



# ECONOMIC IMPACT REPORT

Washington Research Council

August 25, 2005

## The Economic Impact of Physicians' Practices in Washington State, 2003

### EXECUTIVE SUMMARY

In 2003, more than 12,000 men and women worked as physicians (either Doctors of Medicine or Doctors of Osteopathic Medicine) in Washington State. While physicians were employed in a broad range of settings, including nursing homes, medical schools, research laboratories, and government, the vast majority (about 10,700) provided patient care in offices, clinics, and hospitals.

This study calculates the economic impacts of those 10,700 physicians and their practices on the Washington State economy. Focusing on four chief economic indicators—business revenue, employment, personal income, and taxes—this study's results are comparable in method and magnitude to other similar studies performed around the country. For each indicator, practices have both *direct impacts* (which occur within the practices), and *indirect and induced impacts* (which occur elsewhere in the economy).

**Revenue:** In 2003, practice revenue is estimated to have totaled \$5.97 billion (the direct impact). This revenue was reinjected into the state economy via spending by the practices and their employees. That spending rippled through the economy, generating \$5.83 billion in revenue for other businesses (the indirect and induced impacts). Thus the total business revenue attributable to the physicians' practices was almost \$11.80 billion, nearly twice the direct impact. Charity care provided to patients by physicians' practices totaled \$44.6 million.

**Employment:** Physicians practices provided jobs for 10,700 physicians and 48,000 staff. The spending by practices and their 58,700 employees is responsible for creating 57,000 jobs in other sectors of the economy. Thus more than 115,000 jobs economy wide, 3.2 percent of total employment, were directly or indirectly created physicians' practices.

**Wage and Salary Income:** Wages and salaries paid to those working in physicians' practices totaled \$3.0 billion in 2003. In addition these employees received benefits worth about \$0.5 billion. Furthermore, the economic activity of physicians' practices and their employees resulted in \$1.7 billion in personal income for people who worked in other industries, an average of \$29,960 per indirectly created job.

**Taxes:** Physicians' practices also generate significant tax revenue for state and local government. The state collects business and occupation (B&O) tax at the rate of 1.5 percent on most practice revenue in addition to some minor excise taxes. Practices generated \$79.7 million in B&O and other state excise revenue for the state in 2003. Beyond these tax revenues received directly from the practices, the indirect and in-

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duced activity generated by the practices brought additional excise taxes to the state—including sales, use, B&O, and utility taxes—totaling \$127.4 million. Physicians' practices also generated local sales taxes of \$32.8 million. Thus, the total tax revenue generated by physicians' practices was \$239.9 million.

**Impacts per Physician:** This study also looks at these impacts on a per physician basis. For each physician, 5.5 jobs (including the physician's own) are created in physicians' practices and 5.4 jobs are created elsewhere in the economy. The average physician generates about \$558,000 in revenue for the practice and \$545,000 in revenue for other businesses.

The average physician also generated \$7,500 of state tax revenue directly and \$19,600 indirectly, while generating \$3,100 for local governments.

## I. INTRODUCTION

In 2003, more than 12,000 men and women worked as physicians (either Doctors of Medicine or Doctors of Osteopathic Medicine) in Washington State. While physicians were employed in a broad range of settings, including nursing homes, medical schools, research laboratories, and government, the vast majority (about 10,700) provided patient care in offices, clinics, and hospitals.

This study calculates the economic impacts of these 10,700 physicians and their practices on the Washington State economy. Focusing on four chief economic indicators—business revenue (and the expense of charity care to patients), employment, personal income, and taxes—this study's results are comparable in method and magnitude to other similar studies performed around the country. For each indicator, practices have both *direct* impacts (which occur within the practices themselves), and *indirect and induced* impacts (which occur elsewhere in the economy).

The report is organized as follows: Section II describes data we use on employment and revenue for the health care industry, while Section III describes the available data on Washington State physicians. In Section IV we calculate the economic impact of these physicians. In Section V we extend the analysis to physicians whose practices are classified to other health care industries, and in Section VI we combine the results. Section VII documents the uncompensated charity care that physicians' practices provide. Section VIII concludes the report with a review of other studies of the impacts of physicians.

## II. THE HEALTH CARE INDUSTRY

For statistical purposes, the federal and state governments now use the North American Industry Classification System (NAICS). NAICS is intended to provide a consistent system of industrial classification for Canada, Mexico and the United States. Each industry classified by the system is identified by a six-digit number (NAICS code). The system is hierarchical; industries are grouped into sectors, indicated by the first two digits of the NAICS code. Each sector is divided into sub-sectors, indicated by the third digit. Each sub-sector is divided into industry groups, indicated by the fourth digit. Each industry group is divided into NAICS industries, indicated by the fifth digit. Finally, each nation may subdivide NAICS industries into National Industries, indicated by the sixth digit.

Sector 62, titled "Health Care and Social Assistance," contains the health care industries. Within Sector 62 there are four Sub-sectors: 621—

“Ambulatory Health Care Services;” 622—“Hospitals;” 623—“Nursing and Residential Care Facilities” and 624—“Social Assistance.”

The industry group that employs the greatest number of physicians—more than half— is 6211—“Offices of Physicians.” This group is defined thus:

This industry comprises establishments of health practitioners having the degree of M.D. (Doctor of Medicine) or D.O. (Doctor of Osteopathy) primarily engaged in the independent practice of general or specialized medicine (e.g., anesthesiology, oncology, ophthalmology, psychiatry) or surgery. These practitioners operate private or group practices in their own offices (e.g., centers, clinics) or in the facilities of others, such as hospitals or HMO medical centers. (US Census)

Within industry group 6211, the U.S. defines two national industries 621111—“Offices of Physicians (except Mental Health Specialists),” and 621112—“Offices of Physicians, Mental Health Specialists.”

Note that industry group 6211 includes only those clinics that are physician owned. Clinics that are not physician owned (e.g. staff model HMOs) fall under industry group 6214—“Outpatient Care Centers.”

Until very recently, the United States used a system of classifying industries called the Standard Industrial Classification (SIC) System. Under SIC, office-based physicians generally were recorded in either of two “four digit” industries: SIC 8011—“Offices and Clinics of Doctors of Medicine” or 8031—“Offices and Clinics of Doctors of Osteopathy.” Both industries

include offices and clinics owned by physicians as well as clinics that are not owned by physicians.

While the NAICS system is generally much superior to SIC, the transition has presented researchers with considerable difficulties as the changing definitions of industries complicates historical comparisons.

**Revenue by Industry**

Businesses in Washington State are subject to the business and occupation (B&O) tax. The B&O is levied against a business’s gross revenues, with some excep-

tions, and these revenues are reported to the Washington State Department of Revenue (DOR) on the business’s tax return. The DOR releases summaries of revenue and taxes paid by NAICS code quarterly.

In 2003, the state’s health care industries, reflected in NAICS sub-sectors 621, 622 and 623, had gross revenue totaling \$18.7 billion, which was 4.5 percent of the total business revenue in the state. (See Table 1.) The gross revenue of the “Offices of Physicians” industry group was \$4.58 billion. This was 24.5 percent of health care revenues and 1.1 percent of total business revenues.

**Employment by Industry**

The federal government publishes three separate data series on employment. (See Table 2.)

Table 1: Health Care Industries Revenue in 2003

Industry		Gross Revenue	
Title	Code	Amount	Percent
Health Care and Social Assistance	62	19,258,626,086	4.7%
Ambulatory Health Care Services	621	11,827,783,959	2.9%
Offices of Physicians	6211	4,576,674,565	1.1%
Hospitals	622	5,793,263,984	1.4%
General Medical and Surgical Hospitals	6221	5,707,480,294	1.4%
Nursing and Residential Care Facilities	623	1,039,804,640	0.3%
Social Assistance	624	597,773,503	0.1%
All Industries		413,915,113,020	100%

Source: DOR



Table 2: Health Care Employment in 2003

		BLS: Covered		BLS: Non-Agricultural		BEA: Total	
		Employment		Wage and Salary		Employment	
		Number	Percent	Number	Percent	Number	Percent
Health Care and Social Assistance	62	264,997	10.0%	270,700	10.2%	334,592	9.4%
Ambulatory Health Care Services	621	105,179	4.0%	109,900	4.1%	139,250	3.9%
Offices of Physicians	6211	39,649	1.5%	-	-	-	-
Hospitals	622	62,496	2.4%	62,500	2.4%	63,549	1.8%
General Medical and Surgical Hospitals	6221	60,789	2.3%	-	-	-	-
Nursing and Residential Care Facilities	623	52,609	2.0%	52,900	2.0%	55,546	1.6%
Social Assistance	624	44,713	1.7%	45,300	1.7%	76,184	2.1%
All Industries		2,653,776	100%	2,658,000	100%	3,562,494	100%

Source: BLS and BEA

The most basic of these series is produced by the federal Bureau of Labor Statistics (BLS) in cooperation with state employment security departments and counts the number of workers covered by unemployment insurance. This series is derived from the administrative records of the unemployment insurance system.

The major advantage of this data series is that it is available to the six-digit industry level and by county. Disadvantages include a roughly six-month publication lag and the failure to count those workers not covered by unemployment insurance (e.g., the self-employed). For 2003, average monthly covered employment for the state of Washington totaled 2,653,776. Health care covered employment (NAICS 621, 622 and 623) totaled 220,284, or 8.3 percent of the total.

The second data series on employment, also produced by the BLS in cooperation with state employment security departments, is the non-agricultural wage and salary employment series. This series is produced from a monthly survey of business payroll records, the Current Employment Survey (CES). The CES is the timeliest information on employment that the government provides and it is generally broader than the covered employment series. Industry detail, however, is only available to the three-digit level, and farm employment is not included. (The 2003 figure for covered employment in Washington State includes 57,509 employed on farms.) The series only counts those who are wage and salary employees of business establishments and omits proprietors. For 2003, CES puts Washington State employment at 2,658,000 including 225,300 in the health care sub-sectors.

The most comprehensive measure of employment is that produced by the U.S. Department of Commerce's Bureau of Economic Analysis (BEA). The BEA's measure of employment includes the self-employed proprietors who are not captured in the covered employment or non-agricultural employment series. The BEA provides industrial breakdown of employment to only the three-digit level. For 2003, the BEA places Washington's total average employment at 3,562,494. Of this, 258,345 (7.3 percent), is in the three health care sub-sectors.

As we show in Section III, a substantial number of physicians work as proprietors of their practices rather than wage and salary employees and are

**Table 3: Covered Employment and Percent Total Covered Employment for Health Care Sectors by County**

	Health Care and Social Assistance		Ambulatory Health Care Services		Offices of Physicians		Hospitals		Nursing and Residential Care Facilities	
	NAIC: 621		NAIC: 6211		NAIC: 62111		NAIC: 622		NAIC: 623	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Adams	366	5.3%	218	3.1%	D	D	0	0%	78	1.1%
Asotin	812	15.2%	203	3.8%	86	1.6%	D	D	194	3.6%
Benton	5,630	8.3%	2,596	3.8%	1,106	1.6%	D	D	1,143	1.7%
Chelan	4,328	12.3%	1,902	5.4%	1,218	3.5%	D	D	745	2.1%
Clallam	2,071	10.0%	893	4.3%	363	1.7%	0	0%	625	3.0%
Clark	13,372	11.6%	5,497	4.8%	1,914	1.7%	D	D	2,707	2.3%
Columbia	46	3.1%	D	D	0	0.0%	0	0%	0	0%
Cowlitz	4,550	12.7%	1,490	4.2%	473	1.3%	D	D	D	D
Douglas	426	4.7%	173	1.9%	D	D	0	0%	217	2.4%
Ferry	65	4.0%	D	D	0	0%	0	0	D	D
Franklin	1,888	8.5%	652	2.9%	140	0.6%	D	D	334	1.5%
Garfield	D	D	D	D	0	0%	0	0	0	0.0%
Grant	2,234	7.1%	1,431	4.6%	481	1.5%	0	0%	346	1.1%
Grays Harbor	1,981	8.5%	681	2.9%	249	1.1%	D	D	364	1.6%
Island	1,154	7.8%	574	3.9%	186	1.3%	0	0%	230	1.6%
Jefferson	691	8.1%	209	2.5%	54	0.6%	0	0	129	1.5%
King	93,511	8.6%	37,451	3.4%	12,890	1.2%	23,527	2%	16,078	1.5%
Kitsap	9,121	11.8%	3,610	4.7%	1,475	1.9%	D	D	2,559	3.3%
Kittitas	824	6.6%	306	2.5%	134	1.1%	0	0%	373	3.0%
Klickitat	243	4.2%	122	2.1%	D	D	0	0	64	1.1%
Lewis	2,710	11.1%	1,004	4.1%	464	1.9%	D	D	738	3.0%
Lincoln	76	2.6%	D	D	D	D	0	0	D	D
Mason	922	7.3%	372	2.9%	143	1.1%	0	0%	427	3.4%
Okanogan	1,060	6.4%	613	3.7%	334	2.0%	0	0	236	1.4%
Pacific	444	7.2%	108	1.8%	32	0.5%	0	0%	193	3.1%
Pend Oreille	96	3.3%	D	D	D	D	0	0	D	D
Pierce	32,237	13.3%	11,904	4.9%	4,847	2.0%	8,137	3%	5,329	2.2%
San Juan	229	4.5%	75	1.5%	D	D	0	0	92	1.8%
Skagit	4,140	9.3%	2,058	4.6%	927	2.1%	0	0%	1,411	3.2%
Skamania	37	1.9%	D	D	0	0%	0	0	D	D
Snohomish	18,630	9.0%	8,298	4.0%	2,912	1.4%	D	D	4,184	2.0%
Spokane	27,275	14.3%	9,885	5.2%	3,599	1.9%	8,030	4.2%	5,543	2.9%
Stevens	1,423	14.2%	555	5.5%	164	1.6%	D	D	D	D
Thurston	9,415	10.6%	3,697	4.2%	1,342	1.5%	D	D	D	D
Wahkiakum	74	9.3%	D	D	0	0%	0	0%	D	D
Walla Walla	3,304	13.2%	985	3.9%	456	1.8%	1,092	4.3%	892	3.6%
Whatcom	7,507	10.4%	2,616	3.6%	1,160	1.6%	D	D	1,893	2.6%
Whitman	1,062	7.0%	374	2.5%	204	1.3%	D	D	296	1.9%
Yakima	10,596	11.4%	4,180	4.5%	1,841	2.0%	2,738	2.9%	2,232	2.4%

D: Data not disclosed in order to protect business privacy

Source: BLS

not counted in the covered employment or non-agricultural wage and salary employment series.

Table 3 shows covered employment by county for the health care sub-sectors and the “Offices of Physicians” industry group. The health care industry is directly responsible for 10 percent of employment in Washington, while physicians’ practices are responsible for 1.5 percent of employment.

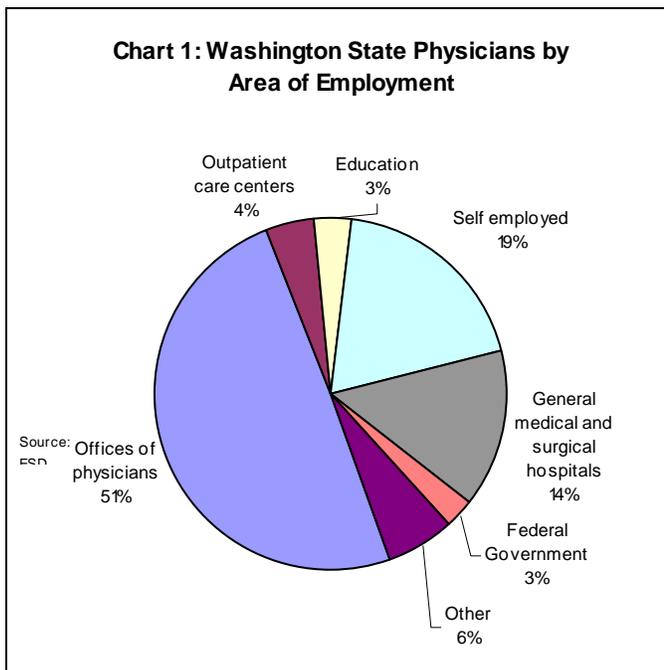
Furthermore, of the three largest employers, King County employs 36 percent of health care employees, with Pierce and Spokane counties employing 12 percent and 10 percent respectively. King County also employs 33 percent of those physicians' practices, with Pierce and Spokane counties employing 12 percent and 9 percent respectively.

### III. PHYSICIANS IN WASHINGTON STATE

How many physicians work in Washington State? This is not a simple question to answer given that the employment data regularly collected by state and federal government is categorized by industry rather than occupation or profession.

The closest thing there is to an administrative count comes from the Washington State Department of Health, which licenses physicians. The Department of Health reports that in 2003 there were 20,118 Doctors of Medicine and 764 Doctors of Osteopathic Medicine licensed by Washington state. This provides an upper bound on the possible number of physicians practicing in the state, but certainly not all of those who are licensed in this state currently practice here.

A more reliable estimate comes from the Washington State Employment Security Department (ESD), which prepares short- and long-range occupational projections as career planning aids for state residents. For use as an input to the most recent projections, ESD has estimated employment by occupation and industrial group for Washington State in 2002. These estimates put the number of physicians working in the state in 2002 at 12,087. ESD projects that the number of physicians will grow to 13,487 (2.2 percent per year) by 2007 and then to 14,669 by 2012 (1.7 percent per year). We describe the ESD estimates for 2002 in more detail in the following subsection and use these estimates in preparing our calculations of physicians' economic impact.



The American Medical Association (AMA) provides alternate estimates of the number of physicians in the state, which are a bit higher than the ESD estimates. The AMA estimates that in 2000, excluding those working for the federal government, there were 12,485 physicians in the state whose major professional activity was patient care. The AMA estimates do not link these physicians to industries and so are less useful than the ESD estimates in calculating economic impacts. The AMA data, however, does provide interesting detail on specialties and geographic location of physicians, which we summarize in Table 5.

#### ESD Estimates of Physicians in Washington State

Washington State's occupational estimates and forecasts are based in part on the Occupational Employment Statistics (OES) program, which is a cooperative program of the BLS and state employment security agencies to produce estimates of employment and wages by industry and occupation. The OES program

surveys a nationwide sample of 1.2 million establishments over a three-year cycle. The survey collects data on employment and wages by occupation and industry for individuals who work full and part time for wages and salaries.

Excluded from the OES survey are agricultural workers, household workers, unpaid family workers, and the self employed.

**Table 4: Washington State Doctors by Area of Employment**

	Number	Percent
Offices of physicians	6,008	49.71%
Self employed	2,319	19.19%
General medical and surgical hospitals	1,732	14.33%
Outpatient care centers	535	4.42%
Education	396	3.27%
Federal Government	346	2.86%
Scientific research and development services	149	1.24%
Local Government	136	1.13%
Psychiatric and substance abuse hospitals	81	0.67%
Medical and diagnostic laboratories	66	0.55%
Offices of other health practitioners	60	0.49%
Private households	41	0.34%
Residential mental health facilities	37	0.31%
State Government	31	0.26%
Druggists' Goods Merchant Wholesalers	28	0.23%
Individual and family services	25	0.21%
Offices of dentists	25	0.21%
Employment services	13	0.11%
Home health care services	11	0.09%
Aerospace product and parts manufacturing	9	0.08%
Insurance agencies, brokerages, and related	9	0.07%
Advertising and related services	9	0.07%
Other amusement and recreation industries	7	0.06%
Management and technical consulting services	4	0.03%
Other ambulatory health care services	3	0.03%
Community care facilities for the elderly	2	0.02%
Other hospitals	2	0.02%
Scheduled air transportation	1	0.01%
Facilities support services	1	0.01%
Religious organizations	1	0.01%
<b>Total</b>	<b>12,087</b>	

Source: ESD, WRC

Washington State’s Employment Security Department (ESD) is an OES partner and uses survey results in preparing occupational estimates and forecasts for the state. The coverage of the ESD estimates go beyond that of the OES survey to include the agricultural and household sectors, unpaid family workers, and the self-employed. However, while ESD does estimate the occupations of unpaid family workers and the self-employed, it does not allocate these individuals to specific industries.

The data presented in Table 4 and graphed in Chart 1 are derived from ESD’s occupational employment estimates for 2002. The 12,087 physicians that ESD estimates worked in Washington in 2002 include 9,768 wage and salary employees and 2,319 self-employed. ESD is able to distribute wage and salary physicians to specific industries, as shown. The self-employed physicians, however, are not assigned to specific industries. Almost 50 percent of physicians worked in industry group 6211—“Offices of Physicians.” The second largest fraction, 19 percent, was self-employed. Following in order were general medical and surgical hospitals (14.3 percent), outpatient care centers (4.4 percent) and education (3.2 percent). Together these five categories account for almost 91 percent of physicians.

The use of the term “self-employed”, as it is applied to physicians, can cause confusion. Most of those physicians listed under industry group 6211 are owners of the offices or clinics in which they practice and so actually are self-employed. (The AMA data on physicians uses the term “self-employed” in this way.) Conversely, most of the physicians shown as “self employed” in Table 4 and Chart 1 are surely working in industry group 6211. As we use the term, physicians are self-employed only if they report their income from their practices as profit on Schedule C of the federal income tax form rather than as salary on Schedule A.

As we noted above, the AMA estimates that there are a greater number of physicians working in Washington State than does ESD. Table 5 shows the AMA estimates for a detailed range of specialties in 2000. The AMA was

**AMA Estimates of Physicians in Washington State**

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**Table 5: Nonfederal Physicians in Washington State by Specialty and Activity, 2000**

	Patient Care					Other Professional Activity			
	Total	Total PC	Hospital Based			Admini- stration	Teaching	Research	Other
			Office Based	Resident or Fellow	Staff				
<b>Medical Specialty</b>	<b>4066</b>	<b>3740</b>	<b>3138</b>	<b>436</b>	<b>166</b>	<b>87</b>	<b>48</b>	<b>181</b>	<b>10</b>
Internal Medicine	2150	1962	1607	272	83	54	18	111	5
Pediatrics	1015	943	780	117	46	20	18	31	3
Cardio Disease	284	264	234	16	14	2	0	14	0
Gastroenterology	196	187	171	8	8	2	0	5	0
Dermatology	192	186	173	7	6	2	2	1	1
Pulmonary Disease	142	124	104	14	6	6	3	9	0
Allergy	68	58	55	1	2	1	4	8	1
Pediatric Cardiology	18	16	14	1	1	0	1	1	0
Epidemiology	1	0	0	0	0	0	2	1	0
<b>Other Specialty</b>	<b>3959</b>	<b>3566</b>	<b>2898</b>	<b>374</b>	<b>294</b>	<b>147</b>	<b>58</b>	<b>131</b>	<b>57</b>
Anesthesiology	855	805	680	67	58	9	22	14	5
Psychiatry	686	633	498	0	70	27	6	16	4
Emergency Medicine	530	513	418	33	62	14	3	0	0
Diagnostic Radiology	446	423	330	71	22	4	7	5	7
Pathology	304	246	186	35	25	0	7	18	19
Neurology	202	190	161	19	0	1	3	7	1
Physical Rehab	155	141	115	0	6	7	2	4	1
Radiology	133	129	114	5	10	0	0	3	1
Other	112	59	56	0	3	23	1	26	3
Child Psychiatry	96	92	77	7	8	1	2	0	1
Radiation Oncology	90	88	79	7	2	14	1	1	0
Unspecified	89	83	45	32	6	1	0	1	4
Occ. Medicine	83	57	51	65	6	19	0	5	2
Preventative Med	60	46	39	7	10	4	1	8	1
Public Health	53	12	11	20	1	19	3	15	4
Nuclear Medicine	37	30	25	2	3	2	0	4	1
Forensic Pathology	11	6	4	1	1	1	0	1	3
Aerospace Medicine	9	8	7		1	1	0	0	0
Medical Genetics	8	5	2	3	0	0	0	3	0
<b>Surgical Specialty</b>	<b>2805</b>	<b>2719</b>	<b>2377</b>	<b>252</b>	<b>90</b>	<b>21</b>	<b>29</b>	<b>21</b>	<b>15</b>
ObGyn	693	671	606	42	23	3	13	6	0
General Surgery	601	585	465	98	22	6	4	4	2
Orthopedic Surgery	486	466	410	45	11	5	4	3	8
Ophthalmology	326	323	293	18	12	0	1	2	0
Otolaryngology	207	205	183	17	5	2	0	0	0
Urology	193	184	161	16	7	2	3	2	2
Plastic Surgery	110	106	99	3	4	1	0	0	1
Neurological Surgery	102	94	80	11	3	1	2	3	2
Thoracic Surgery	68	66	62	2	2	1	0	1	0
Colon & Rectal	17	17	17	0	0	0	0	0	0
Transplantation	2	2	1	0	1	0	2	0	0
<b>GP/FP Prac</b>	<b>2560</b>	<b>2460</b>	<b>2120</b>	<b>237</b>	<b>103</b>	<b>49</b>	<b>30</b>	<b>10</b>	<b>11</b>
Family Practice	2261	2172	1847	237	88	44	30	9	6
General Practice	299	288	273	0	15	5	0	1	5
<b>Inactive</b>	<b>1996</b>								
<b>Total</b>	<b>15386</b>	<b>12485</b>	<b>10533</b>	<b>1299</b>	<b>653</b>	<b>304</b>	<b>165</b>	<b>343</b>	<b>93</b>

Source: AMA

able to classify a total of 15,386 physicians in Washington State. The major professional activity of 12,485 (81 percent) was patient care. Another 905 (6 percent) had a major activity such as administration, teaching, or research, while 1,996 (13 percent) were not active.

Of note, 20 percent of all patient care physicians are in a general or family practice, while 22 percent practice in a surgical specialty, and 30 percent practice in a medical specialty such as immunology or pediatrics. Twenty-nine percent of patient care doctors practice other medical specialties, such as anesthesiology, psychiatry or diagnostic radiology. Sixteen percent of patient care physicians are employed by a hospital to provide patient care or conduct research.

**Table 6: Physicians per county (2000)**

	Number		Number
Adams	12	Lewis	85
Asotin	38	Lincoln	9
Benton	264	Mason	59
Chelan	226	Okanogan	57
Clallam	181	Pacific	25
Clark	550	Pend Oreille	8
Columbia	4	Pierce	1,606
Cowlitz	194	San Juan	63
Douglas	29	Skagit	265
Ferry	4	Skamania	3
Franklin	49	Snohomish	972
Garfield	3	Spokane	1,226
Grant	69	Stevens	44
Grays Harbor	74	Thurston	3
Island	119	Wahkiakum	185
Jefferson	78	Walla Walla	403
King	7,676	Whatcom	60
Kitsap	480	Whitman	394
Kittitas	43	Yakima	568
Klickitat	26		

Table 6 shows the distribution of physicians across counties. King County accounts for 47 percent of all doctors in Washington State, while Pierce and Spokane counties account for 10 percent and 7 percent of doctors respectively. Yakima and Clark counties, the next highest contributors, each account for only 3.5 percent of all doctors.

**IV. ECONOMIC IMPACT OF THE OFFICES OF PHYSICIANS INDUSTRY GROUP**

We start by calculating the economic impact of the physicians who work within physicians’ practices (i.e., the “Offices of Physicians” industry group). We identify the impact of those physicians with the industry group as a whole.

**The WRC-REMI Model of the Washington State Economy**

We will estimate economic impacts using a model of the Washington State economy constructed specifically for the Washington Research Council by Regional Economic Models, Inc. Because it allows supply and demand responses to changes in prices and wages, and

permits substitution among factors of production, the WRC-REMI model is more elaborate than the standard input-output models commonly employed to estimate regional economic impacts. (Treyz 1993).

The core of the standard input-output model is a catalog of inter-industry purchases for the region in a base year, arrayed in an input-output table. The model then assumes that as a specific industry’s production increases or decreases, its purchases from the region’s other industries will change proportionately. Likewise, the industry’s employment will change by the same proportion that its output changes.

Based on these assumptions, the model traces the cascading effects as one industry’s increase in output stimulates an increase in the output of other industries (and its own). These effects are distilled in multipliers that measure how a change in the demand for the output of one industry will affect the total output of the local economy, or how a change in the employment of one industry will affect the total output of the local economy (Chase et al. 1993).



The standard input-output model, however, is incomplete because it fails to model the numerous capacity constraints within the economy, the processes that set prices for goods and services and the responses of consumers and producers to changes in these prices. In the input-output model, industry and labor supply are perfectly elastic—so prices and wage rates do not matter.

By comparison, prices and wages do matter in the WRC-REMI model. The model divides the state into two sub-regions: the four central Puget Sound counties (King, Kitsap, Pierce, and Snohomish) and the balance of the state. There are seventy industrial sectors within each sub-region. (In most cases, these industries are NAICS sub-sectors. Within each sub-region the model tracks inter-industry transactions, much as an input-output model would.

Unlike an input-output model, however, the WRC-REMI model incorporates a number of significant behavioral responses to changes in prices and costs. The wage rate depends on the supply and demand for labor, while migration and labor force participation rates will respond to changes in wage rates. The consumer purchases of specific goods and services respond to changes in relative prices and in personal income. Producers substitute among production factors in response to changes in relative factor costs. Market shares respond to changes in regional production costs.

To see the impact of physicians' practices as an industry, we first run a baseline simulation for the state economy for the eight-year period from 2003 to 2013, followed by a simulation of the state economy with that sector removed. The impact of the industry group on an economic variable then shows up as the difference between the variable's values in the two simulations.

**Table 7: Direct and Total Impacts For Offices of Physicians, 2003**

	Revenue (Billions of \$)	Jobs	W & S Income (Billions of \$)
Offices of Physicians (Direct)	\$ 4.577	44,974	\$ 2.248
Other Industries (Indirect & Induced)	\$ 4.469	43,684	\$ 1.309
Total	\$ 9.045	88,658	\$ 3.557
Implied Multipliers	1.98	1.97	1.58

More specifically, the simulations proceed in this way: NAICS sub-sector 621—"Ambulatory Health Care Services," is one of the industries represented by the model. We reduce overall revenue of this industry by our estimate of revenue in physicians' practices, reduce employment by our estimate employment in physicians' practiced, and reduce wages of our estimate of wages in physicians' practices. Based on the reductions in revenue and wages, the model calculates a consistent reduction in purchases of intermediate inputs.

*Revenue.* We use the \$4.58 billion revenue figure reported by DOR as our estimate of revenue in physicians' practices for 2003 (Table 1). For subsequent years, we assume that revenue in physicians' practices remains the same fraction of ambulatory care revenue it was for 2003.

*Employment.* Our calculation of employment for 2003 starts with the 39,649 covered employees (Table 2). To this we add (consistent with the ESD's 2002 occupational and estimates) 3,325 wage and salary employees not covered by unemployment insurance and 2,000 self-employed physicians, giving a total employment of 44,974. For subsequent years we assume employment in physicians' practices remains the same fraction of ambulatory care employment it was for 2003.

*Wages, Salaries and Physician Income.* Our calculation of employee income in 2003 starts with the wages reported by ESD for the covered employment in the “Offices of Physicians” sub-sector. We assume that the average annual wage of the employees not covered by unemployment insurance is \$30,000 and that the average income of the self-employed physicians is \$164,000, based on data from BLS salary surveys. For years after

2003, we assume that incomes in the “Offices of Physicians” industry group grow at the same rate as the income for the full “Ambulatory Care” sub-sector grows.

**Results**

Table 7 summarizes the impacts of physicians’ practices on the Washington State economy in 2003. Revenue of the practices was \$4.58 billion dollars. In addition to this direct revenue, the money that these businesses paid to employees and spent on supplies rippled through the economy and

boosted revenues of other businesses by \$3.92 billion, so that the total business revenue linked to the physicians’ practices was almost \$8.5 billion.

In terms of jobs, 44,974 people worked in the industry directly, while 43,684 jobs in other industries were induced. Those working in physicians’ practices received nearly \$2.25 billion in wages and salaries, while wages and salaries outside the industry were \$1.31 billion higher because of the impact of physicians’ practices.

The relationship between the direct and induced effect of economic activity is conventionally represented by multipliers, which are the fundamental analytical constructs of input-output models. The multipliers relate changes in the level of activity in a particular industry to changes in overall activity. While multipliers do not play such a central role in the WRC-REMI model, it is straightforward to calculate multipliers for the Offices of Physicians industry from the result presented in Table 7. Such output, employment and wage and salary income multipliers are shown in the bottom row of Table 7.

The output multiplier for 2003 indicates that the direct and indirect business revenue losses when we remove “Offices of Physicians” from the industry in 2003 was 1.98 times the “Office of Physicians” direct revenue.

The employment multiplier indicates that the direct and indirect employment losses when we simulate removal of the “Offices of Physicians” industry is 1.97 times the jobs lost in the industry itself.

The wage and salary income multiplier indicates that the direct and indirect income

**Table 8: Offices of Physicians Impact on Taxes, 2003**

	Amount (millions of \$)	Per Physicians Offices Job	Per Physician
State Excise Taxes*			
Direct	\$ 61.1	\$ 1,358	\$ 7,531
Cumulative	\$ 158.8	\$ 3,530	\$ 19,575
Local Sales Taxes	\$ 25.2	\$ 560	\$ 3,104

\*All taxes reported on the state Combined Excise Tax Return, including Sales, Use, B&O, and Utility

**Table 9: Impact of Physicians Offices by Industry, 2003**

	Output Millions \$	Employment	W&S Income Millions \$
Forestry, Fishing, Other	\$ 9.8	32	\$ 3.1
Mining	\$ 1.4	12	\$ 0.6
Utilities	\$ 34.7	82	\$ 4.9
Construction	\$ 365.8	3,290	\$ 114.7
Manufacturing	\$ 554.2	2,318	\$ 120.1
Wholesale Trade	\$ 222.9	1,420	\$ 77.0
Retail Trade	\$ 428.4	6,706	\$ 161.8
Transportation, Warehousing	\$ 120.1	899	\$ 35.9
Information	\$ 257.4	807	\$ 63.7
Finance, Insurance	\$ 451.3	2,251	\$ 101.7
Real Estate, Rental, Leasing	\$ 515.0	1,939	\$ 23.4
Professional and Technical Services	\$ 323.0	3,296	\$ 138.6
Management of Commercial Enterprises	\$ 154.8	524	\$ 38.8
Administrative and Waste Services	\$ 245.5	4,097	\$ 95.5
Educational Services	\$ 45.7	1,207	\$ 23.0
Health Care, Social Assistance	\$ 4,824.9	48,818	\$ 2,307.0
Arts, Entertainment, Recreation	\$ 72.6	1,556	\$ 22.8
Accommodations, Food Services	\$ 226.1	4,514	\$ 69.6
Other Services (excl Gov)	\$ 191.5	3,659	\$ 72.2
Government		1,232	\$ 82.5
Total	\$ 9,045.4	88,658	\$ 3,557.0



lost when we remove the “Offices of Physicians” industry in 2003 is 1.58 times the income lost in the industry itself.

In the final year of the simulation, 2012, the multipliers are slightly larger.

The model also indicates a significant impact on tax revenue. The practices themselves paid \$61.1 million in B&O and other state excise taxes in 2003. Economy-wide, the impact on state excise taxes, including sales, use, B&O, and utility taxes, was \$158.8 million. Local sales taxes were an additional \$25.2 million.

Table 9 shows the distribution of impacts across industries.

### V. EXTENSION TO OTHER PHYSICIANS’ PRACTICES

In the cases of physicians working in industries other than “Offices of Physicians,” we cannot identify the impact of the physicians as the impact of the full industry. The issue becomes what share of the industry’s impact to allocate to the physicians.

Looking at the distribution of physicians by industry shown in Table 4, the physicians who work in hospitals, outpatient care centers, and offices of dentists and of other practitioners have practices that are similar to the practices of physicians who work in the “Offices of Physicians” industry group. We estimate that there were 2,476 such physicians in 2003. We also estimate the impact of these other physicians’ practices on the assumption that they are the same on a per physician basis as we find in the “Offices of Physicians” industry group.

In the “Offices of Physicians” industry group, the average salaried physician generates:

- o about \$564,000 in direct revenue, and \$1.3 million in business revenue economy-wide;
- o 5.5 direct jobs (including the physician’s own) and 10.9 total jobs economy-wide;
- o \$310,000 in wage and salary income in the practice and \$471,000 in wage and salary income economy-wide.
- o On average, each of these physicians generates \$7,500 in state taxes from the practice itself, \$12.025 in state taxes elsewhere, and \$3,100 in local sales taxes.

Applying these ratios gives the impacts shown in Table 10.

<b>Table 10: Other Physicians Impact, 2003</b>		
	Direct	Total
Revenue (Billions of \$)	1.397	2.761
Employment	13,729	27,065
W & S Income (billions of \$)	0.768	1.167
State Excise Taxes (millions of \$)	18.647	48.469
Local Sales Taxes (millions of \$)		7.686

The direct revenue attributed to these other 2,476 physicians was nearly \$1.4 billion. Adding in the direct and induced impacts gives a cumulative impact on revenue of \$3.3 billion.

The direct employment attributed to these physicians exceeded 13,000, and including the indirect and induced jobs brings the impact to 27,000.

The direct wage and salary income exceeded \$767 million, while the economy wide the in wage and salary income impact was nearly \$1.2 billion.

### VI. COMBINED RESULTS

Combining the impacts of the Offices of Physicians group with that of these other physicians gives the overall impacts for physicians practices shown in Table 11.



**Revenue:**

In 2003, practice revenue is estimated to have totaled \$5.97 billion (the direct impact). This revenue was reinjected into the state economy via spending by the practices and their employees. That spending rippled through the economy, generating \$5.83 billion in revenue for other businesses (the indirect and induced impacts). Thus the total business revenue attributable to the physicians’ practices was almost \$11.80 billion, nearly twice the direct impact.

**Table 11: Combined Offices of Physicians and Other Physicians Economic Impact, 2003**

	Direct	Total
Revenue (Billions of \$)	5.974	11.807
Employment	58,703	115,723
W & S Income (billions of \$)	3.016	4.724
State Excise Taxes (millions of \$)*	79.729	207.243
Local Sales Taxes (millions of \$)		32.863

**Employment:**

Physicians’ practices provided jobs for 10,700 physicians and 48,000 staff. The spending by practices and their 58,700 employees is responsible for creating 57,000 jobs in other sectors of the economy. Thus more than 115,000 jobs economy wide, 3.2 percent of total employment, were directly or indirectly created physicians’ practices.

**Wages and salaries:**

Wages and salaries of those working in physicians’ practices totaled \$3.0 billion in 2003. Furthermore, the economic activity of physician’s practices and their employees resulted in \$1.7 billion in wage and salary income for

people who worked in other industries.

**Taxes:**

Physicians’ practices also generate significant tax revenue for state and local government. The state collects B&O tax at the rate of 1.5 percent on most practice revenue in addition to some minor excise taxes. Practices generated \$79.7 million in B&O and other state excise revenue for the state in 2003. Beyond these tax revenues received directly from the practices, the indirect and induced activity generated by the practices brought additional excise taxes to the state— including sales, use, B&O, and utility taxes— totaling \$127.4 million. Physicians’ practices also generated local sales taxes of \$32.8 million. Thus, the total tax revenue generated by physicians’ practices was \$239.9 million.

**VII. CHARITY CARE**

Uncompensated or “charity” care is provided by physicians’ practices to patients who are not covered by either commercial insurance or health care programs sponsored by federal, state or local government entities, and who do not have the resources to pay for health care services. (Charity care differs from so-called “bad debts” which involve services rendered to patients who have the resources to pay but who refuse to do so).

Finding data on the provision of charity care by physicians’ practices can be challenging as there are no requirements that those data be gathered and reported to an external party. Washington’s hospitals, however, must track and report their charity care data to the Washington State Department of Health. There are reputable resources to analyze to reasonably extract charity care data for physicians’ practices.

Between May 2003 and January 2004, the Washington State Office of the Insurance Commissioner convened its *Let’s Get Washington Covered* Task Force. Data provided in the Task Force materials indicated that in 2004, physicians in Washington State provided \$44,592,191 in Uncompensated Care, 14% of all Uncompensated Care in Washington.



## VIII. OTHER STUDIES

The literature on the impact of the health care sector on regional economies is well developed and has been an important tool for regional economic analysis for more than a decade. The literature on the specific impact of physicians on a regional economy, however, is far less developed due to limitations in the data collected by public sources. This limited survey of the literature first provides an overview of the Input/ Output model used in most studies, then explores studies on the health care sector's impact on urban and rural areas. Next, studies of the health care industry as an export are summarized, followed by the limited available literature that has attempted to isolate physicians' economic impact.

Gerald Doeksen has become the authority for studies on the impact of physicians in rural areas and is cited in virtually all of the economic impact literature. In his broad 1997 article for The Southern Rural Development Center, Doeksen gives a thorough explanation of the Input/Output analysis that is widely used and accepted for measuring the economic impact of an industry on a region. Using historical data on input, output, employment and revenue, interrelationships between a region's industries are imputed.

The results of this analysis are multipliers—factors that when multiplied by the output, employment or income of an industry, give that industry's total indirect impact on the regions output, employment, income, retail sales, and tax revenue. The indirect impact not only measures direct spending and hiring by the industry, but also the residual spending and hiring that occurs because of the industry's economic activity.

Applying this methodology to Atoka County, Oklahoma (a rural community, population 2,988 in 2000, with seven physicians and dentists who had 67 employees), Doeksen estimated a multiplier for physicians' and dentists' offices of 1.79 on employment and 1.34 on income. This translates into 7.9 additional jobs elsewhere in the county for every 10 jobs in the health care sector and \$34 in income elsewhere in the county for every \$100 income in the healthcare sector. From this he concluded that 120 jobs are dependent on those offices, as well as \$2,615,000 in income and \$1,414,605 in retail sales. He further concluded that 18.5 percent of total employment in Atoka County is attributable to the health care sector (directly and indirectly) and that having a strong health sector is crucial to attracting industrial firms, businesses and retirees to rural communities.

The same input/output methodology can be applied to urban areas. A relevant example is Robert Chase's 2004 study of the impact of health care providers (physicians' offices, HMOs, hospitals etc) in Seattle, which estimated total impact multipliers of 1.55 for employment, 1.37 for income, 2.73 for tax revenues, and 1.62 for output. These imply total impacts of health care providers to the Washington economy of 115,600 in employment, \$4.1 billion in income, \$29.6 million in tax revenue and \$10.3 billion in output.

In his study detailing the economic impact of the health care industry on Washington, David Bunting also used an input/output model to estimate the economic impact of the health care industry on Spokane and King Counties, in addition to the state as a whole. He found that physicians' and dentists' offices are responsible for 29.3 percent of health care employment and 31.7 percent of health care income in the health care industry in Washington (compared to hospitals, nursing care facilities, other health care and other health services). Furthermore, compared to other groups in the health care industry (most notably hospitals and nursing care) physicians' and



dentists' offices were estimated to have the largest impact on Washington's output, employment and income.

Bunting also noted that 26 percent of discharges from Spokane hospitals were for patients from outside of the county. Furthermore, 54 percent of all revenues in the 5 largest non-state and non-federal hospitals came from Medicare and Medicaid, representing "a significant trade flow as Spokane County exports health care and accounts are settled by payments from out of county sources."

For Washington state hospitals in 2004, 3.5 percent of patients were from out of state, representing 5.3 percent of revenues—the difference representing the fact that traveling patients are seeking more specialized and expensive services from hospitals. Furthermore, Medicare and Medicaid payments represent 56 percent of total charges, giving hospital revenues an even more substantial export component. Doeksen and Berry both emphasized that health care services, with payments coming from out-of-region sources such as insurance, Medicare and Medicaid, provide substantial value to communities as an export.

All the previous studies examined have not addressed the impact of physicians exclusively due to aggregation found in public data sources. The following two studies use primary data and limiting assumptions to isolate the economic impacts of physicians (although neither includes physicians working in non-patient care occupations).

Sharon Klienzholz and Doeksen found, using the standard input/output methodology and a detailed community survey, that in a rural Oklahoma community of 5,000 residents each physician created an additional 0.78 jobs (assuming that all other health services remained unchanged). Making the more realistic assumption that a physician's leaving the region would close his/her practice entirely, each physician in the community created 4.75 direct jobs and 8.4 total jobs in the community, giving a multiplier of 1.78. The 3.2 FTE physicians in the community also each generated \$556,480 in total income with a multiplier of 1.52, as well as \$419,195 in total retail sales.

Such an accurate count of practicing physicians is implausible in a larger analysis—in order to avert this problem the Oklahoma Physician Manpower Training Commission chose more broad assumptions to estimate the impact of physicians isolated from their places of work and other industries. First, they assumed that physicians have an average income of \$144,290 in order to isolate physicians' direct impact on the industry income data that is aggregated by place of employment. Second, they assumed that physicians are 100 percent responsible for the economic activity of hospitals, 50 percent responsible for the economic activity of pharmacies and 50 percent responsible for the economic activity of nursing homes. Finally, they assumed that each physician requires 4.6 support staff.

Performing an input/output analysis with these assumptions the Manpower Commission estimated that in Oklahoma a physician brings approximately \$1.2 million in income to a rural economy and \$0.9 million into an urban economy. Subsequently, the Society for Teachers of Family Medicine estimated that for Washington State, this translates to \$2.29 billion in total economic impact for family physicians in 2002.

This final study of interest took a very different approach—Hans Radtke used an econometric model regressing production of health, physician availability and income generation, on a variety of demographic variables



from the Pacific Northwest. He found that “physicians remain the most important resource in the provision of medical care.”

He estimated that the marginal product of physicians was \$35,511 in economic savings (1970 dollars) from a reduction of “productivity lost from early deaths.” That equals \$408,160 in 2004 dollars (adjusted for inflation and productivity), assuming the level of health care technology remains constant. This figure roughly estimates the economic impact of a physician using 1970’s technology and techniques on employees with a productivity from 2004, and would be much higher if an adjustment for advances in medical technology could be included.

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