

# The Economic Impact of Inpatient Psychiatric Facilities

*A National and State-level Analysis*

Dobson | DaVanzo

Dobson DaVanzo & Associates, LLC Vienna, VA 703.260.1760 [www.dobsondavanzo.com](http://www.dobsondavanzo.com)

# The Economic Impact of Inpatient Psychiatric Facilities

*A National and State-level Analysis*

Submitted to:

National Association of Psychiatric Health Systems (NAPHS)

Submitted by:

**Dobson | DaVanzo**

Allen Dobson, Ph.D.

Joan E. DaVanzo, Ph.D., M.S.W.

Steve Heath, M.P.A.

Greg Berger

Audrey El-Gamil

Friday, February 19, 2010 – Final Report

# Table of Contents

Executive Summary .....	1
Chapter 1: Total Inpatient Psychiatric Facilities .....	5
Chapter 2: Inpatient Psychiatric Hospitals.....	12
Chapter 3: Residential Treatment Centers .....	15
Chapter 4: Inpatient Psychiatric Hospitals by State.....	18
Chapter 5: Literature Review.....	26
Discussion and Conclusion.....	32
Appendix A: IMPLAN and Literature Review Methods .....	34
Appendix B: Super Multipliers by State .....	40
Appendix C: Employment Impact .....	42
Total Inpatient Psychiatric Facilities.....	42
Inpatient Psychiatric Hospitals.....	44
Residential Treatment Centers .....	46
Inpatient Psychiatric Hospitals by State.....	48
Appendix D: Employee Compensation .....	52
Total Inpatient Psychiatric Facilities.....	52
Inpatient Psychiatric Hospitals.....	54
Residential Treatment Centers .....	56
Inpatient Psychiatric Hospitals by State.....	58
Appendix E: About NAPHS and Dobson   DaVanzo .....	62

# Executive Summary

## Purpose and Background

During the last 35 to 40 years, the mental health system in the United States has undergone many important changes, and patient need for these services is now far greater than the accessible supply. Current public and private efforts directed toward health care reform could potentially accelerate the transformation of the United States behavioral health system. As change accelerates, it is important to understand the current components of the health care delivery system and their impact not only on individuals in need of treatment, but on the nation overall.

One key component of the mental health delivery system is 24-hour behavioral health treatment, delivered by inpatient psychiatric hospitals as well as residential treatment centers.

Given the importance of understanding the specific role and impact of inpatient psychiatric treatment within a changing health care system, the National Association of Psychiatric Health Systems (NAPHS) commissioned Dobson DaVanzo & Associates, LLC (Dobson | DaVanzo) to estimate the economic contribution of inpatient psychiatric facilities to the United States economy, including calculating the economic output, employment, and tax effects. Dobson | DaVanzo was also asked to put this new economic analysis into context by providing background on the clinical impact of 24-hour behavioral health services provided by inpatient psychiatric facilities. This study is intended to assist policymakers, providers, and others in understanding the broader economic and social “value proposition” of inpatient psychiatric facilities to the United States economy.

In our analysis, we use the term “total inpatient psychiatric facilities” to refer to all providers of 24-hour behavioral health services (including inpatient psychiatric hospitals

### Key Findings:

- **Inpatient psychiatric facilities are an important economic engine**
- **The total economic impact of inpatient psychiatric facilities on the United States economy is \$61.2 billion, with a multiplier of 2.97**
- **The total economic impact of inpatient psychiatric hospitals at the state level ranges from 0.4 to 3.0 percent of overall state health care expenditures**

and residential treatment centers). The first component of the study aims to provide an estimate of the full economic contribution of inpatient psychiatric facilities to the United States economy and, in turn, to the economy of each individual state. Inpatient psychiatric facilities represent a crucial component within the health care continuum, and this study quantifies a range of economic benefits that are conveyed to the community, beyond the more visible financial operations and activities.

The second component of this study, a focused literature review, overviews the role of inpatient psychiatric hospital and residential behavioral health care in providing mental health and substance abuse services to the community. We summarize the most relevant works, relating them to the activities of inpatient psychiatric facilities. The review portrays the types of clinical services required to treat patient populations served by these providers and illustrates the crucial and irreplaceable role inpatient psychiatric facilities play within the broader health care delivery system.

*Exhibit 1* shows the two central research questions answered in this study, as well as the study component that addresses each question.

### Exhibit 1: Study Research Questions

Research Question	Component
What is the economic contribution in terms of output, employment, and taxes of inpatient psychiatric facilities? Other than health care delivery, what other industries are affected?	Economic Modeling using IMPLAN data
What is known about the health status and clinical needs of the populations that utilize inpatient psychiatric hospitals and residential care? Is supply adequate to meet demand?	Literature Review

### Methods

To estimate the economic and employment impact of inpatient psychiatric facilities at the national and (in some instances) state level, we used a proprietary economic model known as IMPLAN (see Appendix A). This analytic tool is a type of applied economic analysis that tracks the interdependence among various producing and consuming sectors of an economy to estimate the economic contribution of an industry (or economic sector) on either a defined region or on the entire United States economy.

By determining the direct expenditures and employment of all inpatient psychiatric facilities, we were able to estimate the economic impact, employment impact, employee compensation impact, and tax impact of the inpatient psychiatric facility industry, as well as the multiplier effects of direct expenditures and employment. The economic impact and multiplier effects can be interpreted as follows:

**Total economic impact** is the combined effect or sum of overall inpatient psychiatric facilities direct, indirect, and induced effects.

- **Direct effect** is the initial change in revenue, earnings, and employment (jobs) for inpatient psychiatric facilities.
- **Indirect effect** is a change in inter-industry transactions, as supplying industries respond to the direct effects of inpatient psychiatric facilities.
- **Induced effect** is the change in downstream household spending caused by the direct and indirect effects on household income.

**The multipliers** show the relationship between the direct effect and the total economic effect. The direct effect *times* the multiplier produces the total economic effect.

**Tax effects** represent federal and state/local taxes on the total economic effect.

We also conducted a literature review to provide an overview of the clinical role of inpatient psychiatric facilities (see Chapter 5).

### Summary of Key Findings

Our national and state level analyses of the economic and employment contribution of inpatient psychiatric facilities found that:

- There were a total of 2,257 inpatient psychiatric facilities (including non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, state psychiatric hospitals, and residential treatment centers) throughout the United States in calendar year (CY) 2008. See *Exhibit 3* on page 6.
- All inpatient psychiatric facilities nationwide have combined total expenditures of \$20.6 billion and employ approximately 223,000 people. See *Exhibit 6* on page 9.
- The \$20.6 billion in direct expenditures for inpatient psychiatric facilities translates to a total economic impact of \$61.2 billion on the United States economy (a multiplier of 2.97 at the national level). That is, for every dollar spent by inpatient psychiatric facilities, the national economy realizes \$2.97. See *Exhibit 6* on page 9.
- The direct employment of approximately 223,000 jobs for inpatient psychiatric facilities translates to a total employment impact of more than 477,000 jobs (a multiplier of 2.14 at the national level). That is, for every job created by inpatient psychiatric facilities, 2.14 jobs are created in the national labor market. See *Exhibit 6* on page 9.
- Direct employee compensation of \$11.1 billion for inpatient psychiatric facilities translates to \$21.4 billion in total employee compensation (a multiplier of 1.93 at

the national level). That is, for every dollar earned by inpatient psychiatric facility employees, \$1.93 is realized in the national economy. See *Exhibit 6* on page 9.

- The total tax impact of all inpatient psychiatric facilities is \$7.9 billion, with \$5.0 billion in federal and \$2.9 billion in State/local taxes. See *Exhibit 7* on page 10.
- Inpatient psychiatric facility direct expenditures are roughly of the same magnitude as that of the veterinary medicine industry (67.1 percent) and represent approximately one percent of United States health care expenditures. See *Exhibit 5* on page 7.
- At the state level, inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) have a total economic impact of between 0.4 and 3.0 percent of overall state health care expenditures (see *Exhibit 14* on page 22).
- Every Medicaid dollar spent in each state is matched by the federal government and creates a “super multiplier.” For example, each Medicaid dollar spent on inpatient psychiatric hospitals,<sup>1</sup> with a match of 50 percent in a state with a base multiplier of 2.00, has a “super multiplier” of 4.00, creating \$4.00 in the state economy (see Appendix B).

### Implications

This report provides important information to stakeholders by examining the economic and clinical importance of 24-hour behavioral health services. The report indicates that inpatient psychiatric facilities are an important economic engine in communities across the United States in that their economic value is substantial. The direct expenditures of inpatient psychiatric facilities represent one percent of United States health care expenditures, and their total economic impact at the national level is comparable in value to three percent of United States health care expenditures. From a clinical perspective, 24-hour behavioral health services provide unique and unparalleled services to patients with some of the most severe and debilitating mental and behavioral conditions, many of whom need crisis stabilization.

Taken together, the findings of this report indicate that 24-hour behavioral health services are fundamental community services providing a specific level of care, not otherwise available. These services are required by many individuals with complex mental and addictive disorders, especially under crisis conditions. Yet despite their clinical and economic importance, these services are in short supply.

---

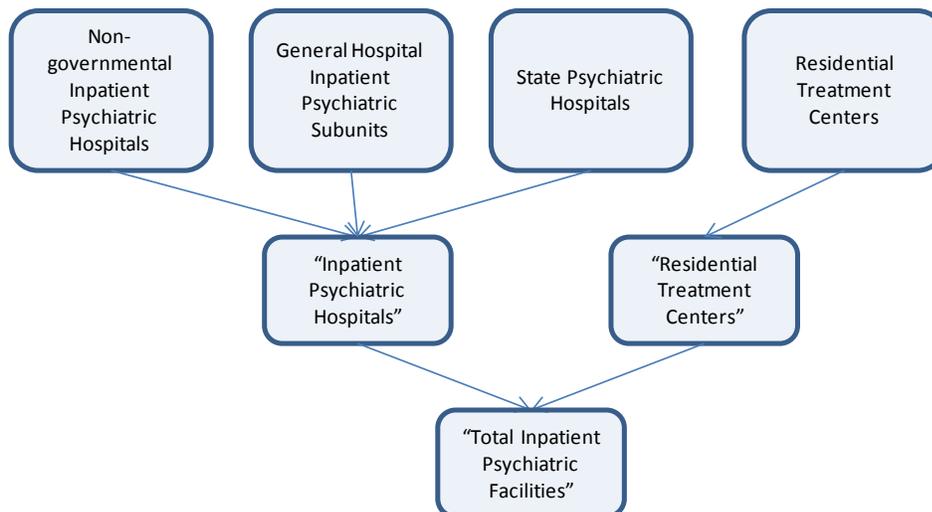
<sup>1</sup> Inpatient psychiatric hospitals include non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals. Data were not available to conduct a state-level analysis of residential treatment centers, but the “super multiplier” effect for residential treatment center expenditures would likely be comparable.

# Chapter 1: Total Inpatient Psychiatric Facilities

## Study Process and Results

Our first step in the economic impact analyses was to determine the number of inpatient psychiatric facilities by type. *Exhibit 2* shows the types of inpatient psychiatric facilities included in these analyses and how we combined categories.

### Exhibit 2: Types of Inpatient Psychiatric Facilities and Categories Used for Analyses



We use the term “total inpatient psychiatric facilities” to refer to all providers of 24-hour behavioral care. We use the term “inpatient psychiatric hospitals” to refer to a combination of non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals. The term “residential

## Chapter 1: Total Inpatient Psychiatric Facilities

treatment centers” refers only to residential treatment centers, so these providers are not included in the category of “inpatient psychiatric hospitals.”

*Exhibit 3* below presents the total number of inpatient psychiatric facilities included in our analysis by category.

**Exhibit 3: Number of Inpatient Psychiatric Facilities by Type, CY 2008 estimate**

	Inpatient Psychiatric Hospitals			Residential Treatment Centers	Total Inpatient Psychiatric Facilities
	<b>1,749</b>			<b>508</b>	
Region	Non-governmental Inpatient Psychiatric Hospitals <sup>a</sup>	General Hospital Inpatient Psychiatric Subunits <sup>b</sup>	State Psychiatric Hospitals <sup>c</sup>	Residential Treatment Centers <sup>d</sup>	
National	255	1274	220	508	<b>2,257</b>

<sup>a</sup> Medicare Cost Reports for inpatient hospitals. All facilities with a provider number between xx.4000 and xx.4999 were selected. State psychiatric hospitals were also selected from the Medicare Cost Reports.

<sup>b</sup> Medicare Cost Reports for inpatient hospitals. All facilities with a provider number for sub-providers with a third digit of “S” or “M” were selected.

<sup>c</sup> National Association of State Mental Health Program Directors (NASMHPD) Web site, retrieved from: [http://www.nasmhpd.org/state\\_hospitals.cfm](http://www.nasmhpd.org/state_hospitals.cfm).

<sup>d</sup> U.S. Department of Health and Human Services. (2004). *Mental Health, United States, 2004*.

We then calculated direct expenditures by facility type as indicated in *Exhibit 4*. We found combined total expenditures of \$20.6 billion for all inpatient psychiatric facilities at the national level.

**Exhibit 4: National Direct Expenditures by Inpatient Psychiatric Facility Type (2008 Dollars in Billions)**

Direct Expenditures	Inpatient Psychiatric Hospitals <sup>a</sup>	Residential Treatment Centers	Total Inpatient Psychiatric Facilities
Nationally	\$16.1	\$4.5	\$20.6
Percent of Total	78.3%	21.7%	100%

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>a</sup> Include non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals.

*Exhibit 5* provides an indication as to the relative magnitude of \$20.6 billion in direct expenditures by inpatient psychiatric facilities, in terms of United States health care expenditures and the direct expenditures of other industries. **Inpatient psychiatric facility expenditures are roughly of the same magnitude as that of the veterinary medicine industry**, and can be compared as follows:  $[(\$20.6b / \$30.7b = 0.671) \times 100 = 67.1\%]$ .

**Inpatient psychiatric facility expenditures are also approximately one percent of total United States health care expenditures and represent nearly three percent of overall United States hospital expenditures.**

## Chapter 1: Total Inpatient Psychiatric Facilities

### Exhibit 5: Comparison of Total Inpatient Psychiatric Facility Direct Expenditures to Industries within the United States Economy

Industry	Direct Expenditures (Billions)	Total Inpatient Psychiatric Facility Expenditures as a Percent of Other Sectors of the Economy
U.S. Health Care Sector <sup>1a</sup>	\$2,378.6	0.9%
Hospitals <sup>1a</sup>	\$746.5	2.8%
Physicians <sup>1a</sup>	\$508.5	4.1%
Nursing Homes <sup>1a</sup>	\$137.4	15.0%
Computer Systems <sup>1b</sup>	\$82.6	24.9%
Veterinary Medicine <sup>1b</sup>	\$30.7	67.1%
<b>Inpatient Psychiatric Facilities<sup>1c</sup></b>	<b>\$20.6</b>	<b>100.0%</b>

<sup>1a</sup> Sisko, A., et al. (2009). Health Spending Projections Through 2018: Recession Effects Add Uncertainty to the Outlook. *Health Affairs*, 28 (2), w346-w357.

<sup>1b</sup> DaVanzo, J.E., et al. (2009). The Economic Contribution of the Dietary Supplement Industry: Analyses of the Economic Benefits to the U.S. Economy. Submitted to the Natural Products Foundation’s Dietary Supplement Information Bureau.

<sup>1c</sup> Dobson | DaVanzo analysis of IMPLAN data.

### Summary of Total Inpatient Psychiatric Facilities Economic and Employment Impacts

This section presents our findings on the economic impact of total inpatient psychiatric facilities at the national level. Below, we present the following tables:

Exhibit 6	Summary of Total Inpatient Psychiatric Facility Economic and Employment Impacts
Exhibit 7	Summary of Total Inpatient Psychiatric Facility Tax Impacts
Exhibit 8	Total Inpatient Psychiatric Facilities: Economic Impact at the National Level by Industry

*Exhibit 6* below—see column numbers—shows (1) the type of economic impact estimated, (2) United States health care expenditures and health and social services employment, (3) direct inpatient psychiatric facilities expenditures, employment, and employee compensation, (4) direct inpatient psychiatric facility expenditures as a percent of United States health care expenditures, (5) total inpatient psychiatric facility economic and employment impact (direct inpatient psychiatric facility value multiplied by the corresponding multiplier (e.g. \$20.6 billion x 2.97 ≈ \$61.2 billion), (6) total inpatient psychiatric facility economic and employment impact as a percent of United States health care spending, and finally, (7) the economic and employment multipliers used to produce total inpatient psychiatric facility economic output values.

*Exhibit 6* indicates a multiplier of 2.97 for the economic output of all inpatient psychiatric facilities. **This means that \$20.6 billion in direct expenditures for inpatient psychiatric facilities translates to a total economic impact of \$61.2 billion on the United States economy.**

## Chapter 1: Total Inpatient Psychiatric Facilities

---

Similarly, **direct employment of approximately 223,000 jobs translates to more than 477,000 total jobs (a multiplier of 2.14).**

**Direct employee compensation of \$11.1 billion translates to \$21.4 billion in total employee compensation (a multiplier of 1.93).**

*Exhibit 6* also shows the two component inpatient psychiatric facility types: (a) inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals), and (b) residential treatment centers. Using similar multipliers, the components show roughly the same relationship between direct expenditures and total economic impacts.

For inpatient psychiatric hospitals, \$16.1 billion in direct expenditures translates to a total economic impact of \$48.2 billion; approximately 137,000 direct jobs translates to an employment impact of nearly 337,000 jobs; and \$8.2 billion in direct employee compensation translates to \$16.3 billion in total employee compensation impact.

For residential treatment centers only, \$4.5 billion in direct expenditures translates to a total economic impact of \$13 billion; approximately 86,000 direct jobs translates to an employment impact of over 140,000 jobs; and \$2.9 billion in direct employee compensation translates to \$5.1 billion in total employee compensation impact.

## Chapter 1: Total Inpatient Psychiatric Facilities

**Exhibit 6: Economic and Employment Impact of Inpatient Psychiatric Facilities at the National Level, Total and by Facility Type, CY 2008**

Facility Type	Impact	U.S. Health Expenditures <sup>a</sup> and Health and Social Services Employment <sup>b</sup>	Direct Expenditures, Employment (Jobs), Employee Compensation	Direct Expenditures as a Percent of U.S. Health Expenditures and Health and Social Services Employment	Total Impact, Employment (Jobs), Employee Compensation,	Total Impact as a Percent of U.S. Health Expenditures and Health and Social Services Employment	Total Economic Multiplier
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total Inpatient Psychiatric Facilities	Economic Output	\$2.3 trillion	\$20.6 billion	0.9%	\$61.2 billion	2.6%	2.97
	Employment (Jobs)	16.5 million	223,268	1.4%	477,477	2.9%	2.14
	Employee Compensation	n/a	\$11.1 billion	n/a	\$21.4 billion	n/a	1.93
Inpatient Psychiatric Hospitals <sup>c</sup>	Economic Output	\$2.3 trillion	\$16.1 billion	0.7%	\$48.2 billion	2.1%	2.99
	Employment (Jobs)	16.5 million	137,077	0.8%	336,923	2.0%	2.46
	Employee Compensation	n/a	\$8.2 billion	n/a	\$16.3 billion	n/a	1.99
Residential Treatment Centers	Economic Output	\$2.3 trillion	\$4.5 billion	0.2%	\$13.0 billion	0.6%	2.90
	Employment (Jobs)	16.5 million	86,191	0.5%	140,554	0.9%	1.63
	Employee Compensation	n/a	\$2.9 billion	n/a	\$5.1 billion	n/a	1.75

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>a</sup> Kaiser Family Foundation and the World Health Organization National Health Accounts. Kaiser provides health expenditures by state for 2004, retrieved from: <http://www.statehealthfacts.kff.org>. The National Health Accounts published a national picture of health expenditures for 2008, retrieved from:

<http://www.who.int/nha/country/usa/en/>. The National Health Accounts listed health expenditures as 16.2 percent of gross domestic product. This is calculated to be approximately \$2.3 trillion. We proportioned this figure among the states using the proportions from the Kaiser 2004 state health expenditure data.

<sup>b</sup> United States Bureau of Labor Statistics. The total number of employees was listed for the Health Care and Social Assistance Sector for the United States. Subsets of that total for Healthcare Practitioner, Technical Occupations, and Community and Social Services Occupations constituted the majority of the employees in the Health Care and Social Assistance Sector. Healthcare Practitioner, Technical Occupations, and Community and Social Services Occupations figures were available by state. This proportion was distributed across the national total for Health Care and Social Assistance Sector. Does not include self-employed individuals.

<sup>c</sup> Inpatient psychiatric hospitals include non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals.

## Chapter 1: Total Inpatient Psychiatric Facilities

*Exhibit 7* presents the total national level tax effects for federal and state/local taxes, and by inpatient psychiatric facility type. **The total tax impact of all inpatient psychiatric facilities (including inpatient psychiatric hospitals and residential treatment centers) is \$7.9 billion, with approximately \$5.0 billion in federal and \$2.9 billion in state/local taxes.**

### Exhibit 7: Total Inpatient Psychiatric Facilities, Inpatient Psychiatric Hospitals, and Residential Treatment Centers, Tax Impacts by Facility Type, CY 2008 (Billions)

Facility Type	Federal Tax Impact	State/local Tax Impact	Total Tax Impact <sup>1a</sup>
Total Inpatient Psychiatric Facilities <sup>1a</sup>	\$5.0	\$2.9	\$7.9
Inpatient Psychiatric Hospitals <sup>1b</sup>	\$3.8	\$2.2	\$6.0
Residential Treatment Centers	\$1.0	\$0.7	\$1.7

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> The slight difference between the sum of federal and State/local taxes is due to Corporate Enterprise Taxes.

<sup>1b</sup> Include non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals.

### Impact of Total Inpatient Psychiatric Facilities (Inpatient Psychiatric Hospitals and Residential Treatment Centers) at the National Level by Industry

In *Exhibit 8* below we present the total economic impact of direct expenditures from inpatient psychiatric facilities on economic output by industry. We used a blend of the “private hospital” and “nursing and residential care facilities” sectors as a proxy industry for inpatient psychiatric facilities, in order to input direct expenditures (see Appendix A). For example, the “private hospital” industry has direct expenditures of \$17.3 billion, and these expenditures translate to a total economic impact of \$18.1 billion after adding the indirect and induced effects. The indirect and induced effects are relatively low in this sector because the expenditures pass through the private hospital industry and circulate throughout other sectors in the economy. Real estate establishments, for example, have no direct expenditures, but have an indirect effect of \$2.2 billion and an induced effect of \$1.4 billion, creating a total economic impact of \$3.7 billion. The economic impact on the private hospital and nursing and residential care facility sectors represents approximately 36 percent of the total economic impact of inpatient psychiatric facilities on all industries, which means that almost two-thirds of their economic impact occurs in other industries. These industries include real estate, retail, telecommunications, and energy, which are impacted through the indirect and induced economic effects. **Inpatient psychiatric facilities, thus, impact a wide range of industries within and outside of the health care industry.**

## Chapter 1: Total Inpatient Psychiatric Facilities

**Exhibit 8: Economic Impact of Total Inpatient Psychiatric Facilities (Inpatient Psychiatric Hospitals and Residential Treatment Centers) at the National Level by Industry, CY 2008**

Order	Industry	Direct Expenditures	Indirect Effect	Induced Effect	Total Economic Impact	Percent of Total
1	Private hospitals	\$17,258,455,040	\$34,947,072	\$833,976,832	\$18,127,378,432	29.6%
2	Real estate establishments	\$0	\$2,226,546,432	\$1,435,651,072	\$3,662,197,504	6.0%
3	Nursing and residential care facilities <sup>a</sup>	\$3,351,685,888	\$0	\$208,828,160	\$3,560,514,048	5.8%
4	Imputed rental activity for owner-occupied dwellings	\$0	\$0	\$2,036,296,960	\$2,036,296,960	3.3%
5	Wholesale trade businesses	\$0	\$616,710,656	\$1,160,733,056	\$1,777,443,712	2.9%
6	Pharmaceutical preparation manufacturing	\$0	\$943,791,360	\$401,587,616	\$1,345,378,944	2.2%
7	Insurance carriers	\$0	\$361,750,080	\$743,586,240	\$1,105,336,320	1.8%
8	Management of companies and enterprises	\$0	\$714,627,968	\$368,376,832	\$1,083,004,800	1.8%
9	Food services and drinking places	\$0	\$178,014,368	\$886,077,952	\$1,064,092,288	1.7%
10	Telecommunications	\$0	\$348,735,936	\$615,984,192	\$964,720,128	1.6%
11	Offices of physicians, dentists, and other health practitioners	\$0	\$8,736,190	\$887,683,840	\$896,420,032	1.5%
12	Securities, commodity contracts, investments, and related activities	\$0	\$234,419,856	\$629,614,912	\$864,034,752	1.4%
13	Monetary authorities and depository credit intermediation activities	\$0	\$185,033,808	\$616,517,184	\$801,550,976	1.3%
14	Petroleum refineries	\$0	\$250,867,808	\$521,180,096	\$772,047,872	1.3%
15	Electric power generation, transmission, and distribution	\$0	\$346,084,864	\$416,198,368	\$762,283,264	1.2%
16	Medical and diagnostic labs and outpatient and other ambulatory care services	\$0	\$372,172,480	\$287,134,240	\$659,306,752	1.1%
17	Employment services	\$0	\$393,245,952	\$162,324,480	\$555,570,432	0.9%
18	Legal services	\$0	\$197,443,600	\$334,759,552	\$532,203,136	0.9%
19	Management, scientific, and technical consulting services	\$0	\$265,223,360	\$173,513,664	\$438,737,024	0.7%
20	Extraction of oil and natural gas	\$0	\$149,158,784	\$286,381,120	\$435,539,904	0.7%
	<b>Subtotal</b>	<b>\$20,610,140,928</b>	<b>\$7,827,510,574</b>	<b>\$13,006,406,368</b>	<b>\$41,444,057,280</b>	<b>67.7%</b>
	Other Industries	\$0	\$6,334,843,157	\$13,418,284,657	\$19,753,127,752	32.3%
	<b>Total</b>	<b>\$20,610,140,928</b>	<b>\$14,162,353,731</b>	<b>\$26,424,691,025</b>	<b>\$61,197,185,032</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>a</sup> In the IMPLAN model, nursing and residential facilities do not produce an indirect effect because their services are purchased by households but not by other industries (see Appendix A).

# Chapter 2: Inpatient Psychiatric Hospitals

In the previous chapter we presented our findings for the economic and employment impacts of total inpatient psychiatric facilities (inpatient psychiatric hospitals and residential treatment centers) at the national level.

In this section, we present the economic and employment impact of inpatient psychiatric hospitals only (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) at the national level and the effects on other industries.

We will present the following tables in this section:

Exhibit 9	Summary of Inpatient Psychiatric Hospitals Economic and Employment Impact
Exhibit 10	Inpatient Psychiatric Hospitals: Economic Impact at the National Level by Industry

## Economic and Employment Impact of Inpatient Psychiatric Hospitals (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals)

*Exhibit 9* below summarizes the economic and employment impact of inpatient psychiatric hospitals at the national level. **Inpatient psychiatric hospitals have a total economic impact of \$48.2 billion (a multiplier of 2.99), create more than 337,000 jobs in the national labor market across all industries, and create \$16.3 billion in employee compensation across all industries.**

## Chapter 2: Inpatient Psychiatric Hospitals

**Exhibit 9: Economic and Employment Impact of Inpatient Psychiatric Hospitals (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) at the National Level, CY 2008**

Impact	U.S. Health Expenditures <sup>1a</sup> and Health and Social Services Employment <sup>1b</sup>	Direct Expenditures, Employment (Jobs), Employee Compensation	Direct Expenditures as a Percent of U.S. Health Expenditures and Health and Social Services Employment	Total Impact, Employment (Jobs), Employee Compensation,	Total Impact as a Percent of U.S. Health Expenditures and Health and Social Services Employment	Total Economic Multiplier
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Economic Output	\$2.3 trillion	\$16.1 billion	0.7%	\$48.2 billion	2.1%	2.99
Employment (Jobs)	16.5 million	137,077	0.8%	336,923	2.0%	2.46
Employee Compensation	n/a	\$8.2 billion	n/a	\$16.3 billion	n/a	1.99

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> Kaiser Family Foundation and the World Health Organization National Health Accounts. Kaiser provides health expenditures by state for 2004, retrieved from: <http://www.statehealthfacts.kff.org>. The National Health Accounts published a national picture of health expenditures for 2008, retrieved from: <http://www.who.int/nha/country/usa/en/>. The National Health Accounts listed health expenditures as 16.2 percent of gross domestic product. This is calculated to be approximately \$2.3 trillion. We proportioned this figure among the states using the proportions from the Kaiser 2004 state health expenditure data.

<sup>1b</sup> United States Bureau of Labor Statistics. The total number of employees was listed for the Health Care and Social Assistance Sector for the United States. Subsets of that total for Healthcare Practitioner, Technical Occupations, and Community and Social Services Occupations constituted the majority of the employees in the Health Care and Social Assistance Sector. Healthcare Practitioner, Technical Occupations, and Community and Social Services Occupations figures were available by state. This proportion was distributed across the national total for Health Care and Social Assistance Sector. Does not include self-employed individuals.

In *Exhibit 10* below we present the total economic impact of direct expenditures from inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) on economic output by industry. We used the “private hospital” sector as the proxy industry for inpatient psychiatric hospital expenditures (see Appendix A). The private hospital sector therefore has direct expenditures of \$16.1 billion, which translates to a total economic impact of \$16.8 billion after adding the indirect and induced effects. The indirect and induced effects are relatively low in this sector because the expenditures pass through the private hospital industry and circulate throughout other sectors in the economy. Real estate establishments, for example, have no direct expenditures but have an indirect effect of \$1.9 billion and an induced effect of \$1.1 billion, creating a total economic impact of \$3 billion. The economic impact on the private hospital sector represents 35 percent of the total economic impact of inpatient psychiatric hospitals on all industries, which means that almost two-thirds of their economic impact occurs indirectly to other industries, including real estate, retail, insurance and telecommunications. **Inpatient psychiatric hospitals, therefore, also impact a wide range of industries within and outside of the health care industry.**

## Chapter 2: Inpatient Psychiatric Hospitals

**Exhibit 10: Economic Impact of Inpatient Psychiatric Hospitals** (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) **at the National Level by Industry, CY 2008**

Order	Industry	Direct Expenditures	Indirect Effect	Induced Effect	Total Economic Impact	Percent of Total
1	Private hospitals	\$16,136,902,656	\$32,665,600	\$636,634,816	\$16,806,203,392	34.8%
2	Real estate establishments	\$0	\$1,932,513,920	\$1,095,837,312	\$3,028,351,232	6.3%
3	Imputed rental activity for owner-occupied dwellings	\$0	\$0	\$1,554,812,288	\$1,554,812,288	3.2%
4	Wholesale trade businesses	\$0	\$522,480,384	\$886,027,392	\$1,408,507,776	2.9%
5	Pharmaceutical preparation manufacturing	\$0	\$837,591,232	\$306,514,240	\$1,144,105,472	2.4%
6	Management of companies and enterprises	\$0	\$623,405,184	\$281,214,656	\$904,619,840	1.9%
7	Insurance carriers	\$0	\$290,827,488	\$567,733,248	\$858,560,768	1.8%
8	Food services and drinking places	\$0	\$131,610,064	\$676,454,592	\$808,064,640	1.7%
9	Telecommunications	\$0	\$290,262,112	\$470,224,416	\$760,486,528	1.6%
10	Offices of physicians, dentists, and other health practitioners	\$0	\$8,160,297	\$677,642,752	\$685,803,072	1.4%
11	Securities, commodity contracts, investments, and related activities	\$0	\$204,716,096	\$480,665,600	\$685,381,696	1.4%
12	Monetary authorities and depository credit intermediation activities	\$0	\$145,808,096	\$470,644,992	\$616,453,120	1.3%
13	Petroleum refineries	\$0	\$203,888,320	\$397,858,272	\$601,746,560	1.2%
14	Electric power generation, transmission, and distribution	\$0	\$283,824,256	\$317,701,632	\$601,525,888	1.2%
15	Medical and diagnostic labs and outpatient and other ambulatory care services	\$0	\$347,638,720	\$219,200,832	\$566,839,552	1.2%
16	Employment services	\$0	\$329,268,704	\$123,922,672	\$453,191,360	0.9%
17	Legal services	\$0	\$165,120,704	\$255,557,104	\$420,677,824	0.9%
18	Extraction of oil and natural gas	\$0	\$119,698,560	\$218,616,560	\$338,315,136	0.7%
19	Management, scientific, and technical consulting services	\$0	\$201,344,336	\$132,464,448	\$333,808,768	0.7%
20	Nondepository credit intermediation and related activities	\$0	\$79,947,464	\$252,496,896	\$332,444,352	0.7%
	<b>Subtotal</b>	<b>\$16,136,902,656</b>	<b>\$6,750,771,537</b>	<b>\$10,022,224,720</b>	<b>\$32,909,899,264</b>	<b>68.2%</b>
	Other Industries	\$0	\$5,179,962,806	\$10,151,041,890	\$15,331,004,714	31.8%
	<b>Total</b>	<b>\$16,136,902,656</b>	<b>\$11,930,734,343</b>	<b>\$20,173,266,610</b>	<b>\$48,240,903,978</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

# Chapter 3: Residential Treatment Centers

In the previous chapter we presented our findings for the economic and employment impacts of inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) at the national level.

In this section, we present the economic and employment impact of only residential treatment centers at the national level and the effects on other industries.

We will present the following tables in this section:

Exhibit 11	Summary of Residential Treatment Centers Economic and Employment Impact
Exhibit 12	Residential Treatment Centers: Economic Impact at the National Level by Industry

## Economic Impact of Residential Treatment Centers at the National

*Exhibit 11* below summarizes the economic effects of residential treatment centers at the national level. **Residential treatment centers have a total economic impact of \$13.0 billion on the United States economy (a multiplier of 2.90), create nearly 141,000 jobs in the national labor market, and generate \$5.1 billion in employee compensation across all industries.**

## Chapter 3: Residential Treatment Centers

**Exhibit 11: Summary of Residential Treatment Centers Economic and Employment Impact at the National Level, CY 2008**

Impact	U.S. Health Expenditures <sup>1a</sup> and Health and Social Services Employment <sup>1b</sup>	Direct Expenditures, Employment (Jobs), Employee Compensation	Direct Expenditures as a Percent of U.S. Health Expenditures and Health and Social Services Employment	Total Impact, Employment (Jobs), Employee Compensation,	Total Impact as a Percent of U.S. Health Expenditures and Health and Social Services Employment	Total Economic Multiplier
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Economic Output	\$2.3 trillion	\$4.5 billion	0.2%	\$13.0 billion	0.6%	2.90
Employment (Jobs)	16.5 million	86,191	0.5%	140,554	0.9%	1.63
Employee Compensation	n/a	\$2.9 billion	n/a	\$5.1 billion	n/a	1.75

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> Kaiser Family Foundation and the World Health Organization National Health Accounts. Kaiser provides health expenditures by state for 2004, retrieved from: <http://www.statehealthfacts.kff.org>. The National Health Accounts published a national picture of health expenditures for 2008, retrieved from: <http://www.who.int/nha/country/usa/en/>. The National Health Accounts listed health expenditures as 16.2 percent of gross domestic product. This is calculated to be approximately \$2.3 trillion. We proportioned this figure among the states using the proportions from the Kaiser 2004 state health expenditure data.

<sup>1b</sup> United States Bureau of Labor Statistics. The total number of employees was listed for the Health Care and Social Assistance Sector for the United States. Subsets of that total for Healthcare Practitioner, Technical Occupations, and Community and Social Services Occupations constituted the majority of the employees in the Health Care and Social Assistance Sector. Healthcare Practitioner, Technical Occupations, and Community and Social Services Occupations figures were available by state. This proportion was distributed across the national total for Health Care and Social Assistance Sector. Does not include self-employed individuals.

*Exhibit 12* below presents the economic impact of residential treatment centers on the national economy by industry. We used a blend of the “private hospital” and “nursing and residential care facilities” sectors as a proxy industry for residential treatment centers (see Appendix A). The “private hospital” industry in this case has direct expenditures of \$1.1 billion, and these expenditures translate to a total economic impact of \$1.3 billion after adding the indirect and induced effects. The indirect and induced effects are relatively low in this sector because the expenditures circulate throughout other sectors in the economy. Real estate establishments, for example, have no direct expenditures, but have an indirect effect of \$294 million and an induced effect of \$340 million, creating a total economic impact of \$634 million. The economic impact on the private hospital and nursing and residential care facility sectors represents approximately 36 percent of the total economic impact of residential treatment centers on all industries, which means that almost two-thirds of their economic impact occurs in other industries. These industries include real estate, retail, telecommunications, and energy, which are impacted through the indirect and induced economic effects. **Residential treatment facilities impact a wide range of industries within and outside of the health care industry as well.**

## Chapter 3: Residential Treatment Centers

**Exhibit 12: Economic Impact of Residential Treatment Centers at the National Level by Industry, CY 2008**

Order	Industry	Direct Expenditures	Indirect Effects	Induced Effects	Total Economic Impact	Percent of Total
1	Nursing and residential care facilities <sup>1a</sup>	\$3,351,685,888	\$0	\$49,404,120	\$3,401,090,048	26.3%
2	Private hospitals	\$1,121,552,896	\$2,281,472	\$197,342,048	\$1,321,176,448	10.2%
3	Real estate establishments	\$0	\$294,032,480	\$339,813,728	\$633,846,208	4.9%
4	Imputed rental activity for owner-occupied dwellings	\$0	\$0	\$481,484,736	\$481,484,736	3.7%
5	Wholesale trade businesses	\$0	\$94,230,304	\$274,705,696	\$368,936,000	2.8%
6	Food services and drinking places	\$0	\$46,404,304	\$209,623,328	\$256,027,632	2.0%
7	Insurance carriers	\$0	\$70,922,584	\$175,852,976	\$246,775,552	1.9%
8	Offices of physicians, dentists, and other health practitioners	\$0	\$575,893	\$210,041,072	\$210,616,960	1.6%
9	Telecommunications	\$0	\$58,473,808	\$145,759,792	\$204,233,600	1.6%
10	Pharmaceutical preparation manufacturing	\$0	\$106,200,160	\$95,073,384	\$201,273,536	1.6%
11	Monetary authorities and depository credit intermediation activities	\$0	\$39,225,712	\$145,872,208	\$185,097,920	1.4%
12	Securities, commodity contracts, investments, and related activities	\$0	\$29,703,756	\$148,949,312	\$178,653,072	1.4%
13	Management of companies and enterprises	\$0	\$91,222,784	\$87,162,192	\$178,384,976	1.4%
14	Petroleum refineries	\$0	\$46,979,492	\$123,321,808	\$170,301,296	1.3%
15	Electric power generation, transmission, and distribution	\$0	\$62,260,624	\$98,496,728	\$160,757,344	1.2%
16	Legal services	\$0	\$32,322,900	\$79,202,456	\$111,525,360	0.9%
17	Management, scientific, and technical consulting services	\$0	\$63,879,024	\$41,049,216	\$104,928,240	0.8%
18	Employment services	\$0	\$63,977,264	\$38,401,816	\$102,379,080	0.8%
19	Extraction of oil and natural gas	\$0	\$29,460,220	\$67,764,544	\$97,224,768	0.8%
20	Nondepository credit intermediation and related activities	\$0	\$14,276,692	\$78,222,824	\$92,499,520	0.7%
	<b>Subtotal</b>	<b>\$4,473,238,784</b>	<b>\$1,146,429,473</b>	<b>\$3,087,543,984</b>	<b>\$8,707,212,296</b>	<b>67.2%</b>
	Other Industries	\$0	\$1,085,189,925	\$3,163,880,515	\$4,249,070,437	32.8%
	<b>Total</b>	<b>\$4,473,238,784</b>	<b>\$2,231,619,398</b>	<b>\$6,251,424,499</b>	<b>\$12,956,282,733</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> In the IMPLAN model, nursing and residential facilities do not produce an indirect effect because their services are purchased by households but not by other industries (see Appendix A).

# Chapter 4: Inpatient Psychiatric Hospitals by State

In this section we present our findings for the economic and employment impact of inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) at the state level. Residential treatment centers are not included in this analysis.<sup>2</sup>

Exhibit 13	State Economic and Inpatient Psychiatric Hospital Profiles
Exhibit 14	Inpatient Psychiatric Hospitals: Economic Impact by State
Exhibit 15	Inpatient Psychiatric Hospitals: Tax Impact by State

## **Economic Impact of Inpatient Psychiatric Hospitals (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) at the State Level**

*Exhibit 13* below provides context by summarizing relevant demographic and behavioral health descriptive statistics for each state. The table—see column numbers—shows (1) the state population, (2) state employment (jobs), (3) overall number of distinct industries within each state, (4) the gross state product, and (5) the estimated number of patients with mental disorders in each state.

<sup>2</sup> Data were not available to conduct a state level analysis of residential treatment centers.

## Chapter 4: Inpatient Psychiatric Hospitals by State

**Exhibit 13: Selected Economic and Mental Health Profile of States, CY 2008**

State	Population <sup>a</sup>	Employment <sup>b</sup>	Number of Industries <sup>b</sup>	Gross State Product <sup>c</sup>	Number of Patients with Mental Health Disorders <sup>d</sup>
	(1)	(2)	(3)	(4)	(5)
Alabama	4,661,900	2,553,364	414	\$173,602,471,404	1,221,418
Alaska	686,293	441,464	256	\$38,133,920,634	179,809
Arizona	6,500,180	3,376,989	413	\$250,293,800,120	1,703,047
Arkansas	2,855,390	1,563,552	401	\$96,169,597,459	748,112
California	36,756,660	20,663,149	432	\$1,894,650,723,660	9,630,245
Colorado	4,939,456	3,155,064	411	\$270,886,135,812	1,294,137
Connecticut	3,501,252	2,175,661	393	\$225,248,689,589	917,328
Delaware	873,092	537,631	317	\$44,923,883,849	228,750
District of Columbia	591,833	838,426	196	\$105,382,066,284	155,060
Florida	18,328,340	10,114,123	432	\$722,267,908,076	4,802,025
Georgia	9,685,744	5,395,391	423	\$416,050,444,277	2,537,665
Hawaii	1,288,198	846,512	275	\$63,199,155,773	337,508
Idaho	1,523,816	920,991	388	\$54,035,916,159	399,240
Illinois	12,901,560	7,386,620	425	\$655,882,195,717	3,380,209
Indiana	6,376,792	3,618,454	408	\$258,417,251,381	1,670,720
Iowa	3,002,555	1,993,939	391	\$133,167,810,140	786,669
Kansas	2,802,134	1,812,435	394	\$131,308,539,345	734,159
Kentucky	4,269,245	2,379,182	409	\$160,248,129,632	1,118,542
Louisiana	4,410,796	2,468,249	396	\$187,996,902,998	1,155,629
Maine	1,316,456	812,337	353	\$49,726,714,755	344,911
Maryland	5,633,597	3,366,301	413	\$289,991,901,351	1,476,002
Massachusetts	6,497,967	4,109,208	407	\$387,479,529,580	1,702,467
Michigan	10,003,420	5,237,537	424	\$413,489,678,643	2,620,896
Minnesota	5,220,393	3,459,578	415	\$271,985,688,499	1,367,743
Mississippi	2,938,618	1,528,586	385	\$90,570,389,519	769,918
Missouri	5,911,605	3,582,951	414	\$254,680,337,947	1,548,841
Montana	967,440	636,500	334	\$38,980,336,992	253,469
Nebraska	1,783,432	1,225,247	371	\$83,542,888,173	467,259
Nevada	2,600,167	1,584,695	366	\$125,251,074,394	681,244
New Hampshire	1,315,809	827,975	370	\$63,426,048,296	344,742
New Jersey	8,682,661	4,981,596	421	\$498,998,397,040	2,274,857

## Chapter 4: Inpatient Psychiatric Hospitals by State

State	Population <sup>a</sup>	Employment <sup>b</sup>	Number of Industries <sup>b</sup>	Gross State Product <sup>c</sup>	Number of Patients with Mental Health Disorders <sup>d</sup>
	(1)	(2)	(3)	(4)	(5)
New Mexico	1,984,356	1,089,428	361	\$70,350,994,351	519,901
New York	19,490,300	10,867,215	426	\$1,140,017,024,319	5,106,459
North Carolina	9,222,414	5,330,178	422	\$379,083,831,677	2,416,272
North Dakota	641,481	484,339	288	\$32,215,750,693	168,068
Ohio	11,485,910	6,615,127	426	\$473,763,344,739	3,009,308
Oklahoma	3,642,361	2,133,056	408	\$162,444,571,559	954,299
Oregon	3,790,060	2,262,267	410	\$155,733,351,934	992,996
Pennsylvania	12,448,280	7,137,828	423	\$573,743,657,936	3,261,449
Rhode Island	1,050,788	592,730	339	\$45,434,861,386	275,306
South Carolina	4,479,800	2,444,627	419	\$159,121,307,558	1,173,708
South Dakota	804,194	556,089	326	\$34,021,368,214	210,699
Tennessee	6,214,888	3,645,746	421	\$260,037,891,483	1,628,301
Texas	24,326,970	14,007,615	430	\$1,299,495,014,477	6,373,666
Utah	2,736,424	1,638,059	390	\$107,227,382,792	716,943
Vermont	621,270	418,608	325	\$26,226,108,052	162,773
Virginia	7,769,089	4,836,371	409	\$405,619,440,754	2,035,501
Washington	6,549,224	3,880,528	413	\$333,372,855,540	1,715,897
West Virginia	1,814,468	598,334	343	\$61,293,328,960	475,391
Wisconsin	5,627,967	3,502,490	413	\$240,732,267,956	1,474,527
Wyoming	532,668	385,455	286	\$31,487,173,960	139,559
<b>United States</b>	<b>304,059,700</b>	<b>176,316,800</b>	<b>436</b>	<b>\$14,441,400,029,587</b>	<b>79,663,641</b>

<sup>a</sup> United States Census Bureau.

<sup>b</sup> Dobson | DaVanzo analysis of IMPLAN.

<sup>c</sup> United States Bureau of Economic Analysis and the World Health Organization National Health Accounts.

<sup>d</sup> National Institute of Mental Health. (2008). *The Numbers Count: Mental Disorders in America*. Retrieved from <http://www.nimh.nih.gov/health/publications/the-numbers-count-mental-disorders-in-america/index.shtml#Intro>. "An estimated 26.2 percent of Americans ages 18 and older — about one in four adults — suffer from a diagnosable mental disorder in a given year."

Note: Data were not available to estimate the number of residential treatment centers at the state level.

In *Exhibit 14* below we present the economic impact that inpatient psychiatric hospital expenditures have on each state economy and what proportion of overall state spending on health care the total impact represents. New York has the highest amount of direct inpatient psychiatric hospital expenditures, followed by California, New Jersey, Pennsylvania, and Texas. Aside from New York (1.6 percent) and New Jersey (1.3 percent), a different set of states have the highest inpatient psychiatric hospital expenditures as a proportion of total health care spending, with Connecticut at 1.6

## Chapter 4: Inpatient Psychiatric Hospitals by State

---

percent, the District of Columbia at 1.5 percent, and Wyoming at 1.2 percent. The states with the lowest proportion of direct health care spending on inpatient psychiatric hospitals are Hawaii at 0.2 percent, and Florida, Colorado, Oregon, Virginia, and Minnesota at 0.4 percent.

The states that have the highest economic impact from inpatient psychiatric hospital expenditures, as a proportion of overall state health expenditures, are Connecticut at 3.0 percent, New York at 2.8 percent, New Jersey at 2.6 percent, the District of Columbia at 2.2 percent, and Louisiana at 1.8 percent. States with the lowest impacts include Hawaii at 0.4 percent, Oregon at 0.7 percent, and Florida, New Mexico, Colorado, Virginia, Nebraska, and South Dakota each at 0.8 percent.

Surprisingly, the states with the highest economic impact are not the states in which inpatient psychiatric hospital expenditures have the largest multiplier, or ripple effect, in their economies. For instance, California has the highest multiplier at 2.23, followed by Florida at 2.15, Illinois at 2.12, Colorado at 2.06, and Massachusetts at 2.05. None of these states are in the top five for highest economic impact noted above. The states with the lowest multiplier effect are the District of Columbia at 1.46, Wyoming at 1.50, West Virginia at 1.51, North Dakota at 1.56, and Mississippi at 1.61.

The multiplier effect for direct expenditures at the state level is greatly enhanced by the large proportion of inpatient psychiatric hospital patients enrolled in the Medicaid program. Due to the federal match, which assigns states a level of federal spending match using the Federal Medical Assistance Percentage (FMAP), every Medicaid dollar spent in each state is matched at some level by the federal government (from 50 percent – the minimum match – to 76.29 percent as seen in Mississippi). Federal matching has a powerful effect on the state economies by increasing the amount of federal dollars circulating through businesses and households, and greatly increases the overall state multiplier effect for each Medicaid dollar spent.

For instance, in Utah, the federal government matches each Medicaid dollar at the FMAP rate of 71.6. With a base multiplier of 1.98, this means that each state Medicaid dollar spent on inpatient psychiatric hospital services in Utah has a “super multiplier” of 6.99 and actually creates \$6.99 in the state economy, which additionally ripples through the national economy. For a full list of state super multipliers, see Appendix B.

In this way, inpatient psychiatric hospitals are important to the state economies because they produce high multipliers on state “investments” in behavioral health. **Inpatient psychiatric hospital expenditures therefore have a considerable impact on health care spending at the state level.**

## Chapter 4: Inpatient Psychiatric Hospitals by State

**Exhibit 14: Economic Impact of Inpatient Psychiatric Hospitals** (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) **by State, CY 2008**

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Gross State Product <sup>1a</sup>	Health Expenditures <sup>1b</sup>	Health Expenditures as a Percent of Gross State Product	Direct Inpatient Psychiatric Hospital Expenditures	Direct Inpatient Psychiatric Hospital Expenditures as a Percent of Health Expenditures	Total Impact of Inpatient Psychiatric Hospital Expenditures <sup>1c</sup>	Total Impact Inpatient Psychiatric Hospital Expenditures as a Percent of Health Expenditures	Multiplier
Alabama	\$173,319,749,265	\$34,514,293,016	19.9%	\$227,460,944	0.7%	\$390,598,381	1.1%	1.72
Alaska	\$48,843,600,096	\$6,288,761,770	12.9%	\$45,931,820	0.7%	\$77,902,525	1.2%	1.70
Arizona	\$253,727,373,952	\$36,592,449,783	14.4%	\$216,362,304	0.6%	\$434,629,162	1.2%	2.01
Arkansas	\$100,242,946,257	\$19,265,930,843	19.2%	\$163,704,352	0.8%	\$271,465,569	1.4%	1.66
California	\$1,882,665,311,055	\$252,195,936,049	13.4%	\$1,424,616,960	0.6%	\$3,178,191,123	1.3%	2.23
Colorado	\$253,436,832,417	\$33,641,105,230	13.3%	\$129,482,688	0.4%	\$266,653,334	0.8%	2.06
Connecticut	\$220,377,283,504	\$33,267,097,336	15.1%	\$528,926,080	1.6%	\$997,706,257	3.0%	1.89
Delaware	\$63,030,182,559	\$7,636,999,905	12.1%	\$60,082,436	0.8%	\$107,313,485	1.4%	1.79
District of Columbia	\$99,125,635,652	\$9,482,909,835	9.6%	\$140,206,080	1.5%	\$205,337,914	2.2%	1.46
Florida	\$758,588,656,365	\$143,474,254,144	18.9%	\$525,768,928	0.4%	\$1,130,160,855	0.8%	2.15
Georgia	\$405,489,960,760	\$62,581,474,144	15.4%	\$304,575,424	0.5%	\$609,325,918	1.0%	2.00
Hawaii	\$65,088,439,960	\$9,463,304,582	14.5%	\$19,911,132	0.2%	\$34,034,114	0.4%	1.71
Idaho	\$53,772,611,753	\$8,517,728,172	15.8%	\$49,557,352	0.6%	\$85,113,235	1.0%	1.72
Illinois	\$646,018,593,469	\$97,896,566,321	15.2%	\$639,363,136	0.7%	\$1,353,486,839	1.4%	2.12
Indiana	\$263,894,288,791	\$49,961,723,906	18.9%	\$263,501,952	0.5%	\$464,611,459	0.9%	1.76
Iowa	\$138,340,587,333	\$22,733,044,347	16.4%	\$127,343,968	0.6%	\$222,188,518	1.0%	1.74
Kansas	\$125,117,379,434	\$21,487,356,763	17.2%	\$101,453,832	0.5%	\$187,098,094	0.9%	1.84
Kentucky	\$159,477,738,869	\$33,948,756,885	21.3%	\$206,749,856	0.6%	\$348,902,824	1.0%	1.69

## Chapter 4: Inpatient Psychiatric Hospitals by State

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Gross State Product <sup>1a</sup>	Health Expenditures <sup>1b</sup>	Health Expenditures as a Percent of Gross State Product	Direct Inpatient Psychiatric Hospital Expenditures	Direct Inpatient Psychiatric Hospital Expenditures as a Percent of Health Expenditures	Total Impact of Inpatient Psychiatric Hospital Expenditures <sup>1c</sup>	Total Impact Inpatient Psychiatric Hospital Expenditures as a Percent of Health Expenditures	Multiplier
Louisiana	\$226,538,802,935	\$34,410,234,368	15.2%	\$357,905,344	1.0%	\$623,771,441	1.8%	1.74
Maine	\$50,675,540,933	\$12,680,074,092	25.0%	\$90,096,552	0.7%	\$166,233,181	1.3%	1.85
Maryland	\$278,647,682,108	\$46,227,677,349	16.6%	\$261,701,840	0.6%	\$493,694,908	1.1%	1.89
Massachusetts	\$372,084,820,337	\$66,538,718,961	17.9%	\$558,874,112	0.8%	\$1,146,645,360	1.7%	2.05
Michigan	\$389,982,178,897	\$74,893,572,728	19.2%	\$480,927,232	0.6%	\$971,030,199	1.3%	2.02
Minnesota	\$267,957,792,506	\$46,494,610,403	17.4%	\$208,786,912	0.4%	\$423,922,574	0.9%	2.03
Mississippi	\$93,566,607,615	\$21,036,435,955	22.5%	\$176,799,280	0.8%	\$284,495,913	1.4%	1.61
Missouri	\$242,420,720,741	\$48,699,447,263	20.1%	\$277,334,016	0.6%	\$515,864,086	1.1%	1.86
Montana	\$36,588,863,981	\$6,935,735,104	19.0%	\$42,197,608	0.6%	\$69,247,639	1.0%	1.64
Nebraska	\$84,892,158,767	\$14,869,829,989	17.5%	\$71,813,136	0.5%	\$123,183,821	0.8%	1.72
Nevada	\$133,784,692,174	\$16,417,136,842	12.3%	\$95,789,024	0.6%	\$167,575,160	1.0%	1.75
New Hampshire	\$61,171,736,179	\$10,570,247,302	17.3%	\$100,980,048	1.0%	\$181,420,739	1.7%	1.80
New Jersey	\$484,170,647,341	\$72,931,539,379	15.1%	\$933,170,944	1.3%	\$1,868,719,624	2.6%	2.00
New Mexico	\$81,454,593,657	\$12,052,706,012	14.8%	\$57,286,824	0.5%	\$95,292,522	0.8%	1.66
New York	\$1,166,734,268,700	\$189,815,038,719	16.3%	\$2,622,389,248	1.4%	\$5,244,064,113	2.8%	2.00
North Carolina	\$407,973,326,302	\$67,242,999,956	16.5%	\$380,958,432	0.6%	\$723,333,650	1.1%	1.90
North Dakota	\$31,814,807,810	\$6,008,255,850	18.9%	\$49,624,352	0.8%	\$77,540,017	1.3%	1.56
Ohio	\$480,675,993,368	\$99,131,697,230	20.6%	\$520,348,704	0.5%	\$1,000,713,249	1.0%	1.92
Oklahoma	\$149,295,532,370	\$25,029,875,084	16.8%	\$131,428,136	0.5%	\$225,479,368	0.9%	1.72
Oregon	\$164,714,622,608	\$26,420,339,917	16.0%	\$105,612,080	0.4%	\$195,828,157	0.7%	1.85
Pennsylvania	\$564,059,375,041	\$112,324,524,080	19.9%	\$925,361,216	0.8%	\$1,870,301,243	1.7%	2.02

## Chapter 4: Inpatient Psychiatric Hospitals by State

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Gross State Product <sup>1a</sup>	Health Expenditures <sup>1b</sup>	Health Expenditures as a Percent of Gross State Product	Direct Inpatient Psychiatric Hospital Expenditures	Direct Inpatient Psychiatric Hospital Expenditures as a Percent of Health Expenditures	Total Impact of Inpatient Psychiatric Hospital Expenditures <sup>1c</sup>	Total Impact Inpatient Psychiatric Hospital Expenditures as a Percent of Health Expenditures	Multiplier
Rhode Island	\$48,284,944,794	\$10,246,006,587	21.2%	\$71,134,808	0.7%	\$138,710,856	1.4%	1.95
South Carolina	\$159,424,727,782	\$31,228,151,074	19.6%	\$195,973,488	0.6%	\$350,805,050	1.1%	1.79
South Dakota	\$37,677,630,155	\$6,457,668,561	17.1%	\$32,949,384	0.5%	\$54,301,817	0.8%	1.65
Tennessee	\$257,029,353,012	\$51,002,310,386	19.8%	\$265,118,224	0.5%	\$508,362,099	1.0%	1.92
Texas	\$1,247,300,926,649	\$159,132,818,523	12.8%	\$778,253,312	0.5%	\$1,584,527,395	1.0%	2.04
Utah	\$111,911,502,083	\$15,016,115,335	13.4%	\$109,168,408	0.7%	\$216,608,700	1.4%	1.98
Vermont	\$25,936,693,806	\$5,364,298,709	20.7%	\$28,363,552	0.5%	\$48,180,387	0.9%	1.70
Virginia	\$404,744,747,209	\$53,944,606,361	13.3%	\$231,137,744	0.4%	\$433,812,948	0.8%	1.88
Washington	\$329,054,089,830	\$48,159,548,771	14.6%	\$275,216,640	0.6%	\$562,194,599	1.2%	2.04
West Virginia	\$62,850,760,418	\$15,267,967,425	24.3%	\$108,650,384	0.7%	\$164,580,529	1.1%	1.51
Wisconsin	\$245,103,897,303	\$46,520,248,040	19.0%	\$322,752,192	0.7%	\$601,542,901	1.3%	1.86
Wyoming	\$35,996,567,027	\$3,423,378,709	9.5%	\$39,888,012	1.2%	\$59,971,454	1.8%	1.50
<b>United States</b>	<b>\$14,441,000,000,000</b>	<b>\$2,339,442,000,000</b>	<b>16.2%</b>	<b>\$16,136,902,656</b>	<b>0.7%</b>	<b>\$48,240,903,978</b>	<b>2.1%</b>	<b>2.99</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> United States Bureau of Economic Analysis and the World Health Organization National Health Accounts.

<sup>1b</sup> Kaiser Family Foundation and the World Health Organization National Health Accounts. Kaiser provides health expenditures by state for 2004, retrieved from: <http://www.statehealthfacts.kff.org>. The National Health Accounts published a national picture of health expenditures for 2008, retrieved from: <http://www.who.int/nha/country/usa/en/>. The National Health Accounts listed health expenditures as 16.2 percent of gross domestic product. This is calculated to be approximately \$2.3 trillion. We proportioned this figure among the states using the proportions from the Kaiser 2004 state health expenditure data.

<sup>1c</sup> The total economic impact of direct inpatient psychiatric facility expenditures on each state does not sum to the total economic impact of direct expenditures at the national level due to the way IMPLAN calculates multipliers (see Appendix A).

## Chapter 4: Inpatient Psychiatric Hospitals by State

In Exhibit 15 below, we present the tax impact of inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) at the state level.

The state/local tax contribution range is from \$170 million (California) to \$1.4 million (Hawaii), while the federal tax range is from \$296 million (California) to \$2.5 million (Hawaii). The states that generate the greatest total tax impact are California, New York, California, and New Mexico, while the states with the least total tax impact are Hawaii, South Dakota, and Vermont.

**Exhibit 15: Tax Impact of Inpatient Psychiatric Hospitals (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) by State, CY 2008**

State	Federal Tax Impact	State/Local Tax Impact	Total Tax Impact	State	Federal Tax Impact	State/Local Tax Impact	Total Tax Impact
Alabama	\$28,657,100	\$13,555,316	\$42,212,416	Montana	\$5,285,314	\$2,524,788	\$7,810,102
Alaska	\$6,284,898	\$3,430,996	\$9,715,894	Nebraska	\$8,896,517	\$4,020,193	\$12,916,710
Arizona	\$37,979,664	\$18,412,986	\$56,392,650	Nevada	\$15,671,212	\$5,738,005	\$21,409,217
Arkansas	\$18,880,864	\$9,370,661	\$28,251,525	New Hampshire	\$16,899,695	\$6,071,305	\$22,971,000
California	\$300,700,811	\$164,994,240	\$465,695,051	New Jersey	\$193,572,018	\$82,914,709	\$276,486,727
Colorado	\$23,788,553	\$11,359,236	\$35,147,789	New Mexico	\$7,131,585	\$3,824,763	\$10,956,348
Connecticut	\$112,502,112	\$47,038,835	\$159,540,947	New York	\$513,276,323	\$310,480,620	\$823,756,943
Delaware	\$9,608,981	\$4,768,655	\$14,377,636	North Carolina	\$56,968,780	\$30,170,195	\$87,138,975
District of Columbia	\$14,003,926	\$6,902,969	\$20,906,895	North Dakota	\$5,513,762	\$2,177,838	\$7,691,600
Florida	\$95,603,627	\$41,245,211	\$136,848,838	Ohio	\$75,386,408	\$44,210,793	\$119,597,201
Georgia	\$49,478,631	\$26,566,548	\$76,045,179	Oklahoma	\$16,709,324	\$7,529,519	\$24,238,843
Hawaii	\$2,887,833	\$1,586,818	\$4,474,651	Oregon	\$16,682,904	\$9,222,482	\$25,905,386
Idaho	\$6,465,546	\$3,171,804	\$9,637,350	Pennsylvania	\$159,265,040	\$77,282,818	\$236,547,858
Illinois	\$120,736,334	\$57,319,302	\$178,055,636	Rhode Island	\$12,128,914	\$6,179,180	\$18,308,094
Indiana	\$34,956,070	\$17,691,440	\$52,647,510	South Carolina	\$25,842,394	\$13,852,493	\$39,694,887
Iowa	\$15,800,589	\$7,505,686	\$23,306,275	South Dakota	\$3,998,762	\$1,583,401	\$5,582,163
Kansas	\$13,786,576	\$6,655,317	\$20,441,893	Tennessee	\$40,032,288	\$16,058,004	\$56,090,292
Kentucky	\$24,523,325	\$12,897,695	\$37,421,020	Texas	\$132,337,165	\$54,095,858	\$186,433,023
Louisiana	\$42,903,945	\$21,406,582	\$64,310,527	Utah	\$16,587,743	\$8,797,953	\$25,385,696
Maine	\$12,454,238	\$7,043,187	\$19,497,425	Vermont	\$3,910,576	\$1,849,213	\$5,759,789
Maryland	\$46,269,057	\$25,062,165	\$71,331,222	Virginia	\$38,288,717	\$19,029,283	\$57,318,000
Massachusetts	\$116,122,701	\$55,590,468	\$171,713,169	Washington	\$52,085,200	\$19,174,414	\$71,259,614
Michigan	\$79,809,193	\$44,259,750	\$124,068,943	West Virginia	\$12,705,200	\$5,437,688	\$18,142,888
Minnesota	\$37,366,550	\$19,288,272	\$56,654,822	Wisconsin	\$46,814,691	\$25,647,689	\$72,462,380
Mississippi	\$19,055,511	\$9,794,784	\$28,850,295	Wyoming	\$5,167,331	\$1,838,835	\$7,006,166
Missouri	\$38,881,320	\$18,801,329	\$57,682,649	<b>United States<sup>1a</sup></b>	<b>\$3,826,689,900</b>	<b>\$2,154,984,900</b>	<b>\$5,981,674,800</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> The total tax impact of direct inpatient psychiatric facility expenditures by state does not sum to the total tax impact of direct expenditures at the national level due to the way IMPLAN calculates multipliers (see Appendix A).

# Chapter 5: Literature Review

The prevalence of mental health conditions and the need for various types of services and treatment is widespread in the United States. According to the National Institute for Mental Health:

- One in four Americans ages 18 and older — an estimated 26.2 percent of adults — suffer from a diagnosable mental disorder in a given year, and one in seven adults (approximately six percent) suffers from a serious mental illness.
- For Americans ages 15 to 44 years old, mental disorders are the leading cause of disability.
- Nearly half (45 percent) of those with any mental disorder suffer from two or more disorders, and for many patients the severity of their illness is linked to the presence of multiple disorders.
- Mental illness, including suicide, accounts for over 15 percent of the burden of disease – more than all cancers combined – in the United States and other established market economies, according to the Global Burden of Disease study conducted by the World Health Organization, the World Bank, and Harvard University.<sup>3</sup>

Of all of the millions of children, adolescents, adults, and older adults with mental and addictive disorders, only a critical percentage will experience problems so severe, debilitating, or complex that they require 24-hour out-of-home placement for treatment.

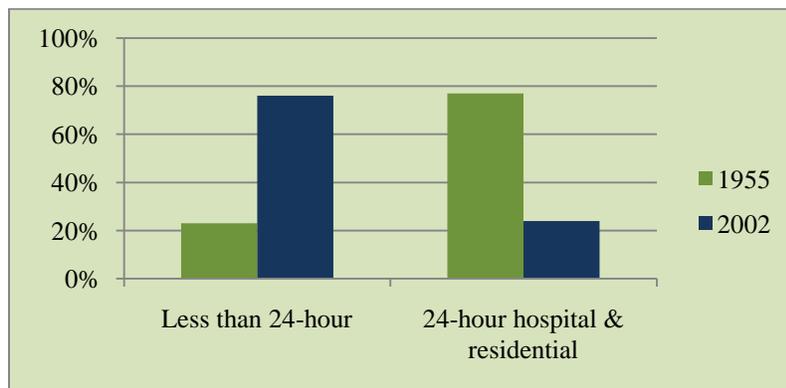
The numbers of individuals receiving inpatient care have shifted dramatically during the last 35 to 40 years, as the mental health system in the United States has undergone many

---

<sup>3</sup> National Institute of Mental Health. (2008). *The Numbers Count: Mental Disorders in America*. Retrieved from <http://www.nimh.nih.gov/health/publications/the-numbers-count-mental-disorders-in-america/index.shtml#Intro>.

changes. The behavioral health care system has shifted its emphasis to the provision of community-based support for individuals with mental illness and substance abuse issues. Once based exclusively on inpatient care, there has been a long term shift in the “locus of hospitalization” from state hospitals to community hospitals, and ultimately to non-hospital residential facilities.<sup>4</sup>

**Exhibit 16: Patient Care Episodes in Mental Health Organizations in 1955 (1.7 Million Patient Care Episodes) and 2002 (9.5 Million Patient Care Episodes)<sup>5</sup>**



Hospitals have dramatically shortened inpatient lengths of stay.<sup>6</sup> For example, where patients 20 years ago might spend months or years in a psychiatric hospital, today’s average length of stay is only days.

With the push toward community-based care, capacity for providing inpatient acute psychiatric care in state and non-governmental hospitals and general hospital subunits has declined steadily, with 80 percent of states recently reporting a shortage of psychiatric beds.<sup>7</sup> At the same time, demand continues to grow.

### Imbalance between Supply and Demand Worsening

The 24-hour behavioral health care system faces capacity constraints in hospital-level inpatient and residential services at a time when demand for psychiatric services is sharply rising.<sup>8</sup> According to a January 2010 report, as many as half of adults in the United States with major depression do not receive treatment for depression.<sup>9</sup>

<sup>4</sup> Bloom J.D., Krishnan B., Lockey C. (2008). The majority of inpatient psychiatric beds should not be appropriated by the forensic system. *The Journal of American Academy of Psychiatry and Law*, 36(4), 438-442.

<sup>5</sup> U.S. Department of Health and Human Services. (2004). [Figure 19.5]. *Mental Health, United States, 2004*. 209.

<sup>6</sup> 2008 Annual Survey. (2009). *National Association of Psychiatric Health Systems*.

<sup>7</sup> State Psychiatric Hospital Survey. (2006). *National Association of State Mental Health Program Directors*.

<sup>8</sup> Salinsky, E., Loftis, C. (2007). Shrinking Inpatient Psychiatric Capacity: Cause for Celebration or Concern? *National Health Policy Forum: Washington D.C.*

<sup>9</sup> González, H.M., Vega, W.A., Williams, D.R., Wassim, T., West, T.B., Neighbors H.W. (2010). Depression care in the United States: Too little for too few. *Archives of General Psychiatry*, 67(1), 37-46.

Furthermore, the vast majority (90 percent) of individuals who commit suicide suffer from mental illness that has neither been diagnosed nor treated.<sup>10</sup>

The number of psychiatric admissions to emergency departments (EDs) has continued to rise, with patients who are increasingly severely ill.<sup>11</sup> Waits in the ED for a psychiatric bed to become available can last over 24 hours, if not for days. The crowding and other over-stimulation in hospital EDs often creates an environment in which a psychiatric patient can rapidly decompensate.<sup>12,13</sup>

Individuals serving in the Army and the Marine Corps who were involved in combat operations in Iraq and Afghanistan experience significant risk of major depression, generalized anxiety, or post-traumatic stress disorder (PTSD). Furthermore, a 2004 study found that many servicemen and women reported important barriers to receiving mental health services.<sup>14</sup> As further evidence of the serious need for mental health care, the number of Army suicides increasing again last year, which was the most violent year yet in both the Iraq and Afghanistan wars. The 115 deaths last year and 102 in 2006 followed 85 in 2005 and 67 in 2004.<sup>15</sup>

### Composition and Role of 24-Hour Behavioral Health Care

Care provided in inpatient psychiatric facilities (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, state psychiatric hospitals, and residential treatment centers) is often referred to as “24-hour behavioral health care). This care is characterized by intensive individualized treatment delivered by teams of multidisciplinary professionals to the most vulnerable and sickest patients. One important function of 24-hour behavioral health care is crisis stabilization, with “crisis” including issues like dangerousness to self or others, acute decline in function, and/or a therapeutic impasse.<sup>16</sup> The crisis can be a symptom pattern so atypical and quick to develop that it exceeds the capacity of a less restrictive environment to manage effectively or safely. In 2006, one out of every 5 community hospital stays (21.3%) had either a principal or secondary diagnosis of a mental health condition, and mood disorders and schizophrenia

---

<sup>10</sup> Iglehart, J. (2004). The Mental Health Maze and the Call for Transformation. *New England Journal of Medicine*, 350(5), 507-514.

<sup>11</sup> ACEP Psychiatric and Substance Abuse Survey (2008). Retrieved from: [http://www.acep.org/uploadedFiles/ACEP/Advocacy/federal\\_issues/PsychiatricBoardingSummary.pdf](http://www.acep.org/uploadedFiles/ACEP/Advocacy/federal_issues/PsychiatricBoardingSummary.pdf).

<sup>12</sup> Howard, P. (2006). Psychiatric Care in the Emergency Department -- Chaos or Crisis? *Emergency Medicine and Critical Care Review*, 41-42.

<sup>13</sup> Richardson, D.B., Bryant, M. (2004). Confirmation of Association between Overcrowding and Adverse Events in Patients Who Do Not Wait To Be Seen. *Academic Emergency Medicine*, 11(5), 462.

<sup>14</sup> Hoge C.W., Castro C.S., Messer S.C., McGurk, D., Cotting, I. D., Koffman, R. L. (2004). Combat Duty in Iraq and Afghanistan, Mental Health Problems, and Barriers to Care. *New England Journal Medicine*, 351, 13-22.

<sup>15</sup> Military Suicide Rate. (2008, May 29). *Chicago Tribune*.

<sup>16</sup> Glick I.D., Tandon R. (2009). The Acute Crisis Stabilization Unit for Adults. In S.S Sharfstein, F.B. Dickinson, J.M. Oldham. (Ed.), *Textbook of Hospital Psychiatry*. (pp.23-35). Washington D.C.: American Psychiatric Publishing, Inc.

were the most common reasons for mental health community hospital stays – responsible for 82% of all community mental health hospitalizations.<sup>17</sup>

24-hour behavioral health care plays a unique and valuable role in the health care safety net, providing direct services to all populations, including uninsured and underinsured populations.

### What is Unique about 24-Hour Behavioral Health Care?

Twenty-four hour behavioral health care – provided by inpatient psychiatric hospitals and residential treatment centers – is an essential part of the treatment continuum for a vulnerable sub-group of patients who are in need of intensive (often lifesaving) care delivered in a safe and secure physical environment.<sup>18</sup> Bio-psycho-social treatment is provided by a multidisciplinary professional staff, according to an individualized treatment plan. There is no substitute for 24-hour behavioral health care, and persons in need of the structure and containment it provides cannot obtain it elsewhere.

Admission criteria include self-injury or injury to others, physical aggression and/or assault, and/or destructive and antisocial behavior. The admission to 24-hour behavioral health care accomplishes several objectives: 1) protection for the patient, 2) community protection, and 3) benefits to the patient that can only be provided in facility-based care, such as crisis stabilization and monitored medication assessment/management.

Several studies have reported that one-third of the homeless are seriously mentally ill. A recent study of 81 American cities found a direct relationship between reductions in psychiatric beds and an increased number of homeless individuals, as well as a prevalence of violent crimes (defined as murder, robbery, assault, and rape).<sup>19</sup>

### Adherence to Quality Standards

#### REGULATORY OVERSIGHT

24-hour behavioral health care is subject to a wide range of federal, state, and local regulations. States license psychiatric hospitals and residential treatment centers and the state agency conducts regular surveys to ensure compliance with regulations. In addition to state and federal laws, facilities must meet the Medicare and Medicaid Conditions of

---

<sup>17</sup> Saba, D.K., Levit, R. K., Elixhauser, A. (2008). Hospital Stays Related to Mental Health, 2006. *Agency for Healthcare Research and Quality*. Retrieved from: [www.hcup-us.ahrq.gov/reports/statbriefs/sb62.pdf](http://www.hcup-us.ahrq.gov/reports/statbriefs/sb62.pdf).

<sup>18</sup> Abt Associates Inc. (2008). Characteristics of Residential Treatment for Children and Youth with Serious Emotional Disturbances. For the National Association of Children’s Behavioral Health (NACBH) and the National Association of Psychiatric Health Systems (NAPHS).

<sup>19</sup> Markowitz, F.E. (2006). Psychiatric Hospital Capacity, Homelessness, and Crime and Arrest Rates. *Criminology*. 44, 45-72.

Participation requirements to be a certified Medicare and Medicaid provider. Generally, the criteria cover staffing requirements and compliance with the Social Security Act. Psychiatric hospitals and residential treatment centers are also accredited by national organizations such as the American Osteopathic Association (AOA), the Commission on Accreditation of Rehabilitation Facilities (CARF), the Council on Accreditation (COA), or the Joint Commission (JC).

### HOSPITAL-BASED PERFORMANCE MEASURES

Quality measures for inpatient psychiatric facilities have been considered and tested for over two decades. One major initiative has been the field's efforts to join other medical specialties in developing core measures. The National Association of Psychiatric Health Systems (NAPHS), the National Association of State Mental Health Program Directors (NASMHPD), and the NASMHPD Research Institute began a collaboration that led to discussions with the JC and other stakeholders in 2003 and 2004. From that work JC announced in April 2004 the development of standardized, core quality measures for inpatient psychiatric care, in collaboration with NAPHS, NASMHPD, and the NASMHPD Research Institute.<sup>20</sup>

As part of the JC's ORYX initiative—the phase of its *Agenda for Change* to accredit hospital-based performance measurement—the measures begun in 2004 have now evolved into the Hospital Based Inpatient Psychiatric Services (HBIPS) core measure set. The final measures set, approved and recommended by the project's technical advisory panel in February 2008, included the following measures:<sup>21</sup>

- (1) Admission screening for violence risk, substance use, psychological trauma history and patient strengths completed
- (2) Hours of physical restraint use
- (3) Hours of seclusion use
- (4) Patients discharged on multiple antipsychotic medications
- (5) Patients discharged on multiple antipsychotic medications with appropriate justification
- (6) Post discharge continuing care plan created
- (7) Post discharge continuing care plan transmitted to next level of care provider upon discharge

---

<sup>20</sup> JCAHO Teams up with NAPHS, NASMHPD to Identify Core Measure Set for In-patient Psychiatric Services. (2004). *Joint Commission on Accreditation of Healthcare Organizations*. [Press release]. Retrieved from: <http://www.naphs.org/news/documents/coremeasuresforpsychservices2.04.pdf>

<sup>21</sup> Performance Measurement Initiatives: Hospital Based Inpatient Psychiatric Services (HBIPS) Core Measure Set. (2010). *Joint Commission on Accreditation of Healthcare Organizations*. Retrieved from: <http://www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/Hospital+Based+Inpatient+Psychiatric+Services.htm>

## Chapter 5: Literature Review

---

In September 2009 the National Quality Forum (NQF) endorsed the HBIPS measures 4 and 5 (related to multiple antipsychotic medications) and measures 6 and 7 (related to continuing care plans).<sup>22</sup> The remainder of these core measures are in the process of NQF review and endorsement. The HBIPS measures are now available for hospitals to use to meet JC performance measurement requirements. Once approved by NQF, they will become part of the JC accreditation process and will be publicly reported.

### Conclusion

We have noted that 24-hour behavioral health care is an essential part of the treatment continuum for a vulnerable subgroup of patients who may not be able to obtain necessary care in other settings. The return of injured Army and Marine troops from Iraq and Afghanistan needing mental health and substance-abuse care is just one current example of an increasingly strong demand for services at a time when supply is limited. The end result is additional pressures on community providers, emergency departments, and the judicial system.

In summary, our finding is that the 24-hour behavioral health care plays a unique and irreplaceable role for certain members of our society.

---

<sup>22</sup> NQF Endorses Several HBIPS Measures; Seeks Comments on Remainder. (2009). *National Association of Psychiatric Health Systems*. [Press release] Retrieved from: [http://www.naphs.org/quality/documents/NQFendorsesseveralHBIPSmeasures\\_000.pdf](http://www.naphs.org/quality/documents/NQFendorsesseveralHBIPSmeasures_000.pdf).

# Discussion and Conclusion

This report presents the economic and social contributions of inpatient psychiatric facilities (inpatient psychiatric hospitals and residential treatment centers) through an economic impact analysis and a targeted literature review conducted by Dobson DaVanzo & Associates, LLC (Dobson | DaVanzo) for NAPHS.

**The economic impact analyses indicates that in an era of stagnant economic growth, where jobs are becoming increasingly scarce, the role of inpatient psychiatric facilities in generating economic output, job growth, and income is critically important.**

**At the national level, the total economic impact of inpatient psychiatric facilities is comparable in value to three percent of United States health care expenditures.**

**At the state level, inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) have a total economic impact ranging from 0.4 percent to 3.0 percent of overall state health care expenditures.<sup>23</sup> The direct expenditures of inpatient psychiatric hospitals also afford a form of “super multiplier” given the federal match to Medicaid. For every state dollar contributed to Medicaid support of inpatient psychiatric hospital care, the inpatient psychiatric hospital generates between \$3 and \$7 for their state economy (see Appendix B).<sup>24</sup>**

In order to provide a means of judging the importance of our findings, we presented comparisons to other industries in *Exhibit 5* (See Chapter 1, page 7).

---

<sup>23</sup> Data were unavailable to conduct an analysis of residential treatment centers at the state level.

<sup>24</sup> Data were not available to include residential treatment centers in this state-level analysis, but the “super multiplier” effect for residential treatment center expenditures would likely be comparable.

**These comparisons indicate that inpatient psychiatric facility direct expenditures are as large as several other important industries and represent a visible portion of United States health care expenditures.** The path toward achieving a balance between job development and social need points to a careful reappraisal of national and state level support for 24-hour behavioral health services.

The literature review indicated that as demand for behavioral health services has grown, inpatient behavioral health is now considered to be in short supply. Just as the nation's physical infrastructure is in need of repair, the nation's behavioral health care system is in need of modernization.

Our literature review points to the following key conclusions regarding inpatient psychiatric facilities. 24-hour behavioral health care:

- Comprises hospital-level inpatient and residential treatment;
- Plays a unique and valuable role in the nation's safety net;
- Provides patient shelter, patient protection, community protection, and crisis stabilization;
- Provides good outcomes for many types of patients;
- Lessens the stress on community providers, hospital emergency departments, and the judicial system;
- Is subject to a wide range of quality standards and regulatory oversight;
- Is undersupplied relative to a growing need for care; and
- Should be expanded and paid for in ways that improve patient access.

This report provides important information to stakeholders by examining the economic and clinical importance of 24-hour behavioral health services. The report indicates that inpatient psychiatric facilities are an important economic engine in communities across the United States in that their economic value is substantial. From a clinical perspective, 24-hour behavioral health services provide unique and unparalleled services to patients with some of the most severe and debilitating mental and behavioral conditions, many of whom are in a crisis mode.

Taken together, the findings of this report indicate that 24-hour behavioral health services are fundamental community services providing a specific level of care, which is not otherwise available. These services are required by many individuals with complex mental and addictive disorders, especially under crisis conditions. Yet despite their economic and clinical importance, these services are in short supply.

# *Appendix A: IMPLAN and Literature Review Methods*

To quantify the economic, employment, and other impacts of 24-hour behavioral health services at the national and state levels, we used the IMPLAN (Impact Analysis for PLANning) input-output (I-O) model developed by the Minnesota IMPLAN Group. This model is based on previous work conducted by the United States Department of Agriculture Forest Service.<sup>25</sup>

IMPLAN is a type of applied economic analysis that tracks the interdependence among various producing and consuming sectors of an economy to estimate the economic contribution of an industry (or economic sector) on either a defined region or the entire United States economy. More particularly, it measures the relationship between a given set of demands for final goods and services (health care and/or insurance coverage) and the inputs required to satisfy those demands.

We chose to use IMPLAN in this study because we have determined in our previous economic impact studies that this modeling system is widely accepted, cost-effective, readily replicated by other researchers, and well suited to our study objectives. IMPLAN is widely used, and we were able to benchmark this study's results to other studies to ensure the validity of our work.

---

<sup>25</sup> I-O models were originally developed by Wassily Leontief in the 1940s. Leontief was awarded the Nobel Prize in Economics for his efforts in 1973.

## Appendix A: IMPLAN and Literature Review Methods

---

### IMPLAN

In expressing the flow of dollars through the national economy, the IMPLAN model assumes fixed relationships between producers and their suppliers based on demand. IMPLAN is, in a sense, a general accounting system of the economic transactions taking place between industries, businesses, and consumers in an economy, and estimates the impacts on total output (sales), employment employee compensation, and taxes.

By expanding its analysis beyond the direct impacts, IMPLAN provides a more complete picture of the economic effects of transactions. Simply put, an I-O model is based on the theory that when new money enters a community through investment, revenues, or income, some of it is re-spent one or more times in the local economy, thereby creating additional economic impact. This impact is most often measured in terms of income or employment (jobs).

In the I-O model, an increase in demand for a certain product or service causes a multiplier effect, which refers to the downstream effects of the increase in demand. Demand for a product affects the producer of the product, the producer's employees, the producer's suppliers, the supplier's employees, and so on, ultimately generating a total effect in the economy that is greater than the initial change in demand. In I-O models the ratio of overall effect to original change is the multiplier, expressed like this:

$$(\text{Direct Effect} + \text{Indirect Effect} + \text{Induced Effect}) / (\text{Direct Effect}) = \text{Multiplier}$$

Our analyses with IMPLAN enabled us to calculate the multiplier effects of changes in final demand for 24-hour behavioral health services on all other industries within each state economy (in some instances) and within the nation as a whole. These multipliers produce measures of total change for many variables, including output, income, and employment. In addition, tax impacts can be estimated.

For inpatient psychiatric facilities, multipliers estimate three components of total change within the geographic (state or national) area:

- **DIRECT EFFECTS** represent the initial change in the industry in question (e.g., the impact of each dollar of revenue produced by inpatient psychiatric facilities in terms of economic output and employment).
- **INDIRECT EFFECTS** are changes in inter-industry transactions as supplying industries respond to increased or decreased demands from the directly affected industries (e.g., a reduction in inpatient psychiatric facilities revenue stream creates negative effects in other industries throughout the community).

## Appendix A: IMPLAN and Literature Review Methods

---

- **INDUCED EFFECTS** reflect changes in local spending that result from income changes in the directly and indirectly affected industries (e.g., the ripple effects from a reduction in revenue for inpatient psychiatric facilities output and employment). Reduced spending will result in less employment and thus, less overall spending by the local households.

Multipliers usually range in size from 1.5 to just under 3.0 and are interpreted in the following way:

- **OUTPUT MULTIPLIERS** relate the changes in sales to final demand by one field to total changes in output (gross sales) by all industries within the local area. An industry output multiplier of 1.65 would indicate that a change in sales to final demand of \$1.00 by the industry in question would result in a total change in local economic output of \$1.65.
- **INCOME AND EMPLOYMENT MULTIPLIERS** relate the change in direct income to changes in total income within the local economy. For example, an income multiplier for a direct industry change of 1.75 indicates that a \$1.00 change in income in the industry under analysis will produce a total income change of \$1.75 in the local economy. Similarly, an employment multiplier of 1.75 indicates that the creation of one new direct job will result in a total of 1.75 new jobs in the local economy.

### Facility Types

Our first step in the economic impact analyses was to determine the number of inpatient psychiatric facilities by type (see *Exhibit 1* on page 5 to see the types of inpatient psychiatric facilities included in these analyses and how we combined categories).

We use the term “total inpatient psychiatric facilities” to refer to all providers of 24-hour behavioral care. We use the term “inpatient psychiatric hospitals” to refer to a combination of non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals. The term “residential treatment centers” refers only to residential treatment centers, so these providers are not included in the category of “inpatient psychiatric hospitals.”

*Exhibit 3* (on page 6) presents the number of inpatient psychiatric facilities we identified by facility type, and *Exhibit 4* (on page 6) presents the amount of direct expenditures we calculated overall and for each facility type.

For each facility type, we were required to use a different source in order to calculate direct expenditures as the main input for our IMPLAN model.

## Appendix A: IMPLAN and Literature Review Methods

---

The economic impact of inpatient psychiatric hospitals and residential care facilities is primarily based on the direct expenditures of the provider sectors. Due to the unavailability of input data, we were unable to conduct a state-level analysis for the economic impact of the residential treatment centers.

### Expenditures

#### INPATIENT PSYCHIATRIC HOSPITALS

Based on the Center for Medicare and Medicaid Services' (CMS) Medicare Cost Reports (MCR) for inpatient hospitals for years 2007 and 2008, we were able to extract all non-governmental inpatient and state psychiatric hospitals, and identify the geographic location by state for each facility based on the Medicare provider number.<sup>26</sup> The direct expenditures associated with these facilities are provided in MCR Worksheet G3 Line 4.

This methodology, however, does not identify an inpatient psychiatric subunit within a general hospital. To identify the direct expenditures from general hospital inpatient psychiatric subunits, we relied on MCR Worksheet S2 Line 3 Column 2. This number can be used to identify sub-provider direct expenditures in the Medicare Cost Reports.

We searched both the 2007 and 2008 MCR files in order to be sure we captured data from all facilities that had filed a MCR in either 2007 or 2008 and create a complete set of data for 2008 inpatient psychiatric hospital expenditures.

Next, we inflated and centered the expenditure data. This step was necessary due to the number of facilities (more than 1,500) that have different fiscal years and, in some cases, had filed their MCRs in completely different years. We used the Medicare Market Basket for inpatient hospitals to inflate expenditures, which for 2008 was 1.033. First we calculated the daily inflation rate, and then calculated the difference (in number of days) between the middle calendar day of each hospital's MCR reporting period and the middle day of calendar year 2008 (July 1, 2008). We then inflated or deflated the expenditure data for each facility to July 1, 2008 by multiplying the daily inflation rate by the difference in number of days between July 1, 2008 and the middle of each MCR reporting period.

All direct expenditures provided by the MCRs were then inflated forward to CY 2008 using IMPLAN inflation factors. In constructing these inflation factors, IMPLAN combines the Bureau of Economic Analysis (BEA) benchmark sectoring output inflators with the Bureau of Labor Statistics (BLS) employment growth model (for inflator projections).

---

<sup>26</sup> Inpatient psychiatric facilities are identified by the last four digits of the provider number – XX.4000 through XX.4999. The first two digits designate the state where the facility is located.

## Appendix A: IMPLAN and Literature Review Methods

### RESIDENTIAL TREATMENT CENTERS

Direct expenditures for residential treatment centers were identified in a publication by the United States Department of Health and Human Services' (HHS) Substance Abuse and Mental Health Services Administration (SAMHSA).<sup>27</sup> This publication provided direct expenditures in 2002 for the entire United States in aggregate (not by state), which we then extrapolated to 2008 using IMPLAN inflation factors. As a result, the economic impact of residential treatment centers is only presented at the national level.

#### Analytic Process

The IMPLAN model requires that we input expenditures using a proxy industry – one close to the profile of inpatient psychiatric facilities – and then translate its IMPLAN results into inpatient psychiatric facility multipliers. Using North American Industrial Classification System (NAICS) and Standard Industrial Classification (SIC) codes allowed us to recognize the different economic situations and outcomes associated with each component industry.

With the assistance of NAPHS staff, we selected a proxy industry for each of the facility types. For the inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals), we relied on the “private hospital” sector (or industry) in IMPLAN (Sector 397). Residential treatment centers were based on a blend of the “private hospital” sector and the “residential and nursing care facilities” sector (Sector 398).<sup>28</sup> We input these two sectors simultaneously by using calculation weights to create one synthetic proxy industry.

The IMPLAN sector codes correspond with NAICS codes. *Exhibit A-1* below shows the corresponding NAICS codes for each IMPLAN code:

#### Exhibit A-1: NAICS Codes used for IMPLAN Analysis

NAICS Code	IMPLAN Code Description
622210	Private Hospitals (397)
623220	Private Hospitals (397)
623220	Residential and Nursing Care Facilities (398)

Source: 440 IMPLAN Sector Scheme (2007 to Current). Available at: [http://implan.com/v3/index.php?option=com\\_docman&task=cat\\_view&gid=145&Itemid=138](http://implan.com/v3/index.php?option=com_docman&task=cat_view&gid=145&Itemid=138).

<sup>27</sup> Mandersched, W.R., Berry T.J. (2004). Amount, percent distribution, and rate per capita of expenditures in current dollars, by type of mental health organization: United States, selected years, 1969-2002. [Table 19.8a]. *Mental Health, United States*. Rockville, Maryland: Substance Abuse and Mental Health Services Administration.

<sup>28</sup> To achieve the most accurate blend of the “private hospital” and “residential and nursing care facilities” sectors, we adjusted our input ratio to match the full time equivalent (FTE) employment numbers for residential treatment centers from *Mental Health, United States, 2004*, which contains the most current descriptive statistics.

## Appendix A: IMPLAN and Literature Review Methods

---

The multipliers for a given industry in any location are unique, and are based on local industry composition and geographic area. The larger the area under examination, typically, the larger the “multiplier effect,” since there will be more opportunities to purchase inputs within the study area. Therefore, it is not surprising that an industry multiplier for the nation would be larger than for a single state, and that the multiplier for a state would be larger than that for an individual county or metropolitan statistical area (MSA).

Based on the direct expenditures and the IMPLAN market sector chosen, IMPLAN is able to calculate economic output, number of employees, employee compensation, and tax impacts.

### Employment

There were no reliable data available to estimate the number of people employed in the inpatient psychiatric facility industry. We entered the direct inpatient psychiatric facility expenditure data into IMPLAN, and based upon BEA and BLS data, IMPLAN generated a series of direct employment numbers that we use as estimates in our analysis.

### Literature Review Methods

There is considerable literature devoted to the role of inpatient psychiatric hospitals and residential treatment centers within the United States health care delivery system. We focused our literature review on the following questions:

*What is known about the health status and clinical needs of the populations that utilize inpatient psychiatric hospitals and residential care? Is supply adequate to meet demand?*

The primary purpose of this literature review is to document the role of psychiatric hospitals and residential treatment programs within the mental health treatment continuum. In so doing, we present a brief discussion of the evolution of public and private psychiatric hospitals and residential treatment centers and how environmental changes have and are impacting these providers. We then briefly summarize the researched literature concerning the clinical contribution of the facility-based systems and discuss the critical role of 24-hour behavioral health services in the continuum of care.

# Appendix B: Super Multipliers by State

Using the Federal Medical Assistance Percentage (FMAP) for each state, we calculated a “super multiplier” for the economic impact of inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals).<sup>29</sup> Every Medicaid dollar spent in each state is matched at some level by the federal government and therefore increases the amount of federal dollars circulating through businesses and households in each state. For example, each Medicaid dollar spent on inpatient psychiatric hospitals, with a match of 50 percent in a state with a base multiplier of 2.00, has a “super multiplier” of 4.00, creating \$4.00 in the state economy. Super multipliers for state inpatient psychiatric hospital expenditures range from 6.99 (Utah) to 3.01 (Wyoming).<sup>30</sup> We present super multipliers for each state in *Exhibit B-1* below:

**Exhibit B-1: Super Multipliers for Inpatient Psychiatric Hospitals (Non-governmental Inpatient Psychiatric Hospital, General Hospital Inpatient Psychiatric Subunit, and State Psychiatric Hospital) by State, CY 2008<sup>29</sup>**

State	FMAP	Multiplier	Super Multiplier
Alabama	68.0%	1.72	5.37
Alaska	51.4%	1.70	3.49
Arizona	65.7%	2.01	5.86
Arkansas	72.7%	1.66	6.07
California	50.0%	2.23	4.46
Colorado	50.0%	2.06	4.12
Connecticut	50.0%	1.89	3.77

<sup>29</sup> Data were not available to include residential treatment centers in this state-level analysis, but the “super multiplier” effect for residential treatment center expenditures would likely be comparable.

<sup>30</sup> We calculated the super multiplier as follows: Super Multiplier = Multiplier x 1/(1 – FMAP). Any differences are due to rounding.

## Appendix B: Super Multipliers by State

---

State	FMAP	Multiplier	Super Multiplier
Delaware	50.2%	1.79	3.59
District of Columbia	70.0%	1.46	4.87
Florida	54.9%	2.15	4.77
Georgia	65.1%	2.00	5.73
Hawaii	54.2%	1.71	3.73
Idaho	69.4%	1.74	5.70
Illinois	50.1%	2.12	4.24
Indiana	65.9%	1.76	5.17
Iowa	63.5%	1.72	4.71
Kansas	60.3%	1.84	4.65
Kentucky	70.9%	1.69	5.80
Louisiana	67.6%	1.74	5.38
Maine	64.9%	1.85	5.26
Maryland	50.0%	1.89	3.77
Massachusetts	50.0%	2.05	4.10
Michigan	63.1%	2.02	5.47
Minnesota	50.0%	2.03	4.06
Mississippi	75.6%	1.61	6.59
Missouri	64.5%	1.86	5.24
Montana	67.4%	1.64	5.03
Nebraska	60.5%	1.72	4.34
Nevada	50.1%	1.75	3.51
New Hampshire	50.0%	1.80	3.59
New Jersey	50.0%	2.00	4.01
New Mexico	71.3%	1.66	5.80
New York	50.0%	2.00	4.00
North Carolina	65.1%	1.90	5.44
North Dakota	63.0%	1.56	4.22
Ohio	63.4%	1.92	5.25
Oklahoma	64.4%	1.72	4.82
Oregon	62.7%	1.85	4.97
Pennsylvania	54.8%	2.02	4.47
Rhode Island	52.6%	1.95	4.11
South Carolina	70.3%	1.79	6.03
South Dakota	62.7%	1.65	4.42
Tennessee	65.5%	1.92	5.56
Texas	58.7%	2.04	4.93
Utah	71.6%	1.98	6.99
Vermont	58.7%	1.70	4.11
Virginia	50.0%	1.88	3.75
Washington	50.1%	2.04	4.09
West Virginia	74.0%	1.51	5.83
Wisconsin	60.2%	1.86	4.68
Wyoming	50.0%	1.50	3.01

# Appendix C:

## Employment Impact

### Total Inpatient Psychiatric Facilities

*Exhibit C-1* below contains the employment impact of total inpatient psychiatric facilities at the national level by industry. As we used a blend of the “private hospital” and “nursing and residential care facilities” sectors as a proxy industry for inpatient psychiatric facility expenditures, we also used these industries to model direct employment (see Appendix A). The private hospital industry has direct employment of approximately 146,000 jobs, which translates to a total employment impact of close to 154,000 jobs after adding the indirect and induced effects. Similarly, the indirect and induced effects are low because the direct employment input is so large and has a much greater indirect and induced effect on other industries. For example, food services and drinking places have no direct employment, but have an indirect effect of slightly more than 3,000 jobs and an induced effect of more than 15,500 jobs, creating a total employment impact of nearly 19,000 jobs from total inpatient psychiatric facilities. The employment impact on the private hospital and nursing and residential care facility sectors represents approximately 50 percent of the total economic impact of inpatient psychiatric facilities on all industries, which means that half of the employment impact occurs in other industries. These industries include real estate, retail, wholesale trade businesses and employment services, which are impacted through the indirect and induced employment effects. **The inpatient psychiatric facility sector has an employment effect that reaches far beyond its own direct employment.**

## Appendix C: Employment Impact

**Exhibit C-1: Employment Impact of Total Inpatient Psychiatric Facilities (Inpatient Psychiatric Hospitals and Residential Treatment Centers) at the National Level by Industry, CY 2008**

Order	Industry	Direct Employment	Indirect Effect	Induced Effect	Total Employment Impact	Percent of Total
1	Private hospitals	146,604	297	7,084	153,985	32.2%
2	Nursing and residential care facilities <sup>a</sup>	76,664	0	4,777	81,440	17.1%
3	Real estate establishments	0	13,759	8,871	22,630	4.7%
4	Food services and drinking places	0	3,149	15,675	18,824	3.9%
5	Employment services	0	10,065	4,154	14,219	3.0%
6	Wholesale trade businesses	0	3,148	5,925	9,074	1.9%
7	Offices of physicians, dentists, and other health practitioners	0	71	7,186	7,257	1.5%
8	Services to buildings and dwellings	0	2,989	2,558	5,548	1.2%
9	Retail Stores - General merchandise	0	200	4,839	5,039	1.1%
10	Retail Stores - Food and beverage	0	188	4,730	4,918	1.0%
11	Management of companies and enterprises	0	2,951	1,521	4,472	0.9%
12	Medical and diagnostic labs and outpatient and other ambulatory care services	0	2,396	1,848	4,244	0.9%
13	Private household operations	0	0	3,879	3,879	0.8%
14	Securities, commodity contracts, investments, and related activities	0	1,041	2,796	3,837	0.8%
15	Insurance carriers	0	1,204	2,474	3,677	0.8%
16	Retail Stores - Motor vehicle and parts	0	209	3,202	3,410	0.7%
17	Legal services	0	1,223	2,073	3,296	0.7%
18	Civic, social, professional, and similar organizations	0	550	2,666	3,216	0.7%
19	Monetary authorities and depository credit intermediation activities	0	723	2,409	3,132	0.7%
20	Retail Nonstores - Direct and electronic sales	0	186	2,903	3,089	0.6%
	<b>Subtotal</b>	<b>223,268</b>	<b>44,346</b>	<b>91,571</b>	<b>359,185</b>	<b>75.2%</b>
	Other Industries	0	33,415	84,878	118,292	24.8%
	<b>Total</b>	<b>223,268</b>	<b>77,761</b>	<b>176,449</b>	<b>477,477</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>a</sup> In the IMPLAN model, nursing and residential facilities do not produce an indirect effect because their services are purchased by households but not by other industries (see Appendix A).

### Inpatient Psychiatric Hospitals

*Exhibit C-2* below contains the employment impact of inpatient psychiatric (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) hospitals at the national level by industry. We used the “private hospital” sector as the proxy industry for inpatient psychiatric hospital employment as well (see Appendix A). The private hospital sector has direct employment of approximately 137,000 jobs, which translates to a total employment impact of close to 143,000 jobs after adding the indirect and induced effects. Similarly, the indirect and induced effects are low because the direct employment input is so large and has much greater indirect and induced effects on other industries. For example, food services and drinking places have no direct employment but have an indirect effect of almost 2,300 jobs and an induced effect of nearly 12,000 jobs, creating a total employment impact of approximately 14,300 jobs from total inpatient psychiatric hospitals. The employment impact on the private hospital sector represents just over 40 percent of the total economic impact of inpatient psychiatric facilities on all industries, which means that nearly 60 percent of the employment impact occurs in other industries. These industries include real estate, retail, employment services, and wholesale trade businesses among others, which are impacted through the indirect and induced employment effects. **Inpatient psychiatric hospitals have an employment effect that reaches far beyond their own direct employment.**

## Appendix C: Employment Impact

**Exhibit C-2: Employment Impact of Inpatient Psychiatric Hospitals** (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) **at the National Level by Industry, CY 2008**

Order	Industry	Direct Employment	Indirect Effect	Induced Effect	Total Employment Impact	Percent of Total
1	Private hospitals	137,077	277	5,408	142,762	42.4%
2	Real estate establishments	0	11,942	6,772	18,713	5.6%
3	Food services and drinking places	0	2,328	11,967	14,295	4.2%
4	Employment services	0	8,427	3,172	11,599	3.4%
5	Wholesale trade businesses	0	2,667	4,523	7,190	2.1%
6	Offices of physicians, dentists, and other health practitioners	0	66	5,486	5,552	1.6%
7	Services to buildings and dwellings	0	2,445	1,953	4,398	1.3%
8	Retail Stores - General merchandise	0	176	3,695	3,870	1.1%
9	Retail Stores - Food and beverage	0	165	3,612	3,777	1.1%
10	Management of companies and enterprises	0	2,574	1,161	3,735	1.1%
11	Medical and diagnostic labs and outpatient and other ambulatory care services	0	2,238	1,411	3,649	1.1%
12	Nursing and residential care facilities	0	0	3,647	3,647	1.1%
13	Securities, commodity contracts, investments, and related activities	0	909	2,134	3,043	0.9%
14	Private household operations	0	0	2,962	2,962	0.9%
15	Insurance carriers	0	968	1,889	2,856	0.8%
16	Retail Stores - Motor vehicle and parts	0	183	2,444	2,628	0.8%
17	Legal services	0	1,023	1,583	2,606	0.8%
18	Civic, social, professional, and similar organizations	0	428	2,035	2,463	0.7%
19	Monetary authorities and depository credit intermediation activities	0	570	1,839	2,408	0.7%
20	Retail Nonstores - Direct and electronic sales	0	163	2,217	2,380	0.7%
	<b>Subtotal</b>	<b>137,077</b>	<b>37,549</b>	<b>69,908</b>	<b>244,534</b>	<b>72.6%</b>
	Other Industries	0	27,588	64,801	92,389	27.4%
	<b>Total</b>	<b>137,077</b>	<b>65,137</b>	<b>134,709</b>	<b>336,923</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

### Residential Treatment Centers

*Exhibit C-3* below shows the employment impact of residential treatment centers at the national level by industry. As we used a blend of “private hospital” and “nursing and residential care facilities” sectors as a proxy industry for residential treatment center expenditures, we also used these industries to model direct employment (see Appendix A). The nursing and residential care facilities industry has direct employment of approximately 77,000 jobs, which translates to a total employment impact of nearly 78,000 jobs after adding the indirect and induced effects. Similarly, the indirect and induced effects are low because the direct employment input is so large and has a much greater indirect and induced effect on other industries. For example, food services and drinking places have no direct employment, but have an indirect effect of approximately 800 jobs and an induced effect of close to 3,700 jobs, creating a total employment impact of over 4,500 jobs from total residential treatment centers. The employment impact on the private hospital and nursing and residential care facility sectors represents approximately 63 percent of the total economic impact of residential treatment centers on all industries, which means that over one-third of the employment impact occurs in other industries. These industries include real estate, retail, wholesale trade businesses, and employment services, which are impacted through the indirect and induced employment effects. **Residential treatment centers also have an employment effect that reaches far beyond their own direct employment.**

## Appendix C: Employment Impact

**Exhibit C-3: Employment Impact of Residential Treatment Centers at the National Level by Industry, CY 2008**

Order	Industry	Direct Employment	Indirect Effect	Induced Effect	Total Employment Impact	Percent of Total
1	Nursing and residential care facilities <sup>1a</sup>	76,664	0	1,130	77,794	55.3%
2	Private hospitals	9,527	19	1,676	11,223	8.0%
3	Food services and drinking places	0	821	3,708	4,529	3.2%
4	Real estate establishments	0	1,817	2,100	3,917	2.8%
5	Employment services	0	1,637	983	2,620	1.9%
6	Wholesale trade businesses	0	481	1,402	1,883	1.3%
7	Offices of physicians, dentists, and other health practitioners	0	5	1,700	1,705	1.2%
8	Retail Stores - General merchandise	0	24	1,144	1,168	0.8%
9	Services to buildings and dwellings	0	545	605	1,150	0.8%
10	Retail Stores - Food and beverage	0	23	1,119	1,141	0.8%
11	Private household operations	0	0	917	917	0.7%
12	Insurance carriers	0	236	585	821	0.6%
13	Securities, commodity contracts, investments, and related activities	0	132	661	793	0.6%
14	Retail Stores - Motor vehicle and parts	0	25	757	782	0.6%
15	Civic, social, professional, and similar organizations	0	122	630	752	0.5%
16	Management of companies and enterprises	0	377	360	737	0.5%
17	Monetary authorities and depository credit intermediation activities	0	153	570	723	0.5%
18	Retail Nonstores - Direct and electronic sales	0	22	687	709	0.5%
19	Legal services	0	200	491	691	0.5%
20	Accounting, tax preparation, bookkeeping, and payroll services	0	320	329	649	0.5%
	<b>Subtotal</b>	<b>86,191</b>	<b>6,958</b>	<b>21,556</b>	<b>114,705</b>	<b>81.6%</b>
	Other Total	0	5,665	20,184	25,850	18.4%
	<b>Total</b>	<b>86,191</b>	<b>12,624</b>	<b>41,740</b>	<b>140,554</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> In the IMPLAN model, nursing and residential facilities do not produce an indirect effect because their services are purchased by households but not by other industries (see Appendix A).

### Inpatient Psychiatric Hospitals by State

*Exhibit C-4* below shows the employment impact that inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) have at the state level, in proportion to total health and social services employment. The states with the highest number of direct inpatient psychiatric hospital employees are New York with 20,904, California with 10,277, and Pennsylvania with 7,972, while the states with the lowest are Hawaii with 159, Vermont with 239, and South Dakota with 305.

New York also has one of the largest proportions of direct inpatient psychiatric hospital employees (as a percentage of total health and social services employment), at 1.8 percent. The other states with the highest proportion of direct inpatient psychiatric hospital employees are Connecticut at 1.9 percent, New Jersey and the District of Columbia each at 1.6 percent, and Louisiana at 1.3 percent. This finding is consistent with the states experiencing the greatest economic impact from direct inpatient psychiatric hospital expenditures, which demonstrates how important labor income is to state economies both in generating additional economic output and employment.

However, the states with the greatest employment multipliers are not necessarily the states with the highest health and social services employment, direct inpatient psychiatric hospital employment, or proportion of inpatient behavioral health as a percentage health and social services employment. States with the highest employment multipliers are California at 2.06, Florida at 2.02, and Arizona at 2.00, while the states with the lowest multipliers are, starting with the lowest, the District of Columbia at 1.31, Wyoming at 1.52, and West Virginia at 1.55. The majority of states have an employment multiplier greater than 1.70.

**These multipliers demonstrate that for every one job directly held in the inpatient psychiatric hospital sector, the state economy adds nearly two jobs. Given the current economic situation, the importance of the employment multiplier for the inpatient psychiatric hospital industry is further magnified.**

## Appendix C: Employment Impact

**Exhibit A-4: Employment Impact of Inpatient Psychiatric Hospitals (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) by State, CY 2008**

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Total Employment	Health Social Services Employment <sup>1a</sup>	Health Employment as a Percent of Total Employment	Direct Inpatient Psychiatric Hospital Employment	Direct Inpatient Psychiatric Hospital Employment as a Percent of Health and Social Services Employment	Total Impact of Inpatient Psychiatric Hospital Employment <sup>1b</sup>	Total Impact of Inpatient Psychiatric Hospital Employment as a Percent of Health and Social Services Employment	Multiplier
Alabama	2,553,364	238,494	9.3%	2,154	0.9%	3,636	1.5%	1.69
Alaska	441,464	36,418	8.2%	377	1.0%	618	1.7%	1.64
Arizona	3,376,989	275,114	8.1%	1,761	0.6%	3,515	1.3%	2.00
Arkansas	1,563,552	153,513	9.8%	1,599	1.0%	2,651	1.7%	1.66
California	20,663,149	1,560,589	7.6%	10,227	0.7%	21,022	1.3%	2.06
Colorado	3,155,064	252,929	8.0%	1,121	0.4%	2,103	0.8%	1.88
Connecticut	2,175,661	224,901	10.3%	4,192	1.9%	7,182	3.2%	1.71
Delaware	537,631	56,331	10.5%	460	0.8%	824	1.5%	1.79
District of Columbia	838,426	68,385	8.2%	1,061	1.6%	1,390	2.0%	1.31
Florida	10,114,123	905,669	9.0%	4,759	0.5%	9,590	1.1%	2.02
Georgia	5,395,391	436,430	8.1%	2,768	0.6%	5,176	1.2%	1.87
Hawaii	846,512	64,538	7.6%	159	0.2%	273	0.4%	1.72
Idaho	920,991	77,746	8.4%	455	0.6%	823	1.1%	1.81
Illinois	7,386,620	701,541	9.5%	5,592	0.8%	10,329	1.5%	1.85
Indiana	3,618,454	358,080	9.9%	2,456	0.7%	4,199	1.2%	1.71
Iowa	1,993,939	181,046	9.1%	1,203	0.7%	2,005	1.1%	1.67
Kansas	1,812,435	160,291	8.8%	939	0.6%	1,596	1.0%	1.70
Kentucky	2,379,182	239,392	10.1%	1,924	0.8%	3,230	1.3%	1.68

## Appendix C: Employment Impact

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Total Employment	Health Social Services Employment <sup>1a</sup>	Health Employment as a Percent of Total Employment	Direct Inpatient Psychiatric Hospital Employment	Direct Inpatient Psychiatric Hospital Employment as a Percent of Health and Social Services Employment	Total Impact of Inpatient Psychiatric Hospital Employment <sup>1b</sup>	Total Impact of Inpatient Psychiatric Hospital Employment as a Percent of Health and Social Services Employment	Multiplier
Louisiana	2,468,249	250,768	10.2%	3,324	1.3%	5,589	2.2%	1.68
Maine	812,337	88,572	10.9%	778	0.9%	1,456	1.6%	1.87
Maryland	3,366,301	326,077	9.7%	2,209	0.7%	3,861	1.2%	1.75
Massachusetts	4,109,208	502,488	12.2%	4,377	0.9%	8,061	1.6%	1.84
Michigan	5,237,537	551,015	10.5%	4,269	0.8%	7,949	1.4%	1.86
Minnesota	3,459,578	375,245	10.8%	1,785	0.5%	3,371	0.9%	1.89
Mississippi	1,528,586	150,856	9.9%	1,721	1.1%	2,814	1.9%	1.63
Missouri	3,582,951	368,613	10.3%	2,523	0.7%	4,510	1.2%	1.79
Montana	636,500	57,027	9.0%	378	0.7%	615	1.1%	1.63
Nebraska	1,225,247	117,846	9.6%	678	0.6%	1,137	1.0%	1.68
Nevada	1,584,695	98,263	6.2%	748	0.8%	1,325	1.3%	1.77
New Hampshire	827,975	76,262	9.2%	881	1.2%	1,490	2.0%	1.69
New Jersey	4,981,596	474,350	9.5%	7,631	1.6%	13,368	2.8%	1.75
New Mexico	1,089,428	103,557	9.5%	485	0.5%	844	0.8%	1.74
New York	10,867,215	1,186,315	10.9%	20,904	1.8%	36,178	3.0%	1.73
North Carolina	5,330,178	500,748	9.4%	3,425	0.7%	6,342	1.3%	1.85
North Dakota	484,339	45,046	9.3%	460	1.0%	716	1.6%	1.56
Ohio	6,615,127	691,228	10.4%	4,723	0.7%	8,739	1.3%	1.85
Oklahoma	2,133,056	193,869	9.1%	1,223	0.6%	2,081	1.1%	1.70
Oregon	2,262,267	206,125	9.1%	883	0.4%	1,601	0.8%	1.81
Pennsylvania	7,137,828	830,488	11.6%	7,972	1.0%	14,727	1.8%	1.85
Rhode Island	592,730	74,082	12.5%	626	0.8%	1,153	1.6%	1.84

## Appendix C: Employment Impact

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Total Employment	Health Social Services Employment <sup>1a</sup>	Health Employment as a Percent of Total Employment	Direct Inpatient Psychiatric Hospital Employment	Direct Inpatient Psychiatric Hospital Employment as a Percent of Health and Social Services Employment	Total Impact of Inpatient Psychiatric Hospital Employment <sup>1b</sup>	Total Impact of Inpatient Psychiatric Hospital Employment as a Percent of Health and Social Services Employment	Multiplier
South Carolina	2,444,627	221,641	9.1%	1,826	0.8%	3,261	1.5%	1.79
South Dakota	556,089	54,883	9.9%	305	0.6%	500	0.9%	1.64
Tennessee	3,645,746	367,954	10.1%	2,239	0.6%	4,183	1.1%	1.87
Texas	14,007,615	1,086,624	7.8%	6,317	0.6%	12,050	1.1%	1.91
Utah	1,638,059	120,850	7.4%	1,027	0.8%	1,981	1.6%	1.93
Vermont	418,608	44,277	10.6%	239	0.5%	414	0.9%	1.73
Virginia	4,836,371	403,603	8.3%	2,087	0.5%	3,591	0.9%	1.72
Washington	3,880,528	341,959	8.8%	2,150	0.6%	4,101	1.2%	1.91
West Virginia	598,334	116,618	19.5%	981	0.8%	1,523	1.3%	1.55
Wisconsin	3,502,490	327,286	9.3%	2,965	0.9%	5,336	1.6%	1.80
Wyoming	385,455	28,596	7.4%	335	1.2%	510	1.8%	1.52
<b>United States</b>	<b>176,316,800</b>	<b>16,499,250</b>	<b>9.4%</b>	<b>137,077</b>	<b>0.8%</b>	<b>336,923</b>	<b>2.0%</b>	<b>2.46</b>

Source: Dobson | DaVanzo analysis of IMPLAN.

<sup>1a</sup> United States Bureau of Labor Statistics. The total number of employees was listed for the Health Care and Social Assistance Sector for the whole nation. Subsets of that total for Healthcare Practitioner, Technical Occupations, and Community and Social Services Occupations constituted the majority of the employees in the Health Care and Social Assistance Sector. Healthcare Practitioner, Technical Occupations, and Community and Social Services Occupations figures were available by state. This proportion was distributed across the national total for Health Care and Social Assistance Sector. Does not include self-employed individuals.

<sup>1b</sup> The total economic impact of direct inpatient psychiatric facility expenditures on each state does not sum to the total economic impact of direct expenditures at the national level due to the way IMPLAN calculates multipliers (see Appendix A).

# Appendix D: Employee Compensation

## Total Inpatient Psychiatric Facilities

*Exhibit D-1* below presents the employee compensation impact of total inpatient psychiatric facilities at the national level by industry. The “private hospital” and “nursing and residential care facility” industries have the greatest direct employee compensation as they are the sectors in which inpatient psychiatric facilities have the greatest direct employment. For the private hospital industry, direct employee compensation of approximately \$8.7 billion translates to a total employee compensation impact of nearly \$9.2 billion after adding indirect and induced effects. As with the employment impact, the indirect and induced effects are low in the private hospital and residential and nursing care facilities industries because the direct employee compensation input is so large and has a much greater indirect and induced effect on other industries. For example, wholesale trade businesses have zero direct employee compensation, but have an indirect effect of close to \$216 million and an induced effect of over \$400 million, creating a total employee compensation impact of more than \$620 million from inpatient psychiatric facilities. The private hospital and nursing and residential care facility industries represent over 54 percent of the total employee compensation impact, meaning that almost half of total inpatient psychiatric facilities employee compensation impacts other industries throughout the economy, including corporate management, investment, insurance, and legal services among others.

## Appendix D: Employee Compensation Impact

**Exhibit D-1: Employee Compensation Impact of Total Inpatient Psychiatric Facilities (Inpatient Psychiatric Hospitals and Residential Treatment Centers) at the National Level by Industry, CY 2008**

Order	Industry	Direct Employee Compensation	Indirect Effect	Induced Effect	Total Employee Compensation Impact	Percent of Total
1	Private hospitals	\$8,736,705,536	\$17,691,170	\$422,182,048	\$9,176,579,072	43.0%
2	Nursing and residential care facilities <sup>1a</sup>	\$2,340,126,464	\$0	\$145,802,544	\$2,485,928,960	11.6%
3	Wholesale trade businesses	\$0	\$215,856,848	\$406,271,840	\$622,128,704	2.9%
4	Management of companies and enterprises	\$0	\$332,015,360	\$171,147,472	\$503,162,816	2.4%
5	Offices of physicians, dentists, and other health practitioners	\$0	\$4,186,408	\$425,380,736	\$429,567,136	2.0%
6	Securities, commodity contracts, investments, and related activities	\$0	\$108,114,296	\$290,378,016	\$398,492,320	1.9%
7	Employment services	\$0	\$255,748,064	\$105,567,952	\$361,316,032	1.7%
8	Food services and drinking places	\$0	\$58,619,992	\$291,784,768	\$350,404,768	1.6%
9	Real estate establishments	\$0	\$173,439,136	\$111,831,528	\$285,270,656	1.3%
10	Insurance carriers	\$0	\$89,154,944	\$183,260,192	\$272,415,136	1.3%
11	Legal services	\$0	\$76,360,424	\$129,466,752	\$205,827,168	1.0%
12	Monetary authorities and depository credit intermediation activities	\$0	\$46,667,992	\$155,493,856	\$202,161,856	0.9%
13	Medical and diagnostic labs and outpatient and other ambulatory care services	\$0	\$108,227,080	\$83,498,120	\$191,725,200	0.9%
14	Management, scientific, and technical consulting services	\$0	\$104,046,360	\$68,068,912	\$172,115,264	0.8%
15	Nondepository credit intermediation and related activities	\$0	\$36,174,032	\$126,968,136	\$163,142,176	0.8%
16	Insurance agencies, brokerages, and related activities	\$0	\$50,994,028	\$109,934,256	\$160,928,288	0.8%
17	Telecommunications	\$0	\$55,488,376	\$98,011,016	\$153,499,392	0.7%
18	Retail Stores - Motor vehicle and parts	\$0	\$9,365,789	\$143,788,736	\$153,154,528	0.7%
19	US Postal Service	\$0	\$77,381,664	\$61,614,800	\$138,996,464	0.7%
20	Pharmaceutical preparation manufacturing	\$0	\$95,961,328	\$40,831,992	\$136,793,312	0.6%
	<b>Subtotal</b>	<b>\$11,076,832,000</b>	<b>\$1,915,493,291</b>	<b>\$3,571,283,672</b>	<b>\$16,563,609,248</b>	<b>77.5%</b>
	Other Industries	\$0	\$1,479,568,617	\$3,317,574,378	\$4,797,142,994	22.5%
	<b>Total</b>	<b>\$11,076,832,000</b>	<b>\$3,395,061,908</b>	<b>\$6,888,858,050</b>	<b>\$21,360,752,242</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> In the IMPLAN model, nursing and residential facilities do not produce an indirect effect because their services are purchased by households but not by other industries (see Appendix A).

## Appendix D: Employee Compensation Impact

---

### Inpatient Psychiatric Hospitals

*Exhibit D-2* below presents the employee compensation impact of inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) at the national level by industry. The “private hospital” industry has the greatest direct employee compensation as it is the sector in which inpatient psychiatric hospitals have the greatest direct employment. For the private hospital industry, direct employee compensation of approximately \$8.2 billion translates to a total employee compensation impact of more than \$8.5 billion after adding indirect and induced effects. As with the employment impact, the indirect and induced effects are low in the private hospital industry because the direct employee compensation input is so large and has a much greater indirect and induced effect on other industries. For example, wholesale trade businesses have zero direct employee compensation, but have an indirect effect of approximately \$180 million and an induced effect of over \$310 million, creating a total employee compensation impact of more than \$490 million from inpatient psychiatric hospitals. The private hospital industry represents over 50 percent of the total employee compensation impact, meaning that almost half of total inpatient psychiatric hospital employee compensation impacts other industries throughout the economy, including corporate management, investment, insurance, and legal services, among others.

## Appendix D: Employee Compensation Impact

**Exhibit D-2: Employee Compensation Impact of Inpatient Psychiatric Hospitals** (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) **at the National Level by Industry, CY 2008**

Order	Industry	Direct Employee Compensation	Indirect Effect	Induced Effect	Total Employee Compensation Impact	Percent of Total
1	Private hospitals	\$8,168,944,640	\$16,536,227	\$322,282,080	\$8,507,762,688	52.2%
2	Wholesale trade businesses	\$0	\$182,875,008	\$310,121,248	\$492,996,256	3.0%
3	Management of companies and enterprises	\$0	\$289,633,344	\$130,652,016	\$420,285,376	2.6%
4	Offices of physicians, dentists, and other health practitioners	\$0	\$3,910,439	\$324,728,416	\$328,638,848	2.0%
5	Securities, commodity contracts, investments, and related activities	\$0	\$94,414,944	\$221,682,688	\$316,097,632	1.9%
6	Employment services	\$0	\$214,140,368	\$80,593,280	\$294,733,632	1.8%
7	Food services and drinking places	\$0	\$43,339,092	\$222,755,968	\$266,095,056	1.6%
8	Real estate establishments	\$0	\$150,535,168	\$85,361,384	\$235,896,544	1.4%
9	Insurance carriers	\$0	\$71,675,752	\$139,920,432	\$211,596,192	1.3%
10	Medical and diagnostic labs and outpatient and other ambulatory care services	\$0	\$101,092,712	\$63,743,204	\$164,835,920	1.0%
11	Legal services	\$0	\$63,859,692	\$98,835,560	\$162,695,248	1.0%
12	Monetary authorities and depository credit intermediation activities	\$0	\$36,774,744	\$118,702,944	\$155,477,696	1.0%
13	Management, scientific, and technical consulting services	\$0	\$78,986,800	\$51,965,420	\$130,952,224	0.8%
14	Nondepository credit intermediation and related activities	\$0	\$30,693,000	\$96,937,248	\$127,630,248	0.8%
15	Insurance agencies, brokerages, and related activities	\$0	\$41,184,460	\$83,935,296	\$125,119,760	0.8%
16	Telecommunications	\$0	\$46,184,436	\$74,818,760	\$121,003,200	0.7%
17	Retail Stores - Motor vehicle and parts	\$0	\$8,241,002	\$109,782,288	\$118,023,288	0.7%
18	Pharmaceutical preparation manufacturing	\$0	\$85,163,280	\$31,165,270	\$116,328,552	0.7%
19	US Postal Service	\$0	\$67,742,168	\$47,039,996	\$114,782,160	0.7%
20	Nursing and residential care facilities	\$0	\$0	\$111,308,888	\$111,308,888	0.7%
	<b>Subtotal</b>	<b>\$8,168,944,640</b>	<b>\$1,626,982,635</b>	<b>\$2,726,332,386</b>	<b>\$12,522,259,408</b>	<b>76.9%</b>
	Other Industries	\$0	\$1,230,398,144	\$2,532,836,533	\$3,763,234,653	23.1%
	<b>Total</b>	<b>\$8,168,944,640</b>	<b>\$2,857,380,779</b>	<b>\$5,259,168,919</b>	<b>\$16,285,494,061</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

## Appendix D: Employee Compensation Impact

---

### Residential Treatment Centers

*Exhibit D-3* below presents the employee compensation impact of residential treatment centers at the national level by industry. The “private hospital” and “nursing and residential care facility” industries have the greatest direct employee compensation as they are the sectors in which residential treatment centers have the greatest direct employment. For the private hospital industry, direct employee compensation of approximately \$570 million translates to a total employee compensation impact of nearly \$670 million after adding indirect and induced effects. As with the employment impact, the indirect and induced effects are low in the private hospital and residential and nursing care facility industries because the direct employee compensation input is so large and has much greater indirect and induced effects on other industries. For example, wholesale trade businesses have zero direct employee compensation, but have an indirect effect of almost \$33 million and an induced effect of close to \$96 million, creating a total employee compensation impact of over \$130 million from residential treatment centers. The private hospital and nursing and residential care facility industries represent over 60 percent of the total employee compensation impact, meaning that more than one-third of total residential treatment center employee compensation impacts other industries throughout the economy, including corporate management, investment, insurance, and legal services among others.

## Appendix D: Employee Compensation Impact

**Exhibit D-3: Employee Compensation Impact of Residential Treatment Centers at the National Level by Industry, CY 2008**

Order	Industry	Direct Employee Compensation	Indirect Effect	Induced Effect	Total Employee Compensation Impact	Percent of Total
1	Nursing and residential care facilities <sup>1a</sup>	\$2,340,126,464	\$0	\$34,493,652	\$2,374,620,160	46.8%
2	Private hospitals	\$567,760,960	\$1,154,944	\$99,899,984	\$668,815,872	13.2%
3	Wholesale trade businesses	\$0	\$32,981,848	\$96,150,608	\$129,132,456	2.5%
4	Offices of physicians, dentists, and other health practitioners	\$0	\$275,970	\$100,652,312	\$100,928,280	2.0%
5	Food services and drinking places	\$0	\$15,280,901	\$69,028,800	\$84,309,704	1.7%
6	Management of companies and enterprises	\$0	\$42,382,004	\$40,495,460	\$82,877,464	1.6%
7	Securities, commodity contracts, investments, and related activities	\$0	\$13,699,355	\$68,695,336	\$82,394,688	1.6%
8	Employment services	\$0	\$41,607,704	\$24,974,674	\$66,582,376	1.3%
9	Insurance carriers	\$0	\$17,479,192	\$43,339,760	\$60,818,952	1.2%
10	Real estate establishments	\$0	\$22,903,964	\$26,470,142	\$49,374,104	1.0%
11	Monetary authorities and depository credit intermediation activities	\$0	\$9,893,247	\$36,790,916	\$46,684,164	0.9%
12	Legal services	\$0	\$12,500,737	\$30,631,194	\$43,131,932	0.8%
13	Management, scientific, and technical consulting services	\$0	\$25,059,558	\$16,103,489	\$41,163,048	0.8%
14	Insurance agencies, brokerages, and related activities	\$0	\$9,809,569	\$25,998,958	\$35,808,528	0.7%
15	Nondepository credit intermediation and related activities	\$0	\$5,481,031	\$30,030,886	\$35,511,916	0.7%
16	Retail Stores - Motor vehicle and parts	\$0	\$1,124,787	\$34,006,452	\$35,131,240	0.7%
17	Telecommunications	\$0	\$9,303,935	\$23,192,258	\$32,496,192	0.6%
18	Retail Stores - General merchandise	\$0	\$598,921	\$28,552,268	\$29,151,190	0.6%
19	Retail Stores - Food and beverage	\$0	\$573,887	\$28,439,148	\$29,013,036	0.6%
20	Accounting, tax preparation, bookkeeping, and payroll services	\$0	\$14,079,641	\$14,516,619	\$28,596,260	0.6%
	<b>Subtotal</b>	<b>\$2,907,887,424</b>	<b>\$276,191,195</b>	<b>\$872,462,916</b>	<b>\$4,056,541,562</b>	<b>79.9%</b>
	Other Total	\$0	\$261,489,947	\$757,226,206	\$1,018,716,153	20.1%
	<b>Total</b>	<b>\$2,907,887,424</b>	<b>\$537,681,142</b>	<b>\$1,629,689,122</b>	<b>\$5,075,257,715</b>	<b>100.0%</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> In the IMPLAN model, nursing and residential facilities do not produce an indirect effect because their services are purchased by households but not by other industries (see Appendix A).

## Appendix D: Employee Compensation Impact

---

### Inpatient Psychiatric Hospitals by State

*Exhibit D-4* below shows the employee compensation impact that inpatient psychiatric hospitals (non-governmental inpatient psychiatric hospitals, general hospital inpatient psychiatric subunits, and state psychiatric hospitals) have on each state economy and what proportion of overall state spending on health care this employee compensation impact represents. The states with the highest direct inpatient psychiatric hospital employee compensation are New York, California, and New Jersey. Aside from New York (0.7 percent), the states with the highest inpatient psychiatric hospital employee compensation as a proportion of overall health care spending are Connecticut at 0.9 percent and the District of Columbia at 0.8 percent. The lowest proportion of direct health care spending on inpatient psychiatric hospitals is 0.1 percent in Hawaii and 0.2 percent in Florida, Colorado, Oregon, and Virginia.

The states with the greatest total employee compensation impact (as a percentage of overall health care spending) are Connecticut at 1.3 percent, New York at 1.2 percent, and New Jersey and the District of Columbia each at 1.0 percent. States with the lowest impact are Hawaii at 0.2 percent, and Florida, Colorado, Oregon, and Virginia each at 0.3 percent. The states with the highest employee compensation impact are not the states in which inpatient psychiatric hospitals have the largest multiplier, or ripple effect, in their economies. For instance, Florida has the highest multiplier at 1.65, followed by Illinois at 1.62, and Pennsylvania at 1.59. While many of these states also had the highest economic impact multipliers, none had the highest employee compensation impact. The states with the lowest multiplier effects are Wyoming at 1.26, the District of Columbia at 1.27, and West Virginia at 1.29 (most of which also had the lowest economic impact multipliers).

## Appendix D: Employee Compensation Impact

**Exhibit D-4: Employee Compensation Impact of Inpatient Psychiatric Hospitals** (Non-governmental Inpatient Psychiatric Hospitals, General Hospital Inpatient Psychiatric Subunits, and State Psychiatric Hospitals) **by State, CY 2008**

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Gross State Product <sup>1a</sup>	Health Expenditures <sup>1b</sup>	Health Expenditures as a Percent of Gross State Product	Direct Inpatient Psychiatric Hospital Employee Compensation	Direct Inpatient Psychiatric Hospital Employee Compensation as a Percent of Health Expenditures	Total Impact of Inpatient Psychiatric Hospital Employee Compensation <sup>1c</sup>	Total Employee Compensation Impact as a Percent of Health Expenditures	Multiplier
Alabama	\$173,319,749,265	\$34,514,293,016	19.9%	\$255,857,600	0.2%	\$422,380,238	0.4%	1.42
Alaska	\$48,843,600,096	\$6,288,761,770	12.9%	\$321,583,712	0.3%	\$522,064,106	0.5%	1.33
Arizona	\$253,727,373,952	\$36,592,449,783	14.4%	\$449,104,608	0.4%	\$711,901,647	0.5%	1.53
Arkansas	\$100,242,946,257	\$19,265,930,843	19.2%	\$305,379,296	0.5%	\$480,819,941	0.5%	1.39
California	\$1,882,665,311,055	\$252,195,936,049	13.4%	\$106,843,152	0.2%	\$168,004,204	0.5%	1.56
Colorado	\$253,436,832,417	\$33,641,105,230	13.3%	\$811,746,560	0.3%	\$1,268,256,243	0.3%	1.56
Connecticut	\$220,377,283,504	\$33,267,097,336	15.1%	\$147,975,984	0.2%	\$230,979,808	1.3%	1.47
Delaware	\$63,030,182,559	\$7,636,999,905	12.1%	\$65,301,752	0.2%	\$101,894,965	0.6%	1.42
District of Columbia	\$99,125,635,652	\$9,482,909,835	9.6%	\$361,729,248	0.2%	\$561,896,765	1.0%	1.27
Florida	\$758,588,656,365	\$143,474,254,144	18.9%	\$35,358,900	0.3%	\$54,852,775	0.3%	1.65
Georgia	\$405,489,960,760	\$62,581,474,144	15.4%	\$1,409,991,680	0.7%	\$2,185,108,385	0.4%	1.56
Hawaii	\$65,088,439,960	\$9,463,304,582	14.5%	\$51,519,484	0.3%	\$79,406,324	0.2%	1.36
Idaho	\$53,772,611,753	\$8,517,728,172	15.8%	\$239,784,528	0.3%	\$369,366,340	0.4%	1.38
Illinois	\$646,018,593,469	\$97,896,566,321	15.2%	\$253,000,208	0.3%	\$387,925,760	0.5%	1.62
Indiana	\$263,894,288,791	\$49,961,723,906	18.9%	\$495,667,328	0.7%	\$759,648,072	0.4%	1.43
Iowa	\$138,340,587,333	\$22,733,044,347	16.4%	\$113,771,712	0.3%	\$174,321,667	0.4%	1.40
Kansas	\$125,117,379,434	\$21,487,356,763	17.2%	\$155,645,264	0.3%	\$234,027,302	0.3%	1.44
Kentucky	\$159,477,738,869	\$33,948,756,885	21.3%	\$187,603,616	0.3%	\$281,600,651	0.4%	1.40

## Appendix D: Employee Compensation Impact

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Gross State Product <sup>1a</sup>	Health Expenditures <sup>1b</sup>	Health Expenditures as a Percent of Gross State Product	Direct Inpatient Psychiatric Hospital Employee Compensation	Direct Inpatient Psychiatric Hospital Employee Compensation as a Percent of Health Expenditures	Total Impact of Inpatient Psychiatric Hospital Employee Compensation <sup>1c</sup>	Total Employee Compensation Impact as a Percent of Health Expenditures	Multiplier
Louisiana	\$226,538,802,935	\$34,410,234,368	15.2%	\$134,455,888	0.3%	\$201,518,271	0.7%	1.42
Maine	\$50,675,540,933	\$12,680,074,092	25.0%	\$124,588,896	0.2%	\$186,728,660	0.5%	1.46
Maryland	\$278,647,682,108	\$46,227,677,349	16.6%	\$150,822,064	0.3%	\$225,266,359	0.4%	1.48
Massachusetts	\$372,084,820,337	\$66,538,718,961	17.9%	\$113,406,320	0.2%	\$169,184,483	0.7%	1.57
Michigan	\$389,982,178,897	\$74,893,572,728	19.2%	\$135,613,680	0.3%	\$201,103,048	0.5%	1.54
Minnesota	\$267,957,792,506	\$46,494,610,403	17.4%	\$287,061,152	0.9%	\$421,093,938	0.4%	1.57
Mississippi	\$93,566,607,615	\$21,036,435,955	22.5%	\$45,798,172	0.4%	\$66,709,226	0.5%	1.35
Missouri	\$242,420,720,741	\$48,699,447,263	20.1%	\$92,828,808	0.3%	\$134,492,494	0.4%	1.50
Montana	\$36,588,863,981	\$6,935,735,104	19.0%	\$54,785,224	0.2%	\$78,757,281	0.4%	1.30
Nebraska	\$84,892,158,767	\$14,869,829,989	17.5%	\$50,224,564	0.5%	\$72,150,471	0.3%	1.43
Nevada	\$133,784,692,174	\$16,417,136,842	12.3%	\$47,515,788	0.2%	\$68,244,716	0.4%	1.38
New Hampshire	\$61,171,736,179	\$10,570,247,302	17.3%	\$33,632,632	0.2%	\$48,102,260	0.7%	1.44
New Jersey	\$484,170,647,341	\$72,931,539,379	15.1%	\$125,345,848	0.3%	\$178,743,148	1.0%	1.53
New Mexico	\$81,454,593,657	\$12,052,706,012	14.8%	\$33,248,368	0.4%	\$47,280,580	0.3%	1.35
New York	\$1,166,734,268,700	\$189,815,038,719	16.3%	\$104,125,480	0.3%	\$147,717,848	1.2%	1.55
North Carolina	\$407,973,326,302	\$67,242,999,956	16.5%	\$167,447,872	0.5%	\$237,171,205	0.4%	1.50
North Dakota	\$31,814,807,810	\$6,008,255,850	18.9%	\$61,990,644	0.2%	\$86,829,809	0.5%	1.31
Ohio	\$480,675,993,368	\$99,131,697,230	20.6%	\$60,049,700	0.3%	\$83,942,054	0.4%	1.53
Oklahoma	\$149,295,532,370	\$25,029,875,084	16.8%	\$98,086,128	0.3%	\$137,111,879	0.3%	1.40
Oregon	\$164,714,622,608	\$26,420,339,917	16.0%	\$74,101,240	0.4%	\$103,192,215	0.3%	1.44
Pennsylvania	\$564,059,375,041	\$112,324,524,080	19.9%	\$23,525,712	0.3%	\$32,430,225	0.6%	1.59

## Appendix D: Employee Compensation Impact

State	Overall Economy			Inpatient Psychiatric Hospitals				
	Gross State Product <sup>1a</sup>	Health Expenditures <sup>1b</sup>	Health Expenditures as a Percent of Gross State Product	Direct Inpatient Psychiatric Hospital Employee Compensation	Direct Inpatient Psychiatric Hospital Employee Compensation as a Percent of Health Expenditures	Total Impact of Inpatient Psychiatric Hospital Employee Compensation <sup>1c</sup>	Total Employee Compensation Impact as a Percent of Health Expenditures	Multiplier
Rhode Island	\$48,284,944,794	\$10,246,006,587	21.2%	\$52,495,208	0.3%	\$72,316,378	0.5%	1.55
South Carolina	\$159,424,727,782	\$31,228,151,074	19.6%	\$10,688,844	0.1%	\$14,581,073	0.4%	1.45
South Dakota	\$37,677,630,155	\$6,457,668,561	17.1%	\$15,333,459	0.2%	\$20,763,778	0.3%	1.35
Tennessee	\$257,029,353,012	\$51,002,310,386	19.8%	\$14,623,466	0.3%	\$19,783,407	0.4%	1.50
Texas	\$1,247,300,926,649	\$159,132,818,523	12.8%	\$79,957,112	0.4%	\$108,113,210	0.4%	1.55
Utah	\$111,911,502,083	\$15,016,115,335	13.4%	\$29,384,896	0.2%	\$39,647,975	0.5%	1.54
Vermont	\$25,936,693,806	\$5,364,298,709	20.7%	\$24,100,760	0.4%	\$32,017,203	0.4%	1.35
Virginia	\$404,744,747,209	\$53,944,606,361	13.3%	\$23,171,630	0.4%	\$30,296,421	0.3%	1.49
Washington	\$329,054,089,830	\$48,159,548,771	14.6%	\$20,391,290	0.3%	\$26,438,636	0.5%	1.49
West Virginia	\$62,850,760,418	\$15,267,967,425	24.3%	\$52,854,428	0.3%	\$68,282,964	0.4%	1.29
Wisconsin	\$245,103,897,303	\$46,520,248,040	19.0%	\$77,403,040	0.8%	\$98,319,015	0.5%	1.50
Wyoming	\$35,996,567,027	\$3,423,378,709	9.5%	\$17,920,502	0.5%	\$22,591,656	0.7%	1.26
<b>United States</b>	<b>\$14,441,000,000,000</b>	<b>\$2,339,442,000,000</b>	<b>16.2%</b>	<b>\$8,168,944,640</b>	<b>0.3%</b>	<b>\$16,285,494,061</b>	<b>0.7%</b>	<b>1.99</b>

Source: Dobson | DaVanzo analysis of IMPLAN data.

<sup>1a</sup> United States Bureau of Economic Analysis and the World Health Organization National Health Accounts.

<sup>1b</sup> Kaiser Family Foundation and the World Health Organization National Health Accounts. Kaiser provides health expenditures by state for 2004, retrieved from: <http://www.statehealthfacts.kff.org>. The National Health Accounts published a national picture of health expenditures for 2008, retrieved from: <http://www.who.int/nha/country/usa/en/>. The National Health Accounts listed health expenditures as 16.2 percent of gross domestic product. This is calculated to be approximately \$2.3 trillion. We proportioned this figure among the states using the proportions from the Kaiser 2004 state health expenditure data.

<sup>1c</sup> The total economic impact of direct inpatient psychiatric facility expenditures on each state does not sum to the total economic impact of direct expenditures at the national level due to the way IMPLAN calculates multipliers (see Appendix A).

# *Appendix E: About NAPHS and Dobson | DaVanzo*

## **About NAPHS**

The National Association of Psychiatric Health Systems (NAPHS), a membership organization comprised of more than 600 member facilities, has been a leader in advocating for high-quality mental health and substance abuse care delivery for more than 75 years. Created in 1933, NAPHS today represents delivery systems that provide a full spectrum of treatment services, including inpatient, residential, partial hospitalization, and outpatient programs, as well as prevention and management services for children, adolescents, adults, older adults, and alcohol and substance abuse patients. NAPHS members have experienced a dramatic change in their operating environment and are, therefore, well prepared to contribute to health care reform efforts, whether publicly or privately initiated.

NAPHS members are actively working to develop integrated delivery systems that offer the most effective and efficient care. NAPHS works to promote appropriate regulation and quality assurance through such organizations as The Joint Commission (JC), other accrediting bodies, Medicare and Medicaid, and state legislatures.

NAPHS represents private-sector psychiatric hospitals and residential treatment centers, including:

- Close to 75 percent of all Medicare-certified non-governmental psychiatric hospitals [as defined in the Inpatient Psychiatric Prospective Payment System (IPPPS)]
- Nearly all of the inpatient behavioral health care companies in the United States

## *Appendix E: About NAPHS and Dobson | DaVanzo*

---

- Nearly 40 percent of all the largest psychiatric units (more than 50 beds) in the United States

NAPHS represents private-sector residential treatment centers, including

- Both for-profit and not-for-profit residential treatment centers
- Nearly all Tricare-certified residential treatment centers (CHAMPUS)
- Many Medicare-defined “Psychiatric Residential Treatment Facilities”

### **About Dobson | DaVanzo**

Dobson | DaVanzo & Associates, LLC (Dobson | DaVanzo) is a health care economics consulting firm based in the Washington, D.C. metropolitan area. The work of our principals has influenced numerous public policy decisions, and appears in legislation and regulation. Our litigation support efforts have helped courts, plaintiffs, and defendants understand the economic value of various health care issues.

We apply decades of experience, access to a broad range of policymakers and subject matter experts, and innovative research techniques in order to best meet our clients' needs. Our analyses are rigorous and objective, and make use of a variety of public and private-sector data sources.

We have provided testimony to the Centers for Medicare and Medicaid Services (CMS), the Medicare Payment Advisory Commission (MedPAC), and the United States Treasury, as well as before members of Congress, State legislatures, and numerous stakeholder groups.