

V. NASHVILLE'S HEALTH CARE INDUSTRY CLUSTER

In order to measure the economic impact of Nashville's health care industry cluster, BEREC uses the counterfactual approach. This differs from the "net new concept" in that the counterfactual approach removes the whole health care industry cluster from the economy and then measures the total economic impact that the subtraction generates across the remaining economy. Besides the counterfactual approach, BEREC also uses employment by sector as an input when assessing the economic impact of the health care industry cluster. Finally, in the absence of detailed industry spending by zip code and vendor, BEREC uses default regional purchasing coefficients to allow for outside leakage. Then BEREC treats the outside leakages as the difference between the impact results with the default regional purchasing coefficients and the impact results with 100 percent local purchasing.

BEREC assumes that each group of sectors in the health care industry cluster is not only closely linked to the core health care sector but that each sector also has its own independent effect on the local economy. Therefore, BEREC measures the economic impact of the individual groups of sectors independent of each other and then adjusts the measure of the economic impact to take into consideration the indirect impact of group on the core health care sector and vice versa. When the health care industry cluster is removed from the economy, BEREC assumes that an economic shock to the core health care providers should not have a ripple effect on themselves. An adjustment for this purpose has been made to the study results.

In this study, BEREC reports on the direct, indirect, and induced impacts of the Nashville health care industry cluster. The direct impact refers to the current state of employment, sales, and personal income generated by the cluster in an economy. The indirect impact refers to the employment, sales, and personal income generated in the local economy by a business-to-business transaction. For example, a hospital purchases goods and services from local businesses for its operation. This hospital's spending in the local economy means additional jobs, business revenues, and personal income in other sectors. Induced impact refers to the employment, sales, and personal income generated in the local economy by employee spending. For example, a hospital employs and pays many individuals for their work at the hospital. These workers then spend their earnings in



the local economy to maintain their lifestyle. This process generates additional jobs, business revenues, and personal income across the local economy. Finally, BERC also estimates linkages between the health care industry cluster and other sectors in the local economy.

V.1. Employment and Office Space

The Nashville health care industry cluster employs 113,453 people (2008), which corresponds to 15 of every 100 nonfarm employees in Nashville. Nashville health care industry cluster employment increased 20.3 percent from 2004. As an industry cluster, its employment is the largest among major aggregate sectors in the Nashville MSA. **Additionally, the Nashville health care cluster accounts for nearly 31 million square feet of office space, up 19 percent from 2004, which corresponds to 16.4 percent of Nashville's total office and industrial space.¹**

Nashville Health Care Industry Cluster: Employment and Office Space

Major Sectors	Employment*	Employment per 1,000 Sq. ft.**	Office Space (Square Foot)
Health Care Management & Consulting (NAICS 551, 5412, 5415, 5416, 561, 813920)	9,604	4.10	2,342,439
Health Care Providers (NAICS 621, 622, 623)	90,282	4.10	22,020,000
Research, Training and Support Organizations			
<i>Educational (NAICS 6112, 6113, 6115)</i>	1,335	2.55	523,529
<i>Research and Public Health (NAICS 54171, 92312)</i>	2,940	2.55	1,152,941
Services to Providers (NAICS 524114)	1,438	4.10	350,732
Products to Health Care Providers			
<i>Manufacturing (NAICS 3391, 3254)</i>	623	3.03	205,611
<i>Wholesalers (NAICS 42345, 42346, 4242)</i>	3,086	1.28	2,410,938
Products to Individuals (NAICS 44611, 44613)	4,145	2.22	1,867,117
Total	113,453		30,873,306

Notes: *BERC estimated employment figures from Tennessee Department of Labor and Workforce Development Database.

**Several studies were consulted to calculate employment density by major sectors, including Urban Land Institute studies.

BERC also used an in-house establishment survey to calculate employment density in several sectors for which data are unavailable.

As the table above indicates, the Nashville health care industry cluster consists of diverse groups of sectors, with health care providers (ambulatory services, hospitals, and nursing care facilities) at the core. **The core health care industry employs 79.6 percent of Nashville health care industry cluster employees.** The rest (20.4 percent) are shared by five major industry groups, of which

¹According to a quarterly MarketView report for Nashville by CB Richard Ellis, Nashville had approximately 189 million square feet of office and industrial space in the first quarter of 2009. For details, see www.cbre.com.



health care management and consulting organizations have the largest share with 9,604 employees.

V.2. Establishment and Wages

The Nashville health care industry cluster, consisting of nearly 3,600 establishments, accounts for \$6.02 billion in wages. From 2004 to 2008, the number of establishments increased nearly 9 percent, while the cluster wages increased 40.36 percent over the same period. Average health care cluster wage is estimated at around \$52,773 in 2008. This average wage is significantly higher than Nashville's average nonfarm wage of \$39,280. Nashville's health care cluster average wage increased about 16 percent from 2004.

Nashville Health Care Cluster Profile: Wages and Establishments (2008)

Major Sectors	Wages (Million \$)	Establishments
Health Care Management & Consulting (NAICS 551, 5412, 5415, 5416, 561, 813920)	\$653.33	222
Health Care Providers (NAICS 621, 622, 623)	\$4,701.98	2,703
Research, Training and Support Organizations		
<i>Educational (NAICS 6112, 6113, 6115)</i>	\$71.62	5
<i>Research and Public Health (NAICS 54171, 92312)</i>	\$119.63	15
Services to Providers (NAICS 524114)	\$98.92	20
Products to Health Care Providers		
<i>Manufacturing (NAICS 3391, 3254)</i>	\$20.89	53
<i>Wholesalers (NAICS 42345, 42346, 4242)</i>	\$206.31	171
Products to Individuals (NAICS 44611, 44613)	\$143.45	393
Total	\$6,016.13	3,582

Source: BERC's estimates from Tennessee Department of Labor and Workforce Development Database.

V.3. Investor-Owned Health Care Management Companies (Public and Private)

Many studies examine the locational patterns of large corporate headquarters in the U.S. The findings suggest that the presence of large corporate headquarters provides substantial benefits to the regional economy since such headquarters (1) bring high-paying jobs, (2) increase the competitive advantage of the host cities, (3) promote innovative technologies through acquisition



and dissemination of information, and (4) spur growth in critical infrastructure industries, such as law, finance, and other professional and business services.²

Furthermore, the location decision of large corporate headquarters is also shaped by the presence of certain qualities in the host region, primarily (1) a good quality of life, (2) major transportation and communication infrastructure, (3) a diverse economic base, (4) a sound financial infrastructure, (5) professional services, and (6) a highly skilled labor force.

As an epicenter of corporate headquarters activities, Nashville presents a unique combination of these qualities. According to Klier and Testa's findings (2002), Nashville was one of the few large cities to experience phenomenal relocation of major corporate headquarters between 1990 and 2000. During this period, 16 large corporations chose Nashville as their new headquarters location for a growth rate of 177.8 percent. From 2006 to 2009, more than 30 company headquarters have relocated to the Nashville MSA (www.nashvillechamber.com). Recently, MarketWatch's 2009 annual survey named the Nashville MSA as the 15th best city for business in the U.S. (www.nashvillechamber.com). In addition, the April (2010) issue of *Site Selection* magazine named the Nashville Chamber's economic development team one of the 10 best in the nation.

Nashville is truly the center of gravity for national health care industry company headquarters with 56 major public and private companies calling it home. Only companies with more than \$500,000 in revenue and at least 100 employees are included in this analysis. As of 2009, 494 out of 958 investor-owned hospitals in the U.S. were owned or operated by Nashville-area hospital management companies. **In 2008, the 56 health care industry cluster companies headquartered in Nashville counted revenues of more than \$62 billion and employed nearly 400,000 people worldwide.**³

² For a review of literature on locational patterns of company headquarters, see Thomas Klier and William Testa's (2002) "Location Trends of Large Company Headquarters during the 1990s," *Economic Perspectives* (Federal Reserve Bank of Chicago). For detailed information on the concept of cluster and competitive advantage, see Michael Porter's (2000) "Location, Competition, and Economic Development: Local Clusters in the Global Economy," *Economic Development Quarterly*, vol. 14, pp. 15-34.

³ Source: 2008 American Hospital Association Annual Survey Database, ReferenceUSA, LexisNexis Academic Universe, *Becker's Hospital Review*, and company Web sites.



Nashville is also a hub for publicly traded health care companies in the U.S. **As of 2008, 17 such companies calling Nashville home had a combined employment of more than 145,000 globally and combined revenue of nearly \$26 billion.**

The following is a profile of these publicly traded health care management companies as well as the largest investor-owned private companies. Together, they form a powerful worldwide presence in the Nashville health care industry cluster with \$61 billion in business revenues and more than 375,000 employees. These companies represent, by far, the largest contributors to worldwide jobs and revenue among headquarters in Nashville's health care industry cluster.

Nashville-Based Investor-Owned and Publicly Traded Health Care Management Companies

Company Name	Ticker	Global No. of Employees	Global Sales /Revenue
ADVOCAT INC.	AVCA	5,809	\$302,031,000
AMERICA SERVICE GROUP INC.	ASGR	4,100	\$606,176,000
AMERICAN HOMEPAIENT INC.	AHOM	2,362	\$236,297,000
AMSURG CORP.	AMSG	1,630	\$668,752,000
ARDENT HEALTH SERVICES LLC.	Private	8,800	\$1,800,000,000
BIOMIMETIC THERAPEUTICS INC.	BMTI	88	\$3,148,384
BROOKDALE SENIOR LIVING INC.	BKD	23,500	\$2,023,068,000
CAPELLA HEALTHCARE INC.	Private	2,700	\$500,000,000
COMMUNITY HEALTH SYSTEMS INC.	CYH	55,579	\$12,107,613,000
CUMBERLAND PHARMACEUTICALS INC.	CPIX	53	\$43,500,000
EMDEON INC.	EM	2,200	\$853,600,000
HCA INC.	Private	191,000	\$28,374,000,000
HEALTHCARE REALTY TRUST INC.	HR	229	\$257,178,000
HEALTHSPRING INC.	HS	1,800	\$2,661,755,000
HEALTHSTREAM INC.	HSTM	300	\$57,398,000
HEALTHWAYS INC.	HWAY	3,500	\$717,426,000
IASIS HEALTHCARE LLC.	Private	10,775	\$2,070,000,000
LIFEPOINT HOSPITALS INC.	LPNT	15,700	\$2,962,700,000
NATIONAL HEALTH INVESTORS INC.	NHI	1	\$70,127,000
NATIONAL HEALTHCARE CORP.	NHC	12,000	\$668,221,000
PSYCHIATRIC SOLUTIONS INC.	PSYS	16,000	\$1,805,361,000
VANGUARD HEALTH SYSTEMS	Private	17,100	\$2,300,000,000
Total	22	375,226	\$61,088,351,384

Sources: ReferenceUSA, BERC, LexisNexis Academic Universe

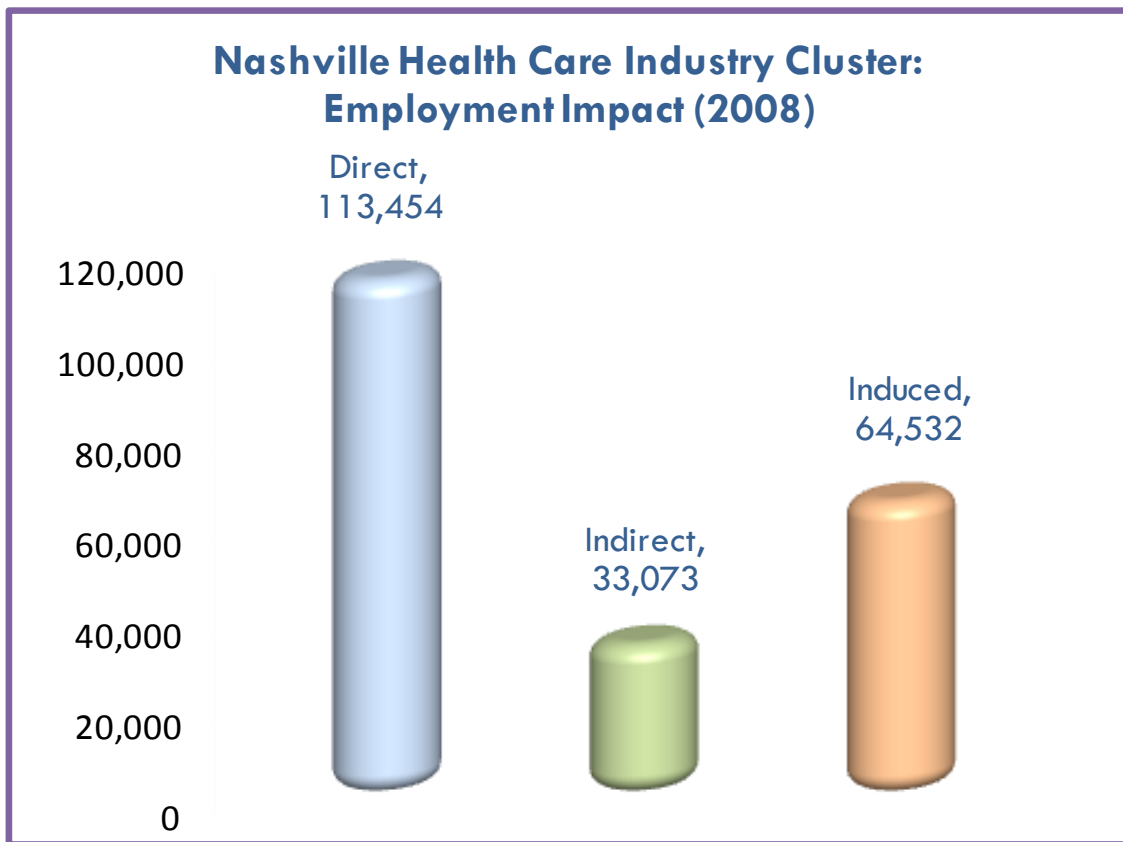


V.4. Economic Impact of the Nashville Health Care Cluster

V.4.a. Employment Impact

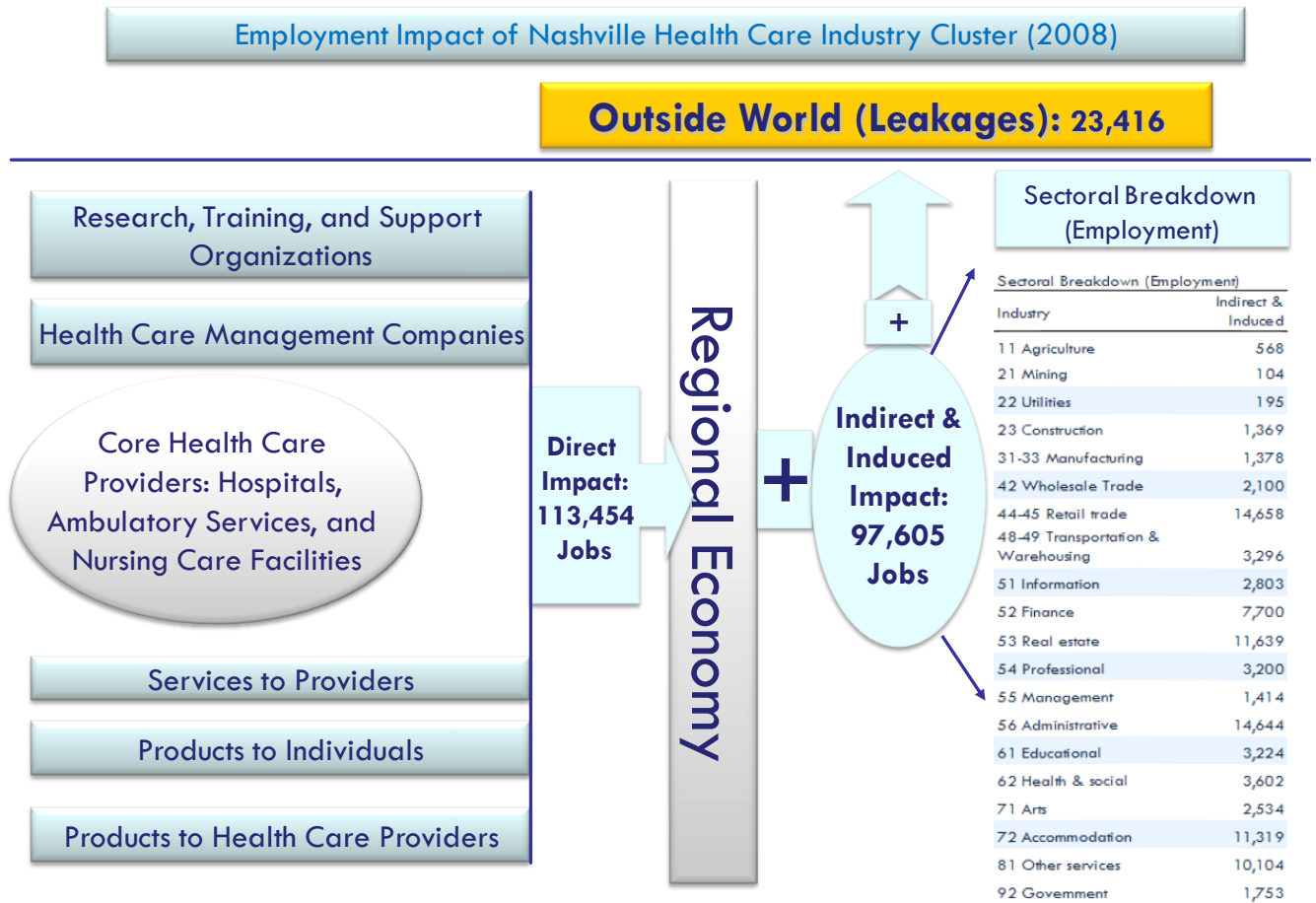
The health care industry cluster's total employment impact is 211,059, which equals eight percent of Tennessee's and 28 percent of the Nashville MSA's nonfarm employment in 2008.

One hundred industry cluster jobs create an additional 86 jobs in the Nashville economy. The employment impact of Nashville's health care industry cluster increased 36.4 percent from 2004.



Sectoral Impact

The largest sectors impacted by the health care industry cluster are retail trade and administrative and waste management services, with almost 15,000 jobs each. Because of interregional transactions, Nashville's health care industry cluster creates nearly 23,416 additional jobs across sectors outside Nashville.



Industry Linkages

For every direct 1,000 jobs in the Nashville health care industry cluster, an additional 129 jobs are created in retail trade and administrative services, 103 in real estate, 100 in accommodation, 89 in other services, 68 in finance, 32 in health and social services, and 29 in transportation.

Employment Linkages between Health Care Industry Cluster and Sectors of Nashville's Economy

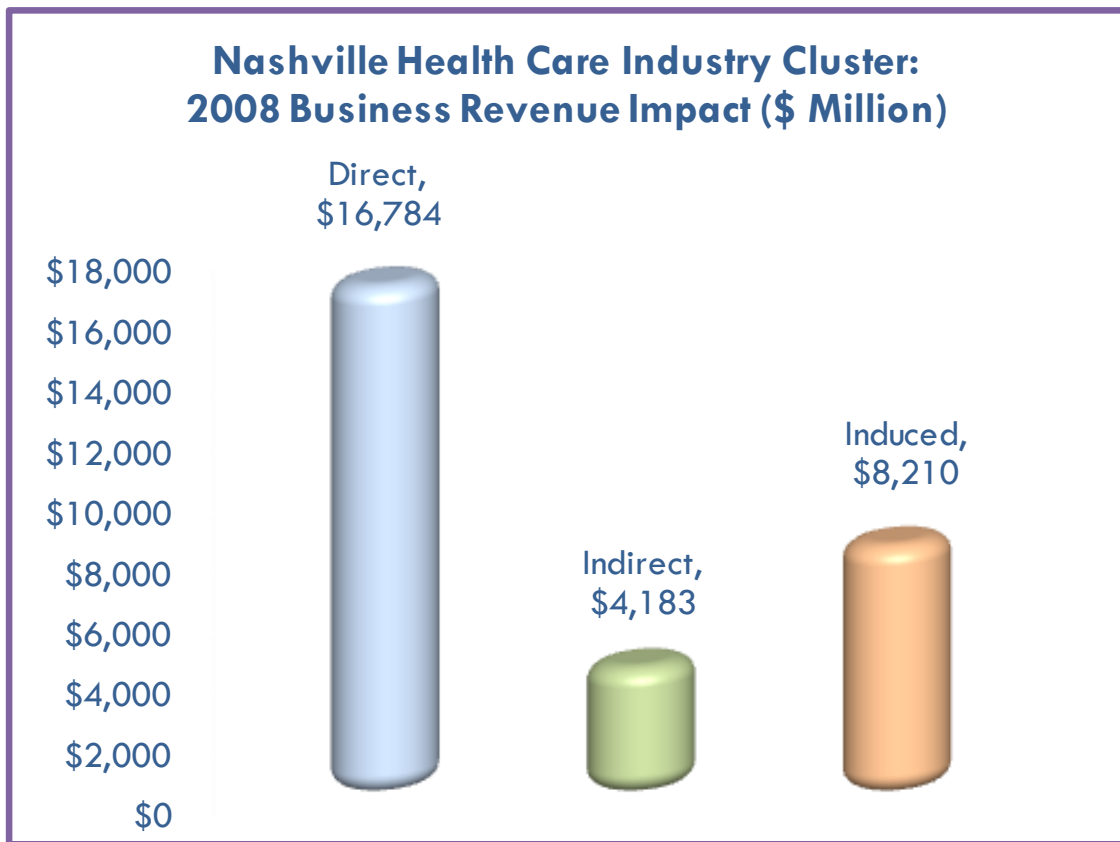
Industry	Indirect & Induced	Number of jobs created per 1,000 health care industry cluster jobs
44-45 Retail trade	14,658	129
56 Administrative	14,644	129
53 Real estate	11,639	103
72 Accommodation	11,319	100
81 Other services	10,104	89
52 Finance	7,700	68
62 Health & Social	3,602	32
48-49 Transportation & Warehousing	3,296	29
61 Educational	3,224	28
54 Professional	3,200	28
51 Information	2,803	25
71 Arts	2,534	22
42 Wholesale Trade	2,100	19
92 Government	1,753	15
55 Management	1,414	12
31-33 Manufacturing	1,378	12
23 Construction	1,369	12
11 Agriculture	568	5
22 Utilities	195	2
21 Mining	104	1

Source: BERC's estimates based on IMPLANpro Inc. impact figures



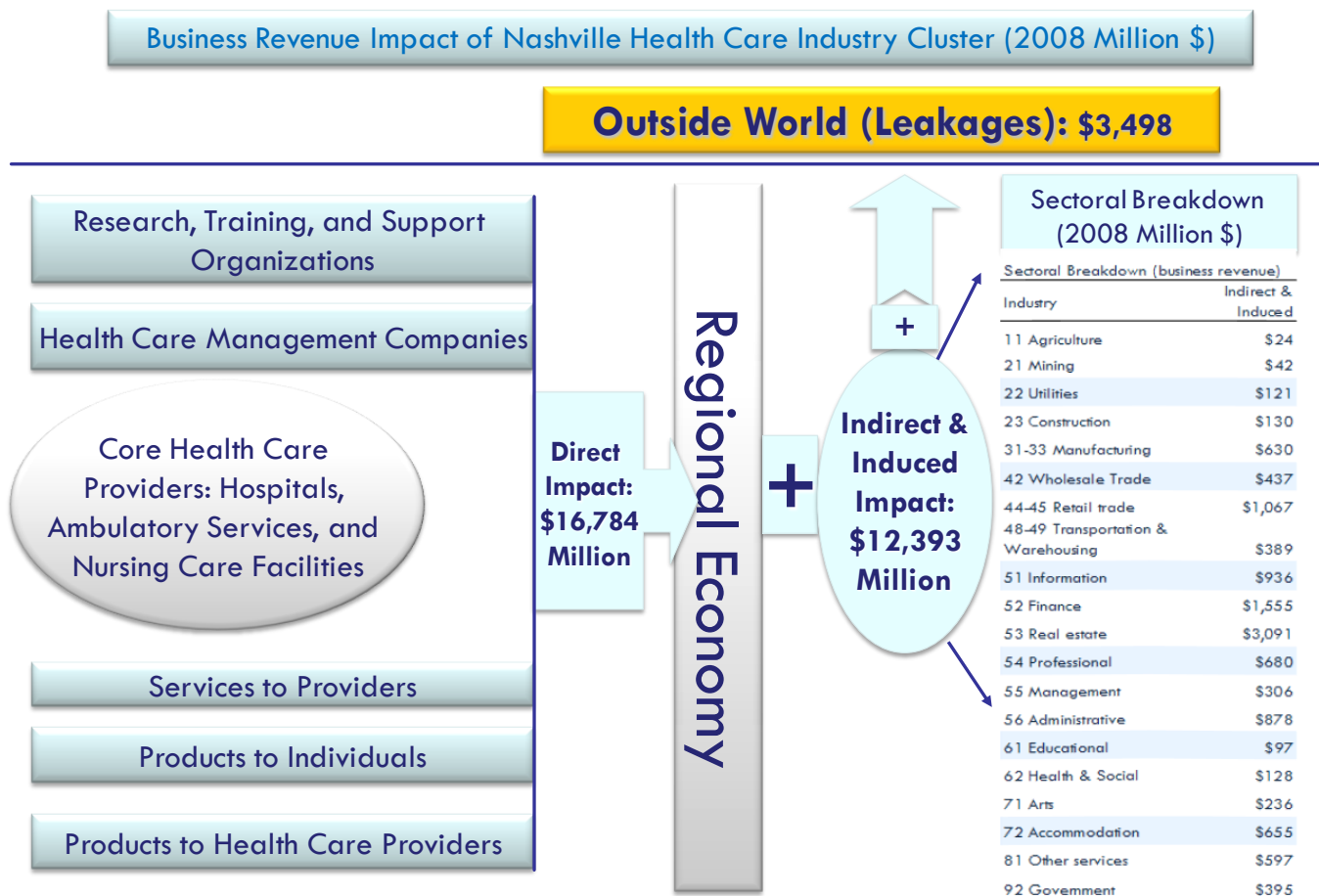
V.4.b. Business Revenue Impact

The total business revenue impact of the health care industry cluster is \$29.2 billion, \$16.8 billion of which is directly injected into the economy. The business revenue impact of Nashville's health care industry cluster increased 60 percent from 2004. This amount is equivalent to nearly 6 percent of Tennessee's and 19 percent of Nashville's total business revenues in 2008. Every \$100 in health care cluster spending generates an additional \$74 in business revenues.



Sectoral Impact

The real estate and rental sector in Nashville greatly benefits from the health care industry cluster, garnering \$3.1 billion in business revenues as a result. Moreover, leakage outside of Nashville is about \$3.5 billion across sectors.



Industry Linkages

Every \$1,000 in business revenue generated by the health care industry cluster generates additional revenue of \$184 in real estate, \$93 in finance, \$64 in retail trade, and \$56 in information. Other sectors seeing substantial benefits are administrative and waste management (\$52), professional and business services (\$41), and accommodation (\$39). The impact on other sectors ranges from \$38 in manufacturing to \$1 in agriculture.

Business Revenue Linkages between Health Care Industry Cluster and Sectors of Nashville's Economy

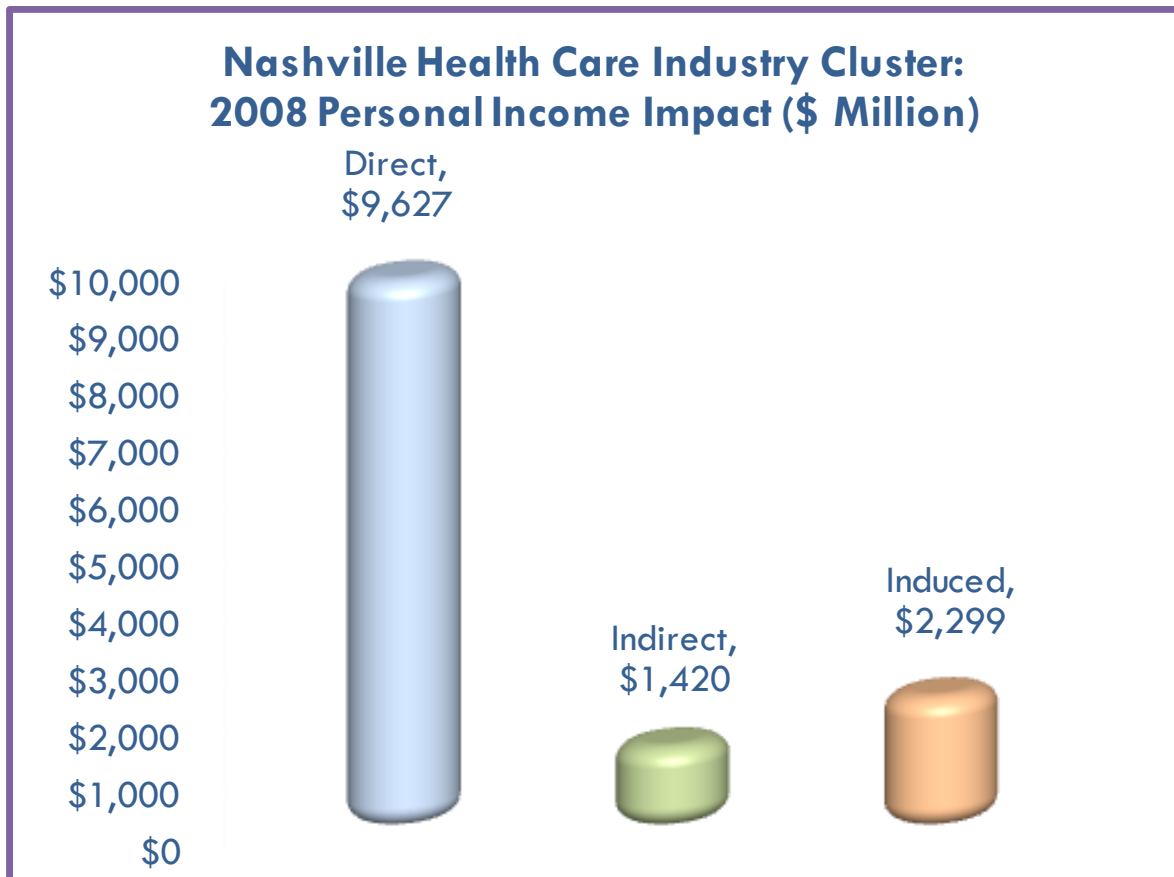
Industry	Indirect & Induced	Revenues generated per \$1,000 health care industry cluster business revenue
53 Real estate	\$3,091	\$184
52 Finance	\$1,555	\$93
44-45 Retail trade	\$1,067	\$64
51 Information	\$936	\$56
56 Administrative	\$878	\$52
54 Professional	\$680	\$41
72 Accommodation	\$655	\$39
31-33 Manufacturing	\$630	\$38
81 Other services	\$597	\$36
42 Wholesale Trade	\$437	\$26
92 Government	\$395	\$24
48-49 Transportation & Warehousing	\$389	\$23
55 Management	\$306	\$18
71 Arts	\$236	\$14
23 Construction	\$130	\$8
62 Health & Social	\$128	\$8
22 Utilities	\$121	\$7
61 Educational	\$97	\$6
21 Mining	\$42	\$3
11 Agriculture	\$24	\$1

Source: BERC's estimates based on IMPLANpro Inc. impact figures



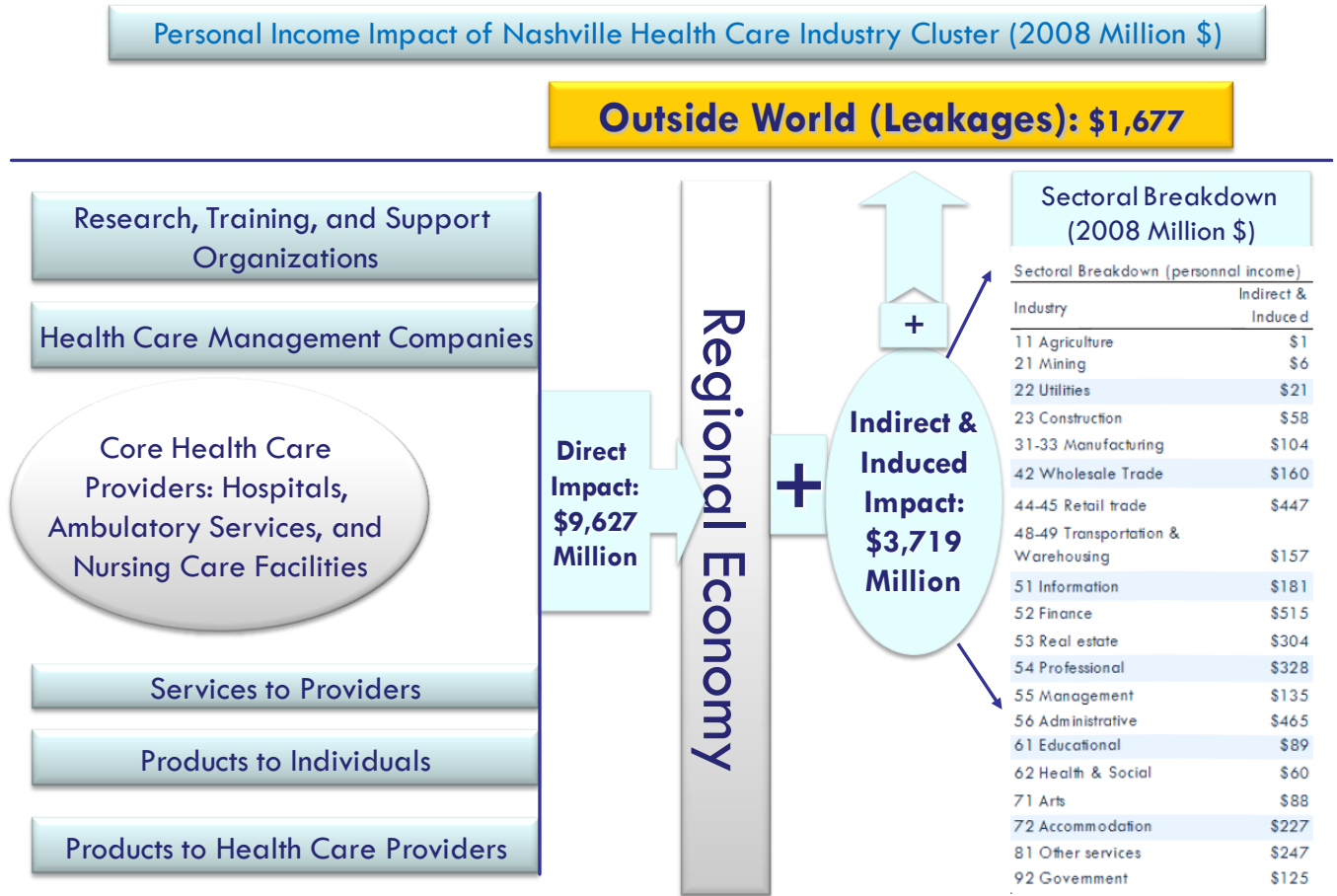
V.4.c. Personal Income

The Nashville health care industry cluster generates about \$13.4 billion in personal income for the local economy. This corresponds to 6 percent of Tennessee's and nearly 22 percent of the Nashville MSA's total personal income in 2008. Moreover, every \$100 of personal income generates an additional \$39 in the local economy. The personal income impact of Nashville's health care industry cluster increased 59 percent from 2004 to 2008.



Sectoral Impact

The largest sectoral impact is in finance with \$515 million. Other notable sectors benefiting from the Nashville health care industry cluster are administrative and waste services (\$465 million), retail trade (\$447 million), and professional and business services (\$328 million). Total outside leakage is estimated at \$1.7 billion across sectors.



Industry Linkages

Every \$1,000 in personal income earned in the health care industry cluster creates an additional \$53 in finance, \$48 in administrative and waste management, and \$46 in retail trade. In addition, there are substantial impacts on professional services (\$34), real estate (\$32), other services (\$26), and accommodation (\$24). Finally, the impact on other sectors ranges from \$19 in the information sector to \$0.05 in the agriculture sector.

Personal Income Linkages between Health Care Industry Cluster and Sectors of Nashville's Economy

Industry	Personal income created by sector per \$1,000 personal income in health care industry cluster	
	Indirect & Induced	
52 Finance	\$515	\$53
56 Administrative	\$465	\$48
44-45 Retail trade	\$447	\$46
54 Professional	\$328	\$34
53 Real estate	\$304	\$32
81 Other services	\$247	\$26
72 Accommodation	\$227	\$24
51 Information	\$181	\$19
42 Wholesale Trade	\$160	\$17
48-49 Transportation & Warehousing	\$157	\$16
55 Management	\$135	\$14
92 Government	\$125	\$13
31-33 Manufacturing	\$104	\$11
61 Educational	\$89	\$9
71 Arts	\$88	\$9
62 Health & Social	\$60	\$6
23 Construction	\$58	\$6
22 Utilities	\$21	\$2
21 Mining	\$6	\$1
11 Agriculture	\$1	\$0

Source: BERC's estimates based on IMPLANpro Inc. impact figures



V.5. Fiscal Impact of the Nashville Health Care Industry Cluster

The Nashville health care industry cluster accounts for \$1.2 billion in state and local taxes. Of this amount, nearly half stems from sales tax while property tax, corporate dividends and profit taxes and other taxes and fees make up the remainder. Compared to 2004, the fiscal impact of Nashville's health care industry cluster is up nearly 55 percent. From a comparative perspective, this figure represents more than 7 percent of all taxes collected in Tennessee and nearly 20 percent of all taxes collected in the Nashville MSA in 2008.

Fiscal Impact of Nashville Health Care Industry Cluster (2008 Million \$)

