

# The Economic and Fiscal Impacts of Oregon Health & Science University, 2019



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# EXECUTIVE SUMMARY

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## INTRODUCTION

Oregon Health & Science University (“OHSU”) is a nationally and internationally recognized leader in patient care, medical education, research and outreach. As a public institution and the only public academic health center in Oregon, OHSU’s mission is to improve the health and well-being of all Oregonians. OHSU provides a wide variety of unique services that benefit individuals, communities, businesses, local and state governments, and the entire state in myriad ways.

The largest proportion of OHSU’s activities involve patient care, including OHSU Hospital, Doernbecher Children’s Hospital, more than 80 primary and specialty care clinics, and clinical outreach programs throughout the state. OHSU offers specialized health care services that in some cases are either not readily available, or are not available at all at other hospitals and clinics in the state. In 2019, with more than 1.1 million patient visits (inpatient and outpatient visits), OHSU accounted for 9 percent of all outpatient visits and 11 percent of all surgeries by hospitals in Oregon. In 2019, OHSU ranked first across all hospitals in Oregon in number of available beds (562), total discharges (29,481), and total surgeries (37,484), and second in occupancy (85 percent).

OHSU also trains thousands of health care professionals each year in Portland and in satellite programs that serve rural areas throughout the state. OHSU offers about 60 types of degrees and certificates in its Schools of Medicine, Dentistry, Nursing, Public Health, and College of Pharmacy. In 2018-19, almost 3,000 students attended OHSU programs, which granted 1,500 degrees and certificates. Within Oregon, only OHSU offers a four-year baccalaureate degree in nursing outside the Portland metropolitan area at its satellite campuses in La Grande, Klamath Falls, Ashland, and Monmouth, thus helping to alleviate the nursing shortage in the state’s more rural areas.

OHSU makes important contributions to medical science by advancing diagnosis and treatment capabilities for some of the world’s most challenging diseases. In 2019, OHSU received \$486.3 million in sponsored research projects and awards, of which \$279.0 million was from the National Institutes of Health (“NIH”).

## OHSU’S ECONOMIC IMPACTS<sup>1</sup>

In pursuing its public mission, OHSU plays two roles in the Oregon economy. First, it is a major local sector provider of health care services to residents throughout the state, often for services not available in their own cities and towns. As such, OHSU benefits the state economy by employing and training a large number of workers, including a large number of middle-income workers; by conducting cutting-edge research and developing new technologies that generate business growth

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<sup>1</sup> This is the third economic impact report commissioned by OHSU. The first two reports were conducted for OHSU’s activities in 2007 and 2012. The purpose of this report is to allow OHSU to develop a deeper understanding of its place in the Oregon economy by quantifying its economic impacts in 2019 and how those impacts have changed over the thirteen-year period. Understanding its current impacts and historical trends will help OHSU leaders and state policymakers shape OHSU’s future in a way that will be most valuable to Oregonians.

and improved health; and by spending on capital projects that employ local workers and businesses.

Second, OHSU is also a traded-sector provider of medical services, education, and research to people outside the state and across the United States and the world. Patients choose to travel to Portland from their home states for sophisticated procedures and medical services. OHSU researchers also attract federal and private dollars to advance medical practices and scientific knowledge. In total, OHSU brings hundreds of millions of dollars in net new revenue into the state, including research grants, Medicare and Medicaid payments, donations, technology licensing fees, and other outside sources.

Hospitals and universities frequently use economic impact studies to demonstrate the contributions of their activities to their local and state economies.<sup>2</sup> Economists have developed several approaches to measure these impacts. The most common approach—called the *expenditure approach*—estimates the economic impacts associated with the institution’s spending, as well as that of its employees, suppliers, and students as it flows through the economy. The expenditure approach is typically implemented within an input-output modeling framework. Input-output models are mathematical representations of an economy and how different industries and institutions are linked.

OHSU’s impacts, as measured using the expenditure approach, can be explored by posing the following hypothetical question:

**How would economic activity in Oregon change if OHSU did not exist?**

Simply citing the economic impacts that occur as a result of some activity would produce an upper bound estimate of economic impacts. This upper bound estimate is often referred to as a measure of the contribution or gross economic impacts. Net economic impacts control for possible substitution effects by removing local services that could be provided by others and local funding that could be spent elsewhere. In so doing, net economic impacts offer a measure of economic activity that is new or additive to the economy.<sup>3</sup>

Table 1 summarizes the gross and net economic impacts associated with OHSU in 2019. These economic impacts are based on spending associated with OHSU’s three major activities: 1) day-to-day operations consisting of payroll and expenditures on goods and services; 2) capital

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<sup>2</sup> It is important to remember that the overall economic impact of OHSU goes far beyond the specific activities that will be measured in this report. The kind of health care research conducted at OHSU results in new treatments and cures that reduce suffering, prolong lives, limit days lost to illness and prevent the loss of intellectual or other skills due to disease or death. Evidence-based research, such as that provided by OHSU, helps providers and policymakers more effectively improve health over broad communities or patient groups. This report does not measure any economic impacts associated with gains in productivity, efficiency, or reductions in long run health costs due to preventative care due to innovations created through research at OHSU.

<sup>3</sup> Within this framework, the net analysis starts with the gross impacts, but excludes the impacts that would still occur in the state in the absence of OHSU. In the case of patient care, for example, other local providers would have (or develop) the capacity to absorb some of the more routine care currently provided by OHSU. That economic activity would remain in the state and would therefore not be included in the net impact analysis. In contrast, services that are unique to the state, such as brain neurosurgery and public medical education, would be redistributed elsewhere outside of Oregon and, as a result, are included in the net economic impacts.

expenditures on new construction, building expansions and retrofits, and health care and other equipment; and 3) student non-university spending on rents, groceries, child care, personal care, etc.<sup>4</sup> Under an expenditure approach, spending associated with these activities were fed into an input-output model of the Oregon economy developed using the IMPLAN economic impact modeling software.<sup>5</sup>

Table 1: Summary of OHSU's Economic Impacts, 2019

IMPACT CATEGORY / Impact Measure	Direct	Indirect	Induced	Total
<b>GROSS</b>				
Output	\$3,981,582,100	\$924,963,600	\$2,257,242,100	<b>\$7,163,787,800</b>
Income	\$1,992,564,700	\$458,167,700	\$1,023,509,200	<b>\$3,474,241,600</b>
Jobs	20,820	6,939	14,880	<b>42,639</b>
<b>NET</b>				
Output	\$2,084,045,300	\$517,695,900	\$1,189,491,800	<b>\$3,791,233,000</b>
Income	\$1,040,014,700	\$253,040,100	\$537,092,300	<b>\$1,830,147,100</b>
Jobs	11,014	3,852	7,841	<b>22,707</b>

Sources: Pinnacle Economics using detailed OHSU data and 2018 IMPLAN model of Oregon.

**In 2019, the total gross economic impacts attributed to all of OHSU's activities amount to \$7.2 billion in economic activity or output, including \$3.5 billion in income and 42,639 jobs in Oregon.** These gross impacts consist of:

- **Direct** impacts attributed to spending by OHSU on day-to-day operations as well as non-university spending by OHSU students that, on a gross basis, **directly generated \$4.0 billion in economic activity, including \$2.0 billion in income and 20,820 jobs in 2019.** Most of these direct gross impacts are captured by Oregon's health care sector.
- **Indirect** impacts that are largely driven by OHSU's supply-chain spending and capital spending.<sup>6</sup> Indirect impacts will also include subsequent supply-chain purchases as vendors and suppliers to OHSU need to support their own operations. In 2019, on a gross basis, **OHSU indirectly generated \$925.0 million in output, \$458.2 million in income, and 6,939 jobs in Oregon.** Benefiting industries include construction and repair services, professional services, wholesale and retail trade, and manufacturing.
- The direct and indirect activity linked to OHSU will increase incomes and enhance household purchasing power and, as a result, will **induce** additional economic activity in Oregon. These purchases are particularly potent at spreading the economic impacts to other sectors of the economy. **In 2019, the induced gross impacts attributed to OHSU amount to \$2.3 billion in output, \$1.0 billion in income and 14,880 jobs.** The major beneficiaries of this consumption-driven spending are service sectors (eating and drinking establishments, health care and social assistance, finance and insurance, and other services) and retail trade.

<sup>4</sup> In addition to the three main expenditure categories related directly to OHSU's activities, many start-up companies are directly linked to the research activities that are funded or that receive laboratory space or other support at OHSU. The economic impacts of start-up companies with Oregon operations are included in this analysis but reported separately.

<sup>5</sup> IMPLAN Group, LLC. IMPLAN Oregon data, 2018. Huntersville, NC. IMPLAN.com.

<sup>6</sup> Capital spending is considered an indirect expenditure because it is ancillary to the health care, research and educational services provided by OHSU.



Net impacts measure the economic impacts attributed to spending and funding that OHSU brings to Oregon that “but for” the institution would accrue elsewhere outside the state. As an analogy, gross impacts measure OHSU’s economic shadow while net impacts measure OHSU’s economic footprint.<sup>7</sup> Even after considering possible substitution effects and the reallocation of funding within the state, **OHSU’s total net economic impacts are significant and impressive, and amount to \$3.8 billion in economic activity, including \$1.8 billion in income and 22,707 jobs in 2019.** These net economic impacts represent OHSU’s economic footprint that would be lost to Oregon’s economy in the absence of the institution. Table 2 reports OHSU’s links to Oregon industries, on a net basis, in 2019.

- Of the total net direct, indirect, and induced employment attributed to OHSU, approximately 59 percent (13,420 jobs) accrue to women employees and 22 percent (5,080 jobs) benefit minority employees in Oregon.

Table 2: OHSU’s Total Net Economic Impacts by Major Industry Sector, 2019<sup>8</sup>

Major Industry Sector	Output	Income	Jobs
Natural resources	\$9,982,700	\$3,830,700	90
Utilities	\$36,137,000	\$8,612,700	42
Construction	\$79,305,200	\$32,120,400	437
Manufacturing	\$48,888,300	\$13,393,300	149
Wholesale trade	\$69,371,200	\$29,128,000	249
Retail trade	\$130,334,700	\$71,383,800	1,701
Transportation and warehousing	\$44,286,100	\$20,204,900	303
Information services	\$64,819,500	\$23,380,400	170
Finance and insurance	\$130,929,500	\$46,844,600	501
Real estate and rental and leasing	\$310,806,100	\$64,724,500	602
Professional and technical services	\$93,494,900	\$51,302,700	681
Management of companies	\$25,325,200	\$16,813,600	114
Administrative and waste services	\$52,173,900	\$28,795,600	603
Educational services	\$18,591,200	\$11,441,900	320
Health care and social assistance	\$2,431,573,100	\$1,272,469,200	13,951
Arts, entertainment, and recreation	\$22,690,100	\$11,100,800	341
Accommodations and food services	\$83,308,900	\$41,198,400	1,182
Other services	\$81,227,100	\$49,962,200	979
Government	\$57,988,900	\$33,439,100	293
<b>Total All Industries</b>	<b>\$3,791,233,000</b>	<b>\$1,830,147,100</b>	<b>22,707</b>

Sources: Pinnacle Economics using detailed OHSU data and 2018 IMPLAN model of Oregon.

**Spending attributed to OHSU has a “multiplier effect” that benefits workers and business owners in other sectors of the Oregon economy.** All of the impact measures described in Table 1 can be summarized across direct, indirect, and/or induced impact categories using mathematical formulae<sup>9</sup> to measure and explain what economists refer to as the “multiplier effect.” In essence, economic multipliers are coefficients that provide a shorthand way to better understand the linkages between an activity and other sectors of the economy. All else the same, larger

OHSU’s Net Economic Impact Multipliers
Output = 1.8
Income = 1.8
Jobs = 2.1

<sup>7</sup> This shadow vs. footprint analogy was first presented by researchers from Oregon State University’s Department of Economics.

<sup>8</sup> Totals in this table and other tables may not add up exactly due to rounding.

<sup>9</sup> A type II or type SAM multiplier is calculated by dividing total impacts by direct impacts, e.g., 20 total jobs divided by 10 direct jobs equals 2.0 multiplier.

economic multipliers suggest greater interdependence between an activity—in this case, OHSU—and the rest of the economy.

- **OHSU’s net output multiplier is 1.8.** Thus, every million dollars in spending attributed to OHSU generates another \$800,000 in economic activity (output) elsewhere in Oregon.
- **OHSU’s net income multiplier is 1.8.** As such, every million dollars in income directly generated by OHSU is linked to another \$800,000 in income for workers in other sectors of the state economy.
- **OHSU’s net employment multiplier is 2.1.** Thus, every ten direct jobs attributed to OHSU are linked, on average, to another 11 jobs elsewhere in Oregon.

Table 1 summarizes the economic impacts attributed to all of OHSU’s activities. The economic impacts for each of the three main activities are presented in detail in the main section of this report. Other key findings include:

- **With 20,335 employees statewide<sup>10</sup> and 17,556 employees in Portland, OHSU was the third largest employer in the Portland metropolitan area in 2019.** In 2019, OHSU employed 13,678 women (67.3 percent of gross direct employment) and 4,272 ethnic and racial minorities (24.4 percent of reported gross direct employment).<sup>11</sup>
- **The average annual income of OHSU employees in 2019 was \$97,255.** OHSU is a provider of family-wage jobs with 56.2 percent of OHSU’s employees making between \$50,000 and \$150,000 in income in 2019.
- Average annual wages and benefits at OHSU amounted to \$75,610 and \$21,645, respectively. According to data from the State of Oregon Employment Department, the average annual wage for all private sector employment in Oregon was \$54,000 in 2019. Thus, **OHSU’s average annual wage (not including benefits) exceeded the statewide average wage by 40 percent in 2019.**
- In 2019, OHSU purchased \$1.95 billion in goods and services necessary to support its’ day-to-day activities with **\$592.2 million in spending going to Oregon businesses.** This spending impacted almost 200 industries and generated 5,400 indirect or supply-chain jobs in almost every county in Oregon.<sup>12</sup>
- Spending associated with OHSU’s day-to-day operations (payroll and purchases of goods and services) benefit workers and business owners throughout Oregon. In 2019, **approximately \$85.0 million in OHSU spending impacted rural Oregon communities.**<sup>13</sup>

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<sup>10</sup> The number of direct jobs at OHSU will be different than the direct jobs reported in Table 1 because those jobs also include direct jobs associated with non-university, student spending.

<sup>11</sup> In 2019, OHSU’s employment data included 2,825 non-responses or unknowns regarding race, which represents 13.9 percent of all OHSU employment.

<sup>12</sup> These supply-chain impacts are based primarily on the first round of indirect impacts as OHSU buys from Oregon-based vendors, but also include additional supply-chain impacts as these vendors purchase the goods and services they need to operate from other Oregon businesses. These supply-chain impacts would not include the indirect impacts attributed to capital spending and student spending, thus, they represent a subset of the gross indirect impacts reported in Table 1.

<sup>13</sup> The geographic distribution of OHSU’s spending on day-to-day operations is based on payroll allocated by employees’ residences and supply-chain spending by vendor location. It does not include OHSU funding or intergovernmental transfers for the Oregon Health Authority. It also does not include spending by OHSU students.

- Between 2012 and 2019, OHSU invested over \$1.91 billion in new equipment and facilities in Oregon. In 2019, **OHSU’s capital spending totaled \$205.6 million, with \$88.2 million in spending on new construction and building retrofits that went directly to construction contractors and construction trades. This spending supported 510 jobs with over 1.04 million hours of work for the construction trades in Oregon.** Oregon’s construction sector was a main beneficiary from OHSU’s capital spending, but so, too, were professional services (architectural and engineering), wholesale and retail trade, and manufacturing.
- OHSU is a revenue generator for state and local governments. In 2019, on a net basis, the economic activity associated with all of OHSU’s activities is linked to **\$163.1 million in tax and fee revenues to state and local jurisdictions.** This includes:
  - \$56.1 million in personal income taxes, \$20.0 million in personal property taxes, and \$15.2 million in all other personal taxes and fees, and
  - \$32.8 million in corporate property taxes and \$39.0 million in all other corporate taxes and fees.
- From a long-term perspective, OHSU increases human capital development. When graduates stay and practice in Oregon, this investment in human capital benefits local communities. A medical education improves the graduate’s lifetime earnings power, and increases state and local tax revenues through higher contributions over time. Although important, this analysis does not include any impacts related to employment or income for the trained medical professionals once they begin to practice. Currently **there are about 21,700 OHSU alumni practicing in Oregon.**

OHSU has commissioned three economic impact studies covering 2007, 2012, and 2019. By almost every measure, growth at OHSU has been significant and has clearly accelerated over the last seven years. Changes in OHSU’s direct economic activity include:

- Since 2007, when the first economic impact report was prepared, gross direct **employment at OHSU increased 54 percent** compared to 15 percent for all private sector employment in Oregon.<sup>14</sup> **OHSU added 4,420 jobs in the last seven years (a 27.8 percent increase since 2012).**
- Similarly, between 2007 and 2019, gross direct **income (wages and benefits) at OHSU increased 122 percent**, compared to the 58 percent wage growth for all private sector employment in Oregon.<sup>15</sup> **OHSU’s payroll increased by \$760 million (+62.3 percent) between 2012 and 2019.**

OHSU’s total net economic impacts in 2012 were modestly higher than in 2007, albeit with a slight decline in total net jobs. However, the total net economic impacts of OHSU increased significantly over the last seven years. On a net basis, between 2012 and 2019:

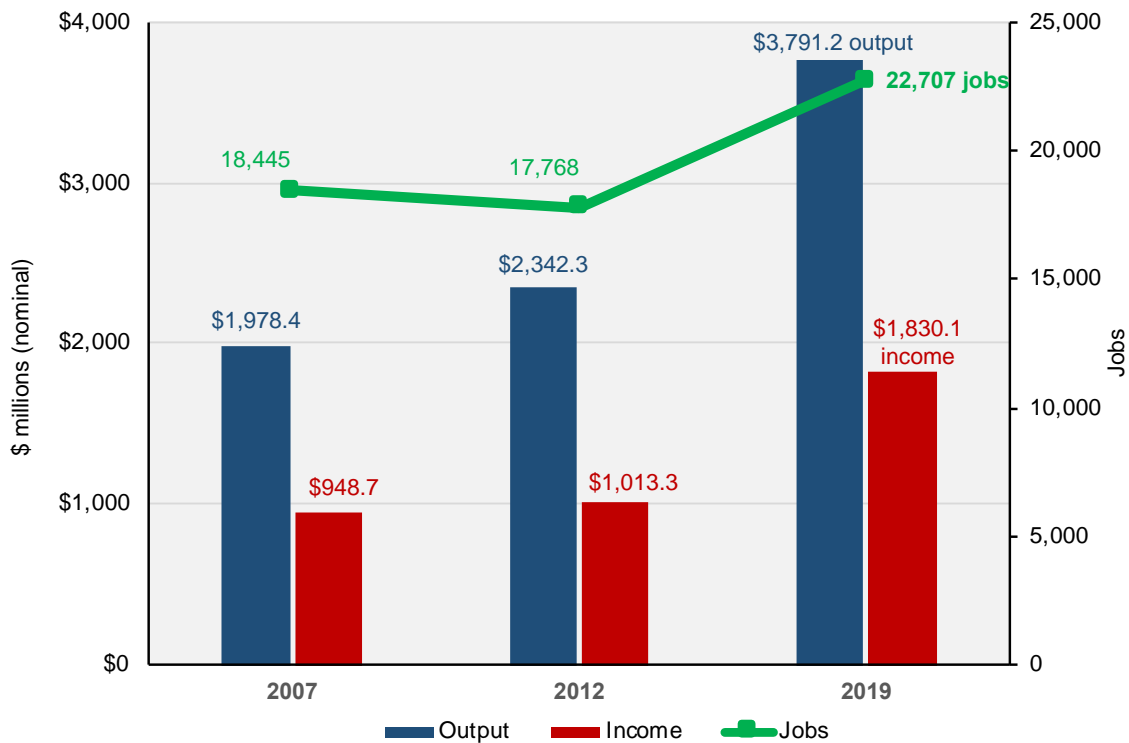
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<sup>14</sup> Employment growth nationally in the health care industry is projected to increase 1.6 percent annually between 2018-2028, ranking it first among all industry sectors in terms of future employment growth

<sup>15</sup> OHSU income includes both wages and benefits. The State of Oregon Employment Department’s Quarterly Census of Employment and Wages (“QCEW”) data reports wages only. According to QCEW’s data definitions: “Wages include tips, commissions, bonuses, vacation, and holiday pay, but do not include benefits.”

- Total net economic activity linked to OHSU increased from \$2.3 billion to \$3.8 billion, or by \$1.5 billion (+61.9 percent),
- Total net income increased from \$1.01 billion to \$1.83 billion, or by \$816.8 million (+80.6 percent), and
- Total net jobs increased from 17,768 jobs to 22,707 jobs, or by 4,939 jobs (+27.8 percent).
- Total net personal income taxes attributed to OHSU increased from \$29.9 million in 2012 to \$56.1 million in 2019, an 87.9 percent increase.<sup>16</sup> Similarly, total net personal property taxes increased from \$17.3 million to \$20.0 million, or by 15.2 percent, over that same time frame.

Figure 1: Changes in OHSU's Total Net Economic Impacts in Oregon



Sources: Pinnacle Economics using detailed OHSU data and 2018 IMPLAN model of Oregon.

<sup>16</sup> With the exception of direct personal property taxes paid by OHSU employees, all fiscal impacts were measured by the IMPLAN model. As a result, these fiscal impacts are not directly comparable to the personal property taxes and personal income taxes estimated in the 2014 report. (No fiscal impacts were included in the 2009 report.)

# ABOUT OHSU

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## HISTORY AND LOCATIONS

From its beginnings in 1887 as a state medical school in Portland to its current status as a non-profit public corporation and one of the state's largest employers, Oregon Health & Science University has played an important role in the history of Oregon. OHSU is a nationally and internationally recognized leader in patient care, medical education, research, and outreach. As a public institution and the only public academic health center in Oregon, OHSU's mission is to improve the health and well-being of all Oregonians. OHSU provides a wide variety of unique services that benefit individuals, communities, businesses, local and state governments, and the entire state in myriad ways. OHSU's primary activities include:

- Providing access to high-quality health care services, especially for Oregon's sickest and most vulnerable patients. In some cases, this level of care is not available elsewhere in the state.
- Providing training for health care professionals who will serve communities throughout Oregon.
- Conducting leading-edge research that results in new treatments, technologies, and scientific knowledge.
- Providing outreach to Oregon residents who might not otherwise have access to important health information and services.

The largest proportion of OHSU's activities involve patient care, including hospital care, more than 80 primary and specialty care clinics, and clinical outreach programs throughout the state. OHSU offers specialized health care services that in some cases are either not readily available, or are not available at all at other hospitals and clinics in the state.

OHSU's inpatient clinical care occurs on the Marquam Hill campus in Portland, mainly in the OHSU Hospital and Doernbecher Children's Hospital buildings. Marquam Hill is also home to a significant array of outpatient services, such as those offered through the Child Development and Rehabilitation Center, the Center for Women's Health, the Division of General Internal Medicine and Geriatrics and Casey Eye Institute. The Marquam Hill campus is situated on 118 acres of land comprising over 35 buildings and nearly 4 million square feet of space. Marquam Hill is also home to a host of research activities, including dozens of individual research labs, centers and institutes such as the Center for Radiochemistry Research, the Knight Cardiovascular Institute, the Vollum Institute, and the Developmental Brain Imaging Laboratory to name only a few. Finally, it is home to many administrative offices, including the School of Nursing, the School of Medicine Dean's Office, the Graduate Medical Education (residency and fellowship) programs and most of the school's 32 Graduate Studies (master's and Ph.D.) programs.

Portland's South Waterfront neighborhood, connected to Marquam Hill via the Portland Aerial Tram, also includes a number of OHSU facilities focused on research, education, and patient care. These buildings, totaling almost 2 million square feet, include the Center for Health and Healing Complex where patients receive high-acuity ambulatory care, highly complex outpatient surgery and invasive procedures. The Rood Family Pavilion – a partnership with the Ronald McDonald

House Charities – houses out of town patients and their families while receiving treatments. The Robertson Life Sciences Building, a partnership between OHSU, OSU and PSU, is designed to promote interdisciplinary learning and collaboration among students, faculty, residents and practicing healthcare providers. The Robertson Life Sciences building hosts OHSU’s School of Medicine MD Program, PA Program and School of Dentistry. And lastly, the Knight Cancer Research Building, a facility dedicated to the mission “to end cancer as we know it,” is on the South Waterfront.

OHSU’s West Campus, located in Hillsboro, is comprised of the Oregon National Primate Research Center (ONPRC) and Vaccine and Gene Therapy Institute (VGTI). ONPRC is one of seven National Primate Research Centers (NPRCs) which are supported by the National Institutes of Health. VGTI scientists research infectious disease threats and newly emerging viral and infectious diseases. The site is 154 acres, of which 62% is forest and floodplain. There are over 30 buildings including research, office, animal care and support facilities, totaling approximately 500,000 square feet.

## HEALTH CARE

As a major academic health center, OHSU’s greatest contribution to Oregon (and the region) may be providing comprehensive, leading-edge health care for the state’s most challenging patients. In 2019, OHSU provided a wide variety of clinical and hospital care to 1.1 million patients (inpatient and outpatient visits) from Oregon, Washington, and every state in the United States and Canada (see Table 3). During 2019, OHSU had the second most outpatient visits of all hospitals in Oregon (9 percent of all outpatient visits), and ranked second in occupancy (85 percent or 131 percent of the state average). In 2019, OHSU ranked #1 in available beds (562 beds), discharges (9 percent of all discharges), and total surgeries (11 percent of all surgeries).

Table 3: Oregon Hospital 2019 Patient Occupancy Data

Hospital	Average Census	Available Beds	Percent Occupancy	Total Discharges	Total Surgeries	Total O/P Visits	Case Mix Index (CMI)
<b>OHSU Hospital</b>	<b>480</b>	<b>562</b>	<b>85%</b>	<b>29,481</b>	<b>37,484</b>	<b>1,073,096</b>	<b>2.28</b>
Providence St Vincent	341	527	65%	24,319	23,301	980,812	1.97
Providence Portland	317	410	77%	19,108	16,372	1,391,966	1.71
Legacy Emmanuel	398	537	74%	20,091	13,546	368,356	2.00
Sacred Heart	317	347	91%	25,766	16,070	114,360	1.82
Salem Hospital	335	449	75%	26,044	15,241	466,429	1.68
Kaiser Sunnyside	208	269	77%	17,976	10,311	71,573	1.84
Asante Rogue	251	337	74%	15,946	16,801	520,673	1.93
St Charles - Bend	184	249	74%	16,903	17,169	427,462	1.86
Legacy Good Samaritan	139	218	64%	9,424	12,195	188,220	1.67
Adventist	86	248	35%	9,272	6,743	470,618	1.76
All Other	1,351	2,588	52%	126,479	148,889	6,487,999	1.55
Total, All Oregon Hospitals	4,407	6,741	65%	340,809	334,122	12,561,564	1.73
<b>OHSU Rank in Oregon</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>
<b>OHSU as % of All Oregon Hospitals</b>	<b>11%</b>	<b>8%</b>	<b>131%</b>	<b>9%</b>	<b>11%</b>	<b>9%</b>	<b>132%</b>

Source: OHSU and Oregon Health Authority Databank

Table 4 reports hospital patient data for the three years in which economic impact studies were conducted. Although total discharges at OHSU fell slightly between 2012 and 2019, all other



statistics show growth and the significant and increased role of OHSU in the state’s health care system. From 2012 to 2019, the total number of outpatient visits at OHSU increased by 32.1 percent, compared to a statewide increase of 30.2 percent during the same period. Hospital patient revenues totaled \$1.835 billion in 2019 and increased by 59.6 percent between 2012 and 2019. Patient revenues for all Oregon hospitals increased by 56.2 percent over the same time period.

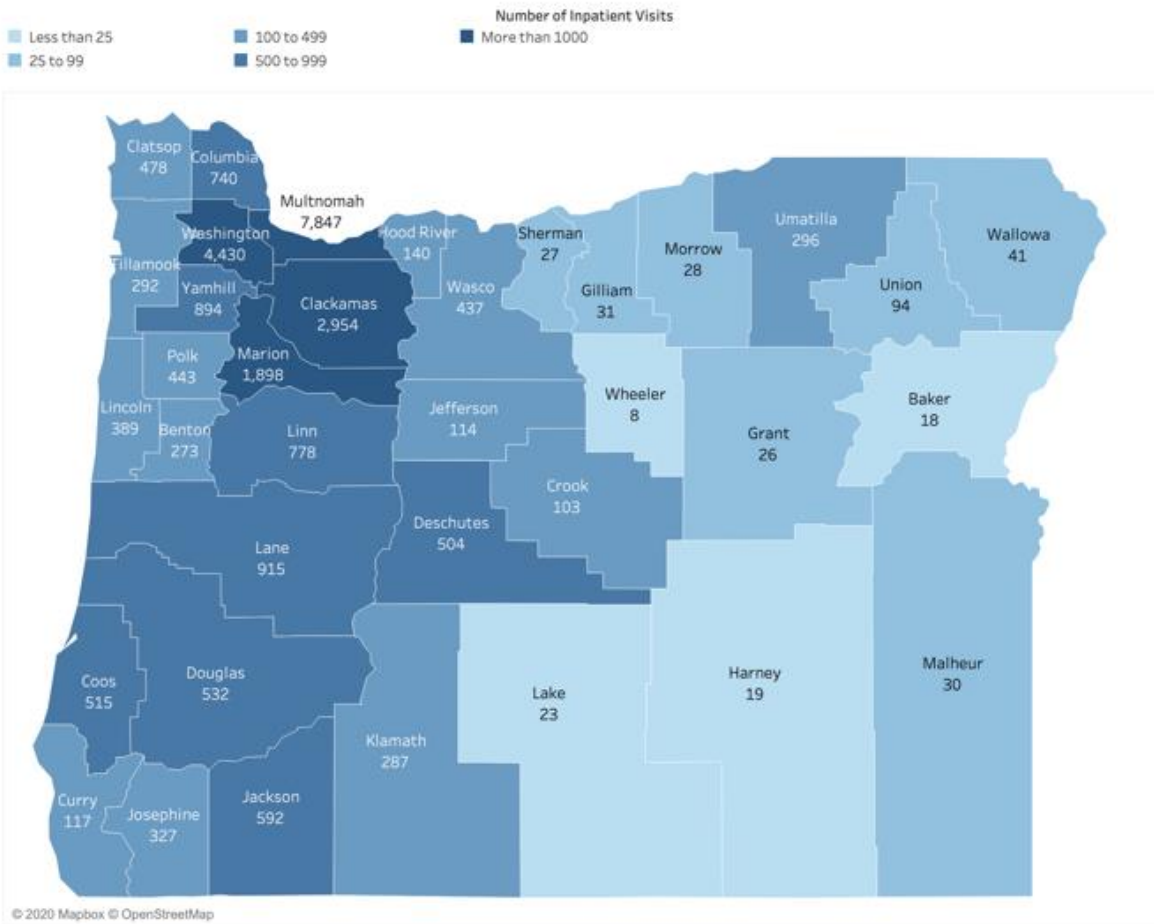
Table 4: OHSU and Oregon Hospitals Patient Data Over Time, (revenues in nominal dollars)

STATISTIC / Hospital	2007	2012	2019	2012 to 2109	
				Change	% Change
<b>DISCHARGES</b>					
OHSU Hospital	27,744	30,066	29,481	-585	-1.9%
All Oregon Hospitals	348,028	337,871	340,809	2,938	0.9%
OHSU as % of all Oregon Hospitals	8.0%	8.9%	8.7%		
<b>PATIENT DAYS</b>					
OHSU Hospital	144,235	159,068	175,216	16,148	10.2%
All Oregon Hospitals	1,526,087	1,424,134	1,608,511	184,377	12.9%
OHSU as % of all Oregon Hospitals	9.5%	11.2%	10.9%		
<b>O/P VISITS</b>					
OHSU Hospital	606,405	812,379	1,073,096	260,717	32.1%
All Oregon Hospitals	8,356,250	9,650,324	12,561,564	2,911,240	30.2%
OHSU as % of all Oregon Hospitals	7.3%	8.4%	8.5%		
<b>PATIENT REVENUES (\$ MILLIONS)</b>					
OHSU Hospital	\$809	\$1,150	\$1,835	\$685	59.6%
All Oregon Hospitals	\$6,940	\$8,780	\$13,712	\$4,932	56.2%
OHSU as % of all Oregon Hospitals	11.7%	13.1%	13.4%		

Source: OHSU and Oregon Health Authority Databank

OHSU’s health care footprint within Oregon is far-reaching, with inpatient (hospital) visits from every county in 2019 (see Figure 2). Twelve counties had at least 500 inpatient visits.

Figure 2: OHSU Inpatient Visits by Oregon Patients' County of Residence, 2019

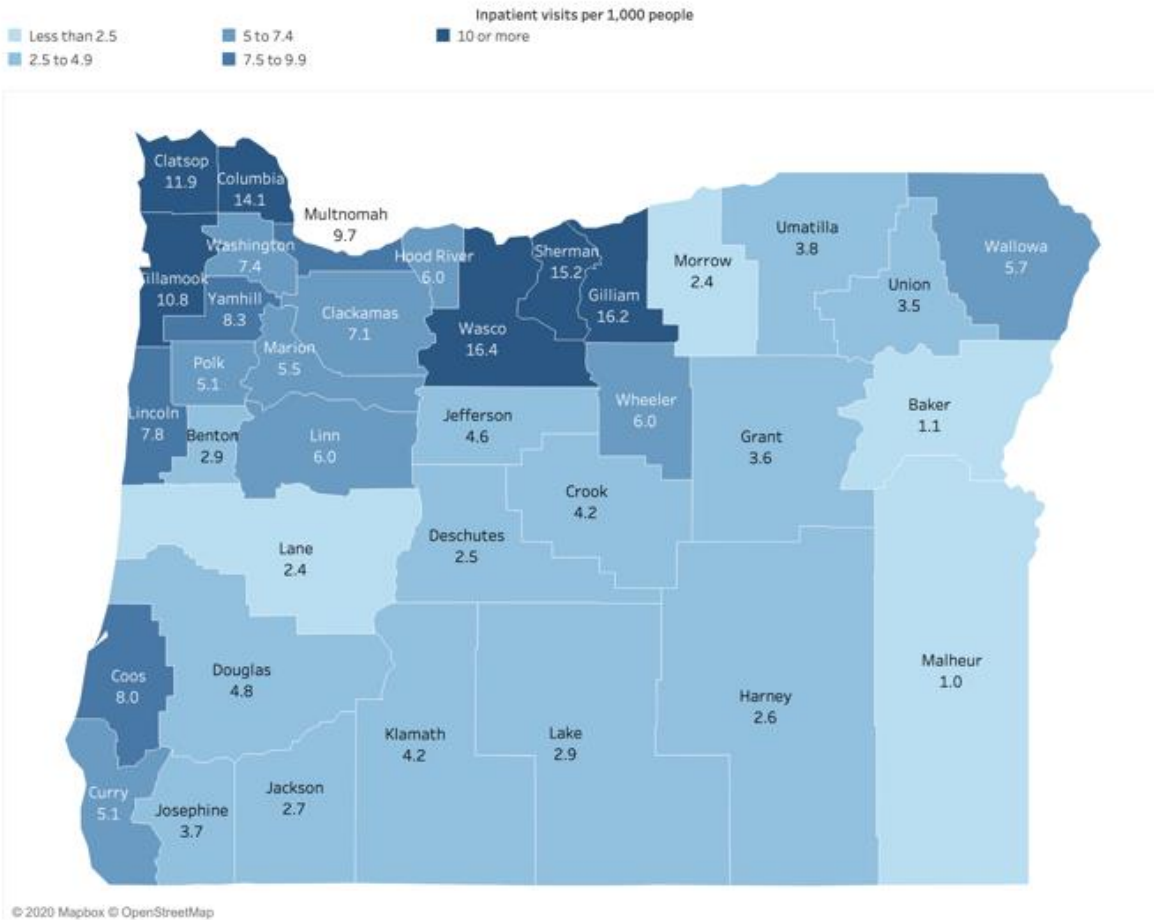


Source: OHSU

OHSU’s health care footprint on rural Oregon can be seen by normalizing OHSU visits by county population (see Figure 3). For example, in Multnomah County, OHSU had 9.7 inpatient visits per 1,000 residents in 2019. Six counties, all rural, had greater inpatient visitation, led by Wasco (16.4 inpatient visits per 1,000 residents), Sherman (15.2) and Gilliam (16.2) counties to the east, and Columbia (14.1), Clatsop (11.9) and Tillamook (10.8) counties to the west.



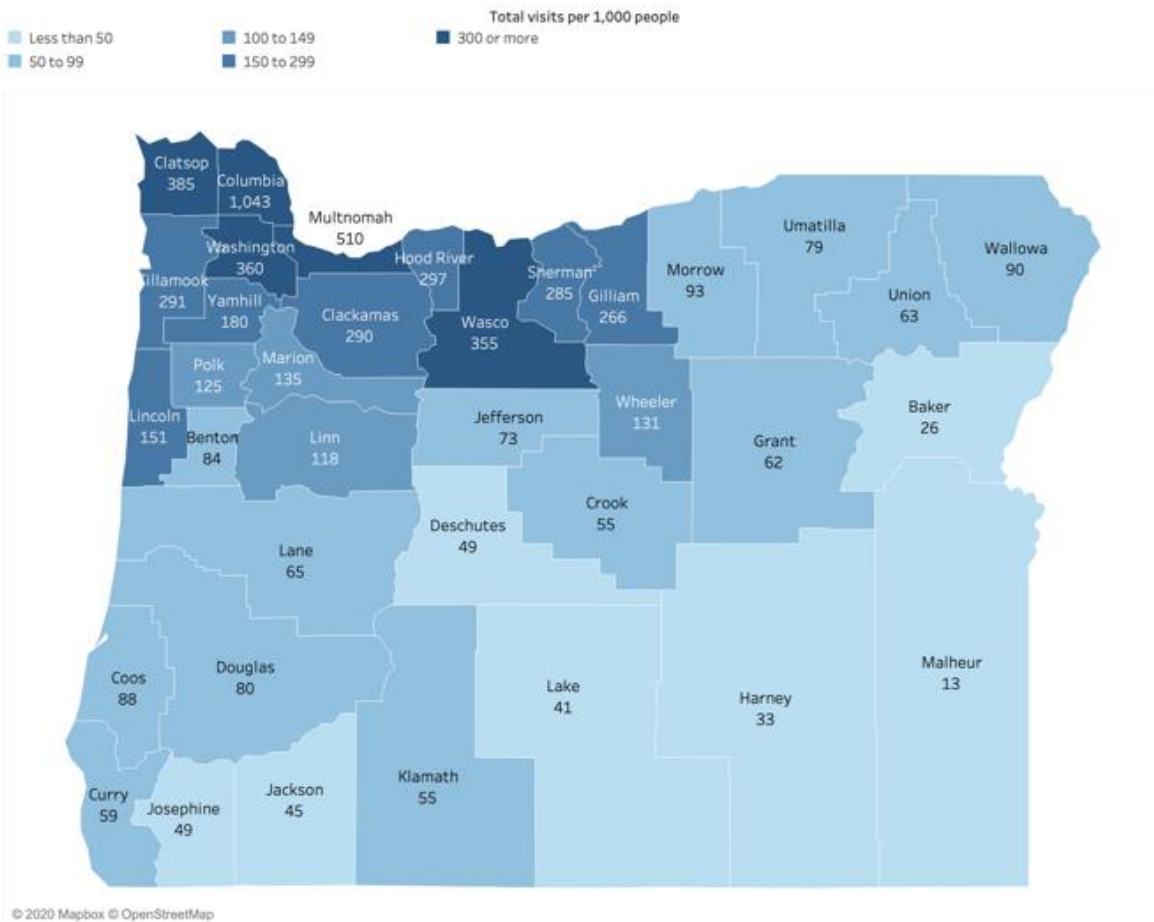
Figure 3: OHSU's Inpatient Visits Per 1,000 Population by Oregon Patients' County of Residence, 2019



Source: OHSU

In 2019, Multnomah County ranked second in terms of total visits (including outpatient, inpatient, and emergency departments) per 1,000 residents (see Figure 4). Columbia County ranked first (1,043 visits per 1,000 residents), followed by Clatsop County (rank 3<sup>rd</sup>), Washington County (rank 4<sup>th</sup>), and Wasco County (rank 5<sup>th</sup>).

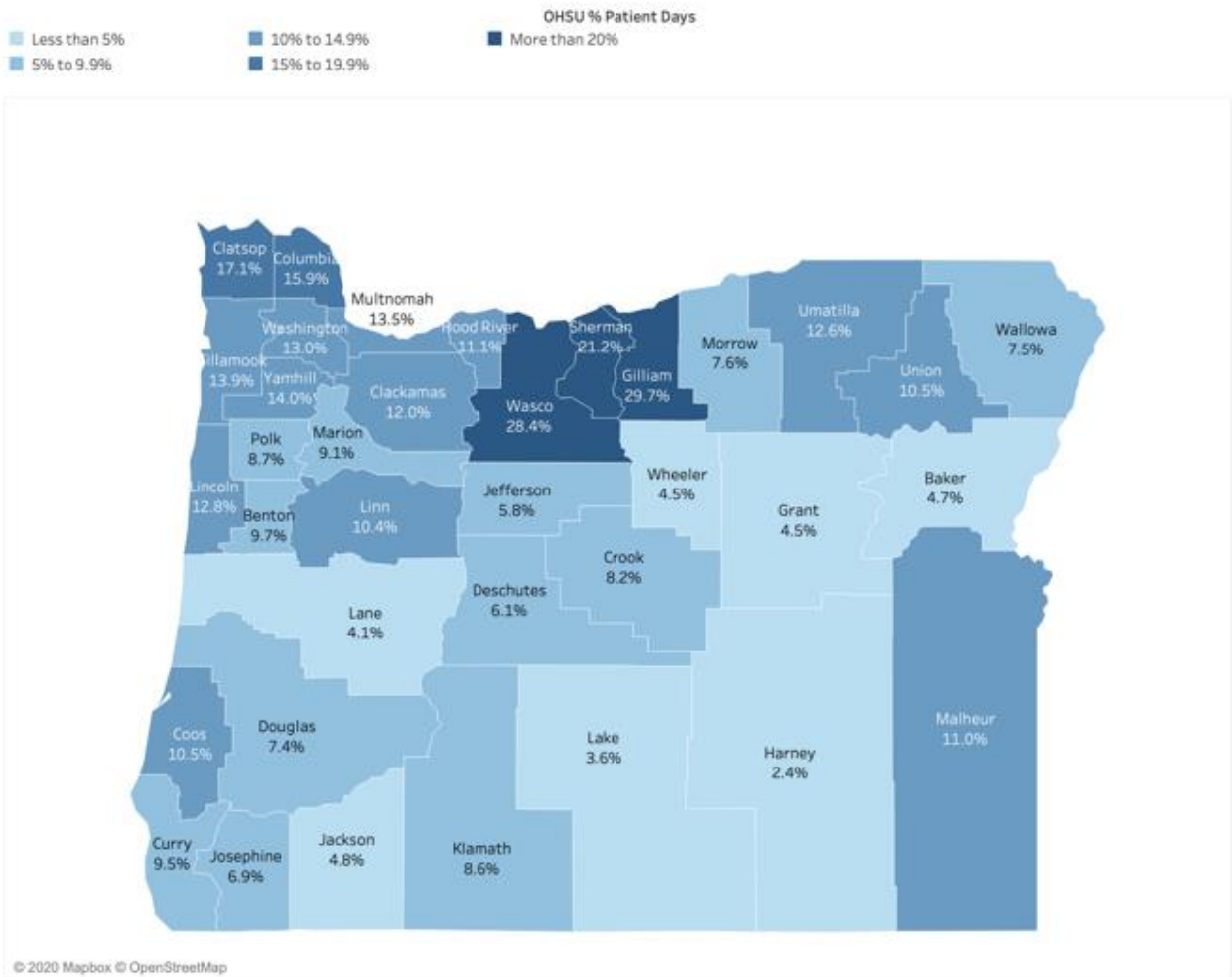
Figure 4: OHSU's Total Visits Per 1,000 Population by Oregon Patients' County of Residence, 2019



Source: OHSU

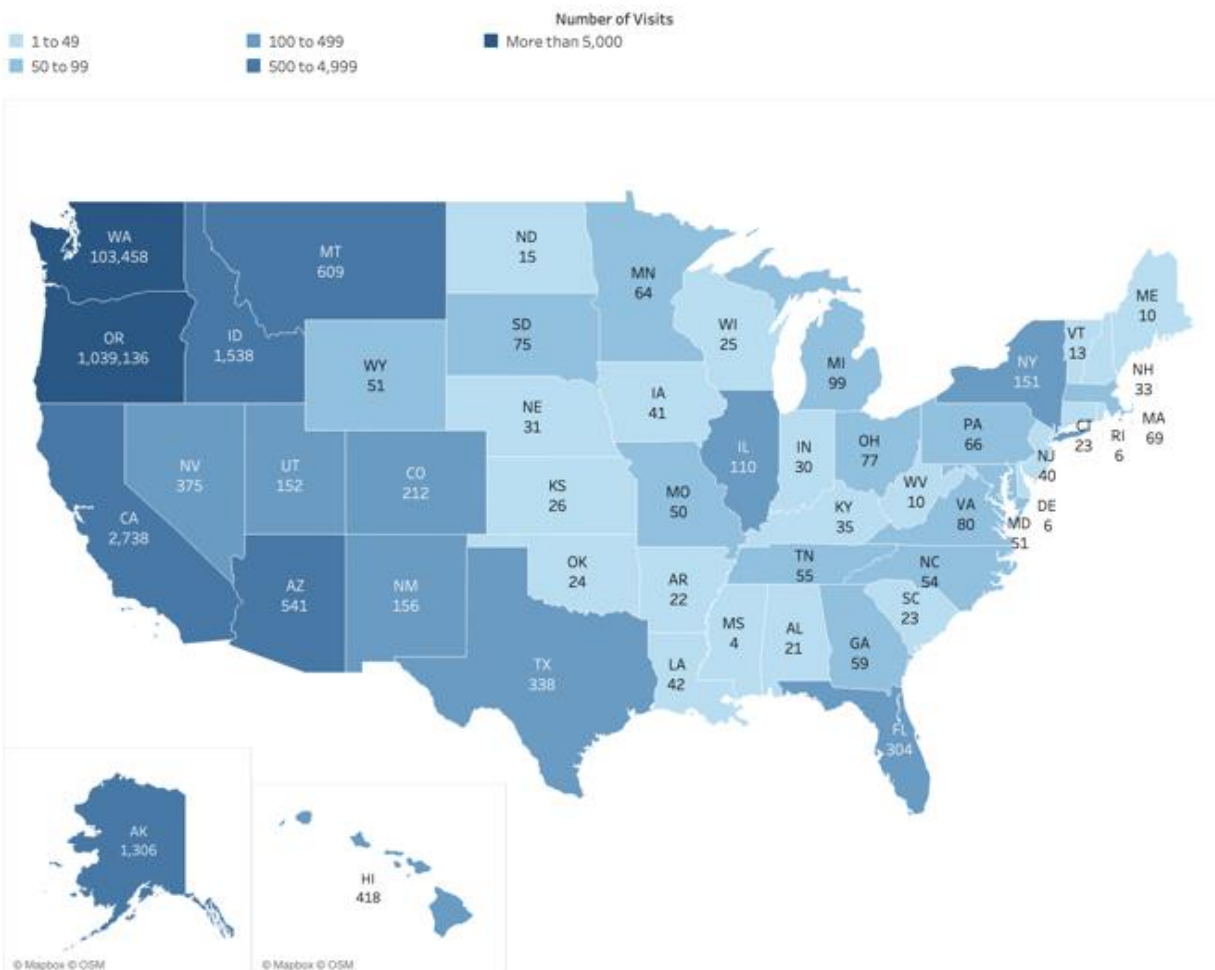
Figure 5 shows OHSU's share of patient days across all Oregon hospitals. In 2019, OHSU accounted for 13.5 percent of all hospital patient days in Multnomah County. This relative share was surpassed in seven rural counties. In addition, OHSU's share of all hospital patient days was significant in all four rural corners of the state.

Figure 5: OHSU's Share of All Hospital Patient Days by Oregon Patients' County of Residence, 2019



OHSU's health care footprint extends beyond this state. The national reach of OHSU can clearly be seen in Figure 6, showing the number of OHSU patients from each state in 2019.

Figure 6: OHSU National Patient Visits by State, 2019



Source: OHSU

## OHSU Health

OHSU Health is a system that today comprises OHSU Healthcare, Adventist Health Portland, Hillsboro Medical Center (formerly Tuality Healthcare) and the OHSU Practice Plan. OHSU Health’s dozens of locations help keep patients close to their home and their loved ones, which promotes healing and emotional wellness. It also keeps people closer to their jobs, schools and local businesses—important factors in a community’s economy. (These partner health care providers are discussed below, with various operational metrics provided in Table 5.)

Since teaming up in early 2016, OHSU and **Hillsboro Medical Center** have opened more services and locations to patients living in Hillsboro and western Washington County, which equals greater access to primary and specialty care. Key services provided by the Hillsboro Medical Center include: cardiovascular care, emergency services, orthopedics, radiation oncology, surgery, imaging, rehabilitation, primary care, sleep disorders, rheumatology, pulmonary medicine, gastroenterology, diabetes care, and labor and delivery. Hillsboro Medical Center has received the HealthInsight Quality Award, Leapfrog Hospital Safety Grade A, and “best performer” by the Collaborative Alliance for Nursing Outcomes.

Similarly, the partnership with **Adventist Health Portland**, effective since January 2018, serves community members in Southeast Portland. For example, a new operating room staffed by OHSU Health clinicians at Adventist Health Portland means access to urology, bariatric surgery and orthopaedic services is expanding. Key services provided by Adventist Health Portland include: cancer care, emergency and urgent care, gastroenterology, heart and stroke care, neurology, orthopedics, primary care, pulmonary, rehabilitation, sleep disorder, surgery, urology and labor and delivery, breast health diagnostic and surgical care, geriatric psychiatry, cardiovascular care, midwifery, obstetrics, and gynecology and family medicine. Adventist Health Portland has been recognized with a Leapfrog Hospital Safety Grade A, Stroke Gold Plus Quality Achievement Award from the American Heart Association, and Lifeline® Gold Plus Receiving Quality Achievement Award.

Table 5: OHSU Health Partnership Statistics, 2019

Metric	Hillsboro Medical Center (CY2019)	Adventist Health Portland (FY2019)
Net Patient Revenues (\$ millions)	\$191	\$329
Average Annual Admissions	4,530	12,000
Average Annual Outpatient Visits	274,306	142,000
Physicians	400	550
Employees	1,200	1,900
Hospital Beds	167	302
Community Clinics	10	10

Source: OHSU

The growing service area of OHSU Health keeps beds open on Marquam Hill for patients who require the most specialized services. OHSU Health manages its hospital capacity through Mission Control, a modern command center that uses predictive analytics and a real-time data display to coordinate patient care from the time the patient enters the hospital until they are discharged. Mission Control improves a patient’s experience, reduces delays in care, and gets a patient the right care at hospitals that are closer to their homes. The team now places more than 1,200 patients in hospitals annually—which means fewer transfers get declined.

**OHSU Declined Patients Due to Capacity**

- FY2018 = 413 declined patients
- FY2019 = 136 declined patients (98.6% acceptance rate)
- FY2020 = 113 declined patients (98.8% acceptance rate)

## EDUCATION

OHSU trains thousands of health care professionals each year in Portland and in satellite programs that serve rural areas throughout the state. OHSU offers about 60 types of degrees and certificates in its Schools of Medicine, Dentistry, Nursing, Public Health and College of Pharmacy. In the 2018-19 academic year, almost 3,000 students attended OHSU programs, which granted 1,500 degrees and certificates.

Table 6: OHSU Enrollment and Degrees Granted, 2018-2019 Academic Year

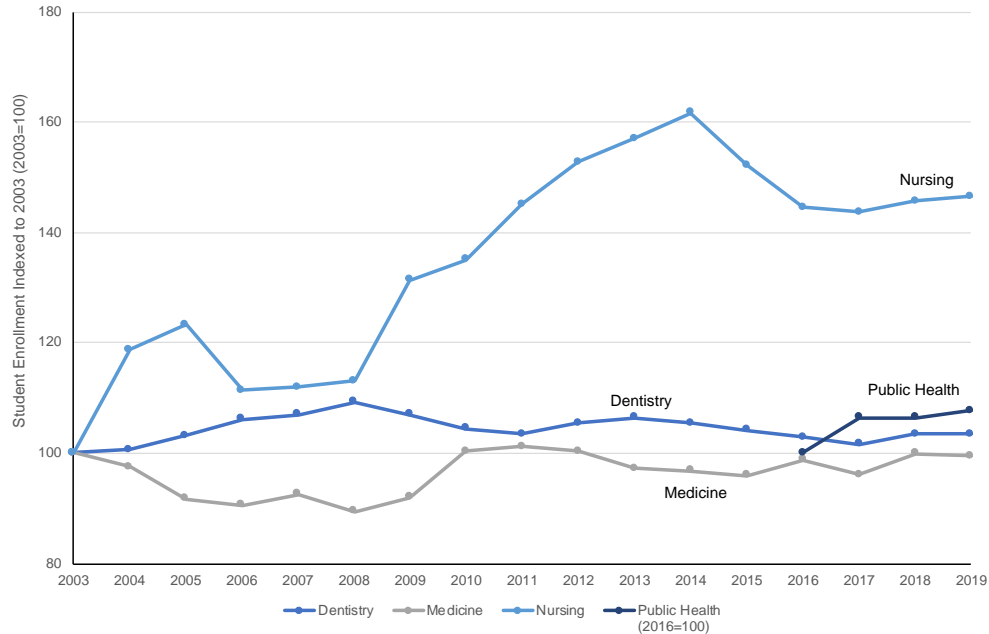
LEVEL	Enrollment				Total by Level
	Dentistry	Medicine	Nursing	Public Health	
UNDERGRADUATE	–	18	764	–	782
GRADUATE	27	778	266	207	1,278
NON-DEGREE	–	34	–	6	40
MD	–	603	–	–	603
DMD	296	–	–	–	296
Total Enrollment by School	323	1,433	1,030	213	2,999
Total Degrees and Certificates by School	91	560	494	355	1,500

Source: OHSU Fact Book, 2019

Note: Enrollment reported for the School of Public Health includes OHSU students only.

OHSU is the only public medical school and the only school of dentistry in Oregon. Currently, other than OHSU, only three universities in Oregon offer a four-year baccalaureate degree in nursing: George Fox University, Linfield College Good Samaritan School of Nursing, and the University of Portland School of Nursing.<sup>17</sup> All of these programs are located in or near the Portland area. Importantly, only OHSU offers this degree outside the metropolitan area at its satellite campuses in La Grande, Klamath Falls, Ashland and Monmouth, thus helping to alleviate the nursing shortage in Oregon’s more rural areas. OHSU offers co-admission to the Bachelor of Science in Nursing Program through eight community colleges throughout the state. The School of Public Health is a collaborative effort between OHSU and Portland State University that was fully accredited in 2016.

Figure 7: OHSU Enrollment Trends by Program, Indexed to 2003 (2003=100)



Source: OHSU Fact Book

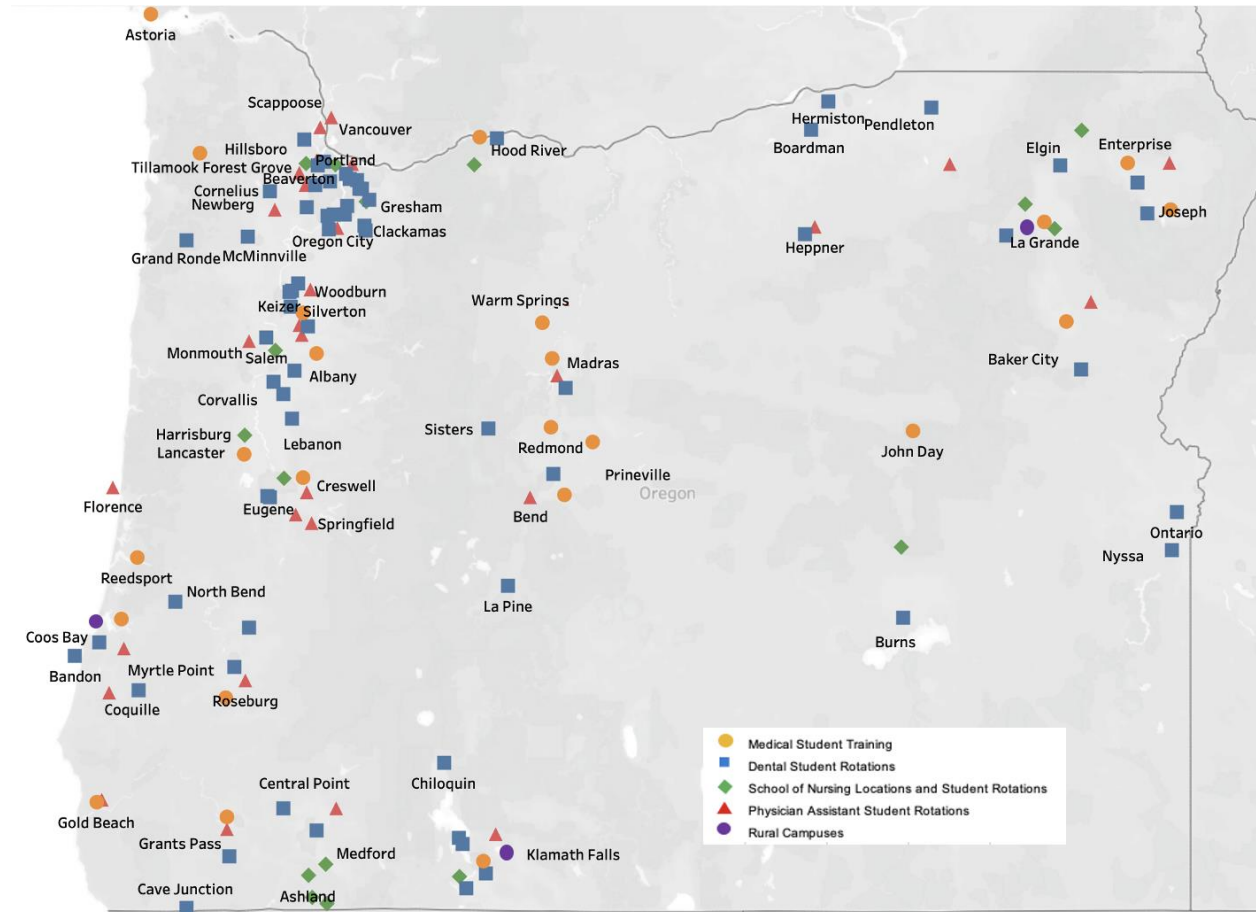
Figure 7 displays the changes in enrollment at OHSU since 2003. Enrollment in the dentistry and medicine programs has remained relatively stable, while the nursing program has increased

<sup>17</sup> A fourth, Concordia University, recently closed.



enrollment by 47 percent since 2003. Student enrollment at the OHSU/PSU School of Public Health is indexed to its accreditation in 2016, and has been steady since 2017.

Figure 8: OHSU Statewide Educational Locations, 2019



Source: OHSU

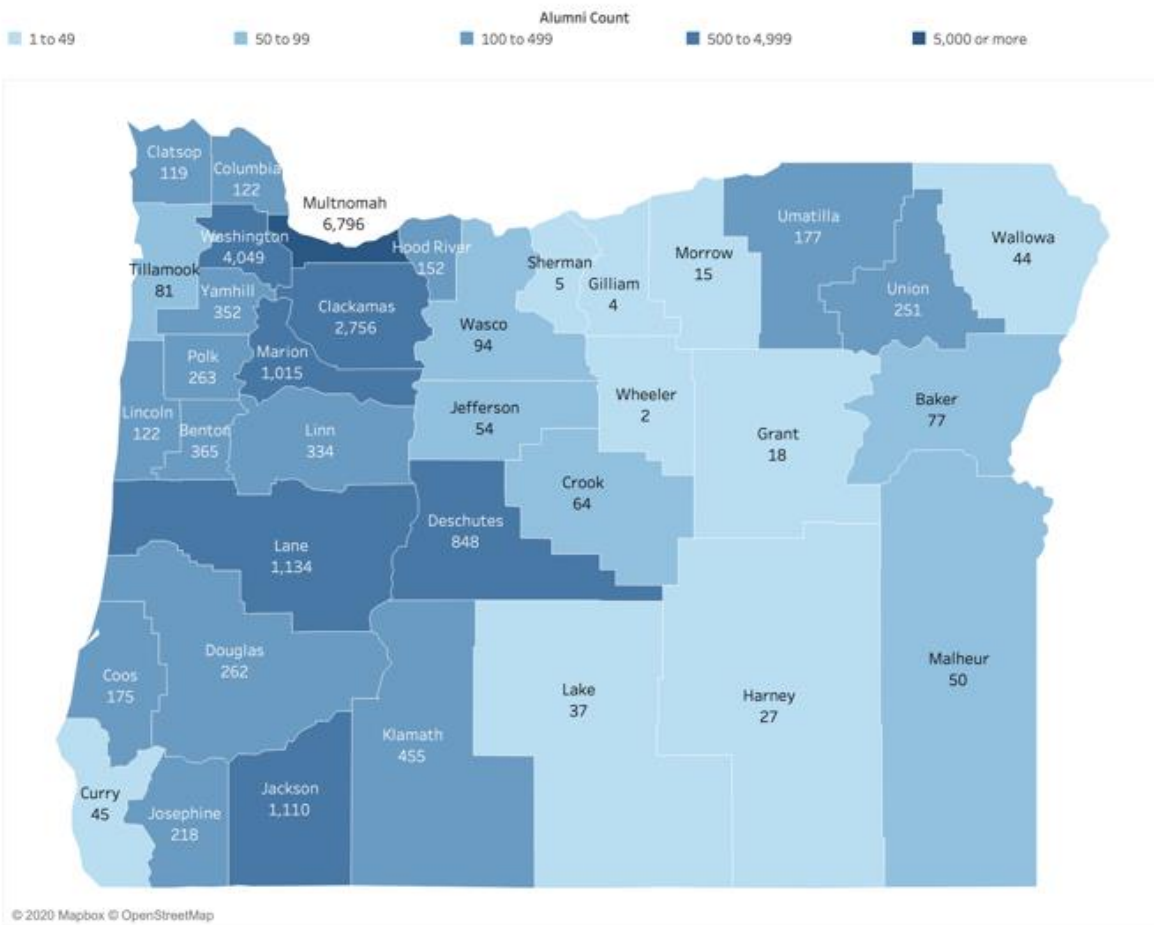
Figure 8 displays OHSU’s rural campuses, medical student training locations, School of Nursing campuses and nursing student rotation sites, and dental student and physician assistant student rotation sites located across Oregon.

In addition to offering numerous degree programs, OHSU is also the largest provider of graduate medical education (“GME”) in Oregon. Also known as medical residency, these are the years of intensive clinical training immediately following graduation from medical school. About \$131 million in federal funds annually flow into Oregon to pay salaries and benefits for 423 resident-physicians at OHSU, as well as to offset additional costs incurred by OHSU to train them. As these dollars come from outside the state of Oregon, they are a net economic benefit that would be lost to Oregon if OHSU did not exist.

More important than the federal funds, one of the strongest predictors of where a new physician will choose to practice is the location of their GME program. From a long-term perspective, OHSU increases human capital development. When graduates stay and practice in Oregon, this investment in human capital benefits local communities. A medical education improves the

graduate’s lifetime earnings power, and increases state and local tax revenues through higher contributions over time. Although important, this analysis does not include any impacts related to employment or income for the trained medical professionals once they begin to practice. Currently, there are approximately 21,700 alumni living in Oregon (Figure 9), with more than 5,000 who received training at OHSU’s School of Medicine, including MD graduates and those who have completed residency.

Figure 9: OHSU Alumni by County of Residence, 2019



Source: OHSU

## RESEARCH

OHSU makes important contributions to medical science, advancing diagnosis and treatment capabilities for some of the world’s most challenging diseases. Research provides innumerable economic benefits that are not captured in this study—long-term gains in efficiency, new medications and cures that contribute to the short- and long-term wellness of patients, and products developed with commercial applications, to name a few. In fiscal year 2019, OHSU received \$486.3 million in research projects and awards, with \$342.9 million (71 percent of total funding) in funding from the federal government and \$143.4 million (29 percent) in funding from other, non-federal sources (see Table 7).



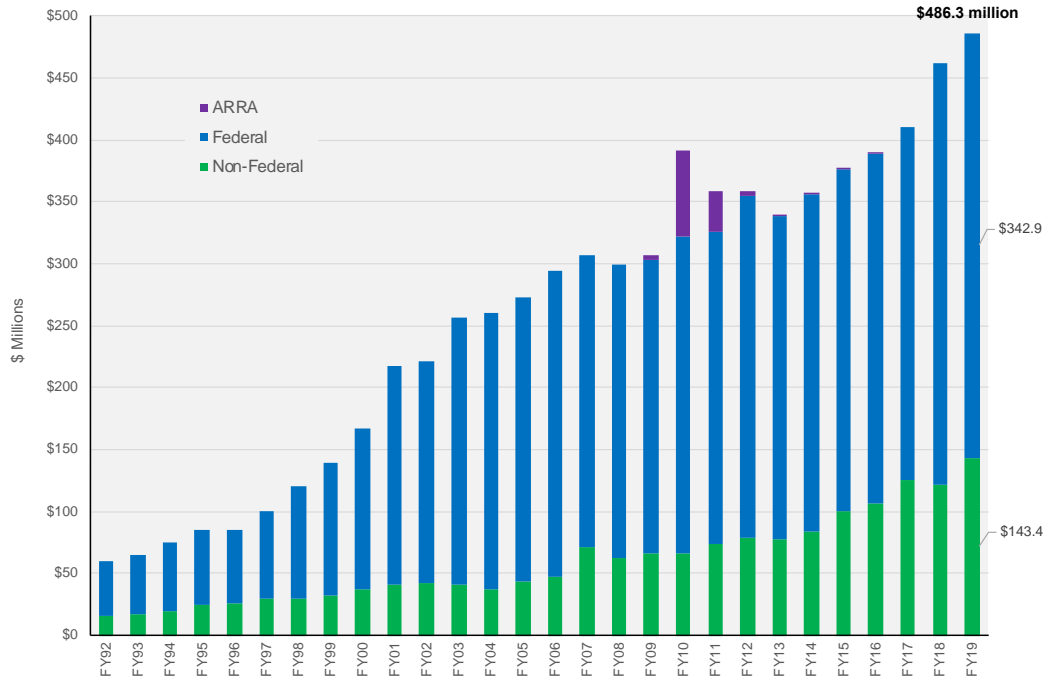
Table 7: OHSU Sponsored Research Projects and Awards, 2019

Activity Type	Awards Received (Millions \$)	% Awards Received
Research	\$353.7	72.7%
Clinical Trials	\$106.2	21.8%
Instruction	\$2.0	0.4%
Other	\$24.5	5.0%
<b>Total</b>	<b>\$486.3</b>	<b>100.0%</b>

Source: OHSU

OHSU research funding is increasing (Figure 10). Year over year, research funding increased by \$24.1 million (+5.2 percent) in FY2019. Over the last five years, research funding has increased by \$110.4 million (+28 percent). From an economic impact perspective, nearly all of OHSU’s research funding originates from outside of the state, making the activities it supports a net economic gain to the state.

Figure 10: OHSU Grants, FY1992-FY2019



Source: OHSU

In 2019, 70.4 percent of all National Institutes of Health (NIH) grants awarded to Oregon institutions went to OHSU (see Table 8), up from 64 percent in 2012. As the largest research institution in Oregon, OHSU is well positioned to compete against other research institutions from other states for federal grants.

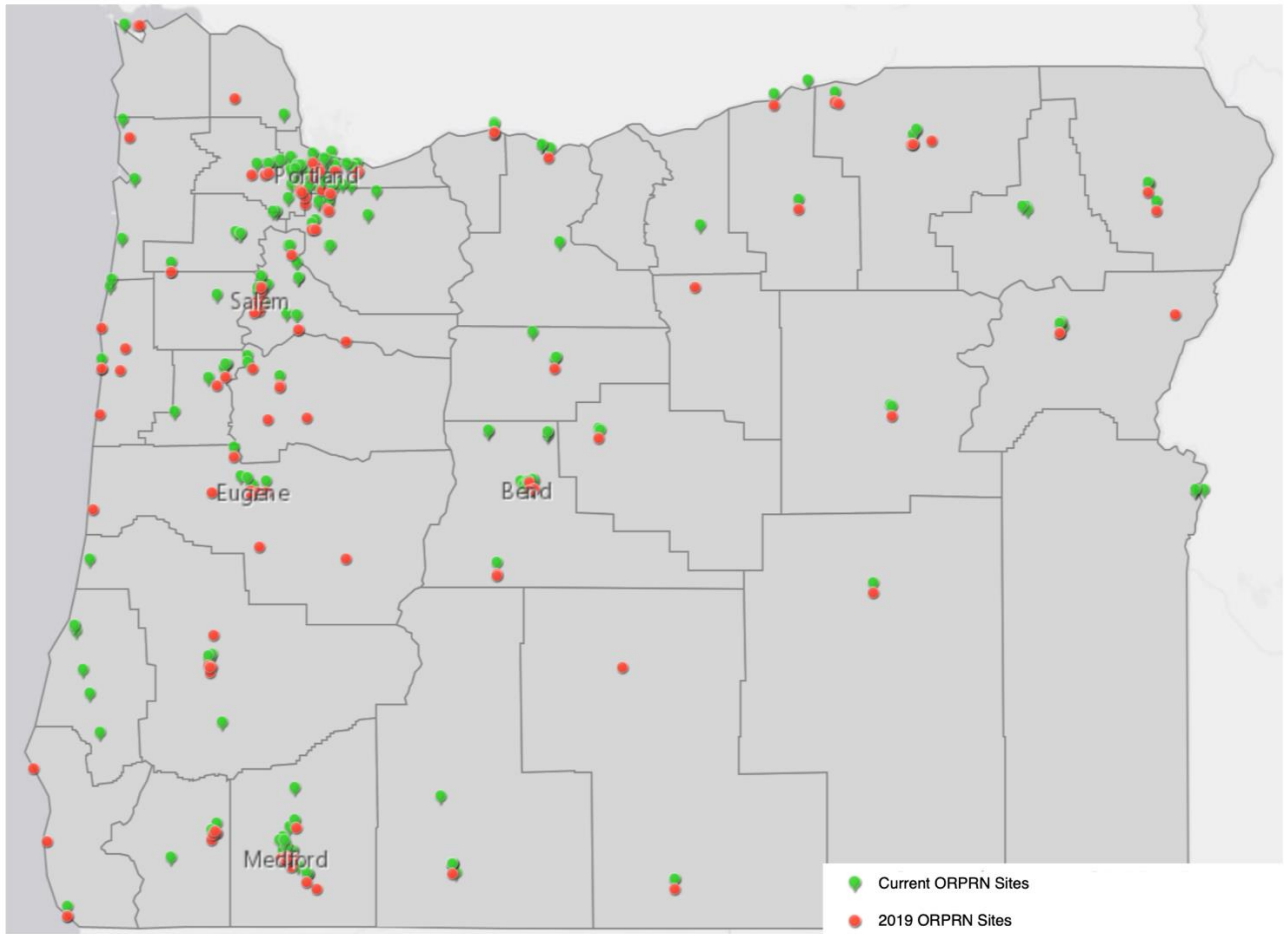
Table 8: Total NIH Grants to Oregon, 2019

NIH Grant Recipient	NIH Grants (Millions \$)	% NIH Oregon Grants
OHSU	\$279.0	70.4%
U of O	\$46.7	11.8%
OSU	\$18.1	4.6%
PSU	\$8.8	2.2%
OR Rsch Inst	\$6.3	1.6%
All Other	\$37.4	9.4%
<b>Total</b>	<b>\$396.3</b>	<b>100.0%</b>

Source: OHSU

OHSU research is conducted across the state. The mission of the Oregon Rural Practice-based Research Network (“ORPRN”) is to improve health outcomes and equity for all Oregonians through community partnered dialogue, research, coaching, and education. ORPRN faculty and staff partner with almost 400 primary care practices around the state. Since its founding in 2002, ORPRN has completed over 85 funded research, transformation and quality improvement projects and in fiscal year 2020 received \$8 million in grant and contract funds. In 2017, ORPRN created the Oregon ECHO (“Extension for Community Healthcare Outcomes”) Network (“OEN”), a statewide tele-mentoring platform for teaching community providers to deliver best-practice medical services. Between 2017-2020, 1,100 clinicians participated in 38 ECHO programs in 15 different topic areas.

Figure 11: OHSU Rural Practice-Based Research Network (“ORPRN”)



Source: OHSU

# ECONOMIC IMPACTS

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OHSU’s greatest economic impacts come from expenditures on day-to-day operations, including payroll and purchases of goods and services. OHSU attracts students from throughout the state and the nation, and these students contribute to the economy, in the short term, by spending money on goods and services and, in the longer term, when they stay and work in the state. OHSU also adds to the Oregon economy through its capital spending on new construction and facility expansions, and new equipment and technologies.

## ECONOMIC IMPACT MODELING FRAMEWORK

Economists have developed several approaches to measure the economic impacts of hospitals and universities on the communities in which they serve. The most common method estimates the economic impacts associated with the institution’s spending on payroll, goods and services, and capital projects, as well as local spending by students. This method is oftentimes referred to as the “expenditure approach.”

The expenditure approach is typically conducted within an input-output modeling framework. Input-output models provide a comprehensive picture of the economic activities in a given area using mathematical relationships that describe the interactions of local industries with each other, with households as suppliers of the factors of production, with industries outside of the region, and with final users of goods and services.

Input-output models that rely on survey or primary source data are expensive to construct and are generally not readily available for state and regional economies. As a result, special modeling techniques have been developed to estimate the necessary empirical relationships from a combination of national technological relationships, and state- and county-level measures of economic activity. These modeling techniques and data have been packaged into the IMPLAN (for IMpact Analysis for PLANning) economic impact modeling software. This is the modeling system Pinnacle used in this analysis.

### The IMPLAN Economic Impact Model

Initially developed in 1993, the IMPLAN model is based on a well-structured, input-output modeling framework that relies on government-vetted data for counties, states, and regions. This analysis uses 2018 baseline IMPLAN data for Oregon—the most current year available. The IMPLAN model is widely used and well respected. The United States Department of Agriculture (USDA) recognized the IMPLAN modeling framework as “*one of the most credible regional impact models used for regional economic impact analysis*” and, following a review by experts from seven USDA agencies, selected IMPLAN as its analysis framework for monitoring job creation associated with the American Recovery and Reinvestment Act (ARRA) of 2009.<sup>18</sup>

IMPLAN provides both the structure and flexibility necessary to incorporate primary source data into the economic impact model. This is particularly important in this analysis where Pinnacle used detailed payroll, non-payroll operating costs, capital spending, and student spending data

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<sup>18</sup> See excerpts from an April 9, 2009 letter to MIG, Inc., from John Kort, Acting Administrator of the USDA Economic Research Service, on behalf of Secretary Vilsack, at [www.implan.com](http://www.implan.com).

provided by OHSU to build custom expenditure functions of their operations. This detailed expenditure approach allows for customization of the inputs that go into the IMPLAN model and, as a result, provides the most reliable estimate of economic and fiscal impacts.

## Types of Impacts

Economic impact analysis employs specific terminology to identify the different types of economic impacts:

- **Direct impacts** include the output (as measured by expenditures), income (payroll), and jobs associated with OHSU. That is, in order to provide its services, OHSU will purchase a variety of goods and services and employ doctors, nurses, professors, researchers, technicians, administrators, and classified staff working in clerical, service, and maintenance positions. Together, these operating and payroll expenses represent the direct output of OHSU.
- **Indirect impacts** occur as businesses buy from other businesses. OHSU, for example, will purchase health care supplies and equipment, electricity, water and sewer services, construction, maintenance and repair services, and a host of other goods and services necessary to operate. In a similar manner, each of these service providers will purchase goods and services that they need to operate. These purchases of goods and services by businesses from other businesses indirectly generate sales, income, and jobs for others. These impacts are often referred to as supply-chain impacts.
- **Induced impacts** result from the increased income and purchasing power of households who are either directly or indirectly affected by OHSU. The OHSU doctor, for instance, will take her family to dinner or purchase clothing for her children. Employees for the construction contractor who repairs OHSU facilities will spend their income in much the same way. This spending induces sales, income, and jobs for workers and businesses in other sectors of the economy. These impacts are often referred to as consumption-driven impacts.

This cycle of spending does not go on forever. It continues until the initial spending (or change in “final demand”) eventually leaks out of the local economy as a result of taxes, savings, or purchases of non-locally produced goods and services or “imports.”

## Economic Impact Measures

The economic impacts associated with OHSU can be measured in several ways—all of the figures reported represent an annual impact for the 2019 calendar year (except where noted). This report focuses on three of the most common and useful measures:

- **Output** is the largest measure of economic activity, and represents the value of goods and services produced. Output includes the value of intermediate goods used in production, as well as the wages and income paid to workers; rents and profits earned by households and businesses; and production taxes paid by businesses to state, local, and federal governments.
- **Personal income** (“income”) includes both employee compensation and proprietary income or small business income. Employee compensation includes workers’ wages and

other benefits such as health and life insurance and retirement payments. Income is included as a value-added component of output, so the two should not be added together.

- **Jobs** consists of the number of people working full- or part-time jobs. The jobs could include direct employees at OHSU, indirect supply-chain jobs, or induced jobs. The jobs numbers are not full-time equivalents, but the actual number of people who are physically employed during a calendar year.<sup>19</sup>

## Gross vs. Net Impacts

The economic impacts of an institution, such as OHSU, can best be explored by posing the following hypothetical question:

**How would economic activity in Oregon change if OHSU did not exist?**

One answer would be to assess the economic impacts associated with OHSU's expenditures regardless of where the revenues originated or what would happen to their patients and students if the institution did not exist. These gross economic impacts measure the contributions to the state's economy and represent an upper-bound estimate of the economic activity that can be traced back to OHSU, but do not necessarily reflect or measure the creation of new jobs or income. It could be the case, for instance, that some of OHSU's revenues come from state sources or that some of their patients would have gone to another hospital in Oregon. In each case, OHSU may have diverted or simply substituted economic activity away from other Oregon businesses.

Another answer would be to measure only the impacts that are new or additive to the Oregon economy based on spending or revenues that would leave the state but for the existence of OHSU. These are called net impacts. From a net economic impact perspective, OHSU is an exporter of health care and education services to non-local patients and students, respectively, as well as a provider of the same services to Oregonians who might otherwise go out of state for medical care or education (in economics, this is called "import substitution"). Further, OHSU brings in new money to the state that otherwise would go elsewhere, e.g., federal research funding.

To estimate net economic impacts, Pinnacle began by analyzing the gross economic impacts attributed to the direct expenditures made by OHSU and its affiliates (*e.g.*, staff and students), and then developed assumptions to determine which of those expenditures would not occur if not for the existence of OHSU. In doing this, it was important to carefully distinguish between revenues that OHSU attracts to this region from other places versus revenues that are locally based. When OHSU provides a service to someone outside of the area or attracts dollars from outside of the area, all of that activity counts as a net impact—in the absence of OHSU, that transaction would not have taken place in Oregon. Consider the following two examples:

- A top OHSU researcher wins a large federal grant to conduct cancer research. The federal grant pays part of her salary, as well as those of a number of her colleagues. But for her qualifications and proposed research approach, a team in Massachusetts would have won

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<sup>19</sup> The direct employment at OHSU consists of all persons who worked at OHSU during the 2019 calendar year. At any single point in time, the number of OHSU employees would be lower.

the grant. This means that the federal grant and the activities it supports has a net impact on the Oregon economy.

- By contrast, consider a 38-year old Portlander who needs more common inpatient medical services. He selects OHSU for its quality, but if OHSU had not been an option, he would have gone to Good Samaritan. In this example, his purchases at OHSU would be counted as part of OHSU's gross impact but not its net impact, because they do not increase overall economic activity in this state. Rather his selection simply assigns that activity to one hospital or another.

Pinnacle worked with OHSU staff to assemble detailed spending data for all of OHSU's activities, including the geographic basis of the revenues and expenditures associated with various activities. We then identified the proportion of OHSU's spending that is a net gain to the state (that is, spending that would not occur in the absence of OHSU), and the proportion that likely would remain in Oregon and be redistributed to other providers (and therefore is not included in the net impact analysis). These analytical components enable us to distinguish between gross and net economic impacts. Below are some major categories or topics that are relevant in identifying net impacts.

- **Patient care revenue.** Revenues associated with patient care represent the largest source of revenue for OHSU, amounting to approximately \$2.5 billion or 71.6 percent of all revenues in 2019. If OHSU did not exist, other local health care providers would absorb some of this demand for health care services. However, OHSU is Oregon's only public academic medical center, treating more complex patients and providing a variety of unique services. OHSU also sees patients with more fragile health than other Oregon health systems and cares for Medicaid patients for longer durations. OHSU is also nationally recognized as providing a higher level of care in a variety of programs. OHSU had 12 nationally ranked programs in the recent US News & World Report, including adult and pediatric cancer treatment, and neurology and neurosurgery. No other Oregon hospital received a national ranking in any program, so for many services OHSU's closest competitors are out of state, including the University of Washington (with 9 ranked programs), Seattle Children's Hospital (with 10 ranked programs), and the University of California at San Francisco (with 25 ranked programs).

Given OHSU's unique place in Oregon's health care continuum, in OHSU's absence, some of OHSU's patients would forgo health care or travel to academic medical centers outside Oregon to receive health care. The net impact analysis in this report takes into account the considerations above, and conservatively estimates that 35 percent of OHSU's patient care revenue would be lost to the state in the absence of OHSU.<sup>20</sup> This amounts to approximately \$859.7 million in patient care revenue in 2019.

- **Federal and other research funding.** In 2019, OHSU received \$486.3 million in research funding with nearly all of this funding coming from outside the state. According to a review of detailed funding sources by OHSU Research Development staff, the net impacts assume that 90 percent of research and sponsored projects represent a net gain to the state of Oregon. This is the same conservative assumption used in the previous two studies.

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<sup>20</sup> This 35 percent net-to-gross assumption with respect to patient revenues is used across all three economic impact studies.

- **Charitable contributions.** OHSU receives charitable contributions through three different but related entities: OHSU itself, the OHSU Foundation, and the Doernbecher Children’s Hospital Foundation. Combined, charitable contributions in 2019 totaled \$106.8 million and represented 3 percent of total OHSU revenues. Based on an analysis of the geographic origin and designated purpose of individual contributions performed by staff with the OHSU & Doernbecher Foundations, we assume that 82 percent of charitable contributions likely would be sent out of state if OHSU did not exist.<sup>21</sup>
- **State appropriations** of \$37.3 million in 2019 are not included in the net impact analysis.
- **Types of educational services offered.** OHSU offers the only public medical school and only (public or private) dental school in the state, and offers educational programs for nursing, allied health professions, and biomedical science and engineering.<sup>22</sup> Many of these programs are unique to the region and the state, and they play a vital role in meeting the critical demand for health care and related services. As such, OHSU keeps local students in the state, brings non-local students to Oregon, and supplies graduates to jobs in the health care sector. With the exception of one-half of the students (106 students) enrolled in the OHSU-PSU School of Public Health, all OHSU students would, in the short-run, leave the state in the absence of the university. Thus, this analysis includes 96.4 percent of tuition revenues and non-university student spending in the net impact analysis.

## ECONOMIC AND FISCAL IMPACT RESULTS

OHSU’s economic impacts in 2019 are based on three major spending categories: 1) expenditures related directly to OHSU’s day-to-day activities include payroll and purchases of goods and services, 2) capital expenditures consist of building construction and remodeling, and capital equipment acquisition, and 3) student expenditures consist of all non-university, non-tuition spending by students for living and other expenses such as rent, groceries, child care, personal care, haircuts, etc. This study will also measure the economic impacts attributed to start-up businesses generated as a result of OHSU research activities. These impacts consist of the estimated spending on payroll and goods and services by bioscience and other companies whose formation was attributed back to OHSU. These impacts are reported separately to maintain consistency with the previous two economic impact reports produced in 2009 and 2014.

### OHSU’s Day-to-Day Operations

In 2019, OHSU spent approximately \$3.93 billion on day-to-day operations, including \$1.98 billion on payroll and \$1.95 billion on goods and services. This spending is shown as the direct output in Table 9. OHSU’s day-to-day operations require a large and growing labor force. In 2019, OHSU directly employed 20,335 persons in Oregon.<sup>23</sup> According to statistics reported by the

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<sup>21</sup> In the 2014 report, it was assumed that 84 percent of charitable contributions would have left the state but for OHSU.

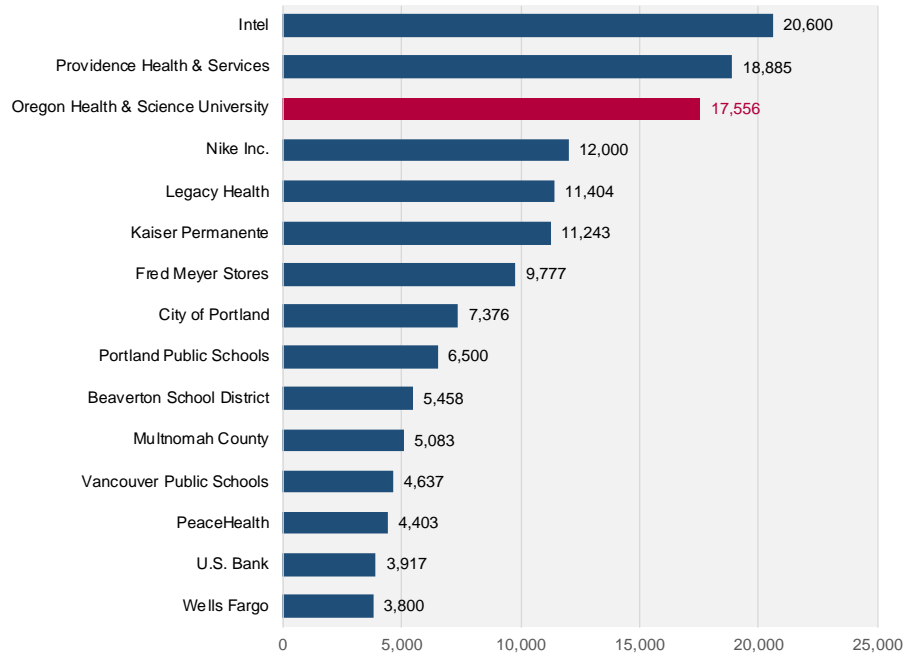
<sup>22</sup> Revenues from student tuition and fees amounted to \$79.5 million in 2019. The loss of these revenues are included in the net impacts of OHSU’s day-to-day operations. The counterfactual scenario for student spending is based on the relocation decision of students in the absence of OHSU rather than revenues.

<sup>23</sup> OHSU employed 20,335 persons over the course of 2019. At any single point in time, the number of OHSU employees will be lower.



Portland Business Journal, OHSU employed 17,556 persons in Portland making it the third largest employer in the Portland metro area in 2019 (see Figure 12).<sup>24</sup>

Figure 12: Portland Metro Area Largest Employers, 2019



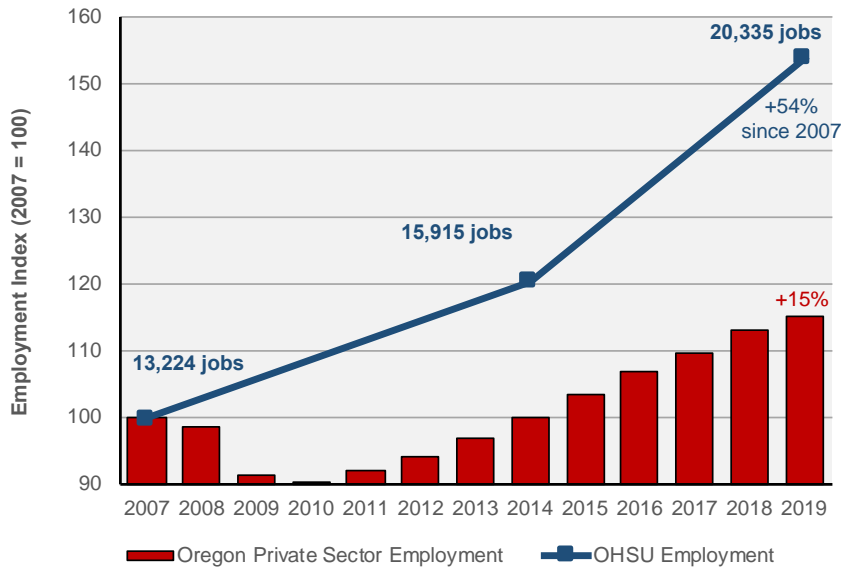
Source: Portland Business Journal

Employment growth at OHSU has exceeded private sector employment growth in Oregon. Since 2007, when the first economic impact report was prepared, employment at OHSU has increased 54 percent compared to 15 percent for all private sector employment in Oregon. (See Figure 13.) This historical trend will likely continue into the future. According to the U.S. Department of Labor, Bureau of Labor Statistics (“BLS”), employment growth nationally in the health care industry is projected to increase 1.6 percent annually between 2018-2028, ranking it first among all industry sectors in terms of employment growth.<sup>25</sup> This compares to a 0.5 percent annual growth rate for all industry sectors.

<sup>24</sup> See the Portland Business Journal’s (“PBJ”) List: Largest Employers in the Portland Metro Area, <https://www.bizjournals.com/portland/subscriber-only/2019/06/27/largest-employers-in-the-portland-metro.html>. Counties included in Portland Business Journal’s definition of the Portland metropolitan area include Clackamas, Multnomah, Washington, and Clark counties. According to the Portland Business Journal, “Information was obtained from firm representatives through questionnaires” and may not be the same as employment numbers presented elsewhere in this report, i.e., PBJ employment numbers may be jobs at a single point in time, whereas, OHSU employment reported in this report are jobs over time (CY2019).

<sup>25</sup> U.S. Department of Labor, Bureau of Labor Statistics, “Employment Projections: 2018-2028”, USDL-19\_1571, September 4, 2019. In addition, the BLS reports the fastest growing occupations in the U.S. include physician assistants (31.1 percent change between 2018-2028, rank #7), nurse practitioners (28.2 percent, #9), and occupational therapy assistants (33.1 percent, #5).

Figure 13: A Comparison of Employment Growth at OHSU and All Private Sector Employers in Oregon, 2007-2019

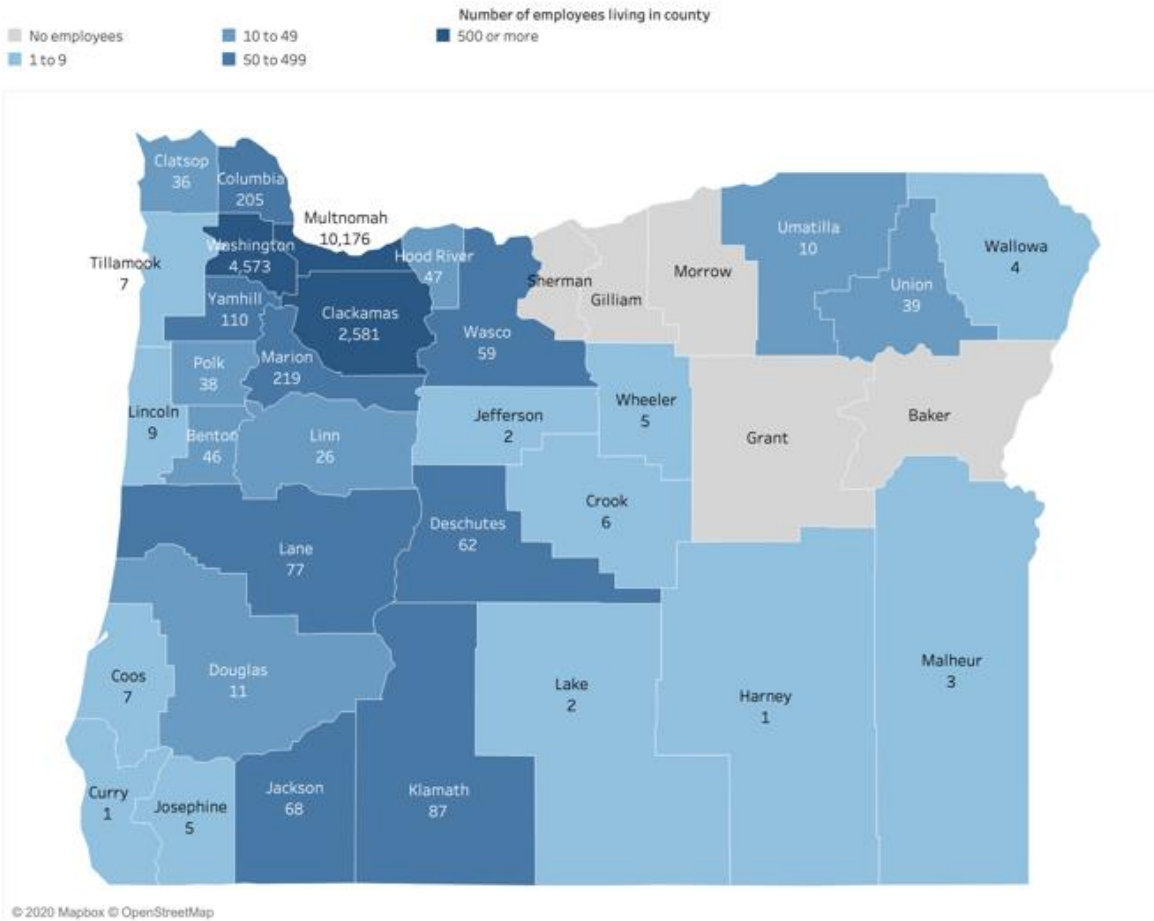


Sources: OHSU and the State of Oregon Employment Department, Quarterly Census of Employment and Wages (“QCEW”), <https://www.qualityinfo.org>.

OHSU is a provider of family-wage jobs for women and ethnic and racial minorities. In 2019, OHSU employed 13,678 women (67.3 percent of OHSU employment) and 4,272 ethnic and racial minorities (24.4 percent of reported OHSU employment).<sup>26</sup> Further, with health care, education, and research activities throughout the state, OHSU is a provider of family-wage jobs throughout the state with OHSU employees living in nearly every part of Oregon (see Figure 14).

<sup>26</sup> In 2019, OHSU’s employment data included 2,825 non-responses or unknowns regarding race, which represents 13.9 percent of all OHSU employment.

Figure 14: Geographic Distribution of OHSU’s Employees’ Residences by Zip Code, 2019

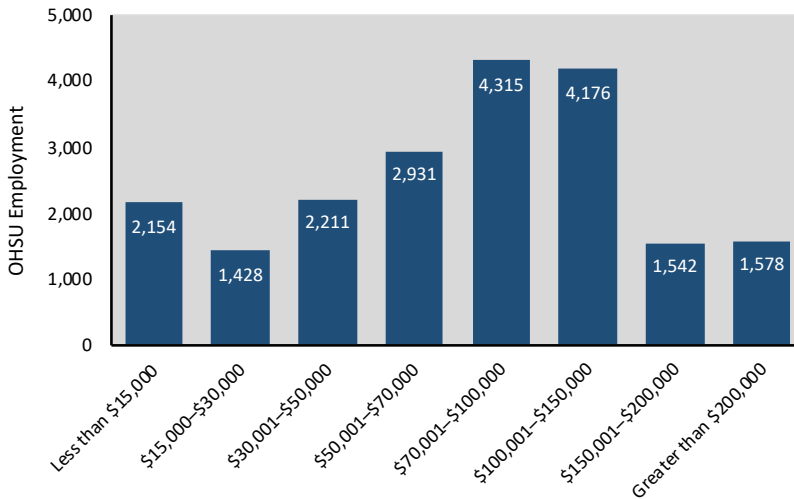


Source: OHSU

OHSU’s day-to-day operations create family-wage jobs for a diverse and well-educated labor force. In 2019, OHSU’s total payroll amounted to \$1.98 billion in income (\$1.54 billion in wages and \$0.44 billion in benefits), which translates into an average annual income of \$97,255 (\$75,610 in average annual wages and \$21,645 in average annual benefits). On average, compensation at OHSU exceeds statewide average wages. According to data from the State of Oregon Employment Department, the average annual wage for all private sector employment in Oregon was \$54,000 in 2019.<sup>27</sup> OHSU average annual wages (not including benefits) exceeds the statewide average wage by 40 percent.

<sup>27</sup> OHSU income includes both wages and benefits. The State of Oregon Employment Department’s Quarterly Census of Employment and Wages (“QCEW”) data reports wages only. According to QCEW’s data definitions: “Wages include tips, commissions, bonuses, vacation, and holiday pay, but do not include benefits.”

Figure 15: OHSU Employment by Income Group, 2019



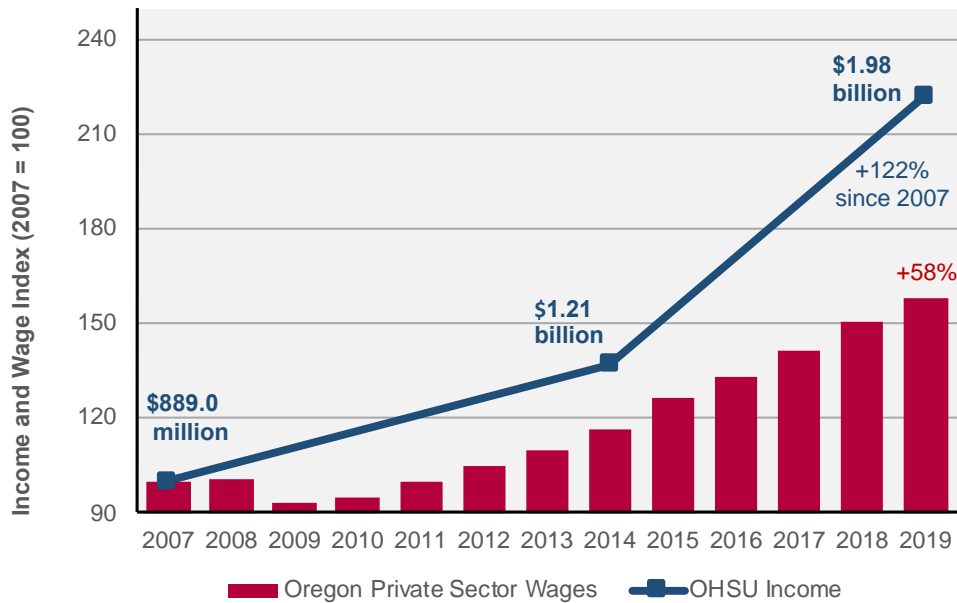
Source: OHSU

In 2019, 56.2 percent of OHSU’s employees made between \$50,000 and \$150,000 in income (see Figure 15). OHSU’s payroll data reflects a variety of employment situations, including employees who work full time (64.5 percent of total employment)<sup>28</sup> and employees who, for various reasons, worked part-time or part of the year (35.5 percent). It’s important to note that individuals who received relatively little compensation in 2019 include, for example, part-time employees such as an adjunct instructor who teaches one class per semester or flex staffers who are hired to provide relief for absences or work on short-term projects, and employees who were hired late in 2019 or left early in 2019.

Income growth at OHSU has been significant (see Figure 16). Since 2007, when the first economic impact report was prepared, income (wages and benefits) at OHSU has increased 122 percent, compared to the 58 percent wage growth for all private sector employment in Oregon.

<sup>28</sup> As reported earlier, the average annual income for all employees, including both full-time and part-time employment, was \$97,255 in 2019. The average annual income for full-time employees at OHSU was \$107,800 in 2019.

Figure 16: A Comparison of Income Growth at OHSU and Wage Growth for All Private Sector Employment in Oregon, 2007-2019



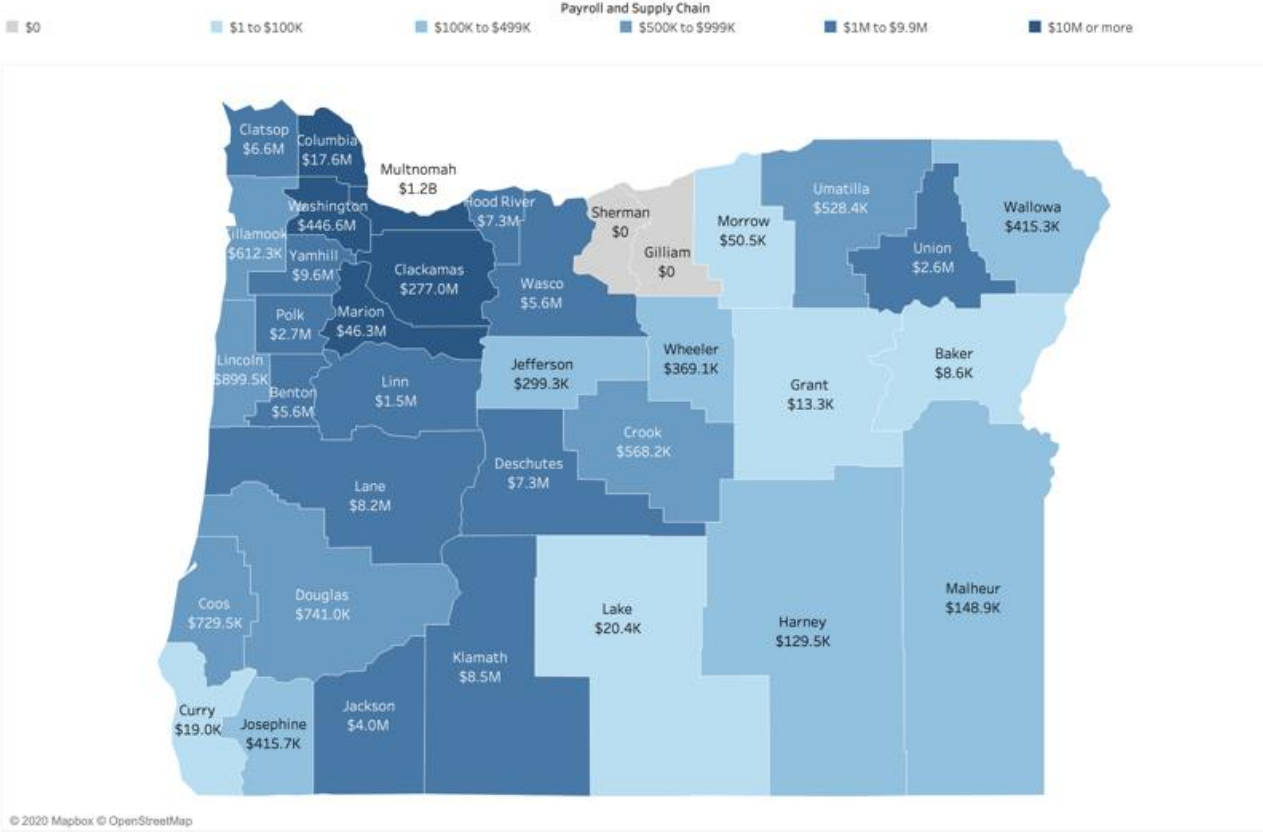
Sources: OHSU and the State of Oregon Employment Department, Quarterly Census of Employment and Wages (“QCEW”), <https://www.qualityinfo.org>.

In addition to the income paid to full- and part-time employees, OHSU also purchases a variety of goods and services necessary to conduct its activities. These supply-chain expenditures include the purchases of medical and dental equipment and supplies, professional and computer services, specialty trade contractors for maintenance and repair services, property and equipment rentals, utilities, and general operating supplies. In input-output terminology, these purchases represent the first round of indirect effects attributed to OHSU.

In 2019, OHSU spent \$1.95 billion on a wide variety of goods and services necessary to support day-to-day operations.<sup>29</sup> Expenditures on goods and services provided by Oregon businesses amounted to \$592.2 million and impacted almost 200 different industry sectors creating 5,400 indirect or supply-chain jobs in almost every county in Oregon. Figure 17 shows how OHSU’s payroll (based on employees’ home location) and supply-chain spending (based on vendor location) impacts counties in Oregon.

<sup>29</sup> Detailed expenditure data was provided by OHSU’s Purchasing Services Department and included 1.5 million records with expense categories and vendor location information. To determine how OHSU spending impacts the state economy, each line item from the operating budget was assigned to one or more of the industrial sectors in IMPLAN model of Oregon. In total, non-payroll operating expenditures were mapped to over 200 different industry sectors in the economic impact model. This level of detail, combined with the mapping of payroll to various household income groups, greatly improves the accuracy of the modeling results.

Figure 17: OHSU Spending on Day-to-Day Operations by County, (Payroll and Supply Chain) 2019



Source: OHSU  
 Note: Day-to-day operations include payroll by employee residence and purchases of goods and services by vendor location. It does not include OHA funding or student spending which will be similarly dispersed throughout Oregon based on educational rotations.

Table 9 reports the gross and net impacts associated with OHSU’s day-to-day operations in 2019. As previously discussed, on a gross or unadjusted basis, OHSU employment and payroll amounted to 20,335 jobs and \$1.98 billion in income (wages and benefits), respectively, in 2019. OHSU’s supply-chain expenditures totaled \$1.95 billion.

- The gross indirect impacts attributed to OHSU’s supply-chain expenditures amount to \$694.8 million in output, including \$361.9 million in income and 5,372 jobs. These impacts are greater than OHSU’s own supply-chain expenditures due to additional rounds of business-to-business purchases and supply-chain impacts that occur in this state.
- The gross induced impacts associated with consumption-driven spending linked to OHSU’s day-to-day operations amount to \$2.16 billion in output, \$991.9 million in income and 14,255 jobs.

The total gross economic impacts attributed to OHSU’s expenditures on day-to-day operations are significant and, in 2019, amounted to \$6.8 billion in economic activity, including \$3.3 billion in income and almost 40,000 jobs in Oregon. *How much of this economic activity would be lost to the state without OHSU?* Based on counterfactual spending and revenue assumptions, Pinnacle

estimates that on a net basis, OHSU’s day-to-day operations in 2019 supported a net increase of \$3.5 billion in total economic activity, including \$1.7 billion in income and 20,714 jobs in Oregon.

Table 9: Gross and Net Impacts of OHSU’s Day-to-Day Activities, 2019

IMPACT CATEGORY / Impact Measure	Direct	Indirect	Induced	Total
<b>GROSS</b>				
Output	\$3,932,355,300	\$694,840,500	\$2,162,333,700	<b>\$6,789,529,500</b>
Income	\$1,977,685,000	\$361,895,600	\$991,873,600	<b>\$3,331,454,200</b>
Jobs	20,335	5,372	14,255	<b>39,962</b>
<b>NET</b>				
Output	\$2,036,566,600	\$359,352,900	\$1,120,976,600	<b>\$3,516,896,100</b>
Income	\$1,025,663,400	\$187,162,700	\$514,254,000	<b>\$1,727,080,100</b>
Jobs	10,546	2,778	7,390	<b>20,714</b>

Sources: Pinnacle Economics using OHSU’s Oregon 2019 payroll and non-payroll operating expense data, and the IMPLAN economic impact model.

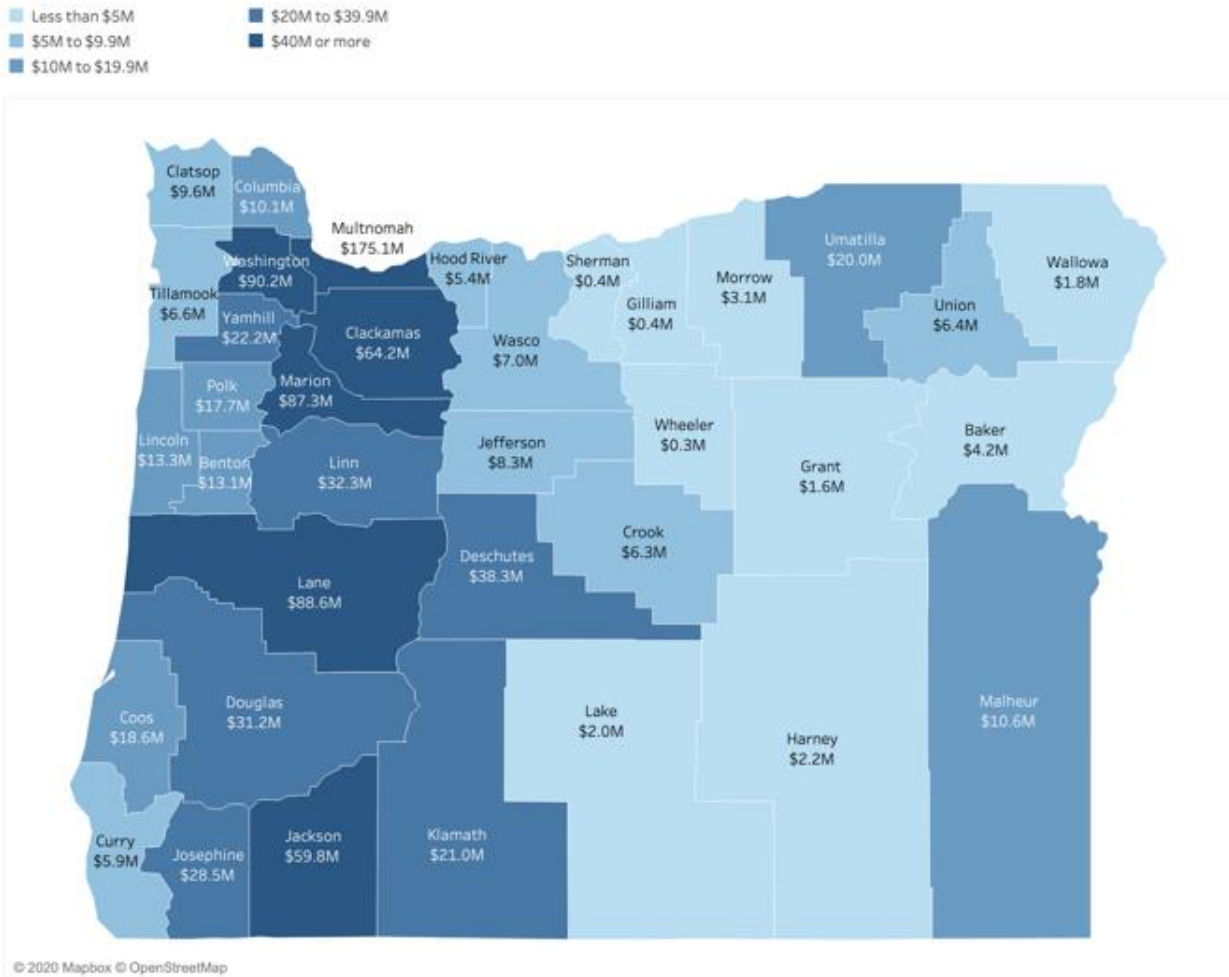
### *OHSU’s Intergovernmental Transfer Agreement with the State and Oregon*

As a public academic health center, OHSU can directly transfer funds to the State of Oregon. As part of an Intergovernmental Transfer (“IGT”) agreement, OHSU transferred \$304.5 million to the State of Oregon in 2019. The Oregon Health Authority then leveraged these funds to access \$894.4 million in federal Medicaid matching funds.<sup>30</sup> Absent the IGT agreement, the State of Oregon would have had \$894.4 million fewer federal Medicaid dollars to provide health care services to low-income Oregonians. Figure 18 provides a sense of how federal Medicaid matching funds directly impact access to health care services across counties in Oregon in 2019.<sup>31</sup>

<sup>30</sup> Oregon’s Medicaid program is funded by a combination of federal and state funds at a roughly 3:1 ratio.

<sup>31</sup> County allocations were made using the Oregon Health Authority, Office of Health Analytics, “Monthly Medicaid Population Report.”

Figure 18: OHSU's IGT Agreement with the State of Oregon and Federal Medicaid Matching Funds Allocated to Oregon Counties Based on Medicaid Enrollments, 2019



Sources: Pinnacle Economics using OHSU's IGT Funding and Federal Medicaid matching rates for 2019, and the Oregon Health Authority, Office of Health Analytics, "Medicaid Population Report."

The gross economic impacts are based on the \$894.4 million in federal Medicaid matching funds allocated to industry sectors providing health care services as part of Oregon's Medicaid Program. Pinnacle developed a custom expenditure model for Oregon's Medicaid Program using detailed expenditure data developed by the Kaiser Family Foundation for Oregon in FY2018, including: 1) acute care services (inpatient hospital, physicians, labs, x-rays, outpatient services, prescription drugs, and other services); 2) long-term care services (nursing facilities, ICF-ID, mental health facilities, and home health and personal care services); and 3) managed care and health plans.<sup>32</sup>

From a net perspective, if OHSU did not exist, it is estimated that 35 percent of OHSU patient revenues would leave the state and 65 percent would accrue to other Oregon hospitals. In 2019, OHSU generated \$1.835 billion in hospital patient revenues, therefore, it is estimated that \$1.193 billion in hospital patient revenues would accrue to other Oregon hospitals in OHSU's absence.

<sup>32</sup> See <https://www.kff.org>



The State of Oregon levies a 6 percent tax on net patient revenues of private hospitals. Absent OHSU and the IGT agreement with the State of Oregon, the 6 percent tax on \$1.193 billion in hospital patient revenues would generate \$71.6 million in tax revenues from other Oregon hospitals and \$210.2 million in federal Medicaid matching funds (using the same approximate 3:1 federal match rate). Thus, from a net perspective, if OHSU did not exist, the state would have received \$684.2 million fewer federal Medicaid matching funds in 2019.

The gross and net impacts attributed to federal Medicaid matching funds accruing to Oregon in 2019 are reported in Table 10. It's important to emphasize that a small portion of these impacts are already accounted for as part of OHSU's day-to-day operations. In order to be consistent with previous reports, however, we have elected to isolate and report separately the economic impacts associated with federal Medicaid matching funds accruing to Oregon under OHSU's IGT agreement with the State of Oregon. As a result, the economic impacts reported in this section of the report should not be added to the economic impacts of OHSU's day-to-day operations.

**Table 10: Economic Impacts from OHSU's IGT Agreement with the State of Oregon and Federal Medicaid Matching Funds, 2019**

IMPACT CATEGORY / Impact Measure	Direct	Indirect	Induced	Total
<b>GROSS</b>				
Output	\$763,858,100	\$258,629,900	\$493,161,200	<b>\$1,515,649,200</b>
Income	\$484,716,200	\$92,921,600	\$164,260,100	<b>\$741,897,900</b>
Jobs	7,025	1,637	3,206	<b>11,868</b>
<b>NET</b>				
Output	\$584,321,500	\$197,841,800	\$377,249,000	<b>\$1,159,412,300</b>
Income	\$370,788,900	\$71,081,300	\$125,652,500	<b>\$567,522,700</b>
Jobs	5,374	1,252	2,453	<b>9,079</b>

Sources: Pinnacle Economics using OHSU data and 2018 IMPLAN model of Oregon.

## OHSU's Capital Spending

By investing in Oregon, OHSU contributes to economic development efforts throughout the state. In its efforts to accommodate growth and provide the highest quality facilities for its patients, employees, and students, OHSU makes significant capital investments that fuel economic development locally, in Portland, and elsewhere in the state.

**Table 11: OHSU Capital Spending, 2019**

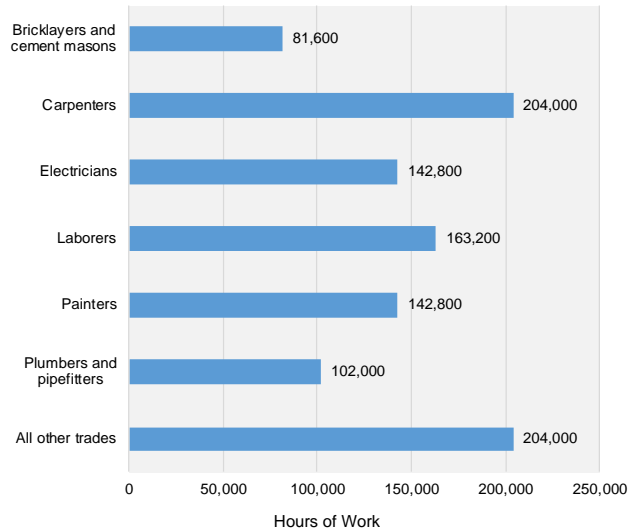
Capital Expenditure Category	Spending	% of Total Capital Spending
Building Improvements	\$47,337,108	23.0%
Building Construction	\$69,430,731	33.8%
Equipment	\$85,449,860	41.6%
Land Improvements	\$1,634,389	0.8%
Other	\$1,703,874	0.8%
<b>Total Capital Expenditures</b>	<b>\$205,555,963</b>	<b>100.0%</b>

Source: OHSU

Between 2012 and 2019, OHSU invested over \$1.9 billion in new equipment and facilities in Oregon. In 2019, OHSU's capital spending totaled \$205.6 million, with spending on construction and building improvements amounting to \$88.2 million to construction contractors and

construction trades (see Table 11).<sup>33</sup> This spending supported an estimated 510 jobs<sup>34</sup> with over 1.04 million hours of work for the construction trades in Oregon (see Figure 18) in 2019.

Figure 19: OHSU Capital Spending and Impacts for the Construction Trades, 2019



Source: Pinnacle Economics using OHSU capital spending on construction hard costs, BLS occupational employment data, and 2018 IMPLAN model of Oregon.

In 2019, OHSU’s capital spending indirectly supported \$218.1 million in economic activity, including \$92.5 million in income and almost 1,500 jobs in Oregon (see Table 12). Oregon’s construction sector was a main beneficiary, but so too were professional services (architectural and engineering), wholesale and retail trade, and manufacturing.<sup>35</sup> With additional consumption-driven spending, the total gross economic impacts associated with OHSU’s capital spending amount to \$297.0 million in output, \$118.8 million in income, and 2,020 jobs.

Table 12: Economic Impacts from OHSU’s Capital Spending, 2019

IMPACT CATEGORY / Impact Measure	Direct	Indirect	Induced	Total
<b>GROSS</b>				
Output	\$0	\$218,091,200	\$78,937,600	<b>\$297,028,800</b>
Income	\$0	\$92,491,400	\$26,311,000	<b>\$118,802,400</b>
Jobs	0	1,499	520	<b>2,020</b>
<b>NET</b>				
Output	\$0	\$146,738,400	\$53,111,600	<b>\$199,850,000</b>
Income	\$0	\$62,231,000	\$17,702,800	<b>\$79,933,800</b>
Jobs	0	1,009	350	<b>1,359</b>

Sources: Pinnacle Economics using detailed OHSU capital spending data and 2018 IMPLAN model of Oregon.

<sup>33</sup> This spending includes only spending on construction services (also called “construction hard costs”). This spending is less than the spending reported for building improvements and building construction in Table 11 because it excludes spending on construction soft costs, such as architectural and engineering services, and state and local permitting.

<sup>34</sup> Given the temporal nature of construction spending, job impacts can be thought of as person-years of labor. For example, one person-year of labor would include a laborer working for three months, followed by a carpenter working for six months, and an electrician working for three months.

<sup>35</sup> There are no direct effects associated with OHSU’s capital spending, as these activities are ancillary to the health care, educational, and research activities conducted by OHSU.

On a net basis, the total economic impacts attributed to OHSU's capital spending amount to \$199.9 million in economic activity, including \$79.9 million in income and 1,359 jobs in Oregon. The modest difference between net and gross impacts shows that much of the funding that supports OHSU's capital spending would be lost to the state "but for" OHSU.

## **OHSU's Student Spending**

OHSU trains thousands of health care professionals each year in Portland and in satellite programs that serve rural areas throughout the state. OHSU offers about 60 types of degrees and certificates in its schools of Medicine, Dentistry, Nursing, Public Health, and College of Pharmacy. In 2018-19, almost 3,000 students attended OHSU programs, which granted 1,500 degrees and certificates.

Spending by students will generate economic activity throughout the economy. This analysis relies on student spending data provided by OHSU's Financial Aid Office to estimate students' non-university spending. OHSU's Financial Aid Office estimates that students will spend \$2,120 per month on non-university expenses. Based on this amount, Pinnacle estimates that OHSU students spent approximately \$56.9 million in Oregon on living expenses in 2019. Spending on tuition and mandatory fees is not included in this category of impacts because they serve as a source of university revenues and partially finance the goods, services, capital, and payroll spending described previously.

To determine the net economic impacts associated with spending by students attending OHSU, we looked at the unique educational services offered by OHSU and assumed that most of the students would leave the state if OHSU did not exist. This assumption is based on a detailed review by OHSU staff of the types of educational services offered and student enrollments at the various schools. These are discussed in detail below. In 2019, we assume that 96.4 percent of enrolled students would continue their education outside of Oregon in the absence of OHSU.

- For the public medical and dental schools, we made this assumption because these are the only such programs in the state and are likely to attract students who are highly willing to relocate to pursue their degree. If OHSU were not here, the students in these programs would almost certainly attend school in another state.
- For the nursing school, we considered the demand for nurses and the shortage of supply for both teachers and program spots. We assume that the overall shortage of spots relative to the demand is such that, in the short-run, if OHSU did not exist, nursing students would be forced to leave the state to obtain a nursing degree.
- Most of the programs in the Department of Biomedical Engineering ("BME") are aimed toward biomedical science and technology. They depend heavily on their proximity to the state's only major academic and research medical center. Therefore, we assume that the small number of students in these programs would seek similarly specialized programs in other states if OHSU did not exist.
- With 213 OHSU-students enrolled in the 2018-2019 academic year, the OHSU-PSU School of Public Health is a collaborative effort between OHSU and Portland State University. OHSU staff estimates that one-half of these students (106 students) would leave the state in the absence of OHSU, with the other one-half continuing their studies at PSU.

This is the only educational program at OHSU that has short-run substitution effects in Oregon.

Table 13 reports the economic impacts associated with non-university spending by OHSU students. Student non-university spending directly supported \$49.2 million in economic activity, including \$14.9 million in income and 485 jobs in Oregon in 2019. The main beneficiaries of student spending are owners of real estate, eating and drinking establishments, general merchandise and other retailers.<sup>36</sup> This spending will largely occur where students live, including those who live near a rural campus or those on a student rotation in a rural area. Student spending will then circulate through other sectors of the Oregon economy via supply-chain and consumption-driven spending. As a result, the total gross economic impacts associated with student spending amount to \$77.2 million in output, including \$24.0 million in income and 658 jobs in 2019.

Table 13: Economic Impacts of OHSU's Students' Non-University Spending, 2019

IMPACT CATEGORY / Impact Measure	Direct	Indirect	Induced	Total
<b>GROSS</b>				
Output	\$49,226,800	\$12,031,900	\$15,970,800	<b>\$77,229,500</b>
Income	\$14,879,700	\$3,780,700	\$5,324,600	<b>\$23,985,000</b>
Jobs	485	68	105	<b>658</b>
<b>NET</b>				
Output	\$47,478,700	\$11,604,600	\$15,403,600	<b>\$74,486,900</b>
Income	\$14,351,300	\$3,646,400	\$5,135,500	<b>\$23,133,200</b>
Jobs	468	65	102	<b>635</b>

Sources: Pinnacle Economics using detailed OHSU student enrollment and spending data and 2018 IMPLAN model of Oregon.

As discussed previously, with the exception of one-half of the students (106 students) enrolled in the OHSU-PSU School of Public Health, all OHSU students would, in the short-run, leave the state in the absence of the university. Thus, the net economic impacts represent 96.4 percent of the gross economic impacts and, in 2019, totaled \$74.5 million in economic activity, including \$23.1 million in income and 635 jobs.

### *OHSU's Startup Companies*

OHSU's Technology Transfer Office is an innovation hub, helping inventors and entrepreneurs protect and commercialize their ideas. Technology Transfer has assisted in the launch of numerous companies based on OHSU research and technologies. These companies will employ workers and purchase a variety of goods and services in Oregon, and, as such, will generate economic and fiscal impacts in this state. These impacts are reported in this section, however, in order to maintain consistency with the previous (2014) report, they are not included in the combined economic impacts reported later. In addition, these impacts should be considered conservative as employment data was not available for all startup companies.

According to recent survey and research efforts, Technology Transfer identified 34 OHSU-related companies with research and/or business activities in Oregon in 2019. These companies employed

<sup>36</sup> The direct output impacts represent approximately 85 percent of the total student spending because some of the initial goods purchased by students are manufactured outside of Oregon, and the state captures only the transportation, wholesale, and retail margins associated with their sale.

319 persons (see Table 14) and marketed 55 products or services in 2019. Pinnacle conducted additional research to map the products and services provided by these companies to the industry sectors in our IMPLAN economic impact model.<sup>37</sup> These companies were engaged in a variety of health care-related activities, including scientific research and development services; software development and publishing; surgical appliance, equipment, and supplies manufacturing; and biological product manufacturing.

**Table 14: OHSU Startup Companies Industry Sectors and Employment, 2019**

Industry (IMPLAN Sectors)	Employment
Pharmaceutical preparation manufacturing	8
Biological product (except diagnostic) manufacturing	7
Semiconductor and related device manufacturing	4
Electromedical and electrotherapeutic apparatus manufacturing	5
Surgical and medical instrument manufacturing	8
Surgical appliance and supplies manufacturing	13
Dental laboratories	1
Software publishers	18
Motion picture and video industries	3
Data processing, hosting, and related services	2
Architectural, engineering, and related services	4
Specialized design services	12
Scientific research and development services	94
Medical and diagnostic laboratories	140
<b>Total All</b>	<b>319</b>

Sources: Pinnacle Economics using OHSU's Technology Transfer survey and research results.

The economic and fiscal impacts associated with OHSU startup companies in 2019 are reported in Table 15 and include:

- Direct economic impacts of \$93.7 million in output, \$29.8 million in income, and 319 jobs. OHSU startup companies will directly generate, either through corporate taxes or taxes paid by their employees, \$2.8 million in tax and fee revenues for state and local governments. In addition, it is estimated that approximately 55 percent of their output will be exported and, as a result, will bring \$51.5 million in “new money” into the state, based on 2019 production levels.
- Total impacts, including the multiplier spending effects, amount to \$167.9 million in output, \$55.8 million in income, 764 jobs, and \$6.0 million in state and local tax and fee revenues. The multiplier effects can be measured in several ways.
  - **Jobs multiplier of 2.4.** Thus, every 10 jobs at OHSU startup companies is linked to another 14 jobs elsewhere in the Oregon economy.
  - **State and local tax impacts per startup employee amounting to \$18,900,** i.e., each startup employee is linked to changes in sales and income that will support, on average, \$18,900 in tax and fee revenues for state and local taxing jurisdictions.<sup>38</sup>

<sup>37</sup> Pinnacle used the direct employment at these companies as the inputs into the appropriate industry sector in the IMPLAN model.

<sup>38</sup> This includes all direct, indirect, and induced tax and fee revenues paid or generated by both employees and businesses.

Table 15: Net Economic and Fiscal Impacts of OHSU Startup Companies, 2019

Type of Impact	Direct	Indirect	Induced	Total
Output	\$93,679,800	\$37,157,300	\$37,021,600	<b>\$167,858,700</b>
Income	\$29,774,800	\$13,741,400	\$12,327,400	<b>\$55,843,600</b>
Jobs	319	204	241	<b>764</b>
S&L Taxes and Fees	\$2,811,000	\$1,322,500	\$1,882,700	<b>\$6,016,200</b>

Sources: Pinnacle Economics using OHSU Technology Transfer data and 2018 IMPLAN model of Oregon.

In consultation with OHSU staff, Pinnacle assumes that OHSU was the catalyst for these startup companies. As such, the economic and fiscal impacts associated with OHSU startup companies are all net impacts, i.e., would not occur in Oregon but for OHSU.

### OHSU's Combined Activities

OHSU's total gross and net economic impacts for all OHSU activities in Oregon in 2019 are shown in Table 16. This includes the impacts generated by OHSU's spending on payroll, goods and services, new equipment and facilities, and non-university spending by OHSU students.

On a gross basis, OHSU contributed \$7.2 billion in economic activity, including \$3.5 billion in income, and 42,639 jobs in Oregon in 2019. After considering counterfactual scenarios for each major activity, this analysis shows net economic impacts amounting to \$3.8 billion in output, including \$1.8 billion in income and 22,707 jobs that would be lost to the state but for OHSU.

Table 16: Gross and Net Economic Impacts of All OHSU Activities, 2019

IMPACT CATEGORY / Impact Measure	Direct	Indirect	Induced	Total
<b>GROSS</b>				
Output	\$3,981,582,100	\$924,963,600	\$2,257,242,100	<b>\$7,163,787,800</b>
Income	\$1,992,564,700	\$458,167,700	\$1,023,509,200	<b>\$3,474,241,600</b>
Jobs	20,820	6,939	14,880	<b>42,639</b>
<b>NET</b>				
Output	\$2,084,045,300	\$517,695,900	\$1,189,491,800	<b>\$3,791,233,000</b>
Income	\$1,040,014,700	\$253,040,100	\$537,092,300	<b>\$1,830,147,100</b>
Jobs	11,014	3,852	7,841	<b>22,707</b>

Sources: Pinnacle Economics using detailed OHSU data and 2018 IMPLAN model of Oregon.

Table 17 reports the net economic impacts for each of OHSU's major activities. Clearly, OHSU's day-to-day activities represent the most significant driver of economic impacts. However, both OHSU's capital spending and OHSU's student spending on non-university expenses are significant and help to diversify the impacts—by occupation, industry, and location—across Oregon.



Table 17: Net Economic Impacts of OHSU by Major Activity Category, 2019

Activity / Impact Measure	Direct	Indirect	Induced	Total
<b>Day-to-Day Operations</b>				
Output	\$2,036,566,600	\$359,352,900	\$1,120,976,600	<b>\$3,516,896,100</b>
Income	\$1,025,663,400	\$187,162,700	\$514,254,000	<b>\$1,727,080,100</b>
Jobs	10,546	2,778	7,390	<b>20,714</b>
<b>Capital Spending</b>				
Output	\$0	\$146,738,400	\$53,111,600	<b>\$199,850,000</b>
Income	\$0	\$62,231,000	\$17,702,800	<b>\$79,933,800</b>
Jobs	0	1,009	350	<b>1,359</b>
<b>Student Spending</b>				
Output	\$47,478,700	\$11,604,600	\$15,403,600	<b>\$74,486,900</b>
Income	\$14,351,300	\$3,646,400	\$5,135,500	<b>\$23,133,200</b>
Jobs	468	65	102	<b>635</b>
<b>Total All Activities</b>				
Output	<b>\$2,084,045,300</b>	<b>\$517,695,900</b>	<b>\$1,189,491,800</b>	<b>\$3,791,233,000</b>
Income	<b>\$1,040,014,700</b>	<b>\$253,040,100</b>	<b>\$537,092,300</b>	<b>\$1,830,147,100</b>
Jobs	<b>11,014</b>	<b>3,852</b>	<b>7,841</b>	<b>22,707</b>

Sources: Pinnacle Economics using detailed OHSU data and 2018 IMPLAN model of Oregon.

**Spending attributed to OHSU has a “multiplier effect” that benefits workers and business owners in other sectors of the Oregon economy.**

All of the impact measures described in Table 1 can be summarized across direct, indirect, and/or induced impact categories using mathematical formulae to measure and explain what economists refer to as the “multiplier effect.” In essence, economic multipliers provide a shorthand way to better understand the linkages between an activity and other sectors of the economy. All else the same, larger economic multipliers suggest greater interdependence between an activity—in this case, OHSU—and the rest of the economy.

OHSU’s Net Economic Impact Multipliers
Output = 1.8
Income = 1.8
Jobs = 2.1

- **OHSU’s net output multiplier is 1.8.** Thus, every million dollars in spending attributed to OHSU generates another \$800,000 in economic activity (output) elsewhere in Oregon.
- **OHSU’s net income multiplier is 1.8.** As such, every million dollars in income directly generated by OHSU is linked to another \$800,000 in income for workers in other sectors of the state economy.
- **OHSU’s net employment multiplier is 2.1.** Thus, every ten direct jobs attributed to OHSU are linked, on average, to another 11 jobs elsewhere in Oregon.

Table 18 reports OHSU’s economic linkages to Oregon industries, on net basis, in 2019. All industry sectors of the Oregon economy benefit from OHSU in this state. Put differently, all major industry sectors—and their workers and business owners—would be negatively impacted in the absence of OHSU in Oregon. The largest beneficiaries from OHSU in Oregon are retailers (1,701 jobs or 19.4 percent of the spillover jobs to non-health care sectors), accommodations and food services (1,182 jobs, 13.5 percent), other services (979 jobs, 11.2 percent), and professional and technical services (681 jobs, 7.8 percent).



Table 18: Total Net Economic Impacts by Major Industry Sector of All OHSU Activities, 2019

Major Industry Sector	Output	Income	Jobs
Natural resources	\$9,982,700	\$3,830,700	90
Utilities	\$36,137,000	\$8,612,700	42
Construction	\$79,305,200	\$32,120,400	437
Manufacturing	\$48,888,300	\$13,393,300	149
Wholesale trade	\$69,371,200	\$29,128,000	249
Retail trade	\$130,334,700	\$71,383,800	1,701
Transportation and warehousing	\$44,286,100	\$20,204,900	303
Information services	\$64,819,500	\$23,380,400	170
Finance and insurance	\$130,929,500	\$46,844,600	501
Real estate and rental and leasing	\$310,806,100	\$64,724,500	602
Professional and technical services	\$93,494,900	\$51,302,700	681
Management of companies	\$25,325,200	\$16,813,600	114
Administrative and waste services	\$52,173,900	\$28,795,600	603
Educational services	\$18,591,200	\$11,441,900	320
Health care and social assistance	\$2,431,573,100	\$1,272,469,200	13,951
Arts, entertainment, and recreation	\$22,690,100	\$11,100,800	341
Accommodations and food services	\$83,308,900	\$41,198,400	1,182
Other services	\$81,227,100	\$49,962,200	979
Government	\$57,988,900	\$33,439,100	293
<b>Total All Industries</b>	<b>\$3,791,233,000</b>	<b>\$1,830,147,100</b>	<b>22,707</b>

Sources: Pinnacle Economics using detailed OHSU data and 2018 IMPLAN model of Oregon.

Table 19 shows the net job impacts attributed to OHSU by demographic group. The net direct jobs represent the gross direct jobs reported by OHSU adjusted for counterfactual spending and revenues. The indirect and induced jobs were estimated using employment data, by gender and race, gathered by the U.S. Equal Employment Opportunity Commission (“EEOC”) for Oregon industries at a three-digit NAICS code level.<sup>39</sup> In 2019, 13,420 jobs accrued to women (59.1 percent of the total net job impacts) and 5,077 jobs (23.9 percent of net reported employment) accrued to ethnic and racial minority employees in Oregon. For comparison, according to the U.S. Census Bureau, in 2019, 50.4 percent of Oregon’s population was female.<sup>40</sup> In addition, 21.1 percent of Oregon’s population 16 years and older were ethnic and racial minorities.<sup>41</sup>

<sup>39</sup> Pinnacle’s Gender and Race Impact Calculator was developed using detailed employment data, by gender and race, gathered by the U.S. Equal Employment Opportunity Commission (“EEOC”). The EEOC requires employers to file reports on the composition of their work forces by sex and by race/ethnic category. Key among these reports are the EEO-1, which is collected annually from private employers with 100 or more employees or federal contractors with 50 more employees, and EEO-4, which is collected biannually from state and local governments with more than 100 employees. Through these reports, EEOC provides employment patterns and participation rates by industry sector at a three-digit NAICS code level, for every state. Industry participation rates for Oregon in 2016 were mapped to the 544 industry sectors in the IMPLAN model of the Oregon economy in 2018.

<sup>40</sup> U.S. Census Bureau, QuickFacts, Oregon, July 2019. See <https://www.census.gov/quickfacts/OR?>

<sup>41</sup> State of Oregon Employment Department. See <https://www.qualityinfo.org/-/race-and-ethnic-diversity-in-oregon-s-workforce>.

Table 19: Net Job Impacts by Gender and Race, 2019

Demographic Group	Direct	Indirect	Induced	Total
<b>Gender</b>	<b>11,014</b>	<b>3,852</b>	<b>7,841</b>	<b>22,707</b>
Men	3,660	1,790	3,837	9,287
Women	7,354	2,062	4,004	13,420
<b>Race</b>	<b>11,014</b>	<b>3,852</b>	<b>7,841</b>	<b>22,707</b>
White	7,196	3,039	5,930	16,166
Black	354	109	263	726
Hispanic	737	351	894	1,982
Asian	1,060	202	400	1,662
Other	202	152	354	707
Unknown	1,465	0	0	1,465

Sources: Pinnacle Economics using detailed OHSU data, 2016 EEOC data for Oregon, and 2018 IMPLAN model of Oregon.

Table 20 summarizes OHSU’s gross and net fiscal impacts for state and local taxing jurisdictions attributed to all OHSU activities in Oregon in 2019. This includes the fiscal impacts generated by OHSU’s spending on payroll, goods and services, new equipment and facilities, and non-university spending by OHSU students and subsequent multiplier spending effects. With the exception of direct personal property taxes paid by OHSU employees,<sup>42</sup> all fiscal impacts were measured by the IMPLAN model. As a result, these fiscal impacts are not directly comparable to the personal property taxes and personal income taxes estimated in the 2014 report. (No fiscal impacts were included in the 2009 report.) In 2019, on net basis, the economic activity attributed to OHSU is linked to \$163.1 million in tax and fee revenues for state and local governments.

Table 20: Gross and Net Fiscal Impacts for State and Local Taxing Jurisdictions of All OHSU Activities, 2019

IMPACT CATEGORY / Type of Tax and/or Fee	Direct	Indirect	Induced	Total
<b>GROSS IMPACTS</b>				
Personal Income Taxes	\$68,126,600	\$12,924,100	\$25,252,900	\$106,303,600
Personal Property Taxes	\$37,967,800	\$169,700	\$331,600	\$38,469,100
All Other Personal Taxes and Fees	\$18,993,400	\$3,304,700	\$6,595,700	\$28,893,800
Corporate Property Taxes <sup>1</sup>	\$2,823,400	\$8,511,800	\$49,006,100	\$60,341,300
All Other Corporate Taxes and Fees	\$32,756,000	\$5,882,200	\$34,440,300	\$73,078,500
<b>TOTAL GROSS</b>	<b>\$160,667,200</b>	<b>\$30,792,500</b>	<b>\$115,626,600</b>	<b>\$307,086,300</b>
<b>NET IMPACTS</b>				
Personal Income Taxes	\$35,922,100	\$6,852,400	\$13,305,100	\$56,079,600
Personal Property Taxes	\$19,698,600	\$89,900	\$174,600	\$19,963,100
All Other Taxes and Fees	\$9,997,200	\$1,752,400	\$3,475,200	\$15,224,800
Corporate Property Taxes	\$2,363,800	\$4,628,800	\$25,820,300	\$32,812,900
Corporate Other Taxes and Fees	\$17,638,700	\$3,202,600	\$18,145,900	\$38,987,200
<b>TOTAL NET</b>	<b>\$85,620,400</b>	<b>\$16,526,100</b>	<b>\$60,921,100</b>	<b>\$163,067,600</b>

Sources: Pinnacle Economics using detailed OHSU data and 2018 IMPLAN model of Oregon.

Note: 1. OHSU does not pay property taxes. Direct corporate property taxes are those paid by businesses impacted by OHSU student spending.

<sup>42</sup> Personal property taxes paid by OHSU employees were estimated using OHSU employment and income by location of residence, and residential property tax revenues as a percent of income for each county in Oregon.

## OHSU Impacts Over Time

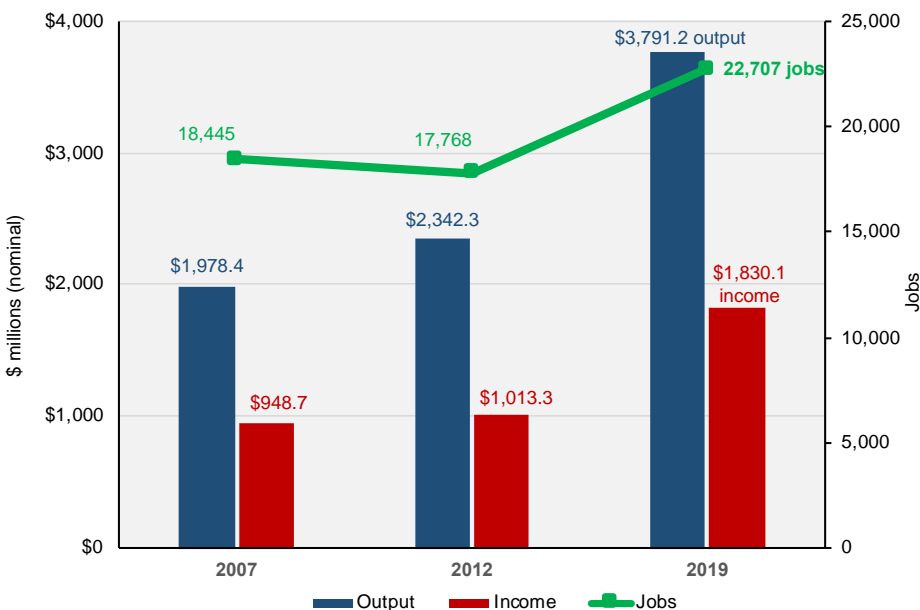
OHSU has commissioned three economic impact studies covering 2007, 2012, and 2019. By almost every measure, growth at OHSU has been significant and has clearly accelerated over the last seven years. For example:

- Since 2007, when the first economic impact report was prepared, gross direct employment at OHSU increased 54 percent compared to 15 percent for all private sector employment in Oregon. OHSU added 4,420 jobs (+28.0 percent) over the last seven years.
- Between 2007 and 2019, OHSU's gross direct income (wages and benefits) increased 122 percent, compared to the 58 percent wage growth for all private sector employment in Oregon. OHSU's payroll increased by \$760 million (+62.3 percent) between 2012 and 2019.

Total net impacts attributed to OHSU increased modestly between 2007 and 2012 (albeit with a small decline in total net jobs), however, total net economic impacts increased significantly over the last seven years (see Figure 20). On a net basis, between 2012 and 2019:

- Total economic activity linked to OHSU increased from \$2.3 billion to \$3.8 billion (a 61.9 percent increase).
- Total net income increased by \$816.8 million (+80.6 percent) and total net jobs increased by 4,939 jobs (27.8 percent).
- In 2012, OHSU generated \$29.9 million in personal income taxes and \$17.3 million in personal property taxes. In 2019, OHSU generated \$56.1 million in personal income taxes (+87.9 percent since 2012) and \$20.0 million in personal property taxes (+15.2 percent).

Figure 20: Changes in OHSU's Total Net Economic Impacts in Oregon



Sources: Pinnacle Economics using detailed OHSU data and 2018 IMPLAN model of Oregon.