.gov/regions/southeast/ms_gulfport_msa.htm

[14] Civilian noninstitutional population is defined as persons 16 years of age and older residing in the 50 states and the District of Columbia, who are not inmates of institutions (e.g., penal and mental facilities, homes for the aged), and who are not on active duty in the Armed Forces.
https://fred.stlouisfed.org/series/CNP16OV

Since 2001, Gulfport-Biloxi-Pascagoula's private nonfarm employment has fallen as a share of that of the United States, but not as low as that of the state of Mississippi.

Figure 3 below shows how the private sector employment in Gulfport-Biloxi-Pascagoula and the entire state of Mississippi has grown relative to the United States. Figure 3 is indexed to 100 in 2006 for pre-Katrina/post-Katrina comparison purposes. The way to read Figure 3 is to look at the path of the line, and its value relative to 100 (its position in 2006). A rising line means that the share of the U.S. is increasing, and a value greater (less than) than 100 means the share of the U.S. is larger (smaller) than it was in 2006.

Figure 3
**Private Nonfarm Employment as a Share of U.S. Private Nonfarm Employment Relative to its Positon in 2006**
(annual averages, indexed to 100 in 2006)




Source: Bureau of Economic Analysis, Laffer Associates Calculations

We can see that both Hurricane Katrina in 2005 and the Deepwater Horizon spill have had significant negative effects on employment. Employment recovered rather quickly after Katrina, pushed by the surge of construction jobs in the rebuilding phase.[15] However, the Great Recession coupled with the 2010 oil spill has caused a much longer descent for both the state and Gulfport-Biloxi-Pascagoula.

According to the Gulf Coast Business Council (GCBC) Economic Indicators Study, overall employment on the Mississippi Gulf Coast (Harrison, Jackson, and Hancock counties) shrank by 11,277 jobs from 2006 to 2017.[16] Relative to the nation, two of the least competitive industry sectors for employment growth were Healthcare/Social Assistance (4th worst) and Professional, Scientific, and Technical Services (worst). The most competitive categories were Accommodation/Food Services and Arts/Entertainment/Recreation, which is likely due to the heavy concentration of tourism, casino, and gaming businesses.

The output and employment data above are consistent with past observations that Gulfport-Biloxi-Pascagoula and the greater Gulf Coast area are growing disproportionately in low-wage, low-productivity industries.

[15] Molly Garber, Linda Unger, James White, and Linda Wohlford, "Hurricane Katrina's effects on industry employment and wages," Bureau of Labor Statistics, August, 2006. https://www.bls.gov/opub/mlr/2006/08/art3full.pdf
[16] Gulf Coast Business Council Economic Indicators Study, 2017.

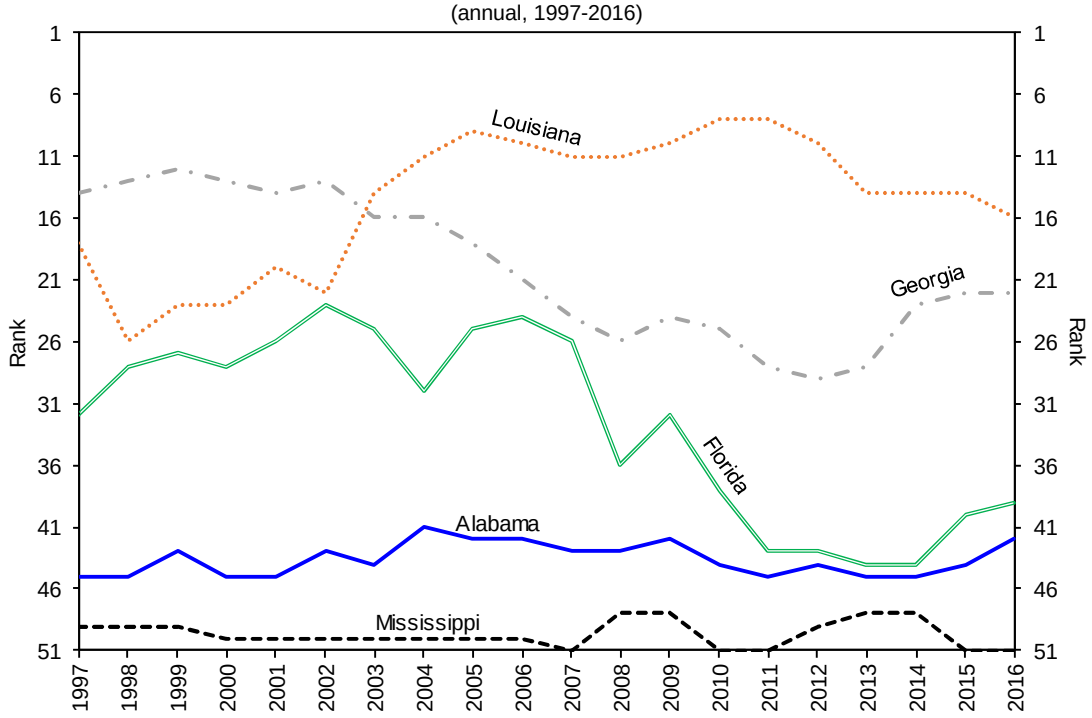
## Productivity

Productivity (GDP per employee) in Mississippi is the lowest in the nation. Figure 4 illustrates how Mississippi has consistently ranked at the bottom for productivity in comparison to its neighbors. Weak productivity growth is certainly related to weak growth in wages. According to the Bureau of Labor Statistics:

> *"Real hourly compensation growth depends upon gains in labor productivity; thus, low labor productivity growth can limit potential gains for workers."*[17]

As we will discuss later, the prevalence of diabetes and obesity is a major contributor to decreased employee productivity in the workplace—this is as much a health issue as much as it is an economic one. In Figure 4, we represent Mississippi and the other states that share the Gulf Coast region by their rankings in productivity compared to all 50 states and Washington, DC.[18] We have displayed these rankings over time in a linear fashion to show how the rankings have changed. A ranking of 1 equals the highest level of productivity and a ranking of 51 equals the lowest level of productivity.

Figure 4
**State Productivity Rankings of the 50 States and D.C.**
(annual, 1997-2016)




Source: Bureau of Economic Analysis, Laffer Associates Calculations

[17] Shawn Sprague, "Below trend: the U.S. productivity slowdown since the Great Recession," Bureau of Labor Statistics, January 2017. https://www.bls.gov/opub/btn/volume-6/below-trend-the-us-productivity-slowdown-since-the-great-recession.htm

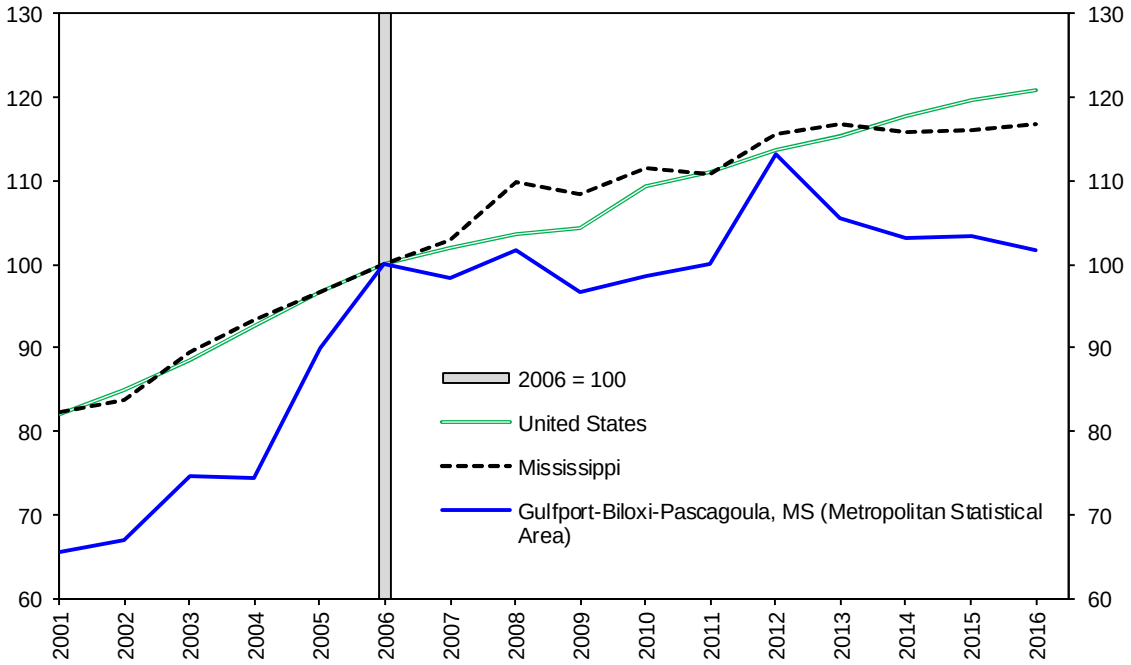
[18] Due to the incredible size and diversity of the Texas economy, we have excluded them from Figure 3 even though they also share the Gulf Coast.

When we compare the growth in productivity (nominal GDP per worker) of the United States with that of Mississippi and Gulfport-Biloxi-Pascagoula, we see that Gulfport-Biloxi-Pascagoula's productivity growth rate is shrinking in an accelerated fashion compared to the state and U.S. (see Figure 5). The rebound in 2012 was thought to be a sign that the local economy had finally broken out of its downswing; the title of a 2012 report by the Atlanta Federal Reserve Board read, "Biloxi-Gulfport Economy Keeps Coming Back."[19] This upturn was short-lived.

Figure 5

**Private Industry Productivity (nominal GDP per worker) Relative to its Positon in 2006**

(annual averages, indexed to 100 in 2006)




Source: Bureau of Economic Analysis, Laffer Associates Calculations

[19] "Biloxi-Gulfport Economy Keeps Coming Back," Federal Reserve Board of Atlanta, 2012.
https://www.frbatlanta.org/-/media/documents/regional-economy/econsouth/12q2grassroots.pdf

## Industry Specialization

The Gulfport-Biloxi-Pascagoula MSA is becoming disproportionately concentrated in low-wage, low-productivity industries compared with the overall United States. For any economic study, it's imperative to understand the differences between the industry mixes of the local economy and the United States as a whole. How different is Gulfport-Biloxi-Pascagoula from the rest of the country in its composition of employment? Using location quotients from the U.S. Census Bureau, we can discern where the concentration is relative to the United States economy (see Table 1).[20,21]

Table 1

**Gulfport-Biloxi-Pascagoula MSA Private Sector Employment Location Quotients and U.S. Annual Wages**

(2017)

| Industry | Employment Location Quotient for Gulfport-Biloxi-Pascagoula | Annual Average U.S. Wage | |
|---|---|---|---|
| Leisure and hospitality | 1.80 | $21,807 | Average Wage of Top 5 Sectors |
| Manufacturing | 1.46 | $64,305 | |
| Construction | 1.20 | $57,009 | |
| Trade, transportation, and utilities | 0.84 | $44,321 | **$51,342.40** |
| Professional and business services | 0.67 | $69,270 | |
| Financial activities | 0.60 | $87,915 | Average Wage of Bottom 5 Sectors |
| Other services (not govt.) | 0.59 | $35,116 | |
| Education and health services | 0.55 | $47,383 | |
| Information | 0.53 | $95,098 | **$64,794.60** |
| Natural resources and mining | 0.10 | $58,461 | |

Source: U.S. Census Bureau

In Table 1, you can see that the lowest wage sector is where most of Gulfport-Biloxi-Pascagoula's jobs are most concentrated relative to the United States. Furthermore, Education and Health Services is 3rd from the bottom—there's about one employee for every two in the U.S. as a whole.

[20] Quarterly Census of Employment and Wages, U.S. Census Bureau.

[21] A location quotient (LQ) is an analytical statistic that measures a region's industrial specialization relative to a larger geographic unit (usually the nation). An LQ is computed as an industry's share of a regional total for some economic statistic (earnings, GDP by metropolitan area, employment, etc.) divided by the industry's share of the national total for the same statistic. For example, an LQ of 1.0 in mining means that the region and the nation are equally specialized in mining; while an LQ of 1.8 means that the region has a higher concentration in mining than the nation. Source: "What are Location Quotients?" Bureau of Economic Analysis. https://www.bea.gov/faq/index.cfm?faq_id=478

# Mississippi's Future

## Room for Growth

According to the most recent edition of the ALEC-Laffer State Economic Competitiveness Index, Mississippi has many of the components necessary to perform much better than it has historically.[22] Its overall economic performance over the last 10 years was ranked 44th in the nation, but its forward-looking outlook, which is based on 15 state and local policy indicators, is ranked 24th in that nation. That's a lot of room to grow. For instance, Mississippi has the 10th lowest corporate income tax rate at 5%. There is no estate or inheritance tax, it's a right-to-work state, and it has a relatively low ratio of debt service costs to tax revenue. There do not appear to be many policies that would stand in the way of growth.

## Recent Tax Changes[23]

Mississippi is ready for a rebound, and while tax cuts for the state that began in 2017 will help pave the way, more can be done to improve the tax structure.[24] According to the law that was passed in 2016, the state will gradually phase out both the 3% income tax bracket (lowest bracket) by 2022, thereby exempting the first $5,000 of income from taxation, as well as the corporate franchise tax, which is currently $2.50 per $1,000 in assets, by 2028. The phase-out for both taxes began in 2018, along with the onset of a new exemption of the first $100,000 of capital value.[25]

We believe, based on a vast historical record of economic performance in low-tax rate states, that Lt. Governor Reeves's corporate franchise tax elimination will significantly improve the business environment in the state.[26] For a state that desperately needs investment and capital formation, eliminating barriers such as the franchise tax is of utmost importance. These corporate tax changes should boost output, employment, and production in a state with shrinking output, weak employment growth, and the lowest productivity levels in the country.

Regarding the income tax phase-out provision, however, there is more that the state could do to improve incentives for economic output. This is because inframarginal tax rates, or the tax rates that apply to income below an individual's top bracket, have no incentive or substitution effect to induce people to earn more or earn less income.

[22] Arthur Laffer, Stephen Moore, and Jonathan Williams, "Rich States, Poor States: ALEC-Laffer Economic Competitiveness Index—11th ed," American Legislative Exchange Council, 2018. https://www.alec.org/publication/rich-states-poor-states-11th-edition/
[23] Associated Press, "Bryant sings largest tax cut in Mississippi history," Clarion Ledger, May 13, 2016. https://www.clarionledger.com/story/news/politics/2016/05/13/bryant-signs-bill-cut-415-million-business-income-taxes/84353830/
[24] Mississippi Legislature, 2016 Regular Session, Senate Bill 2858. http://billstatus.ls.state.ms.us/2016/pdf/history/SB/SB2858.xml
[25] Joseph Bishop-Henchman, "Mississippi Approves Franchise Tax Phasedown, Income Tax Cut," Tax Foundation, May 16, 2016. https://taxfoundation.org/mississippi-approves-franchise-tax-phasedown-income-tax-cut/
[26] Arthur Laffer, Stephen Moore, Rex Sinquefield, and Travis Brown, *An Inquiry into the Nature and Causes of the Wealth of States: How Taxes, Energy, and Worker Freedom Change Everything,* Wiley, 2014. http://a.co/8KkUsfJ

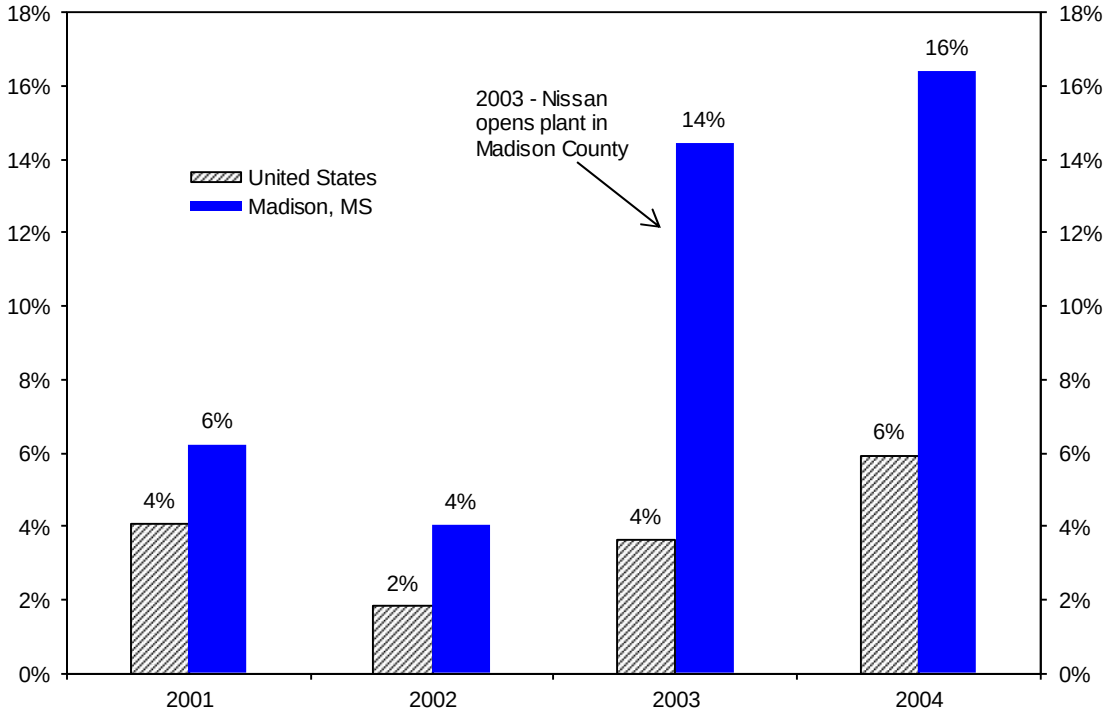
## Signs of a Pro-Business Environment: the Story of Nissan

In August of 2017, auto workers at Nissan voted 2,244 to 1,307 to not join the United Auto Workers (UAW) union. According to Reuters, the vote was "a bitterly contested campaign," which was the latest episode in the "decades-long record of failure by the union to organize a major automaker's plant in the U.S. South."[27] This success of this vote to repel the UAW's attempts to collectivize the workers, sends a signal to other firms that Mississippi is a business-friendly place.

According to the analysis published by Dr. Arthur Laffer in 2014, a state's right-to-work status (legal protection for workers against being forced to pay union dues) has one of the most statistically significant positive correlations with GSP growth.[28] The fact that Mississippi is a right-to-work state is a huge plus for its economic growth potential.

The Madison County region of Mississippi has historically been impoverished averaging 27 percentage points above the U.S. poverty rate from 1960 to 2000.[29] The 2010 Census revealed that Madison County's poverty rate had fallen below that of the U.S. for the first time. This reduction in poverty is due, at least in part, to the opening of Nissan's central Madison County facility in 2003. Just look at what happened to annual personal income growth in Madison County when the plant opened (see Figure 6).

Figure 6
**Personal Income Growth: Madison County, MS vs the U.S.**
(annual, YoY growth, 2001-2004)




Source: BEA

The next part of the story, however, is how new economic activity generated waves of prosperity across the entire state. In a Mississippi State University economic impact analysis, it was concluded that Nissan's presence is worth, on an annual basis, $2.9 billion in gross state product, $2.6 billion in additional wages, and $300 million in state and local tax revenue.[30] Their model concluded that each additional job at Nissan's Mississippi location creates 2.9 new jobs across the state, with a total estimated impact of 25,000 jobs.[31] Nissan radically changed the community it chose to locate in almost overnight, and we believe this kind of growth can also happen on the Gulf Coast.

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[27] Nick Carey, "Nissan Mississippi workers vote heavily against unionization," Reuters, August 4, 2017. https://www.reuters.com/article/us-uaw-mississippi-nissan/nissan-mississippi-workers-vote-heavily-against-unionization-idUSKBN1AL02O

[28] Arthur Laffer, Stephen Moore, Rex Sinquefield, Travis Brown, *An Inquiry into the Nature and Causes of the Wealth of States*, Chapter 6: "Why Growth Rates Differ," 2014. http://a.co/8KkUsfJ

[29] Historical County Level Poverty Estimates Tool, U.S. Census Bureau, 1960-2010. https://www.census.gov/library/visualizations/time-series/demo/census-poverty-tool.html

[30] "Nissan Canton: a Catalyst for Advanced Automotive Manufacturing in Mississippi," Mississippi State University, June 2016. http://www.msmec.com/images/Nissan_6-21-16_FINAL_compressed.pdf

[31] *Ibid.*

## More Work to Be Done

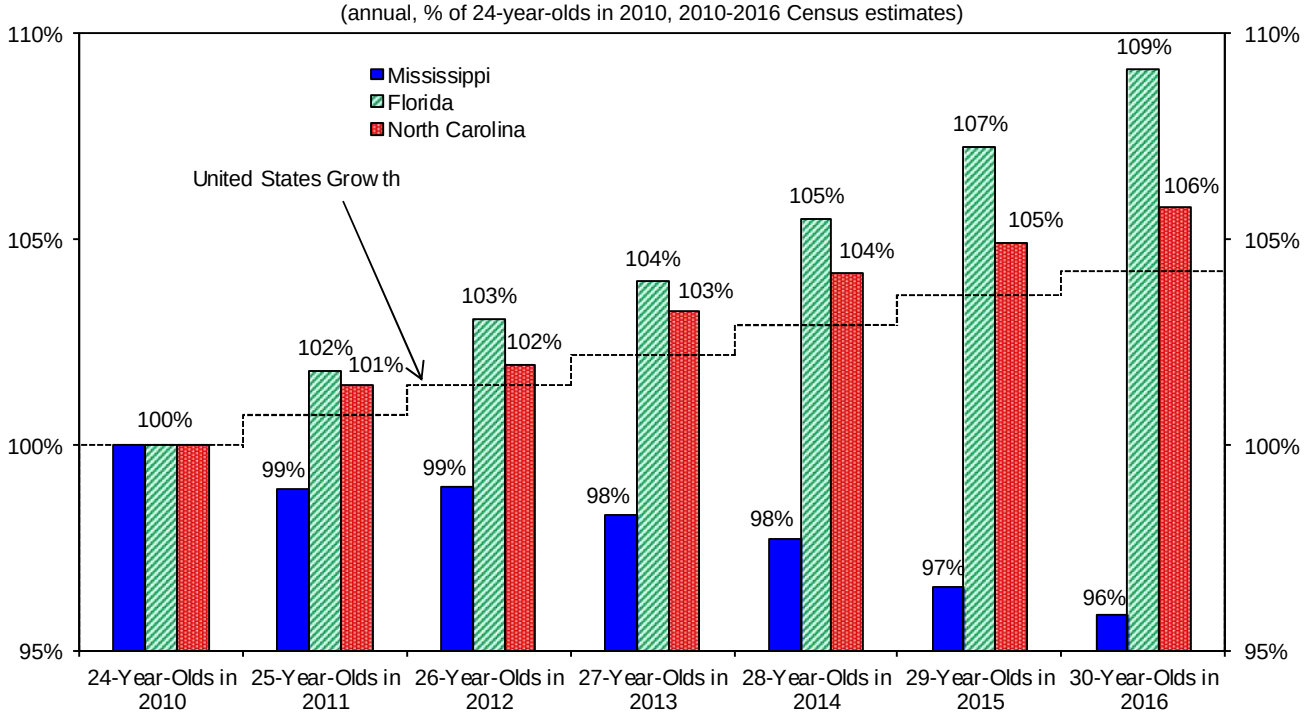
### Reverse the Net Flow of Migrants

One goal that is central to the development at Tradition is to produce jobs and opportunities for Mississippians of all educational backgrounds, and to attract skilled workers from other states. This addresses a current contributing factor for Mississippi's low productivity levels: its inability to retain people in their prime earning years. We already know that Mississippi experiences net domestic out-migration (more people leave Mississippi to move to other states than people who leave other states to move to Mississippi). The state experienced a net domestic outflow of 62,266 residents from 2009 to 2016.[32] Over the same time period, the state lost more than a net $900 million in adjusted gross income (AGI) to other states.[33]

Some states experience net-outmigration of people in their peak earning years (aged 55 and older) because these residents are fleeing high tax states. This has been well documented with the annual net migration of thousands of people from states like New York, New Jersey, and Illinois to states like Florida, Arizona, and Texas. However, Mississippi's out-migrants appear to be those people entering their prime working years. The prime age for the workforce is defined as those between ages 25 and 54.

When we analyze population estimates by age, we see that Mississippi is losing people at the age when they would be entering their prime earning years, while other states are gaining them. We created a time series starting with people in Mississippi that were 24 years of age in 2010 (1 year before they are considered prime-age) and charted how that population changed each year. In this way we can estimate the direction of population growth or decline of those who were entering the prime-age workforce in 2010 and 2011. In Figure 7, we've charted this time series in Mississippi, Florida, and North Carolina from 2010 through 2016 (i.e. 24-year-olds in 2010, 25-year-olds in 2011, and so on) as a share of the original group of 24-year-olds.

Figure 7
**Tracking New Prime-Age Workers**
(annual, % of 24-year-olds in 2010, 2010-2016 Census estimates)




Source: U.S. Census Bureau, Laffer Associates Calculations

[32] U.S. Census Bureau State Population Totals and Components of Change: 2010-2017. https://www.census.gov/data/datasets/2017/demo/popest/state-total.html
[33] IRS Tax Statistics, U.S. Population Migration Data. https://www.irs.gov/statistics/soi-tax-stats-migration-data

Figure 7 shows that those Mississippians who were 24 in 2010 have been leaving the state. In 2010, there were 38,880 24-year-olds in Mississippi. By 2016, there were 37,271 30-year-olds.[34] That's a decline of 1,609 people, or 4.1%. While a 4.1% decline may seem like a small number, it's the second largest decline of the 50 states.

Furthermore, Mississippi's performance differs considerably from our benchmark states. In North Carolina and Florida—two states with thriving economies and growing research campuses—the population of those who were aged 24 in 2010 is growing faster than the population of the same group in the U.S. as a whole.[35]

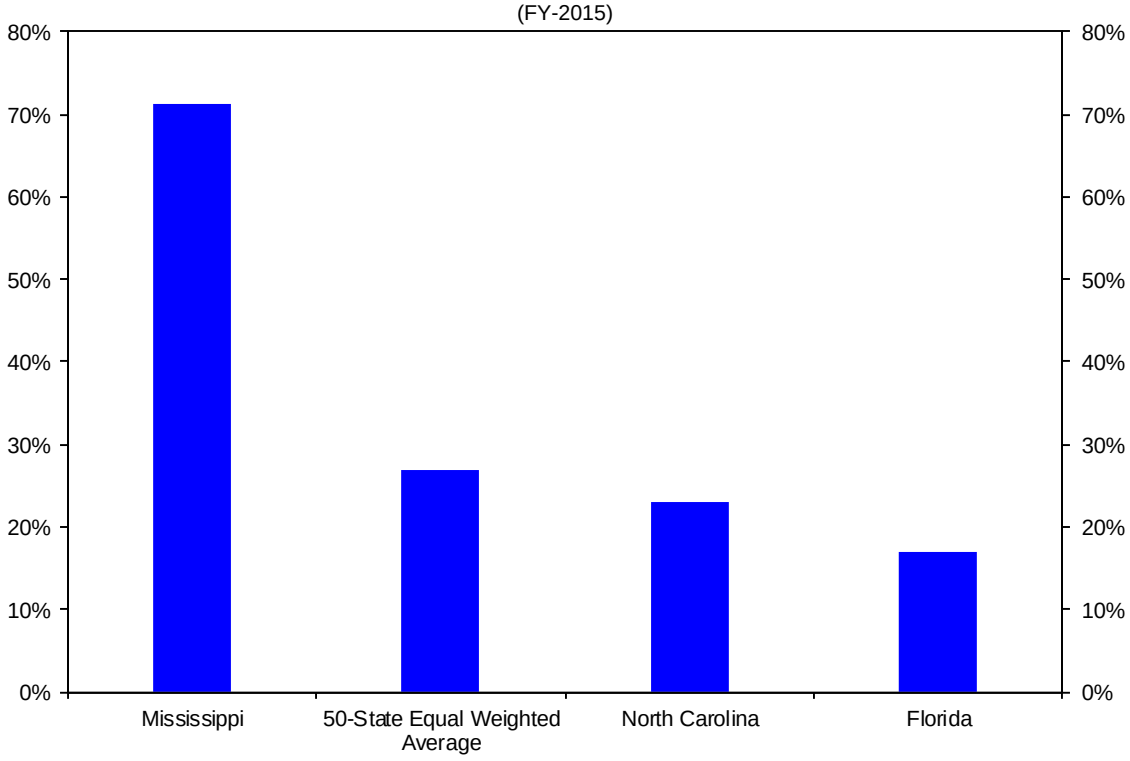
## Chance to Become Less Dependent on Federal Funding

According to a research article from Pew Charitable Trusts, the state government in Mississippi relied on federal grants for almost 41% of its budget in FY-2014—the highest in the country.[36] Another way to measure Mississippi's dependence on federal funds is to look at the federal transfers to state and local governments relative to the total federal tax bill for the state. In FY-2015, the federal government paid Mississippi state and local governments $8.2 billion, while its citizens and businesses paid a total federal tax bill of $11.5 billion. That means that over 70 cents of every dollar paid in federal taxes by Mississippians is then remitted in grants and aid to the state and local governments in Mississippi. The only state with a higher share is New Mexico at 80.2% of its federal tax bill. For perspective, the 50-state equal-weighted average in FY2015 was 26.9% (see Figure 8). For comparison purposes, we show our benchmarks, North Carolina and Florida.

Figure 8

**Federal Transfers to State and Local Governments as a Share of Total Federal Tax Bill[37]**

(FY-2015)




Source: U.S. Census Bureau, Internal Revenue Service, Laffer Associates Calculations

The purpose of Figure 8 is not to highlight any kind of fiscal irresponsibility in the government of Mississippi. The data above are indicative of two things: 1.) Personal and corporate income are relatively weak in Mississippi (low income yields low federal tax receipts), and, 2.) similar to the first point, state and local governments are requiring a huge portion of money

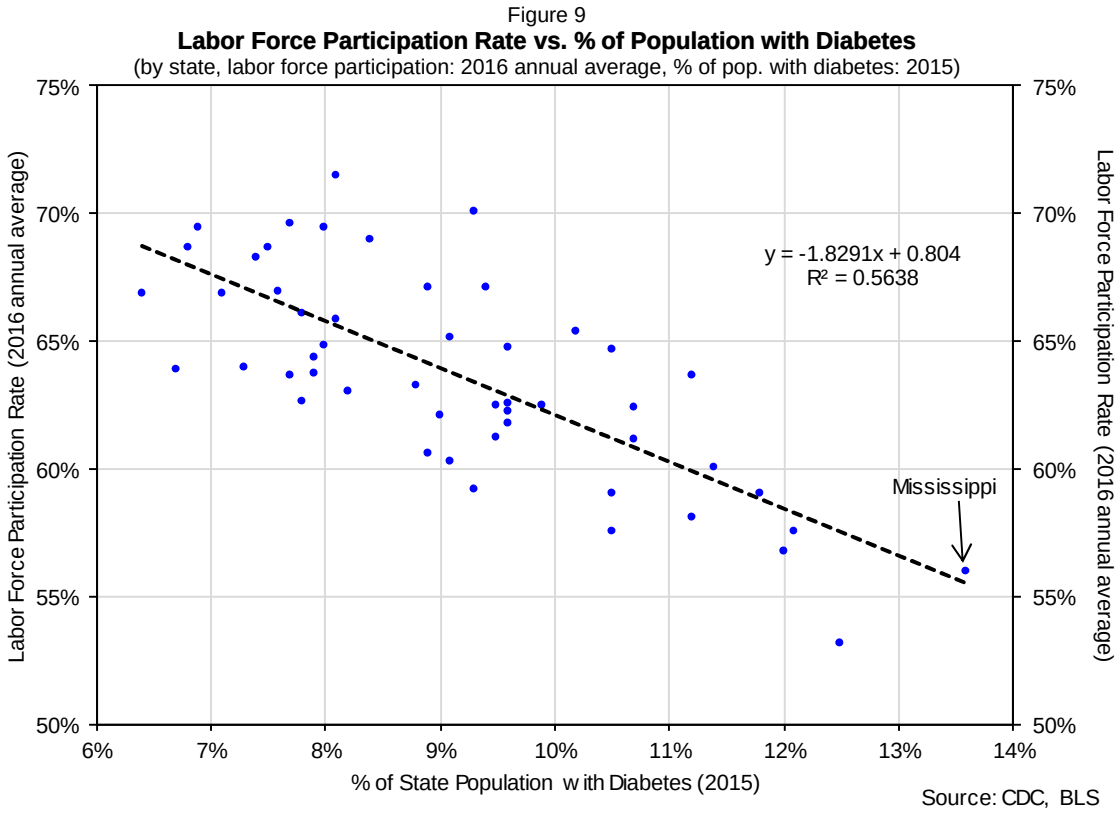
[34] U.S. Census Bureau State Population Totals and Components of Change: 2010-2017.
https://www.census.gov/data/datasets/2017/demo/popest/state-total.html
[35] See section on Benchmark Area Research.
[36] "Funding From Federal Grants Varies as a Share of State Budgets," Pew Charitable Trusts, August 29, 2016.
http://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2016/08/funding-from-federal-grants-varies-as-a-share-of-state-budgets
[37] Federal tax bill equals the sum of all personal, business, estate and excise taxes as provided by Page 12 the FY 2015 IRS Data Book:
https://www.irs.gov/pub/irs-soi/15databk.pdf

from outside of Mississippi to keep up with growing entitlement needs (Medicaid, federal housing aid, etc.).[38] For example, a primary component of federal transfers to Mississippi is Medicaid, which nearly one in four Mississippians receive (9th highest out of all states).[39] We remind the reader that this is just another symptom of the poverty and poor health of the state—issues that new developments at Tradition will address both directly and indirectly.

## Diabetes and the Economy

Aside from the flight of prime-age workers and Gulf of Mexico misfortune, what are the other facets of Mississippi's stagnant economic growth? Two key pieces appear to be that Mississippi has the second lowest labor force participation rate (LFPR) in the country, and it has the second highest poverty rate in the nation. Both of these components appear to be linked to the share of population with diabetes, for which Mississippi is the highest in the U.S. (Figures 9 and 10).

Figure 9




This relationship between the LFPR and the diabetes rate is not new or necessarily groundbreaking. As we will discuss shortly, there is already a body of research out there on the correlation between labor market exits and diabetes rates. However, it is important to display this relationship as a state-level problem and as something that is seriously hindering Mississippi's economic competitiveness.

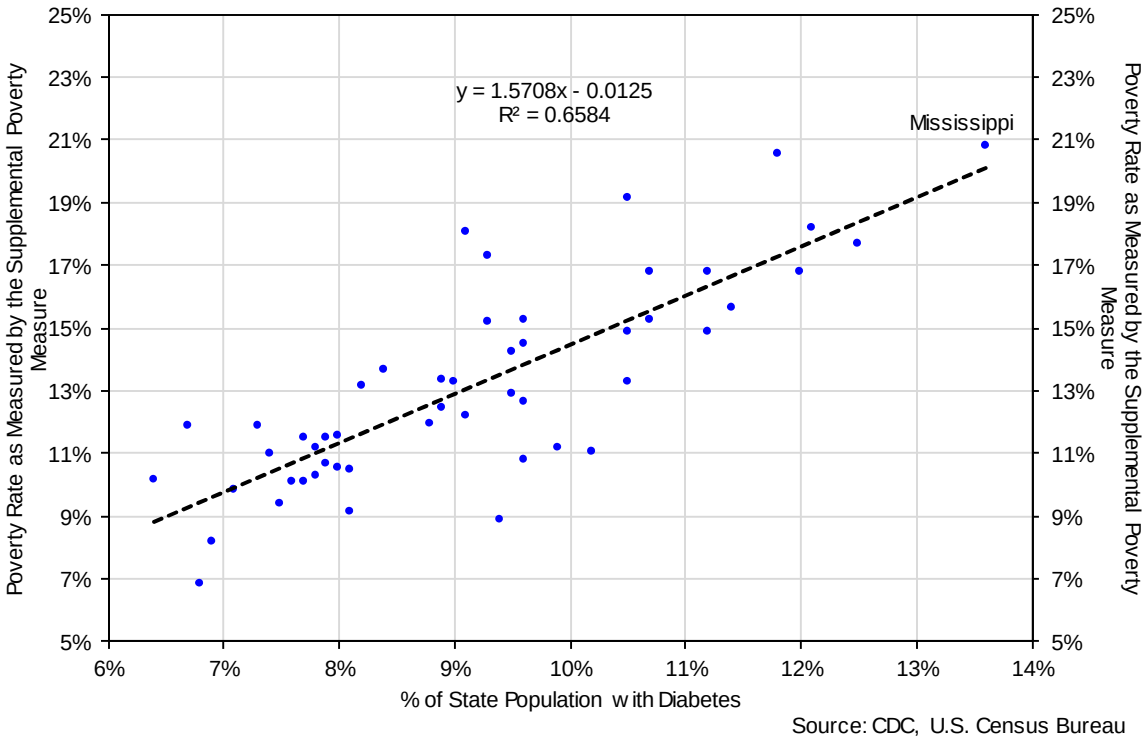
[38] A report from the GAO revealed that the vast majority of federal assistance to state governments is directed towards public welfare items such as Medicaid. Federal aid to local governments is primarily directed at housing and community development projects.
Source: https://www.gao.gov/fiscal_outlook/state_local_fiscal_model/interactive_graphic/about_intergovernmental_revenue

[39] "Medicaid State Fact Sheets," Henry J. Kaiser Family Foundation, June 16, 2017. https://www.kff.org/interactive/medicaid-state-fact-sheets/

Figure 10

**Supplemental Poverty Measure[40] vs. % of Population with Diabetes**

(by state, poverty measure: 2014-2016 average, % of pop. with diabetes: 2015)




Source: CDC, U.S. Census Bureau

Not only are these correlations statistically significant, but they also suggest that the labor force participation rate and supplemental poverty measure could both be highly levered to the diabetes rate. That is, according to these most recent data, a 1 percentage point decrease in the diabetes rate correlates with a 1.83 percentage point increase in labor force participation and a 1.57 percentage point decrease in the supplemental poverty measure.

[40] Beginning in 2011, the Census Bureau began publishing the Supplemental Poverty Measure (SPM), which extends the official poverty measure by taking account of many of the government programs designed to assist low-income families and individuals that are not included in the official poverty measure.

# The Socioeconomic Problem of Diabetes and Obesity[41]

Diabetes and obesity are the two leading causes of health complications and death in both Mississippi and the nation. This section of the report provides insight into the prevalence and impact of these two diseases on Mississippians through the lens of the labor force and its role in economic development. The following information is a compilation of secondary data gathered from peer-reviewed research and national statistics, used together to evaluate direct, indirect, and induced effects of diabetes and obesity and their impact in the workplace.

Mississippi faces a significant challenge with its labor force participation rate ranking among the lowest in the nation. Recent studies indicate that the trends of diabetes and obesity will both affect higher percentages of Mississippians and continue to outpace the rest of the nation over the next few decades.[42] The anticipated increase in diabetes and obesity has a potential negative impact on Mississippi's workplace productivity. For this reason, there is a need to place significant emphasis on interventions, preventions, and cures for diabetes and obesity.

From an economic development perspective, both quality and quantity of highly skilled workers are significant factors for Mississippi employers' long-term growth. A highly skilled workforce is one of the top factors for site selection decisions when locating to new areas for business expansion.[43] For this study, the indirect effects of workers' poor health are addressed to determine the implications on economic competitiveness—in this case specifically, workforce challenges related to diabetes and obesity.

Most economic impact studies begin by defining direct effects; however, this study first addresses indirect effects. This was selected because published peer-reviewed research tends to define worker productivity as an indirect effect when addressing obesity and diabetes. The direct effects include medical expenses incurred as a result of diabetes, while indirect costs include the adverse effect that diabetes and obesity have on worker productivity, which can be measured by indicators such as reduced labor force participation, missed workdays, and reduced productivity for Mississippi and the nation.

## Indirect Effects of Diabetes and Obesity

### Labor Force Participation

As stated previously, labor force participation is comprised of the total employed population and the total unemployed population that is actively seeking work divided by the civilian noninstitutionalized population. Those who are able to work, but are not employed or seeking employment, are not counted in the labor force. The percentage of the eligible population that does not participate in the labor force is telling of the overall state of an economy.

A 2017 study published by the Atlanta Federal Reserve revealed that labor force participation dropped three times more in rural areas than in metropolitan areas from 2007 to 2017.[44] Disability and illness in those who live in non-metropolitan areas is cited as a primary reason for non-participation in the labor force, as poor health conditions limit individuals' ability to work.[45] As a largely rural state with few MSAs, Mississippi is one of the most affected states by this trend. In fact, Mississippi was ranked last out of all 50 states in America's Health Ratings' annual report in December 2017.[46] The state was notably ranked worst for cardiovascular deaths, including heart disease, stroke, hypertension, heart attack, and heart failure—all comorbidities of diabetes and obesity—as well as third-highest for diabetes and preventable hospitalizations.[47] All of these factors contribute to the low and falling labor force participation rate reported in Mississippi.

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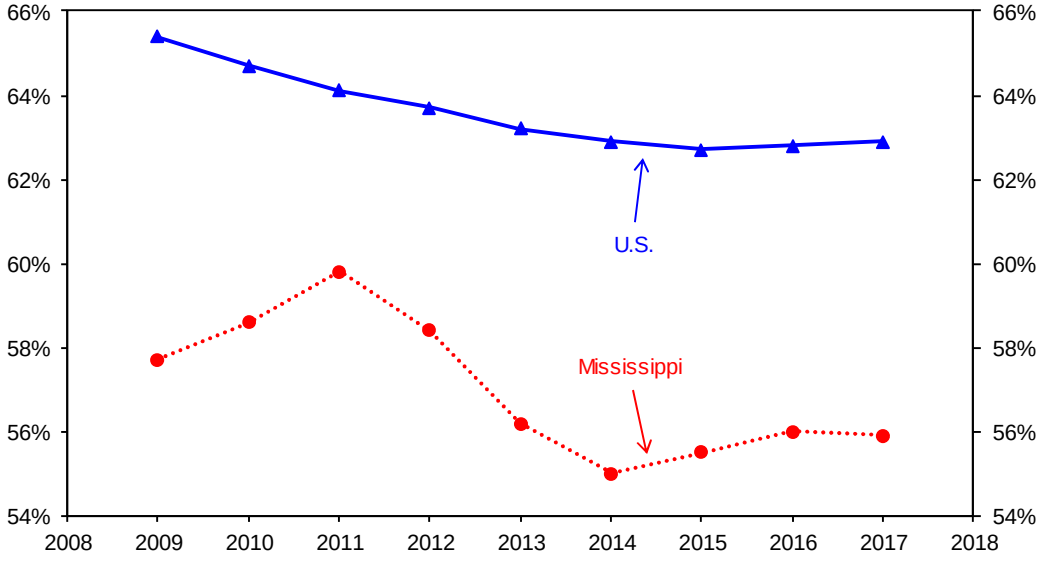
[41] See Appendix G for the full list of references for this section.
[42] Conway BN, Han X, Munro HM, et al. The obesity epidemic and rising diabetes incidence in a low-income racially diverse southern US cohort. Alamian A, ed. *PLoS ONE*. 2018;13(1):e0190993. doi:10.1371/journal.pone.0190993.
[43] 32nd Annual Corporate Survey & the 14th Annual Consultants Survey," Area Development, Q1-2018. http://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2018/32nd-annual-corporate-survey-14th-annual-consultants-survey.shtml
[44] J. Robertson, "Labor Supply Constraints and Health Problems in Rural America. Macroblog," The Federal Reserve Bank of Atlanta, 2017. http://macroblog.typepad.com/
[45] *Ibid.*
[46] "America's Health Ratings," United Health Foundation, 2017. https://assets.americashealthrankings.org/app/uploads/ahrannual17_complete-121817.pdf
[47] A. Wolfe, "Mississippi again unhealthiest state in the country," The Clarion-Ledger, 2017. http://www.clarionledger.com/story/news/politics/2017/12/12/mississippi-again-unhealthiest-state-country/943720001/

Figure 11 compares the period from 2009 to 2017 and shows that although both the United States and Mississippi's workforce participation rates have steadily declined in the past decade, Mississippi's rate averages 6.6% worse than the U.S. rate each year. Labor force data from March 2018 revealed that Mississippi has a labor force participation rate of only 55.6%, meaning that nearly half of the eligible workforce in the state is neither working nor looking for work. These data, combined with the aforementioned declining health in the state, further imply the connection between poor health and poor labor force participation in the state.

Figure 11
**Labor Force Participation Rate Trends in Mississippi and the United States**
(annual, 2009-2017)




Source: Bureau of Labor Statistics

## Diabetes

Type 1 diabetes is genetic, usually diagnosed in childhood, and occurs when a patient's body is not able to produce sufficient amounts of insulin, if any at all. Type 2 diabetes is seen in children and adults who cannot process insulin properly and is usually related to weight gain and lifestyle factors like poor eating and exercise habits.[48] In 2016, 422 million people worldwide, or 8.5% of the global population, had diabetes, a number which is projected to increase to almost 600 million by 2035.[49] In the United States, 30.3 million Americans, or 10.5% of the national population, had diabetes.[50] In Mississippi, 371,662 people, or 15.4% of the state population, had diabetes, representing nearly twice the global rate and significantly higher than the national rate. This figure is anticipated to worsen unless significant interventions are implemented.[51]

Diabetes has a significant adverse effect on labor productivity in terms of absenteeism (missing work due to health-related reasons), presenteeism (being present at work but not productive), and disability (inability to perform necessary physical tasks at work).[52] Women with diabetes were found to have two more work-loss days annually than women without diabetes, and both men and women with diabetes were 5.4% and 6% more likely to have work limitations than individuals without diabetes, respectively. Diabetes also reduced the likelihood of participating in the workforce at all by 4.4 percentage points for women and 7.1 percentage points for men, as increased disability eliminates the possibility of holding a job for some individuals.[53]

Reduced productivity in the workplace due to diabetes can be measured by early retirement. For Type 1 diabetic patients, the mean age of retirement is 35.5 ± 9.3 years, resulting in 17.5 ± 9.1 years of workforce losses. Additionally, the same study

[48] World Health Organization, "Global Report on Diabetes," World Health Organization, 2017.
[49] *Ibid.*
[50] Centers for Disease Control, "National Diabetes Statistics Report, 2017," United States Department of Health and Human Services, 2017. https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf
[51] American Diabetes Association, "The Burden of Diabetes in Mississippi," American Diabetes Association, 2016.
[52] R. and L. Hammond, "The economic impact of obesity in the United States," Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy, 2010. 285. doi:10.2147/dmsott.s7384
[53] K. Tunceli, C. J. Bradley, D. Nerenz, L. K. Williams, M. Pladevall, and J. Lafata, "The Impact of Diabetes on Employment and Work Productivity," Diabetes Care, 2005. 28(11), 2662-2667. doi:10.2337/diacare.28.11.2662

found that patients who retired early had a significantly higher prevalence of severe hypoglycemia, eye disorders and blindness, foot disorders, renal disease requiring dialysis or transplantation, psychological disorders, hypertension, and overweight/obesity than did the employed patients. [54]

In Mississippi, the economic indirect costs of diabetes, such as lost income due to absenteeism, disability, and premature mortality, totaled over $1 billion in 2013, or an estimated $3,221 per diabetic. If this lost income had been utilized according to normal spending patterns, the Mississippi economy would have generated an additional $125.6 million in wages, $409.3 million in Gross State Product, 3,426 jobs, and $55.8 million in lost federal and state revenue.[55]

### Prediabetes

The alarming increase of diabetes in Mississippi is exacerbated by the rates of prediabetes and obesity. Prediabetes, which occurs when blood glucose levels are elevated, but not yet high enough to be diagnosed as diabetes, affected an estimated 810,000 Mississippians (37.5% of the population) in 2016.[56] Obesity can be a prediabetes indicator and is defined as having a body mass index of over 30.0—or 20% higher than normal BMI.

## Direct Effects of Diabetes and Obesity

As the indirect and induced costs of diabetes and obesity weigh upon employers, the economy, and society as a whole, the direct costs are burdensome on the individual patient, healthcare providers, and insurance providers. Like the indirect effects discussed previously, these direct financial burdens are largely preventable, as both obesity and Type 2 diabetes (which accounts for 90-95% of all cases of diabetes) are preventable diseases brought on by poor lifestyle choices.[57]

### Higher Direct Costs of Diabetes

Diabetes and related treatment costs in the U.S. totaled more than $245 billion in 2012, including $176 billion in direct medical costs and $69 billion in indirect costs due to lost productivity. Medical costs for a diabetic patient are 2.3 times higher than for a non-diabetic person. The most recent estimate of direct annual medical expenditures in Mississippi for diabetes totaled $2.4 billion, of which $303.5 million was direct out-of-pocket costs for individuals (see Table 2).[58]

Table 2

**Direct and Indirect Effects of Diabetes in Mississippi in 2013 (excluding induced)**

| | |
|---|---|
| **Direct Medical Effects** | **$2,389,290,280** |
| **Indirect Effects** | **$1,005,080,840** |
| Absenteeism Effects | $73,370,901 |
| Presenteeism Effects | $304,535,494 |
| Unemployment due to Disability | $316,600,465 |
| Reduced Productivity for those not in labor force | $39,198,153 |
| Premature Mortality | $271,371,827 |
| **Total Effects** | **$3,394,371,120** |

Source: Mississippi State University and Mississippi Department of Health

[54] M.B. Gomes and C.A. Negrato, "Retirement due to disabilities in patients with Type 1 diabetes a nationwide multicenter survey in Brazil," BMC Public Health, 2015. 15(1). doi:10.1186/s12889-015-1812-4

[55] A. Barefield, "Estimation of the Economic Burden of Diabetes on the State of Mississippi in 2013," Mississippi Department of Health & Mississippi State University Department of Agricultural Economics, 2015. https://msdh.ms.gov/msdhsite/_static/resources/7317.pdf

[56] American Diabetes Association, "The Burden of Diabetes in Mississippi," American Diabetes Association, 2016.

[57] Centers for Disease Control, "National Diabetes Statistics Report, 2017," United States Department of Health and Human Services, 2017. https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf

[58] A. Barefield, "Estimation of the Economic Burden of Diabetes on the State of Mississippi in 2013," Mississippi Department of Health & Mississippi State University Department of Agricultural Economics, 2015. https://msdh.ms.gov/msdhsite/_static/resources/7317.pdf

Across the country, and particularly in Mississippi, the high and rising cost of medical supplies that diabetics require is a barrier to necessary blood glucose control. Diabetics who use an insulin pump or injections need to closely monitor their blood glucose levels by checking them multiple times per day, but test strips and insulin are no longer affordable in many cases, even with insurance. Supplies needed for self-monitoring of blood glucose levels account for more than a quarter of self-management costs for diabetic patients annually, averaging $772 for prescription test strips and $2,078 for prescription insulin and supplies to administer injections.[59] Additionally, the price per milliliter of insulin increased 197% nationwide from 2002 to 2013, and the estimated average spending per patient on insulin was greater than all other glycemic control medications combined. These expenditures per patient on insulin relate to increased spending by Medicaid and insurance companies to keep up with the rising cost of anti-hyperglycemic treatment.[60]

### Higher Cost of Obesity

Nationwide, obesity-related health issues cost an estimated $210 billion annually, representing 21% of total national healthcare expenditures. Individually, medical costs for obese patients average more than $2,700 higher than normal-weight patients.[61] Previous research comparing costs of medical care between obese individuals and normal-weight individuals found that obesity can have long-term financial consequences for those affected. For a 10-year-old obese child, cumulative lifetime costs range from $16,310 to $39,080 higher than those of a 10-year-old normal-weight child who maintains normal weight through adulthood.[62] These amounts indicate that successful childhood obesity prevention efforts could potentially save up to nearly $40,000 per person in lifetime medical bills.

## Potential Cost-Saving Methods of Intervention and Prevention

### Diabetes

For individuals living with diabetes, studies identified specific preventive care methods with the potential for the most cost savings. As NDORI implements strategies, these preventive care measures should be tracked over time. Preventive care for diabetics is a proactive means of reducing long-term impacts of the illness. An economic analysis on interventions for both Type 1 and Type 2 diabetes revealed the most cost-saving practices are:

- Preventive eye care, including diabetic retinopathy screening and treatment to prevent blindness.
- Pre-conception care for diabetic women, which helps to reduce risk of fetal deformity and miscarriage.
- Nephropathy prevention, including screening for signs of nephropathy (kidney disease) and controlling blood pressure.
- Improved glycemic control delays or prevents the onset of nephropathy, retinopathy, and neuropathy.

In addition to these cost-effective measures, better-quality and more closely monitored glycemic control were also found to add years of life, clarity of sight, and increased kidney function for both Type 1 and Type 2 diabetics.[63] A managed care approach to glycemic control means that a patient's treatment plan is closely monitored by their doctor and is created with socioeconomic sensitivity. Managed care has been associated with a reduced rate of hospitalization for short-term complications related to diabetes. Fewer hospitalizations was shown to lead to reduced medical charges for these complications over a three-year period.[64]

### Obesity

Obesity prevention in the teenage years has been found to go beyond immediate results and have substantial lifelong cost, health, and economic benefits. A BMI progression model found that a single percentage point reduction in overweight and obese adolescents at age 16–17 had a significant impact on the number of normal-weight, overweight, and obese adults at age 40. This reduction of overweight and obese adolescents would most likely be a result of a change in dietary habits. The

[59] J. Yeaw, W.C. Lee, M. Aagren, and T. Christensen, "Cost of self-monitoring of blood glucose in the United States among patients on an insulin regimen for diabetes," Journal of Managed Care & Specialty Pharmacy, 2012. 18(1), 21-32.
[60] X. Hua, N. Carvalho, M. Tew, E. Huang, W. Herman, and P. Clarke, "Expenditures and Prices of Antihyperglycemic Medications in the United States: 2002-2013," Journal of the American Medical Association, 2016. 315(13), 1400-1402.
[61] J. Cawley, C. Meyerhoefer, "The medical care costs of obesity: an instrumental variables approach," Journal of Health Economics, 2013. 31(1), 219-230.
[62] E. Finkelstein, W. Graham, R. Malhotra, "Lifetime Direct Medical Costs of Childhood Obesity," Pediatrics, 2014. 133(5).
[63] D. C. Klonoff, and D. M. Schwartz, "An economic analysis of interventions for diabetes," Diabetes Care, 2000. 23(3), 390-404. doi:10.2337/diacare.23.3.390
[64] J. Menzin, C. Langley-Hawthorne, M. Friedman, L. Boulanger, and R. Cavanaugh, R. (2001). Potential Short-Term Economic Benefits of Improved Glycemic Control: A managed care perspective. Diabetes Care, 24(1), 51-55. doi:10.2337/diacare.24.1.51

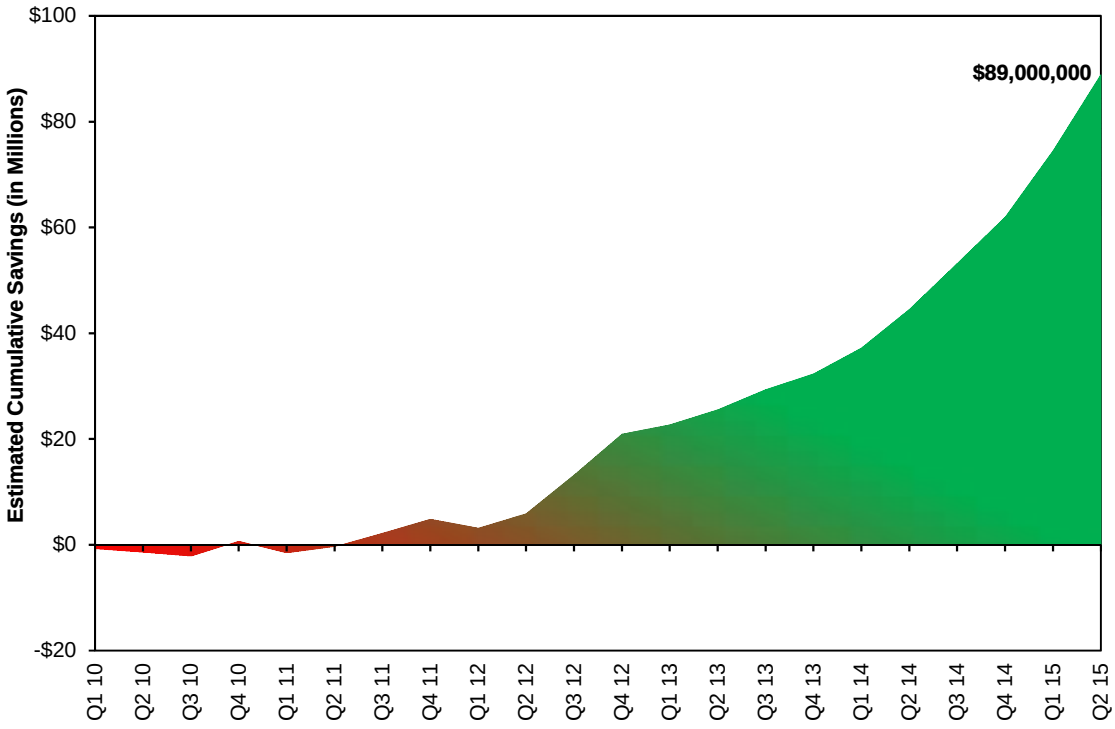
one percent reduction could reduce the number of obese adults by almost 53,000, and lifetime medical costs after age 40 would decrease by a total of $586 million.[65]

## Healthcare Implications

The relationship of the Tradition Learning Medical City includes a formal affiliation between NDORI and Cleveland Clinic Endocrinology & Metabolism Institute (EMI) which began in 2016. Cleveland Clinic employs more than 50,000 caregivers and is a nonprofit, multispecialty, academic medical center that integrates clinical and hospital care with research and education whose mission is to provide better care of the sick, investigation into their problems, and further education of those who serve. Cleveland Clinic's expertise in clinical and preventive health, particularly related to obesity and diabetes, adds valuable experience to the network of public and private partners.

In 2005, Cleveland Clinic's self-insured health plan estimated that per-member, per-month (PMPM) costs were rising 7.5% annually which, left unaddressed, would require the system to implement healthcare cost-cutting measures. So in 2009, the Cleveland Clinic implemented a Healthy Choice incentive program for employees addressing six major chronic diseases, two of which included obesity and diabetes. Its participating members with diabetes in the Healthy Choice program have seen a 20% improvement in the percentage with Hemoglobin A1C scores to less than 8%, with a more than 50% improvement in the percentage with LDL Cholesterol scores less than 100mg/dL. Plan members who are enrolled in the weight management program consistently lose an average of 2 pounds per year, versus a 1.5 pound weight gain per person in the general public. Currently, 60% of employees are participating, and it has saved Cleveland Clinic and those served over $89 million dollars between 2010 and 2015.[66]

Figure 12
**Estimated Cumulative Savings by "Bending the Trend" Since 2010**
(Quarterly, Q1-2010 through Q2-2015)




Source: Cleveland Clinic

On October 19, 2017, Dr. Michael Roizen, Cleveland Clinic's Chief Wellness Officer, presented the Healthy Choice program to the United States Senate's HELP committee. He stated the average cost PMPM trends among commercial insurance plans, which have put similar effort into healthcare utilization and case management, saw costs increase on average 4-5% over the last five years, while at the same time Cleveland Clinic costs increased an average of 0.6% annually, including

[65] L.Y. Wang, M. Denniston, S. Lee, D. Galuska, and R. Lowry, "Long-term Health and Economic Impact of Preventing and Reducing Overweight and Obesity in Adolescence," Journal of Adolescent Health, 2010. 46(5), 467-473. doi:10.1016/j.jadohealth.2009.11.204
[66] Interview with Ronald Gambino, Director of Outreach and Technology at Cleveland Clinic's Endocrinology and Metabolism Institute, June 11, 2018.

incentive and administrative costs. According to Roizen's congressional testimony, "Cleveland Clinic's successes are real. We have healthier employees, and we have lower costs associated with providing health benefits. The journey was not easy, and it required a long view. But this is a meaningful template for the country. This plan is exportable."[67]

The program Healthy Choice Incentive program incentivized employees to maintain good health by offering up to a 30% reduction in annual health plan premiums for those who maintained good health or started becoming healthier. The program is voluntary and now has over 100,000 Cleveland Clinic covered lives, includes a comprehensive approach where employees regularly "check in" with a nurse case manager and are provided various options for:

- healthy eating,
- quitting smoking,
- wellness-medical-surgical weight loss programs,
- partnering with Weight Watchers and Curves,
- exercise programs,
- blood pressure/cholesterol control, and
- managing stress[68]

Cleveland Clinic's demonstrated successes in comprehensive healthcare prevention offers a positive step forward for Mississippi in addressing the behavioral side of its diabetes and obesity challenges. In addition to the Healthy Choices initiative, Cleveland Clinic's expertise in research and data collection methodologies can have a positive impact in tracking and reporting results over time. The state's healthcare system for public employees implemented similar programs to encourage voluntary enrollment in preventive health, and the results of the state's program should be compared to Cleveland Clinic's program to determine if the state is doing all it can to improve citizens health.

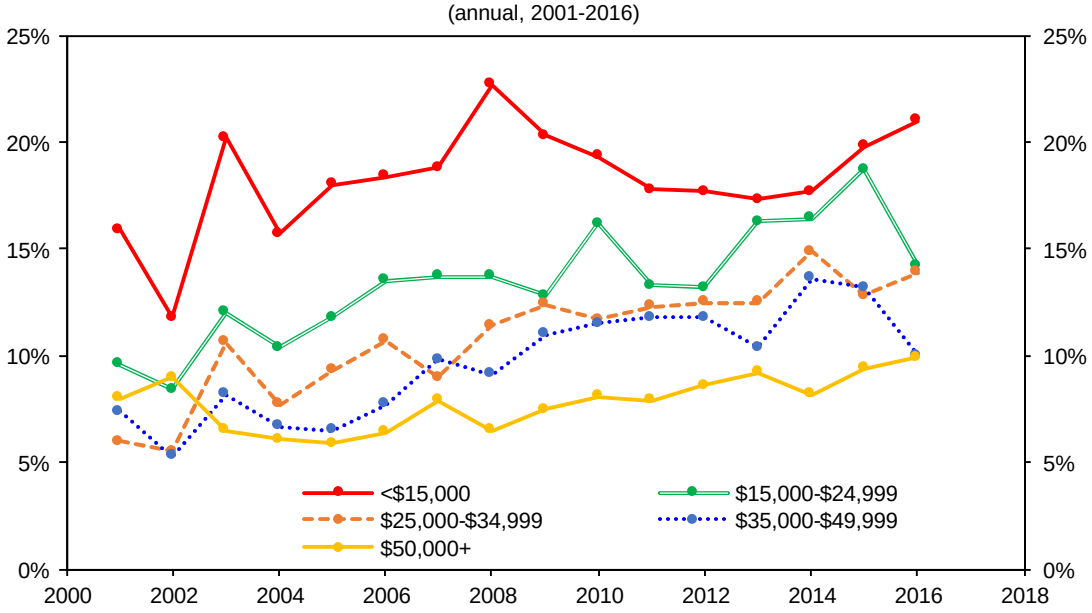
[67] Testimony of Michael F. Roizen, MD to the United States Senate HELP Committee on October 19, 2017.
[68] Interview with Ronald Gambino, Director of Outreach and Technology at Cleveland Clinic's Endocrinology and Metabolism Institute, June 11, 2018.

## Socioeconomic Influences on Diabetes and Obesity

According to the Census Bureau the poverty rate in Mississippi was 20.8%, the highest rate of all 50 states in 2016. An individual's socioeconomic status can be an indicator of the level of risk for diabetes, obesity, and related diseases. Children and adults living in lower income environments are disproportionally more likely to have health issues. Type 1 diabetes in children has been linked to parents' socioeconomic status and found to be a factor in earlier mortality and lower glycemic control later in life. Having parents who received income support or government assistance doubled the risk of diabetes-related death at a younger age. Those with poorly educated mothers also had a higher risk of mortality.[69]

Household income is an indicator for both diabetes and obesity (Figures 13 and 14). In Mississippi, the lowest income group, earning less than $15,000 annually, consistently had among the highest rates of diabetes and obesity. The top income group, earning more than $50,000 annually, consistently had among the lowest rates of both diabetes and obesity. Diabetes was also more than twice as prevalent in the lowest income group (21%) when compared to the highest income group (9.9%) in 2016.

Figure 13
**Percentage of Mississippi's Population with Diabetes by Household Income**
(annual, 2001-2016)



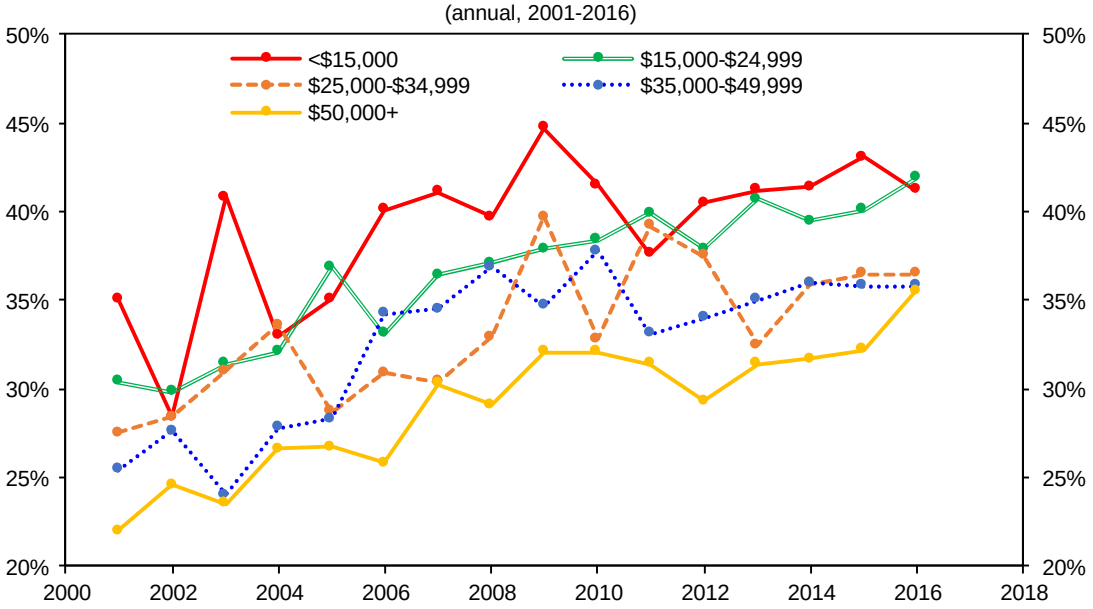

Source: Behavioral Risk Factor Surveillance System (CDC, 2016)

[69] Y. T. Berhan, M. Eliasson, A. Möllsten, I. Waernbaum, and G. Dahlquist, "Impact of Parental Socioeconomic Status on Excess Mortality in a Population-Based Cohort of Subjects with Childhood-Onset Type 1 Diabetes," Diabetes Care, 2015. 38(5), 827-832. doi:10.2337/dc14-1522

Figure 14

**Percentage of Mississippi's Population Considered Obese by Household Income**

(annual, 2001-2016)



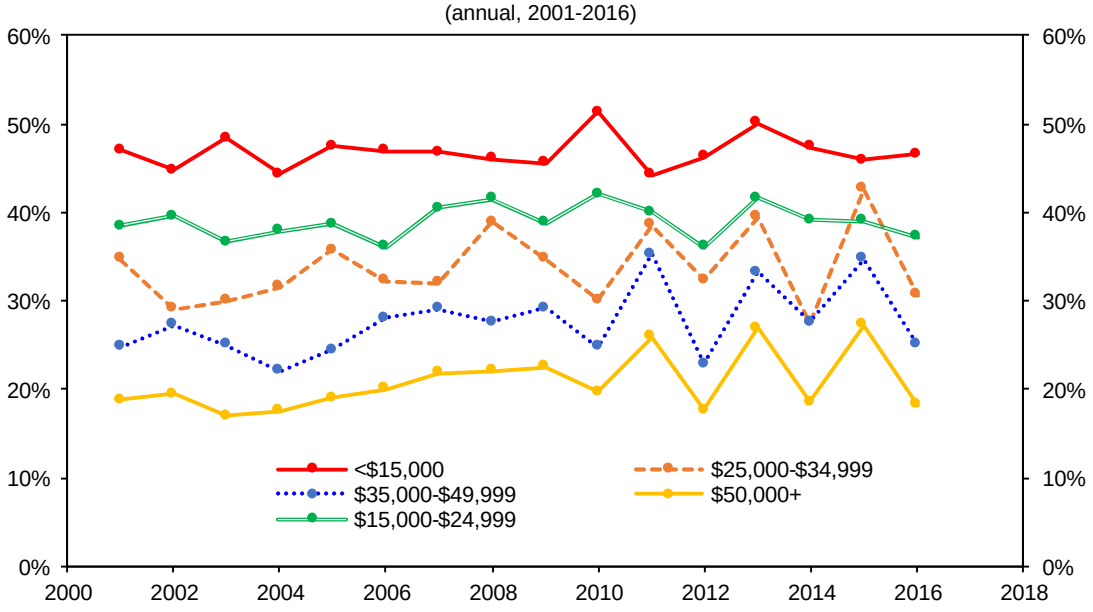

Source: Behavioral Risk Factor Surveillance System (CDC, 2016)

Physical exercise is shown to be disparate among income groups as well. Figure 15 demonstrates the percentage of adults in Mississippi who did not complete any physical activity in the 30 days before being surveyed. Those in the lowest-earning income group reported that they did not complete exercise at a rate 28.4 percentage points higher than the highest-earning income group, highlighting another major disparity that coincides with the findings for diabetes and obesity prevalence by household income.

Figure 15

**Percentage Indicating No Physical Exercise in Preceding Month by Household Income: Mississippi**

(annual, 2001-2016)




Source: Behavioral Risk Factor Surveillance System (CDC, 2016)

## Prevalence of Diabetes and Obesity

The direct and indirect economic costs that are strongly associated with diabetes and obesity are projected to worsen unless dramatic changes are made. This is why the presence of NDORI makes the community at Tradition a statewide issue. In order for NDORI to measure its progress as it works toward finding solutions, preventions, and cures for the diseases, it is important to understand where the state of Mississippi currently stands in terms of diabetes and obesity trends among the population.

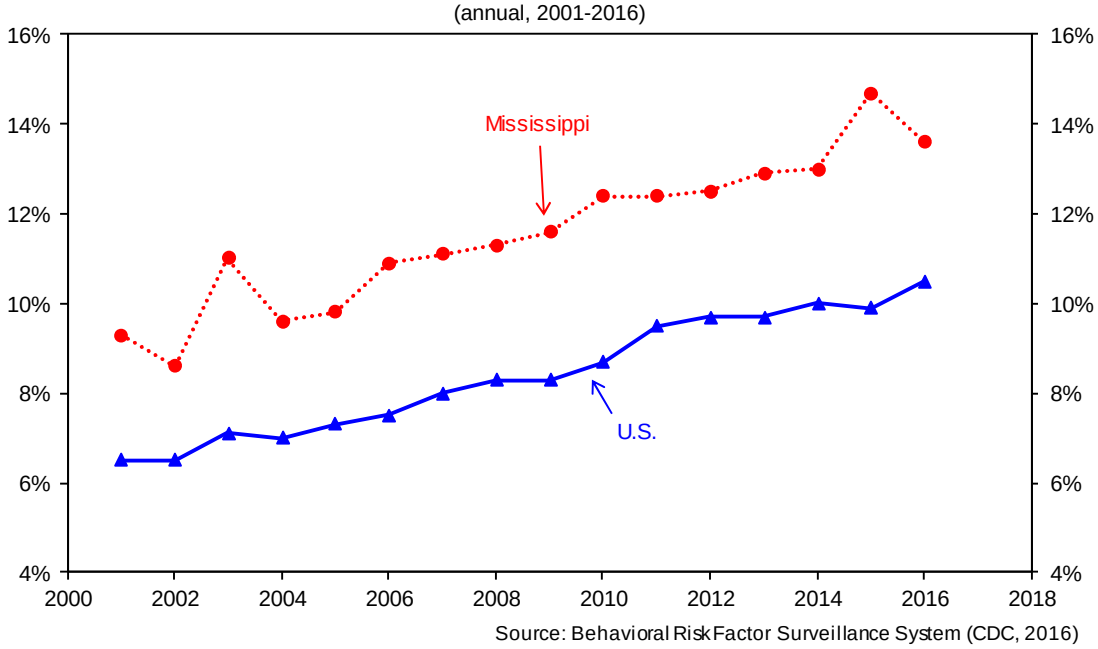
### Diabetes Prevalence

Data from the Center for Disease Control's (CDC) Behavioral Risk Factor Surveillance System, the largest health-related telephone survey in the country, illustrates prevalence trends for diabetes and obesity by comparing Mississippi's rates with the United States as a whole (Figures 16 through 18). Diabetes prevalence in Mississippi averages three percentage points higher than in the U.S. annually (see Figure 16). From 2001 to 2016, the rate of diabetes in Mississippi rose from 9.3% to 13.6%, a change of 4.3% over 15 years. Mississippi did report a 1.1% decline from 2015 to 2016, its first since 2004—although it has yet to be determined whether this is simply statistical noise or a sign of improvement that is here to stay.

Figure 16

**Percentage of Population with Diabetes: Mississippi vs. the United States**

(annual, 2001-2016)



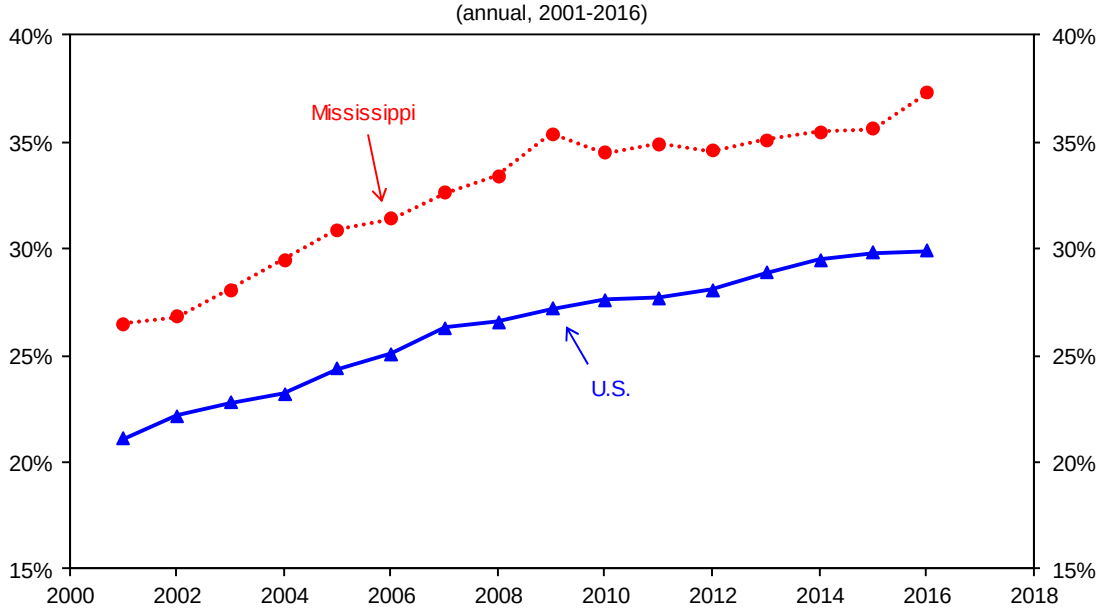

Source: Behavioral Risk Factor Surveillance System (CDC, 2016)

## Obesity Prevalence

Obesity has negative consequences in annual and lifetime medical costs, as obese people annually average 38% more doctor visits and 1.84 times more pharmacy dispensaries than normal-weight individuals. Obesity annually contributes to an estimated $3 billion workplace productivity loss for employers, with obese people having almost twice as many health-related absences from work as normal weight people.[70] It can also limit occupational choices and contribute to lower wages, with obese people working mostly in low paying jobs and having more difficulty finding jobs.[71]

From 2001 to 2016, obesity rose by 10.8% (from 26.5% to 37.3%) in Mississippi and 8.8% in the nation (see Figure 17). Further, Mississippi's rate averages 6.4% higher than the U.S. each year. In 2016, the percentage of the Mississippi population that was considered obese was 7.4% higher than that of the U.S., indicating that the gap between the two rates is widening. Obesity also contributes to other serious health complications such as heart disease, stroke, and cancer—all of which are among the leading causes of death both in Mississippi and the United States.[72]

Figure 17
**Percentage of Population Considered Obese: Mississippi vs. the United States**
(annual, 2001-2016)



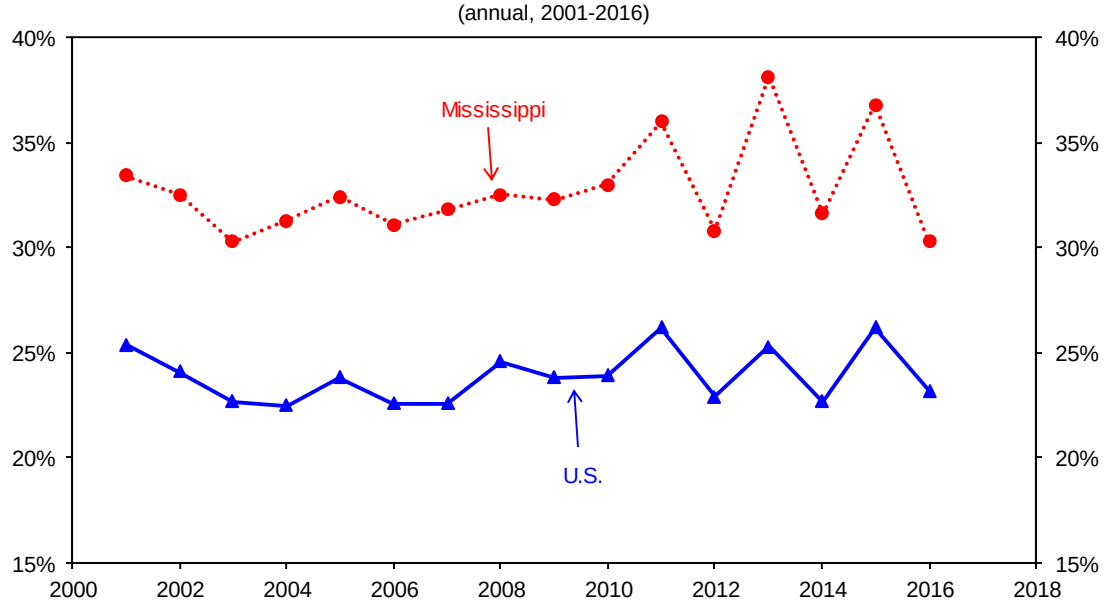

Source: Behavioral Risk Factor Surveillance System (CDC, 2016)

[70] E. A. Finkelstein, C. J. Ruhm, and K. M. Kosa, "Economic Causes and Consequences of Obesity," Annual Review of Public Health, 2005. 26(1), 239-257. doi:10.1146/annurev.publhealth.26.021304.144628
[71] *Ibid.*
[72] Centers for Disease Control, Behavioral Risk Factor Surveillance System, 2016, U.S. Department of Health & Human Services, 2016. https://www.cdc.gov/brfss/index.html

## Physical Exercise

Mississippi continually falls behind the national rate in physical activity. The CDC encourages an active lifestyle as a means for combatting obesity and Type 2 diabetes. The CDC's Behavioral Risk Factor Survey (BRFS) asked, "During the past month, did you participate in any physical activities?" to which Mississippians answered "No" at an average annual rate of 10% worse than the nation (see Figure 18). Noteworthy, however, is the rate of people who get exercise has remained steady in recent years, yet diabetes and obesity rates have steadily increased during the same time period.

Figure 18
**Percentage Indicating No Physical Exercise in Preceding Month: Mississippi vs. the United States**
(annual, 2001-2016)




Source: Behavioral Risk Factor Surveillance System (CDC, 2016)

The findings in the CDC survey suggest that a lack of exercise is not the only factor contributing to the state's declining health; the foremost concern in addressing the issue should be poor dietary habits.

This concludes the outline of socioeconomic status of the state of Mississippi and the coastal metropolitan area of Gulfport-Biloxi-Pascagoula. This paper will now examine how the future developments at Tradition directly address these barriers to growth and will improve the economy and health of both the region and the state.

# The Economic Impact of Tradition

## "The Future of Health Economic Development in Mississippi Using Public-Private Partnerships"

In his 2017 Mississippi College Law Review article, Tray Hairston concludes, that with the Mississippi legislature's creation of Healthcare Zones and incentives…

> *"Not only could healthcare and life sciences be sustainable target industries for [the Mississippi Development Authority] MDA to pursue, they could also provide target-rich environments that MDA could foster to encourage private sector investment. Focusing on these industries will become particularly important as Mississippi yearns to remain competitive while other traditional target industries begin to wane per predictive economic indicators from ratings agencies."*[73]

## What is Tradition?[74]

Tradition is a collaborative cluster for healthcare and life science innovation and is the largest master-planned community under development in the state of Mississippi and one of the largest in the country. It is located in central Harrison County on the Gulf Coast at the intersection of State Highways 67 and 605/Tradition Parkway. Once completed, the 4,800-acre development, which includes a 650-acre medical city town center, will have more than 15,000 residential units, 2,000,000 square feet of commercial and mixed-use development, and 35,000 residents. Tradition's conventional residential component consists of The Village at Tradition (a neighborhood with homes featuring classic Southern architectural style), DeSoto Trails at Tradition (homes averaging a price of $250,000 or more), and The Townhomes at Tradition (stately brick townhomes in the heart of Tradition). Also included in the overall development is a separate active adult community which will contain more than 5,000 homes.

The commercial and mixed-use projects proposed or begun at Tradition have both an educational and research component. As a result, the development has continuously sought to leverage these anchor components to recruit or create spin-off medical device, drug manufacturing, life science, or biotechnology companies. In 2009, William Carey University (WCU) opened a campus at Tradition where in excess of 1,000 students regularly attend classes. In addition, WCU broke ground on a new pharmacy school at Tradition in April 2017. The 35,000 square foot pharmacy school is slated to start classes Fall 2019. In January 2018, Mississippi Gulf Coast Community College (MGCCC) started classes in its new state-of-the-art Nursing and Simulation Center located at Tradition. The 48,500 square-foot Nursing and Simulation Center will double the number of nurses who graduate from MGCCC's Associate Degree Nursing program and provide an easy transition to the school of nursing programs at both The University of Southern Mississippi and WCU through articulation agreements in place between the institutions. Due to the projected growth at Tradition, and specifically its town center where all of the educational and healthcare related offerings are located, a student housing facility is also under design and development.

Because Mississippi has statistically been at the center of the diabetes and obesity epidemic in the United States, the first major development component pursued at Tradition was the creation of a world-class research center to find a cure for diabetes. Consequently, NDORI was created and its founders recruited Cleveland Clinic's Endocrinology & Metabolism Institute, a nationally ranked research juggernaut in academic and clinical research, as a partner. In addition, two major local healthcare partners were identified as sources of diabetes-related patient data, education, and care. Memorial Hospital at Gulfport, the largest hospital system on the Mississippi Gulf Coast, was selected for its size (a hospital with 80+ clinics) and top healthcare rankings. In addition, Coastal Family Health Clinic (CFHC), a primary healthcare provider with 21 service sites throughout the region, was also selected because 52% of its patients are uninsured and represent a large part of the "health disparity" or underserved population on the Gulf Coast. Committed to the cause of curing diabetes, Memorial Hospital's and NDORI's new 9,000 square foot facility just opened in January 2018.

[73] Tray Hairston, "The Future of Economic Development: Using Healthcare as an Economic Driver, Public-Private Partnerships as a Platform to Further Development, and Minority Participation as a Path Forward in a More Diverse Mississippi,"

[74] We'd like to thank Tray Hairston for his contribution to the writing of this section.

## Progress Report

In the table below, we've tallied the total economic impact of the investment in construction that has already taken place at Tradition. We ran these components through our model to provide estimates for past economic impact. About 78% of the additional jobs created were construction jobs and the remainder was spread across other industries.

Table 3

**Economic Impact of Previous Investment for Construction**

| Completed Projects | Amount Invested | Additional Economic Impact | Additional Wages | Additional Jobs |
|---|---|---|---|---|
| Tradition Properties, Inc. (Village residential and Village Center) | $11,509,549 | $15,475,150 | $10,857,341 | 283 |
| Desoto Trails at Tradition (residential subdivision) | $2,175,000 | $2,924,394 | $2,051,750 | 53 |
| East Central Harrison County Public Utility District | $9,714,235 | $13,061,263 | $9,163,761 | 239 |
| Lake Trail Project by Tradition Properties, Inc. in Village | $69,104 | $92,913 | $65,188 | 2 |
| University Blvd. at Tradition Town Center (Columbus Communities, LLC) | $383,258 | $515,309 | $361,540 | 9 |
| Village Communications | $1,107,853 | $1,489,562 | $1,045,075 | 27 |
| Learning Medical City (College Blvd., Commons) (2016 MDA EDHP) Does not include $500K plus of $600K MDA/DIP grant for water/sewer | $2,700,000 | $3,630,282 | $65,188 | 66 |
| St. Patrick Catholic High School | $30,096,638 | $40,466,399 | $28,391,161 | 739 |
| William Carey University *initial campus | $15,256,553 | $20,513,180 | $14,392,014 | 375 |
| *Pharm school, conference center (const. in progress 2017) | $12,500,000 | $16,806,860 | $11,791,666 | 307 |
| First Place Convenience Store on Highway 67 | $1,510,384 | $2,030,785 | $1,424,795 | 37 |
| Village Center YMCA, Santini's Market and Village Community Pool | $1,900,000 | $2,554,643 | $1,792,333 | 47 |
| Memorial Clinic Building (Memorial Walk in Clinic, NDORI) | $2,000,000 | $2,689,098 | $1,886,667 | 49 |
| MGCCC Nursing and Simulation (Const. in progress 2017) | $12,500,000 | $16,806,860 | $11,791,666 | 307 |
| Individual homes built by 3rd parties | $6,651,643 | $8,943,459 | $6,274,716 | 163 |
| **Total** | **$110,074,217** | **$148,000,157** | **$101,354,861** | **2,704** |

Source: Columbus Communities, LLC, BEA, Laffer Associates

The following analysis examines the impacts of the proposed developments not already part of the Gulfport-Biloxi-Pascagoula economy these entities are listed as "current projects."

## Current Project Entities

Table 4
**FTEE"s, Income, and Tax Revenue of Current Projects at Full Capacity**

| Entity | Full-time Equivalent Employees | Average Salary | Total Wages | Students at full capacity (if applicable) | State Income Tax Revenue |
|---|---|---|---|---|---|
| WCU Medical School | 45 | $103,880 | $4,674,599 | 400 | $226,980 |
| NDORI[75] | 60 | $100,000 | $6,000,000 | | $291,000 |
| Memorial Clinic | 5 | $65,000 | $325,000 | | $15,500 |
| MGCCC | 27 | $45,926 | $1,240,000 | 542 | $57,950 |
| WCU Pharmacy School | 34 | $92,849 | $3,156,853 | 192 | $152,743 |
| CFHC | 22 | $59,797 | $1,315,539 | | $62,477 |
| **Total (Salary is weighted average)** | **193** | **$86,591** | **$16,711,992** | **1134** | **$806,650** |

Source: listed entities, Laffer Associates

As Table 4 shows, the immediate developments at Tradition come with a large proportion of high-skill, high-wage labor. Furthermore, the concentration of educational institutions will be supplying the local economy with 284 new college graduates annually (at full capacity), and these new graduates will have specialized degrees in their fields—an attractive item for site selectors. According to the most recent survey by Area Development, the 3rd most important site selection factor is availability of skilled labor.[76]

Among the other top factors for recruiting additional and new business ventures were highway accessibility (1), construction costs (5), labor costs (2), corporate tax rates (8), and state and local incentives (9). Tradition is strong in each of these:

- As mentioned previously, Tradition is located approximately 5 to 8 minutes from an interstate highway.
- According to the most recent National Building Cost Manual, construction costs in Gulfport (and Mississippi) are 6% less than the U.S. average.[77] That's less than both neighbor states Louisiana and Alabama.[78]
- As we have already established, the cost of labor in Mississippi is very low relative to the nation.
- Mississippi has a competitive corporate tax rate of 5% (11th lowest).[79]
- As far as state and local incentives are concerned, there are several available to business in Mississippi and the Gulfport-Biloxi-Pascagoula area.[80]

[75] NDORI/Cleveland Clinic's optimistic scenario places its employment at 60 FTE's at the end of five years. Our 10-year model estimates that NDORI will employ 400 people by the end of 10 years.
[76] "32nd Annual Corporate Survey & the 14th Annual Consultants Survey," Area Development, Q1-2018. http://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2018/32nd-annual-corporate-survey-14th-annual-consultants-survey.shtml
[77] Area Modification Factors, "2017 National Building Cost Manual, 41st Ed.," Craftsman, 2017. https://www.craftsman-book.com/media/static/previews/2017_NBC_book_preview.pdf
[78] *Ibid.*
[79] Arthur Laffer, Stephen Moore, Jonathan Williams, "Rich States, Poor States: ALEC-Laffer State Economic Competitiveness Index, 11th ed.," American Legislative Exchange Council, 2018. https://www.alec.org/publication/rich-states-poor-states-11th-edition/
[80] See Appendix for examples.

## What is NDORI?[81]

The National Diabetes & Obesity Research Institute (NDORI) is committed in the mission to end diabetes and obesity nationwide through research, treatment, education and prevention. Mississippi is in the heart of the crisis for the southern states, ranking consistently among the highest for diabetes and obesity prevalence. Therefore, NDORI's location in Tradition is critical for Mississippi as well as the immediate surrounding states. In order to accomplish the mission, NDORI will strive to lower the prevalence of diabetes and obesity, decrease medical costs at individual, state and national levels, improve our future through childhood obesity prevention programs and improve workplace health initiatives.

The 100,000 sf research building where NDORI will operate (pictured below), will provide space for up to 400 employees. The building will encompass the necessary infrastructure for administrative functions, clinical services, basic science research labs, translational research, interventional resources, imaging and laboratory services, a dietary research kitchen and educational training rooms. The short-term plan is to initiate and establish research projects. Research teams will be assembled to uncover novel mechanisms in the onset and progression of diabetes and the treatment and prevention of obesity. NDORI will work to build a critical mass of scientific and medical investigators and support personnel by fostering a culture of innovation while also continuously building collaborations with hospitals, clinics and institutions to generate a larger impact.


[81] Source: NDORI

## 10-Year Impact Model Results

We determined that the best way to display forward-looking analysis of what amount of growth could arise with new development is by using three different scenarios: WCU College of Medicine (COM, **Scenario 1**); WCU College of Medicine in conjunction with all known ongoing and future projects (**Scenario 2**); and WCU College of Medicine with a clustering effect applied (**Scenario 3**).

The ALME economic impact model uses the requirements tables published by the Bureau of Economic Analysis (BEA) that are then transformed to align with the industry mix of the local economy. All estimates for GDP and wages are cumulative over 10 years, and the job estimates are permanent jobs from additional operations plus temporary employment increases due to heavy investment up front in construction. The model estimates exist on one unified timeline, and any lags in construction or hiring will stretch the window of impact beyond 10 years.[82]

ALME projects very weak baseline growth for the Gulfport-Biloxi-Pascagoula MSA, estimating only 0.7% annual real GDP growth. Furthermore, we estimate a net gain of only about 2,800 jobs over the next 10 years. This is consistent with recent data released by the BEA: Mississippi's statewide real GDP only grew by 0.3% in 2017, and Mississippi has grown by less than 1% annually for four of the last five years.[83] Going forward, state economist Darrin Webb is confident in the state's ability to achieve 1.9% annual growth as the state experienced in 2016.[84]

Tradition could be a large part of boosting Mississippi's economic growth. We estimate that further development at Tradition will boost annual real GDP growth in the local economy to about 0.9% (that's an additional +0.2% compounded annually) and could help create 7,000 to 9,400 jobs after accounting for indirect and induced economic impacts.

Given the substantial success that came with the College of Medicine at Lake Nona, Florida, we've centered the results of this study on the medical school as well. Table 5 summarizes the results. These results are broken down in the subsequent pages.

Table 5

**10-Year Estimated Cumulative* Economic Impact of Tradition on the Gulfport-Biloxi-Pascagoula MSA**

| | 2027 Baseline Estimated Level | College of Medicine (cumulative impact)* | Future Tradition Medical City (cumulative impact)*† |
|---|---|---|---|
| Government Cost ($ millions) | **n/a** | **TBD** | **77** |
| Number of Full-Time and Part-Time Jobs** | **210,631** | **1,832** | **7,050-9,403** |
| Wages ($ millions) | **9,478** | **274** | **821-1,221** |
| Tax Revenue ($ millions) | **883** | **26** | **76-114** |
| GDP ($ millions of 2016 dollars) | **17,585** | **431** | **1,309-1,972** |

*cumulative impacts are a summation of the additional growth in each of the 10 years.
**additional part-time and full-time jobs include permanent increases in employment plus temporary increases due to spending on construction.
†Impacts in the final column indicate a range of impacts between our estimates for Scenario 2 (COM + Current Projects) and Scenario 3 (COM + Research Cluster Effect).

[82] See graphical representation of Scenarios 1,2, and 3.
[83]" Mississippi economy posts weak growth in 2017," Associated Press, May 5, 2018.
https://apnews.com/amp/876ba975aab148b8bc9e5a2166ae4f2a?__twitter_impression=true
[84] "Mississippi Economic Outlook: Volume 4, Number 2," University Research Center, Spring 2018.
http://www.mississippi.edu/urc/downloads/outlook/0418mseo.pdf

## What Happened at Lake Nona?

The original economic impact study for a college of medicine at Lake Nona (conducted by ALME and the Milken Institute in 2006) published high estimates for economic impact. By 2008, the estimates had to be revised up due to the rapid commitment of construction and employment opportunities from clustering entities like the VA Hospital, M.D. Anderson, Nemours Children's Hospital, and various retail and commercial commitments. Table 6 breaks down the necessary revisions that had to be made due to the project's rapid success. The last column shows what the actual total growth of the MSA was over the period.

Table 6

**Lake Nona Economic Study: Cluster Projections and Revisions**

| | 2006 10-Year Cluster Prediction | Committed by 2008 | Revised 10-Year Prediction | Orlando-Kissimmee-Sanford MSA Actual 10-Year Growth |
|---|---|---|---|---|
| Jobs | **25,070** | **16,000** | **30,600** | **258,327** |
| Economic Activity | **$6.4 Billion** | **$5.2 billion** | **$7.6 billion** | **$31 billion** |

Source: ALME, Milken Institute

Lake Nona is now a shining example of how a research cluster centered on healthcare and life science can spur economic growth at a seriously rapid rate and create far-reaching impacts on an entire state.

## Baseline Growth: if Construction at Tradition Ceased in 2017, What Would Happen?

In order to understand the magnitude of the impact of new economic activity, we have to estimate what would happen if the current economy in Gulfport-Biloxi-Pascagoula continued to grow as it has, excluding the new inputs in Tradition.

We have estimated, based on economic growth over the last five years, that Gulfport-Biloxi-Pascagoula's real GDP will grow by only 0.7% annually. We expect for there to be a net gain of 2,757 jobs See Table 7.

Table 7

**Estimated Baseline Growth of the Gulfport-Biloxi Pascagoula Economy**

| GDP (millions of 2016 dollars) | 2016 Actual (BEA) | 2017 estimate | 2027 Estimate | Annual Growth Rate |
|---|---|---|---|---|
| **All industry total** | **16,287** | **16,347** | **17,585** | **0.7%** |
| Agriculture, forestry, fishing, and hunting | 51* | 51 | 51 | 0.0% |
| Mining | 28* | 28 | 28 | 0.0% |
| Utilities | 618 | 609 | 528 | -1.4% |
| Construction | 657 | 613 | 308 | -6.7% |
| Manufacturing | 3,098* | 3,221 | 4,755 | 4.0% |
| Wholesale trade | 392 | 410 | 642 | 4.6% |
| Retail trade | 1,050 | 1,065 | 1,223 | 1.4% |
| Transportation and warehousing | 256 | 239 | 118 | -6.8% |
| Information | 307 | 322 | 512 | 4.8% |
| Finance, insurance, real estate, rental, and leasing | 2,192 | 2,196 | 2,231 | 0.2% |
| Professional and business services | 1,239 | 1,233 | 1,173 | -0.5% |
| Educational services, healthcare, and social assistance | 857 | 865 | 944 | 0.9% |
| Arts, entertainment, recreation, accommodation, and food services | 1,452 | 1,450 | 1,434 | -0.1% |
| Other services, except government | 324 | 324 | 329 | 0.2% |
| Government | 3,766 | 3,722 | 3,310 | -1.2% |

*Due to gaps in the data some industry values were approximated.

| Full-Time and Part-Time Employment | | 2017 estimate | 2027 Estimate | Additional Jobs over the 10 years |
|---|---|---|---|---|
| **All industry total** | | **207,874** | **210,631** | **2,757** |
| Agriculture, forestry, fishing, and hunting | | 2,179 | 2,180 | 1 |
| Mining | | 579 | 579 | 0 |
| Utilities | | 1,448 | 1,256 | -193 |
| Construction | | 12,080 | 6,058 | -6,022 |
| Manufacturing | | 18,124 | 26,750 | 8,626 |
| Wholesale trade | | 3,301 | 5,172 | 1,871 |
| Retail trade | | 22,513 | 25,859 | 3,346 |
| Transportation and warehousing | | 3,790 | 1,868 | -1,922 |
| Information | | 1,987 | 3,164 | 1,176 |
| Finance, insurance, real estate, rental, and leasing | | 13,428 | 13,644 | 217 |
| Professional and business services | | 22,831 | 21,727 | -1,104 |
| Educational services, healthcare, and social assistance | | 17,737 | 19,365 | 1,628 |
| Arts, entertainment, recreation, accommodation, and food services | | 33,442 | 33,066 | -376 |
| Other services, except government | | 12,183 | 12,369 | 185 |
| Government | | 42,252 | 37,573 | -4,679 |

Source: BEA, Laffer Associates Calculations

The estimates account for strong growth in manufacturing, retail trade, and education and health services, the last of which is certainly due at least in part to the presence of the William Carey University undergraduate campus at Tradition. Despite this growth, it is clear that some sectors, like professional and business services, are on a sharp downward path.

## What happens if we add new Tradition projects to the Economy?

Adding the medical school (COM) and the other current projects that are both ongoing (like the MGCCC expansion) and planned (like CFHC) totally change the projected growth in the local economy. According to the ALME economic impact

model, the college of medicine and current projects will cause an additional $1.3 billion in cumulative economic activity that would not have occurred otherwise over the 10-year period.[85] This growth, when we account for the ripple effects of new business activity and personal consumption expenditures, will help create an additional 7,050 jobs in the local economy, 4,078 of which would be permanent. See Table 8.

Table 8

**10-Year Economic Impact of Current Projects at Tradition**

| GDP (millions of 2016 dollars) | 2027 Baseline Estimate | COM | | COM + Current Projects | |
|---|---|---|---|---|---|
| | | Additional GDP in 2027 | Cumulative Economic Impact | Additional GDP in 2027 | Cumulative Economic Impact |
| **All industry total** | **17,585** | **63** | **431** | **243** | **1,309** |
| Agriculture, forestry, fishing, and hunting | 51 | 1 | 8 | 5 | 23 |
| Mining | 28 | 0 | 1 | 1 | 3 |
| Utilities | 528 | 6 | 39 | 23 | 115 |
| Construction | 308 | 3 | 51 | 13 | 179 |
| Manufacturing | 4,755 | 4 | 28 | 22 | 97 |
| Wholesale trade | 642 | 1 | 8 | 5 | 25 |
| Retail trade | 1,223 | 4 | 27 | 17 | 82 |
| Transportation and warehousing | 118 | 2 | 10 | 7 | 33 |
| Information | 512 | 1 | 6 | 4 | 20 |
| Finance, insurance, real estate, rental, and leasing | 2,231 | 1 | 7 | 5 | 26 |
| Professional and business services | 1,173 | 2 | 16 | 27 | 99 |
| Educational services, health care, and social assistance | 944 | 14 | 89 | 30 | 186 |
| Arts, entertainment, recreation, accommodation, and food services | 1,434 | 9 | 55 | 36 | 171 |
| Other services, except government | 329 | 4 | 25 | 14 | 70 |
| Government | 3,310 | 10 | 64 | 35 | 180 |

| Full-Time and Part-Time Employment | 2027 Baseline Estimate | COM | | COM + Current Projects | |
|---|---|---|---|---|---|
| | | Addl. Permanent Jobs in 2027 | Total Jobs Impact* | Addl. Permanent Jobs in 2027 | Total Jobs Impact* |
| **All industry total** | **210,631** | **1,095** | **1,832** | **4,078** | **7,050** |
| Agriculture, forestry, fishing, and hunting | 2,180 | 53 | 67 | 195 | 252 |
| Mining | 579 | 2 | 3 | 11 | 16 |
| Utilities | 1,256 | 14 | 19 | 54 | 72 |
| Construction | 6,058 | 67 | 646 | 251 | 2,584 |
| Manufacturing | 26,750 | 24 | 30 | 122 | 143 |
| Wholesale trade | 5,172 | 10 | 11 | 43 | 50 |
| Retail trade | 25,859 | 90 | 104 | 365 | 424 |
| Transportation and warehousing | 1,868 | 25 | 31 | 110 | 135 |
| Information | 3,164 | 6 | 7 | 27 | 31 |
| Finance, insurance, real estate, rental, and leasing | 13,644 | 6 | 10 | 33 | 50 |
| Professional and business services | 21,727 | 46 | 53 | 499 | 527 |
| Educational services, health care, and social assistance | 19,365 | 293 | 303 | 620 | 659 |
| Arts, entertainment, recreation, accommodation, and food services | 33,066 | 199 | 232 | 832 | 965 |
| Other services, except government | 12,369 | 148 | 174 | 521 | 629 |
| Government | 37,573 | 112 | 142 | 395 | 514 |

*The total jobs impact equals the total additional permanent jobs in year 10 plus the temporary jobs created through the initial injection of construction investment into the economy.

Source: BEA, USCB, Laffer Associates, various Tradition entities

We see that the combined projects planned at Tradition will contribute to growth in construction, professional and business services (NDORI), educational services (MGCCC, William Carey COM and Pharmacy School) healthcare (Memorial Clinic and CFHC), and social assistance jobs. These are higher paying sectors than the baseline which is concentrated heavily in the sector of arts, entertainment, recreation, accommodation, and food services.

[85] These model estimates do not account for "leakages" in output and employment. In other words, it is possible and likely that some of these impacts will occur outside of the local economy used in this study.

It is important to note that the arts, entertainment, recreation, accommodation and food services sector is still the second largest for job growth. Much of this growth is due to the induced demand of new agents within the economy who will be actively consuming services from the arts etc. industry. We can make the same point about the retail industry. The headline here is that the economy should be growing in a much more balanced way compared to the baseline.

These results suggest that the new developments at Tradition will help break the mold of the currently lopsided industry mix and help to grow a much more well-rounded economy on the Mississippi Gulf Coast and in the state of Mississippi at large.

## Scenario 3: What could happen if a Full Research Cluster Forms at Tradition?

Using Lake Nona as a guide, ALME estimated the potential economic impact if Tradition became a medical city with the introduction of a medical device, pharmaceutical, or other related industry that could capitalize on synergies with the medical school, pharmacy school, clinics, and NDORI.[86] See Table 9.

Table 9

**10-Year Economic Impact of COM with Research Cluster Effect**

| | **2027 Baseline Estimate** | **COM with Cluster Effect** | |
|---|---|---|---|
| | | Addl. Growth to the 2027 Baseline | Cumulative Impact |
| GDP (millions of 2016 Dollars) | **17,585** | **367** | **1,972*** |
| Part-Time and Full-time Employment | **210,631** | **5,439** | **9,403**** |

*the cumulative impact on GDP is the summation of the additional growth in each of the 10 years.
** The total jobs impact equals the total additional permanent jobs in year 10 plus the temporary jobs created through the initial injection of construction investment into the economy.

Source: BEA, U.S. Census Bureau, Laffer Associates, Milken Institute, various Tradition entities

[86] See section on Cluster Potential at Tradition.

## Graphical Representation of Scenarios 1, 2, and 3

Figure 19

**Economic Impact on Real GDP in Gulfport-Biloxi-Pascagoula MSA**

(annual, millions of 2016 dollars)

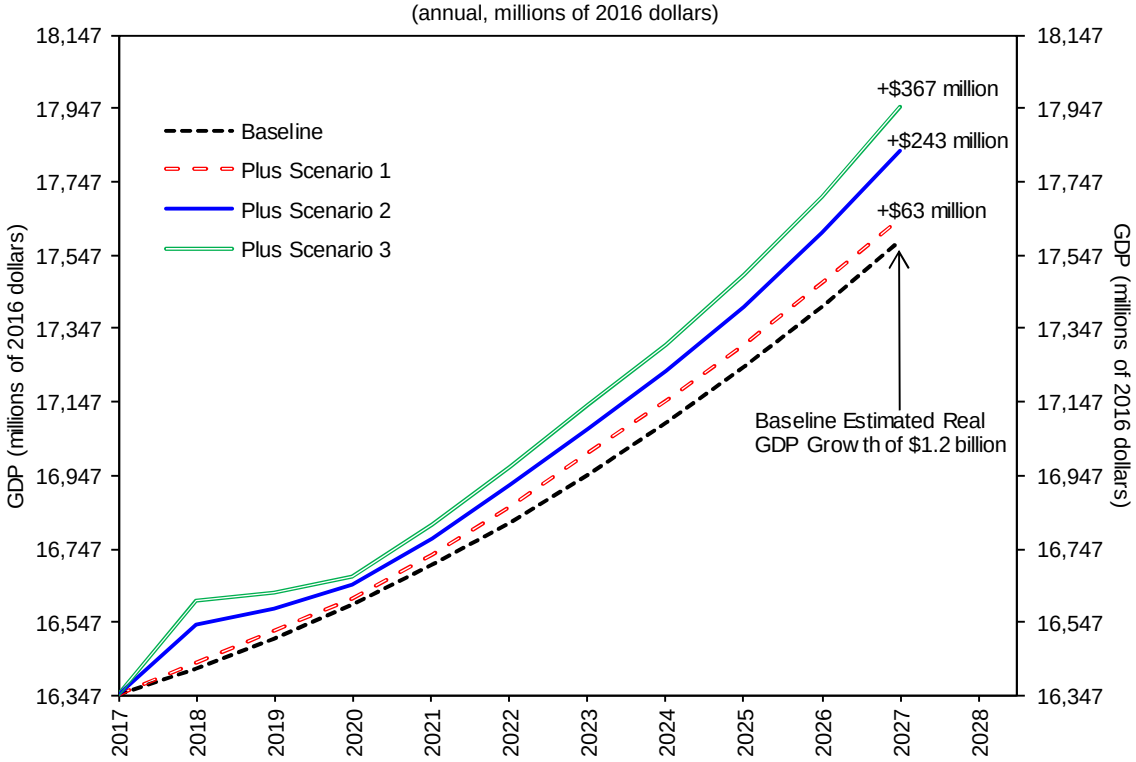
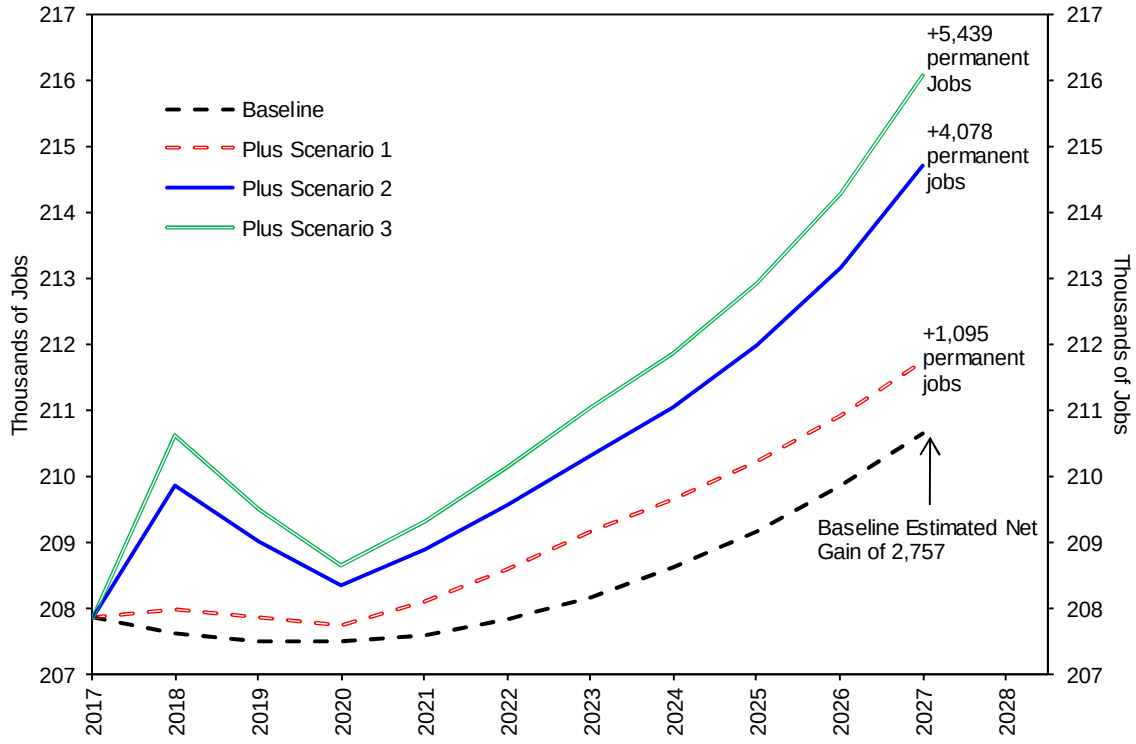



Figure 20

**Economic Impact on Full-Time and Part-Time Employment in Gulfport-Biloxi-Pascagoula MSA**

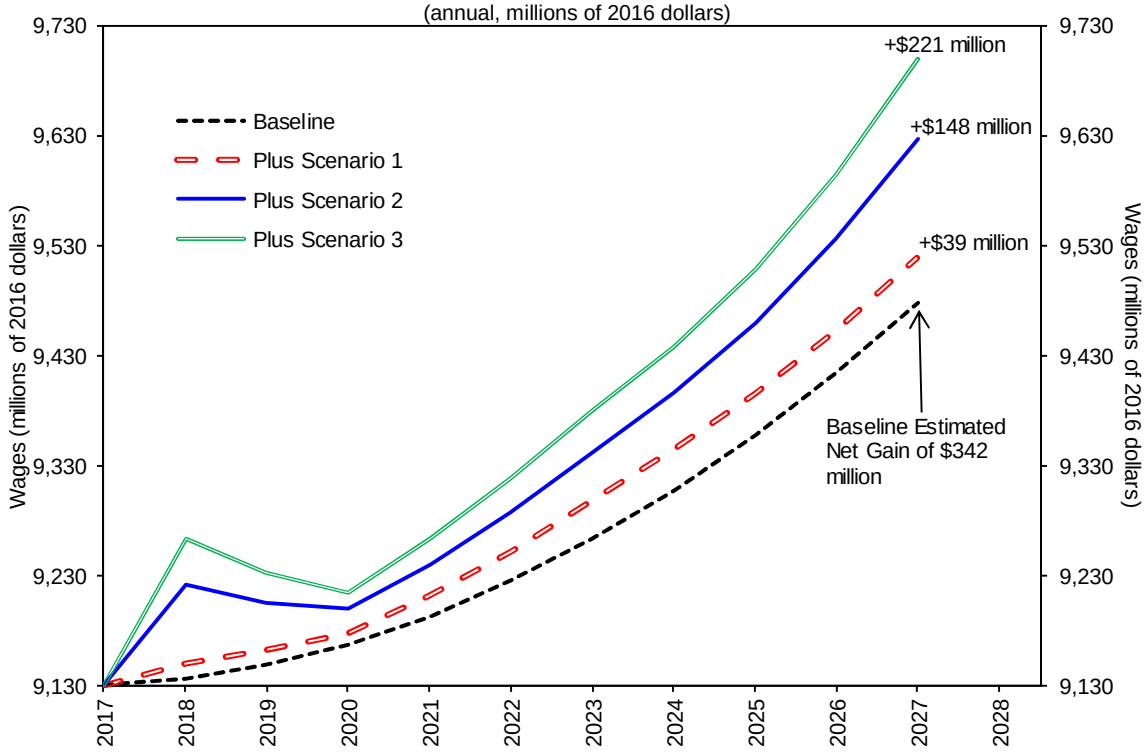
(annual, thousands of jobs)



## Wages, Tax Revenue, and their Relation to Government Cost

The ALME model estimates that the COM will bring about $274 million in additional wages over the next 10 years, and the increase in wages due to the economic impact of clustering entities could be between $821 million and $1.2 billion in year 10. These cumulative amounts are equal to the area between the scenario line and the baseline in Figure 21.

Figure 21
**Economic Impact on Full-Time and Part-Time Wages in Gulfport-Biloxi-Pascagoula MSA**
(annual, millions of 2016 dollars)




ALME approximates the government investment necessary to facilitate the current projects at Tradition to be about $77 million. With the estimated government cost in mind, we can use the estimated additional wages from the ALME impact model to calculate when state and local governments would recover their investment in the form of income, sales, and property tax revenue.

Table 10
**Cumulative Wages, Tax Revenue and Their Relation to Government Cost**

| | COM | COM with Current Projects | COM with Cluster Effect |
|---|---|---|---|
| Additional Cumulative Wages | **$274 million** | **$821 million** | **$1.2 billion** |
| Cumulative State and Local Sales, Income, and Property Tax Revenue[87] | **$26 million** | **$76 million** | **$114 million** |
| Government Cost | **TBD** | **$77 million** | **$77 million** |
| Year govt. cost will be repaid by tax revenue | **TBD** | **Year 11** | **Year 8** |
| Year net present value of govt. cost becomes positive | **TBD** | **Year 12** | **Year 9** |

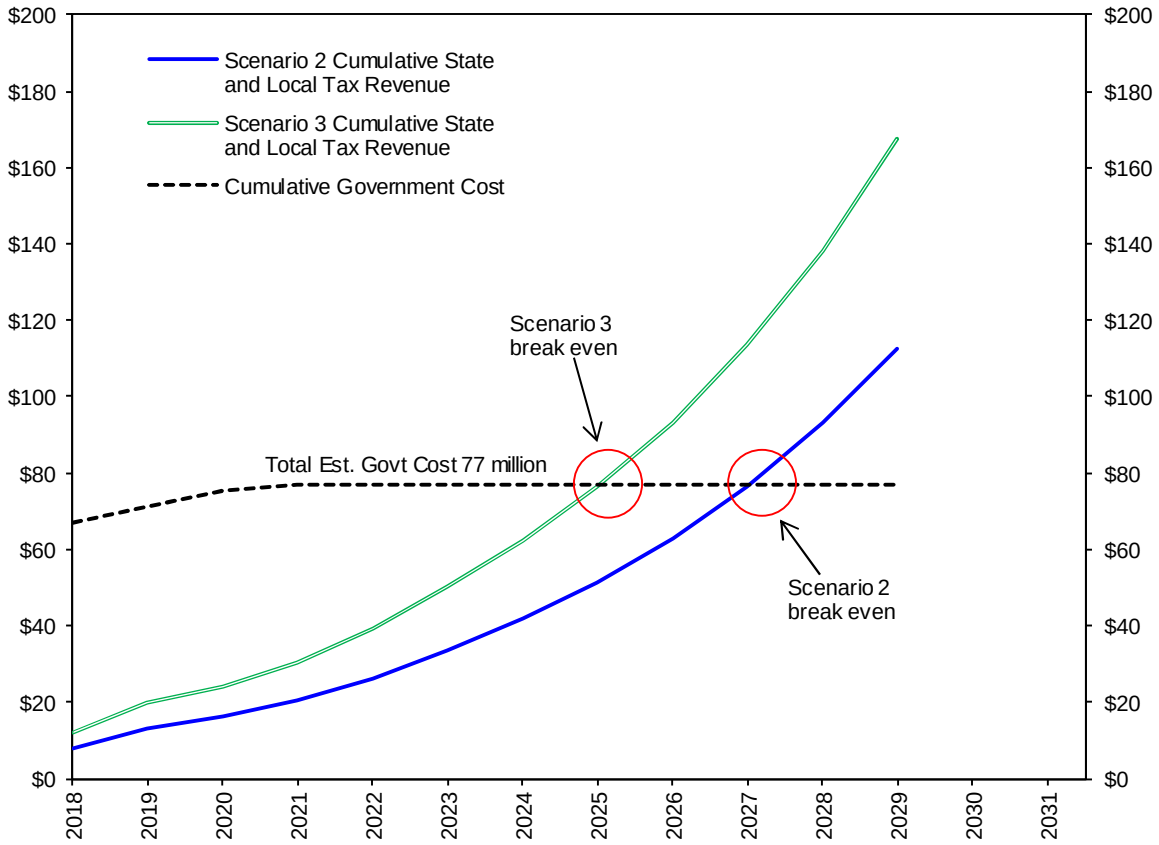
Source: BEA, U.S. Census Bureau, Laffer Associates, Milken Institute, various Tradition entities

[87] An important distinction is that these additional revenues are in real terms, whereas it is standard practice in public finance to estimate revenues in nominal terms. Revenue is calculated by assuming a constant tax burden of 9.31% which is equal to total state and local sales, income and property tax revenue as a share of personal income in 2015.

Figure 22

**When Will State and Local Governments Recover their Investment?**

(annual, millions of dollars, figures are cumulative)




## Commentary on the Results

These results indicate that new developments at Tradition are critical to turning the Mississippi Gulf Coast economy around. The additional economic activity could almost double the net gain in full and part-time employment. In addition, our estimates anticipate that real GDP growth will double. When we look at wage growth, we expect that the government will recoup its investment in 8-11 years due to additional tax revenue.

## Other Model Assumptions and Disclaimers

These results operate on a single timeline for simplicity's sake; everything begins in year 1 including new construction. The medical school does not reach full capacity until year 6 to allow for two years of construction. NDORI currently shares office space with Memorial Clinic, so they can continue to grow for a short time until their facility is complete. This model also assumes that NDORI will have 400 employees in the 10$^{th}$ year. With this in mind, any construction or hiring delays would decrease these output estimates, and these results are only actionable in so far as they are within the stated universe of the model. The economic impact scenario is based upon the planned community achieving its full capacity at WCU, MGCCC, NDORI, and other medical affiliates.

## Additional Economic Growth from Reducing the Diabetes Rate: Evidence from Mississippi State University

Below is the calculation of an IMPLAN model featured in a study that was conducted by Mississippi State University for the Mississippi State Department of Health.[88] Its purpose is to assign a value for the possible improvements in diabetes (and obesity by extension) and their potential effect on the economy.[89] We republish Table 9 from this paper as a reminder that any additional growth that results from decreasing the diabetes rate would be *in addition to* the economic impacts calculated in the ALME model.

*Table 9 – Estimates of the Economic Consequences of Diabetes on Mississippi Residents if Out-of-Pocket Direct Medical Costs and Indirect Effects Were Allocated to Normal Spending Patterns*

| Effect Category | Induced Consequences (Direct Effects) | Induced Consequences (Indirect Effects) | Total Induced Consequences (Direct + Indirect) |
|---|---|---|---|
| Supported Employment (Jobs) | 1,545 | 3,426 | 4,971 |
| Labor Income | $56,760,737 | $125,605,421 | $182,366,158 |
| Value Added | $102,199,416 | $226,429,346 | $328,628,762 |
| Output | $184,805,385 | $409,286,002 | $594,091,387 |
| State/Local Tax Impacts | $12,166,204 | $26,909,586 | $39,075,790 |
| Federal Tax Impacts | $13,047,888 | $28,890,937 | $41,938,825 |

*Source: IMPLAN 2013 model*

Alan Barefield's commentary:

> *"…there are many other costs which may or may not be quantifiable when considering the implications of diabetes. It would be extremely difficult to measure the impact of the loss of a dynamic political or social leader who would have taken Mississippi to the 'next level' but for a diabetes-induced disability or premature mortality. The same could be applicable to the business, scientific and arts communities as well. And who knows what inspiration a young person might have gleaned in a classroom ifs/he had not suffered from pain or discomfort related to this disease. Furthermore, it is almost certain that family and other social interactions are strained as one or more members suffer the mental anguish of pain, loss of earnings and perhaps even impending death."*[90]

[88] IMPLAN is an economic impact assessment software system that allows the user to develop local-level input-output models that can estimate the economic impact of new firms moving into an area as well as the impacts of professional sports teams, recreation and tourism, and residential development. The model accomplishes this by identifying direct impacts by sector, then developing a set of indirect and induced impacts by sector through the use of industry-specific multipliers, local purchase coefficients, income-to-output ratios, and other factors and relationships. Source: Towson University. http://cier.umd.edu/RGGI/documents/IMPLAN.pdf

[89] Alan Barefield, "Estimation of the Economic Burden of Diabetes on the State of Mississippi in 2013," Mississippi Department of Health, September 2015. https://msdh.ms.gov/msdhsite/_static/resources/7317.pdf

[90] *Ibid.*

## Benchmark Area Research

The positive effects that yield from life science clusters are highly prevalent across the nation. Geographic aggregation of health science professionals and stakeholders is a magnet for innovation, research advancement, and economic growth in the areas which they reside. That being said, we would not be doing our due diligence if we did not fully explore the viability of research clusters.

### Lake Nona

A city in Florida has become a trailblazer for life science and healthcare industry clustering, showcasing the positive impact that results from harnessing synergistic benefits generated in cluster areas. As a flagship example of success, the medical research city in the planned community of Lake Nona is the closest thing to a model of what Tradition hopes to achieve. Lake Nona is a 17-square-mile, master-planned, mixed-use community in the Orlando area. Within this community there is the impressive Lake Nona Medical City that includes the following:

- Guidewell Innovation Center
- Nemours Children's Hospital
- Sanford Burnham Prebys Medical Discovery Institute
- UCT Health Sciences Campus
- UF Research & Academic Center
- VA Medical Center

Outside of the official Lake Nona Medical City, there are a host of innovations related to health and sciences that serve to further advance the region's impact in the industry as a whole, as well as cultivate networks of specialized knowledge in the immediate area. Lake Nona Gateway, Lake Nona Institute, and the Johnson & Johnson Human Performance Institute are just a few of the places further multiplying advances on all fronts. Each of these serves Orlando in a unique way to foster additional collaboration across medical and non-medical professionals, all with ranging specialties and interests.

### Research Triangle Park

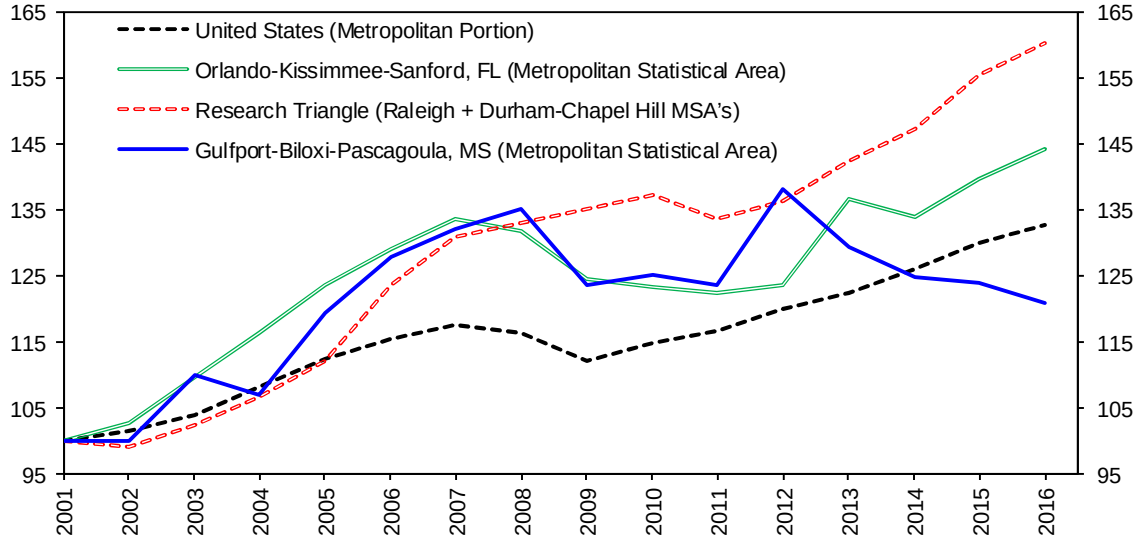
Lake Nona is not the only cluster of its type, and it is rather young compared to, for instance, the Research Triangle Park in North Carolina which was started in 1959. During that time, North Carolina was experiencing some of the same difficulties that Mississippi is experiencing today: lacking in industry-of-the-future, declining employment and market share, and college graduates leaving the state.[91] Duke University, University of North Carolina-Chapel Hill, and North Carolina State University created the park so that they could conduct collaborative research resulting in synergies from each's strengths.

Today, Research Triangle Park today is known as "one of the most prominent high-tech research and development parks in the United States."[92] Since 2001, the private sector in the combined MSA's of Durham-Chapel, NC Hill and Raleigh, NC has grown at a compound annual growth rate of 3.2% in real terms—1.3 percentage points higher than that of all metropolitan areas in the United States.[93]

In Figure 23, we've plotted the cumulative growth of real metropolitan area private GDP indexed to 100 in 2001 for comparison purposes. Raleigh and Durham-Chapel Hill, with its well established research cluster has grown at a dominant pace compared to the US. When we look at the period around the Great Recession, we see that the economy in the Research Triangle did not experience nearly the same decline in economic activity as the other metro areas in the chart. We also see that Orlando-Kissimmee-Sanford, whose research cluster at Lake Nona has been established for a little over 10 years now, is also growing faster than the US. In Figure 24, we show a close-up, year-over-year comparison of private GDP growth over the last four years.

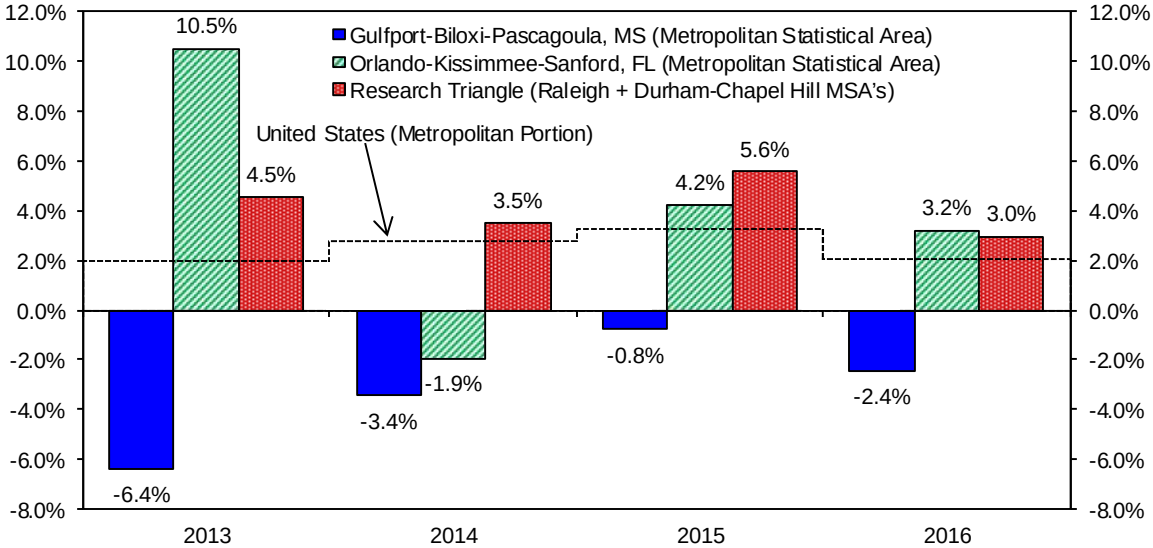
[91] "Research Triangle Park," Wikipedia. https://en.wikipedia.org/wiki/Research_Triangle_Park
[92] *Ibid.*
[93] Bureau of Economic Analysis

Figure 23
**Metropolitan Area Real Cumulative Private GDP Growth**
(annual, indexed to 100 in 2001)




Source: Bureau of Economic Analysis, Laffer Associates Calculations

Figure 24
**Metropolitan Area Real Private GDP Growth**
(Annual, year-over-year, 2013-2016)




Source: Bureau of Economic Analysis, Laffer Associates Calculations

## Cluster Potential at Tradition (Scenario 3)

Table 11
**Scenario 3: Economic Impact of a College of Medicine with a Clustering Effect**
(cumulative by end of year 10)

| | Additional Cumulative Economic Impact | Additional Cumulative Wages | Additional Full Time and Part-Time Employment |
|---|---|---|---|
| **Scenario 3: COM with Research Cluster Effect** | +$2.0 billion | +$1.2 billion | 9,403 |

Source: Laffer Associates

Tradition has the capacity and vision to further grow its health and science cluster to a similar magnitude to that of the Lake Nona Medical City. This can be achieved through leveraging the diabetes and obesity focus and availability of patients to attract specialized professionals to the area, further turning the Medical City into a premier destination for those with diabetes, obesity, and other correlated health problems.

While innovative clusters are generally positive for economic growth, they require more than economic investment to be successful. In a 2017 research paper that analyzed 381 companies in Poland, it was "firmly" concluded that, statistically speaking, "the mere creation of a cluster does not release its innovative potential."[94] The paper goes on:

> *"… there is no doubt that clusters are seen as carriers of innovation and competitive position improvement, not only in regard to companies, but also for entire regions. It is assumed, however, that social capital is a necessary condition for releasing innovation potential in a cluster. Sharing information, knowledge and ideas requires trust, and without this element, the cluster becomes dysfunctional, neither meeting expectations nor comply its tasks."*[95]

Lake Nona, with its shared research spaces and heavy use of collaboration, is proof positive that social capital is vital to unlocking the innovation potential of a cluster, and the economic growth that comes with it.

Two obvious areas to stem from the knowledge concentration would be a focus on the biopharma and medical device industries. With the intensive medical device and insulin needs of diabetes patients, combined with the WCU School of Pharmacy currently under construction at Tradition, these two industries would be a great fit to build on the synergies that will develop from the currently planned facilities centered on NDORI. The potential for innovation and overall impact that could result from the specialization of the area is extremely high. Primarily, eyeing the huge potential for advancement in reducing the daily medical burden and level of attentiveness currently required by diabetics.

The potential for spin-off industries is high because of the many ways to approach the fight against diabetes. Not only will the Medical City possibly attract pharmaceutical and medical device companies, but there are possibilities for new diabetes-focused culinary programs or lifestyle products that help patients cope with the disease to come to the area as well.

In the beginning stages of Lake Nona, the city attracted specialists in optics and photonics. More recently, they have been additionally focused on technology and sport performance. In addition to their current roster related to sports and performance—U.S. Tennis Association Campus, Orlando City Soccer Training Facility, Johnson & Johnson Human Performance Institute—further expansion developments are still rolling in. Most recently, the Johnson & Johnson Human Performance Institute announced that it would build an $18 million global headquarters to further anchor its presence in the area.[96]

The Cleveland Clinic branding is also pivotal to the further development of a health and sciences cluster at Tradition. Having a trusted name will certainly entice stakeholders to invest at Tradition. Not only does the Cleveland Clinic affiliation brand bring huge credibility, but it is also consistently highly ranked by *U.S. News and World Report* as a top hospital for diabetes and endocrinology, where it was most recently awarded the number three spot. This strong foundation of recognition,

[94] Anna Wasiluk, "Pro-innovative Prerequisites for Establishing the Cooperation between Companies (in the Perspective of Creation of Development of Clusters)," Procedia Engineering 181, pp.755-762, 2017. https://www.sciencedirect.com/science/article/pii/S1877705817313322
[95] *Ibid.*
[96] Naseem S. Miller, "J&J Human Performance Institute to get new home in Lake Nona Medical City," *Orlando Sentinel,* February 28, 2018. http://www.orlandosentinel.com/health/os-johnson-johnson-hpi-lake-nona-medical-city-20180228-story.html

experience, and research brought by the Cleveland Clinic sets Tradition on a positive trajectory to compound on existing synergies right from the start.

# Conclusions and Recommendations

## Health Recommendations for the State

Mississippi is supported by a community of organizations with interacting roles focused on preventing, treating, and researching diabetes and obesity. NDORI has an opportunity to provide leadership to strengthen this ecosystem of organizations. The concept of an ecosystem is important to understand in order for NDORI to identify and strengthen potential collaborations and sources of support for their research (see Appendices A, B, and C). The following recommendations will establish mechanisms for tracking and measuring NDORI's progress in lowering rates of diabetes and obesity in Mississippi. The goal in mind for these recommendations is to produce healthier Mississippians who are able to participate in the labor force.

### *Diabetes Recommendations*

NDORI should promote managed care plans as well as the previously mentioned cost-saving methods of treatment for diabetics in order to lower rates of disability due to the disease and ensure that diabetic patients are capable of participating and being productive in the workforce.

### *Obesity Recommendations*

BMI progression model similar to the model discussed previously in this report should be implemented for children and adolescents and serve as a forecast method for NDORI. Lowering the obesity rate even one percent has effects not only on cost savings, but also on the number of people who are able to contribute to the labor force and, ultimately, output and production.

## Conclusion

Mississippi's economy is not meeting its potential, (See Figure 1) and the Gulf Coast economy is still suffering from the shock of the BP oil spill. The community at Tradition packs a punch full of high-wage sustainable jobs that will address the economic growth problem in Mississippi as a whole and the Mississippi Gulf Coast specifically. Our forecasts conclude that new development at Tradition could add between $1.3 and $2 billion dollars in cumulative economic activity over the next decade.

Mississippi has advantages that could be better utilized, such as healthcare economic incentives and low cost of construction and energy. The healthcare economic incentives can be viewed in Appendix E. When analyzed based upon certain site selection factors, Tradition has most of the desired qualities for locating a business despite the current economic climate. According to the ALEC-Laffer Index, the state and Tradition have untapped potential for growth.

The physical health of the state is poor, and the burden of diabetes and obesity has been undercutting prospects for growth. With the cost of diabetes alone equaling a $3+ billion burden annually, fighting the disease must be a primary concern for legislators.

We conclude that an investment in further developing Tradition as a healthcare hub is an investment towards solving some of Mississippi's most pressing economic issues: low productivity (low wages), weak employment growth, and rampant diabetes and obesity.

# Appendices

## Appendix A: Active Transport Recommendation

Tradition's planned development project is centrally focused on promoting a healthier Mississippi. To achieve this goal, infrastructure planners could adopt a policy like Complete Streets to make roads more accessible for pedestrians and cyclists. A Complete Streets policy is a formal commitment to planning, designing, and maintaining streets that are safe for active transport users of all ages and abilities, and benefits include improved safety, health, economic, and environmental effects.[97] The Center for Disease Control (CDC) advocates for increased walking or bicycling infrastructure as an alternative to driving. Many communities are not properly designed to safely allow active transport. Scarcity of sidewalks and crosswalks, heavy traffic, and long distances between destinations all contribute to an environment of less physical activity (CDC, 2017).[98]

It is recommended that NDORI should become an advocate for policies like Complete Streets by developing a metric that is reported publicly on the percentage of communities that have adopted the policy. Complete Streets is a transportation planning policy that requires streets to be designed with pedestrians' and cyclists' safety and accessibility in mind.

Bike Walk Mississippi, a nonprofit organization that promotes Complete Streets policies in Mississippi, advocates for better and safer bicycle and pedestrian accessibility in the state through Complete Streets projects. As a result of Bike Walk Mississippi efforts, eleven Complete Streets policies, ordinances, or resolutions have been passed in cities across the state since 2010, indicating a slow but growing commitment to healthier alternatives in transportation in the state.[99]

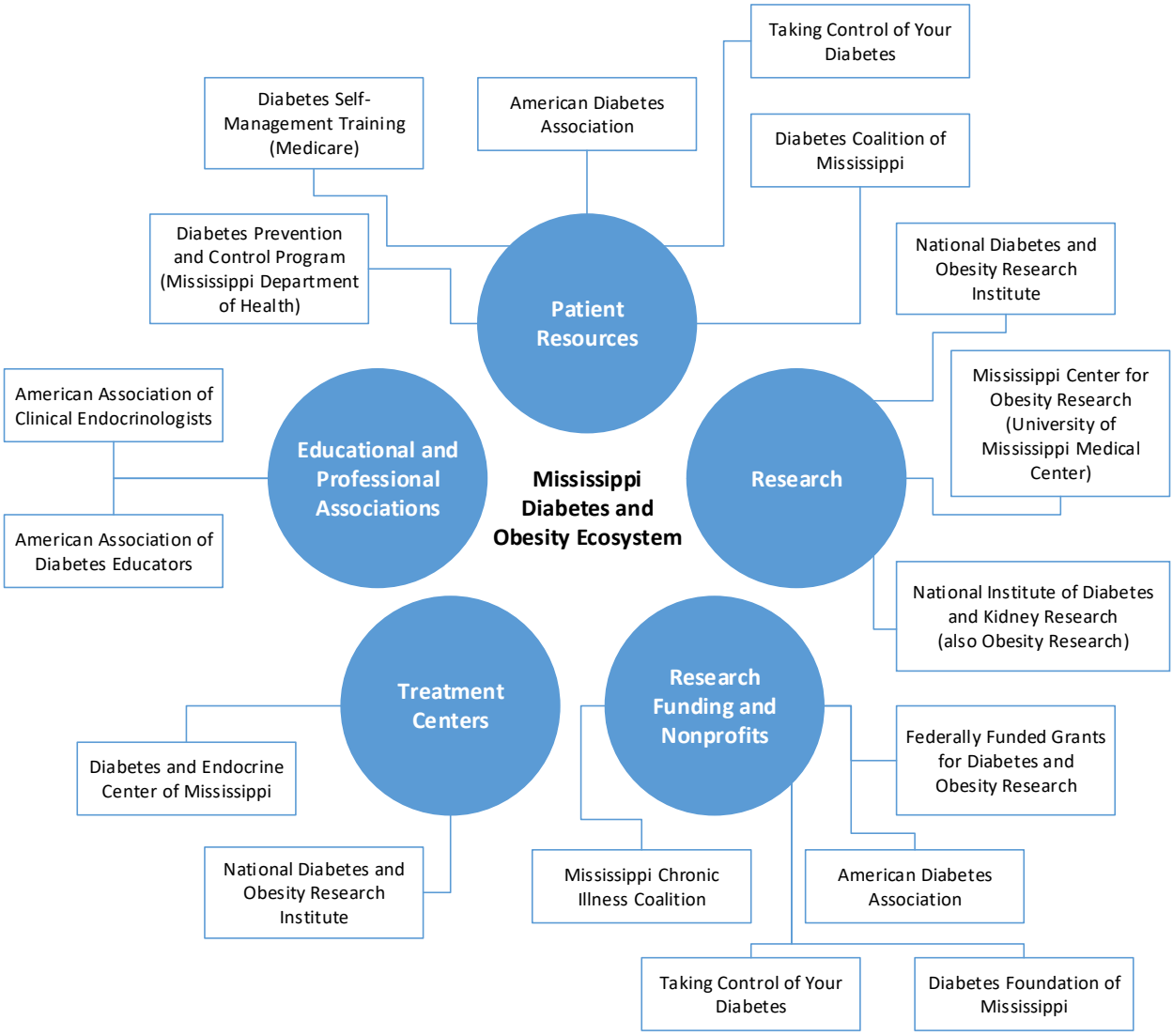
- Tupelo: Passed in 2010
- Pascagoula: Passed in 2010
- Columbus: Passed in 2010
- Hernando: Passed in 2010
- Hattiesburg: Passed in 2011
- Oxford: Passed in 2011
- Senatobia: Passed in 2012
- Greenwood: Passed in 2012
- Byhalia Passed in 2013
- Jackson Passed in 2015
- Gulf Coast Metropolitan Planning Board: Passed in 2015

Another example of promoting healthier living would be the adoption of Walk Score, a website that measures the walkability of cities and neighborhoods on a scale of 0 to 100. Walk Score uses distance and walking routes to amenities, population density, and other road metrics as criteria to determine how pedestrian-friendly a community is. According to the site, Mississippi's top 24 largest cities have an average Walk Score of 24 out of a possible 100. The top three most walkable cities are Hattiesburg, Columbus, and Greenville, with scores of 36, 36, and 34, respectively. Walk Score also scores cities on their bicycle-friendliness and quality of their public transit, but none of Mississippi's cities currently have a score.[100]

For Mississippi to improve public health conditions through promoting active transport, more cities and neighborhoods must become accommodating to pedestrians and cyclists. This begins by making streets safer and more convenient to encourage walking and biking, which would require an investment in infrastructure to ensure that there are adequate sidewalks, crosswalks, and signage for pedestrians. Additionally, cities and planned communities would need to incorporate these elements into future plans for development in order to continue promoting active transport. If these elements are built into a city's infrastructure, people are more likely to opt to walk rather than drive.[101]

[97] Complete Streets. (2017). What are Complete Streets? https://smartgrowthamerica.org/program/national-complete-streets-coalition/what-are-complete-streets/
[98] Centers for Disease Control. (2017). Strategies for health-oriented transportation projects and policies to promote active transportation. https://www.cdc.gov/healthyplaces/transportation/promote_strategy.htm
[99] Bike Walk Mississippi. (2017). Statewide projects. https://www.bikewalkmississippi.org/complete-streets.
[100] Walk Score. (2017). Walk Score methodology. https://www.walkscore.com/methodology.shtml.
[101] Saelens, B., & Handy, S. (2008). Built environment correlates with walking: A review. Medicine & Science in Sports & Exercise, 40(7), 550-566.

## Appendix B: Mississippi's Diabetes and Obesity Ecosystem



## Appendix C: Details on Members of Mississippi's Diabetes and Obesity Ecosystem

Key: Research; Research Funding/Nonprofit; Patient Resources; Treatment Center; Professional Association

American Diabetes Association: Research Funding/Nonprofit patient resources

- diabetes.org
- Arlington, Virginia
- "The mission of the ADA is to prevent and cure diabetes and to improve the lives of all people affected by diabetes."
- Funds research, publishes scientific findings, provides information and other services to people with diabetes, their families, health professionals and the public.
- Advocates for scientific research and for the rights of people with diabetes.
- Sponsors programs and activities that are directed toward consumers, research scientists, healthcare professionals, corporations, and communities.
- Publishes *Diabetes Care*, *Diabetes, Diabetes Spectrum, Clinical Diabetes, BMJ Open Diabetes Research and Care,* and *Diabetes Forecast* research journals

American Association of Clinical Endocrinologists: Professional Association

- Aace.com
- Jacksonville, Florida
- Professional community of physicians specializing in endocrinology, diabetes, and metabolism committed to enhancing the ability of its members to provide the highest quality of patient care.
- World's largest organization representing clinical endocrinologists. More than 6,500 members in the United States and 91 other countries around the globe
- Advocacy: got obesity recognized as a disease by the American Medical Association
- Medical policymaking: working with Congress on National Diabetes Clinical Care Commission Act – creating commission for diabetes experts to advise government on addressing diabetes epidemic
- Educational programs and activities and focus on providing patients with quality and cost-effective care for their endocrine diseases and disorders

American Association of Diabetes Educators Professional Association

- https://www.diabeteseducator.org/
- Resource for accredited diabetes educators as well as patients who are seeking a certified educator
- Webinars and online courses
- Board Certified-Advanced Diabetes Management (BC-ADM) certification for healthcare professionals
- Advocacy for diabetes in federal and state legislation

Diabetes and Endocrine Center of Mississippi: Research Treatment Center

- Decm.ms
- Jackson, Mississippi
- Full service clinic, research center, and complete laboratory for diabetes, thyroid, and other endocrine disorders
- 7 doctors, 2 nurse practitioners

Diabetes Coalition of Mississippi: Patient Resource Nonprofit

- Diabetescoalition-ms.org
- Mission: To serve as a unified voice to reduce the impact of diabetes through improved policy, prevention, and management of diabetes and its complications for all Mississippians.
- Regional chapters: Northern, central, eastern, southern
- Diabetes prevention and management
    - Matches patients with accredited Diabetes Self-Management Training (DMST) programs covered by Medicare Part B
- Early detection and prevention
- Management of diabetes

Diabetes Foundation of Mississippi: Research Funding/Nonprofit Patient Resource

- Msdiabetes.org

- "The state's premier nonprofit health organization working to prevent diabetes and associated complications, as well as work to improve the lives of every child, every adult, and every family touched by type 1 or type 2 diabetes. We accomplish this through education, support, advocacy, medical assistance and research."
- For 50 years has worked to help individuals and families throughout the state to cope with, adjust to and manage diabetes, in a large percentage of cases, donates and pays for diabetic supplies for those unable to do so themselves.
- Prevention-oriented: children's programs, public awareness, education, school resources, and events
- Funds research at the University of Mississippi Medical Center
- 501(c)3 charity
- Charity Navigator 4-star charity; Great Nonprofits 2016 top-rated nonprofit

Mississippi Center for Obesity Research: Research
- Located at the University of Mississippi Medical Center
- Mission:
    - "Assemble a strong, multidisciplinary team of basic, clinical and population scientists in obesity, diabetes and related biomedical research.
    - Translate results from basic research into programs that prevent and treat obesity-related diseases.
    - Educate and train the next generation of researchers and clinicians.
    - Equip health-care professionals, teachers, community leaders and the general public with the knowledge to help prevent obesity.
    - Stimulate economic growth by cutting costs of treating obesity and related diseases and creating a healthier work force for today and tomorrow."
- Seminars and lectures

Mississippi Chronic Illness Coalition: Patient Resource Nonprofit
- Through MSDH
- Focus on reducing risk of diabetes, cardiovascular disease, cancer, arthritis, etc.
- Mission: "The Mississippi Chronic Illness Coalition was formed in 1996 to improve the long-term health of all Mississippians and help reduce the impact of chronic health conditions affecting the state."

Mississippi Department of Health Diabetes Prevention and Control Program: Patient Resource
- http://msdh.ms.gov/msdhsite/_static/43,0,296,469.html
- "Federally funded state-based program established for the purpose of reducing the incidence and prevalence of type 2 diabetes in Mississippi and increasing the quality of life for all persons."
- Action plan
- Prevention
- MSDH diabetes program
- Self-management program
- Tuberculosis & diabetes

National Institute of Diabetes and Digestive and Kidney Diseases: Research
- niddk.nih.gov
- US Dept. of Health and Human Services/National Institute of Health
- Mission: "conduct and support medical research and research training and to disseminate science-based information on diabetes and other endocrine and metabolic diseases; digestive diseases, nutritional disorders, and obesity; and kidney, urologic, and hematologic diseases, to improve people's health and quality of life."
- Government funded

Taking Control of Your Diabetes: Patient Resource Nonprofit
- https://tcoyd.org/
- Education and programs for patients and healthcare professionals
- Conference and health fair
- Sponsored by pharmaceutical companies like AstraZeneca, Lilly, Dexcom, Abbott Nutrition & Diabetes Care, Ascensia, MannKind Corporation, Sanofi, Puracym, Animas, Intarcia, Novo Nordisk, Merck, etc.

## Appendix D: National Diabetes and Obesity Research Institute (NDORI) Partnerships and Collaborations

Mississippi Department of Health
- Potential data sharing with NDORI
- Diabetes Prevention and Control Program
  - "federally funded state-based program established for the purpose of reducing the incidence and prevalence of type 2 diabetes in Mississippi and increasing the quality of life for all persons."

William Carey University
- Tradition location open since 2009
- Pharmacy School capacity
  - 192 students
  - 34 new full-time equivalent jobs
- Medical School capacity
  - 400 students
  - Second location to Hattiesburg
  - 45 new full-time equivalent jobs

Mississippi Gulf Coast Community College – School of Nursing and Simulation Lab
- Committed to more than doubling current number of nursing students to 800
- Plans to add 27 new full time equivalent jobs
- 10th location for MGCCC

Memorial Hospital
- Potential data sharing with NDORI
- Memorial Clinic planned opening in Tradition
- Potential for 20 new jobs
- Potential patient pool of 400,000
- Hospital in Gulfport

Coastal Family Health Center
- Federally Qualified Community Health Center
- National Committee for Quality Assurance Patient-Centered Medical Home Recognized Practice
- Veteran's Administration Choice Provider
- Potential data sharing with NDORI
- 14th location in Tradition
- Potential patient pool of 30,000

3D Dyslexia School
- Dynamic Dyslexia Design School for students grades 2-6 with dyslexia
- Petal campus opened in 2008 and took 128 students in 2017
- Ocean Springs campus opened in 2017 and can take 30-40 students
  - Will move to a permanent location in Tradition near William Carey University where a master's degree in dyslexia therapy is offered (will take 250 students)
- Accredited by Mississippi Department of Education as a nonpublic special purpose school
- All dyslexia therapists trained at William Carey University or Mississippi College, both accredited by the International Dyslexia Association

South Mississippi Planning and Development District
- Grant and infrastructure funding source for development
- Serves Harrison County area

Tradition Properties Development Group

- Developer of the National Diabetes and Obesity Research Institute, The Villages at Tradition, DeSoto Trails, and Tradition Townhomes
- Office located in the Villages at Tradition neighborhood

Keesler Air Force Base Medical Center

- Potential data sharing with NDORI
- Potential patient pool of 25,000
- Located on Keesler Air Force Base in Biloxi, Mississippi

Gulf Coast Veteran's Administration

- Potential data sharing with NDORI
- Potential patient pool of 55,000
- Located in Biloxi, Mississippi

Diabetes Coalition of Mississippi

- Diabetescoalition-ms.org
- Mission: To serve as a unified voice to reduce the impact of diabetes through improved policy, prevention, and management of diabetes and its complications for all Mississippians.
- Regional chapters: Northern, central, eastern, southern
- Diabetes prevention and management
- Matches patients with accredited Diabetes Self-Management Training (DMST) programs covered by Medicare Part B
- Early detection and prevention
- Management of diabetes

## Appendix E: Potential State and Local Incentive Programs[102]

- **Mississippi Healthcare Industry Zone Act of 2012** (the "HCZ Act") can be found at Miss. Code Ann. § 57-117-7. The HCZ Act has been helpful in attracting healthcare investment throughout the State, but has yet to prove helpful in attracting investment at Tradition. It provides for the following incentives:

    - **Accelerated 10-year state income tax depreciation deduction**. See Miss. Code Ann. § 17-29-7 which provides that the accelerated depreciation deduction shall be computed by accelerating depreciation period required by Title 35, Part III, Subpart 5, Chapter 4, Mississippi Administrative Code, to a five-year depreciation period. Chapter 4 on depreciation cites Miss. Code Ann. § 27-7-17(1) (f). The rules states that a reasonable allowance for the exhaustion, wear and tear and obsolescence of property of income shall be allowed as a depreciation deduction. The allowance is that amount which should be set aside for the taxable year in accordance with a consistent plan, so that the aggregate of the amounts set aside will equal the cost or other basis of the property. The allowance shall not reflect amounts representing a mere reduction in market value. Mississippi will follow Federal depreciation guidelines as are not deemed contrary to the context and intent of Mississippi Law.

    - **Sales Tax Exemption** for Equipment and Materials purchased from the date of the project's certification until three months after the facility is completed. See Miss. Code Ann. § 27-65-101(pp) (Industrial).

    - "**Fee in Lieu**" of Property Taxes. Miss. Code Ann. § 27-31-104.

    - **Ad Valorem Tax Exemption** (not state ad valorem taxation, school district) for 10 years for any certified project with an investment of more than $10,000,000 or 25 jobs at the city or county's discretion. Miss. Code Ann. § 27-31-101(j).

- **Mississippi Healthcare Industry Zone Master Plan Act.** For the past couple of years, there has been legislation proposed that would help projects specifically like Tradition that are master planned developments. If enacted, the **Mississippi Healthcare Industry Zone Master Plan Act** (the "Master Plan Act") would focus on certified master plan communities that use healthcare as its main catalyst. Such developments would be eligible for the following incentives if this legislation became law:

    - Healthcare Zone Grant Fund (grant proceeds could be used for soft costs for public, private, for-profit and **non-profit entities** to initiate new ventures and institutions etc.);

    - Healthcare Zone Revolving Loan Fund (loan proceeds could be used for soft costs for public, private, for-profit and **non-profit entities** to initiate new ventures and institutions etc.); and

    - Healthcare Zone Master Plan Job Training Grant Fund (funds could be used to incentivize training in any healthcare or related field at community colleges and other institutions or higher learning in Mississippi); and

    - Healthcare Zone Master Plan Advantage Jobs (a rebate of a percentage of the new healthcare facility's Mississippi payroll could be paid to that business as a result of locating in one of the certified healthcare zone master plan communities for a period of up to 10 years); and

    - Potential $5,000,000.00 State New Market Tax Credit Allocation for certified healthcare zone master plan communities.

    - Debt Section so that Municipalities can issue bonds for projects and lease the projects back to the company.

- **Amend State Medicaid Plan**. Request is for the Division of Medicaid to amend the

[102] Special thanks the Tray Hairston for providing the information for this appendix.

State Medicaid Plan to include Bariatric Surgery as a coverable procedure and use Medical Necessity Guidelines.

## Appendix F: Endocrinologists in the United States

*Shortage of endocrinologists*. It is imperative for NDORI to adopt a plan to increase the presence of endocrinologists in Mississippi. Increases in population and life expectancy of Americans may result in shortages of endocrinologists by 2020.[103] Clinical endocrinology is anticipated to be in greater demand by 2020 because of the larger proportion of the population with aging issues, obesity, and diabetes, and it has been suggested that this demand will exceed the capacity of the endocrinology workforce. The latest report from the 2012 Endocrinologist Survey showed that the average clinic waiting time was 37 days, and patients in some regions even experienced 3–6 month delays.[104] Mississippi ranks 44th of 51 geographic regions (50 states plus District of Columbia) in having at least one endocrinologist located within a 50-mile radius. The ranking is the same for endocrinology specialists in both adult and pediatric practice (see Figure 25a and 25b).

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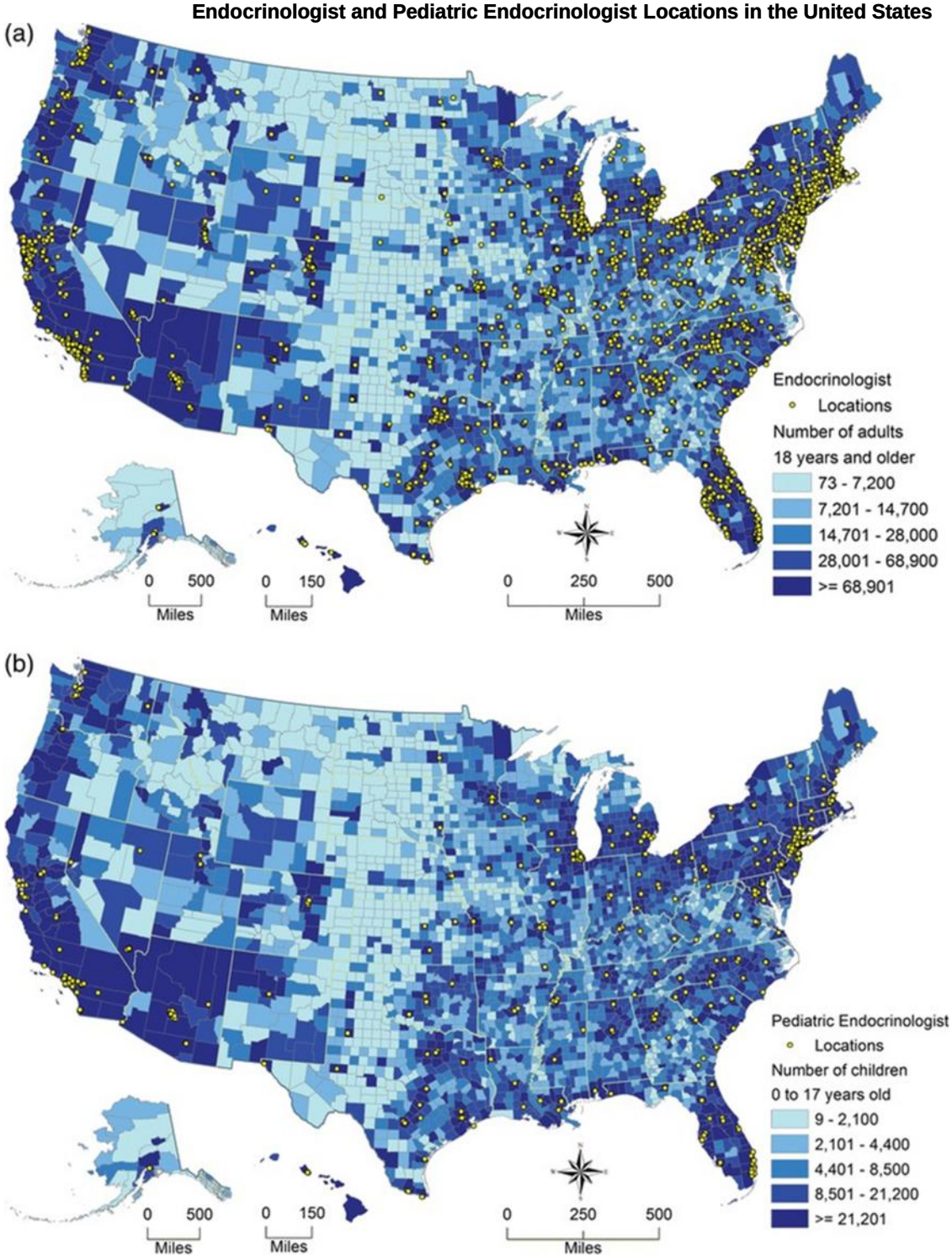
Figure 25

**Endocrinologist and Pediatric Endocrinologist Locations in the United States**




Source:

The Endocrine Society commissioned the Lewin Group to undertake a *2014 Endocrine Clinical Workforce: Supply and Demand Projections* that concluded the demand for endocrinologists is exceeding the supply due to a number of factors. As of 2011, there were 5,496 board certified adult endocrinologists and 1,016 pediatric endocrinologists of which 4,841 and 893 were engaged in clinical practice, respectively. The gap between demand for services and supply of endocrinologists is likely to persist through 2025 largely due to an aging patient population.[105]

[105] The Endocrine Society. (2014, June). 2014 Endocrine clinical workforce: Supply and demand projections. Washington D.C.

## Appendix G: From "The Socioeconomic Problem of Diabetes and Obesity" Section - Full Reference List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