Veterinary Medicine Industry in Texas: An Analysis of Economic Contribution

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Abstract

Several data sets were utilized to estimate the direct effect of the veterinary medicine industry. Preliminary results indicate the total economic contribution of the veterinary medicine industry in Texas was 3.85 billion in 2011. Over 44,000 Texas employees and $1.67 billion in annual wages can be linked to the industry.

JEL Classifications: J30, Q10, R10

Introduction

The veterinary medicine industry plays a vital role in both the protection of animal and human health globally, and the human-animal bond. The industry monitors live animal trade to protect Texas' livestock and its producers, and protects public health through food quality assurance. Through its many roles, the industry is critical to the support of the economy of the state.

The objective of this study was to estimate the economic contribution of the veterinary medicine industry in Texas and assess the role of this industry on the Texas economy.

Background

An analysis of the economic contribution of the veterinary medicine industry in Texas was conducted to assess the role of this industry in the Texas economy. This study was initiated by Jenna Beyer as part fulfillment of her graduate degrees in the Veterinary Medicine and Business Administration dual degree program at Texas A&M University (TAMU). This study also serves as an update to the 2004 study entitled "The Economic Impact of Veterinary Medicine on the State of Texas", also conducted by graduate students in the dual degree program.

Data and Methods

Economic contribution is the study of an industry in an existing economy and is typically used to describe an industry's role in the economy. To measure impact, or economic contribution, the IMPLAN model produces multipliers which estimate the total economic impact of expenditures within an economy (Guerrero, et al., 2011). In this study, the authors quantified the direct effects, which were then used in the IMPLAN input-output model (MIG, 2009). The

IMPLAN model allows for evaluating the economic impacts of a sector of the economy, or an event, through its linkages to other sectors of the economy and estimating the indirect and induced effects using economic multipliers. Furthermore, input-output modeling is a method used to understand the linkages between elements of an economy and estimate the impacts of changes in the economy (Guerrero, et al., 2011).

Indicators included in this study include employment, labor income, value-added, and economic output. Employment represents the number of full and part-time employees, including sole proprietors. Labor income includes employee compensation (salary, wages, and benefits) and sole proprietor income. Economic output is a measure of gross business activity and represents the gross expenditures resulting from direct, indirect, and induced business activity. Value-added is economic output less intermediate purchases from other sectors. Value-added also represents the gross domestic product (GDP) of the state of Texas.

The total economic contribution of veterinary medicine, as measured by any of the four indicators, is the sum of the direct, indirect, and induced effects. Direct effects are those effects directly associated with the veterinary medical industry. For example, if a veterinary practice employs 13 people, the direct effect on employment of the veterinary industry is 13 jobs. Direct effects create a ripple effect on other aspects of the veterinary industry through indirect and induced effects.

Indirect effects occur in sectors that support (provide inputs to) the veterinary sector, while induced effects occur by employees spending their income. Indirect effects are business-to-business effects associated with the practice of veterinary medicine. An example of indirect effects includes purchases of medical equipment, medications, syringes, and other supplies made by a veterinary clinic or hospital from another business. Services provided by other businesses to

the veterinary industry are also an indirect effect; examples of this include business consulting services and advertising.

Induced effects are business-to-consumer effects. They measure the changes in household income associated with the veterinary medical industry. For example, veterinary clinic employees use their wages to purchase household goods and services.

The veterinary medicine industry in Texas can be divided into four categories: (1) private veterinary practice, (2) academia, (3) government veterinarians, and (4) private industry veterinarians. These four components of the industry are described in the following sections, along with the economic data used to conduct the analysis.

Private Veterinary Practice

Veterinarians who practice veterinary medicine in Texas are required to obtain a Texas license. As of March 2012, there were 6,050 actively licensed veterinarians with Texas addresses (Copeland, 2012). However, not all of these licensed veterinarians work in private veterinary practice. Of the total licensed veterinarians in Texas, 5,462 individuals were in private practice. Some of these veterinarians worked in practices that are managed by larger companies, such as Banfield or VCA. Given that the operational differences between a private practice and a practice managed by a larger company are minimal, these two types of practices were treated the same in this analysis. According to the demographics collected by the Texas Veterinary Medical Association, 55% of their members described themselves as exclusively small animal practitioners (Copeland, 2012).

Texas has a total of 29,131 individuals employed in private veterinary practice (Table 1). These employees consisted of veterinarians, registered veterinary technicians, certified veterinary assistants, and other office and clinic staff. Registered veterinary technicians have

completed formal studies in veterinary technology within an educational institution accredited by the American Veterinary Medical Association (AVMA). They also passed both state and national licensing exams. The Texas Veterinary Medical Association (TVMA) offers three levels of certification courses for veterinary assistants who desire additional training. The majority of veterinary technicians who work in private veterinary practices received on-the-job training and did not have any formal training. Other support and office staff includes kennel assistants, groundskeepers, receptionists, and other office workers.

In the IMPLAN model, private veterinary practice is represented in Sector 379 (*Veterinary Services*), which is defined as animal and pet hospitals, labs, testing and inspecting services, internists and surgeons, vaccinations, and practices and clinics for both large and small animals. It does not include research and development, grooming, animal breeding, or transportation of pets.

Using IMPLAN (Ver. 3.0) study area data, direct output for the veterinary services industry was $1.84 billion with total employment of 32,423. Due to the lack of information regarding business income and/or expenses of private practices, the following estimation of the direct effect of private practices was used:

Estimated Direct Output of Private Veterinary Practice in Texas:

Total industry output ($1.84 billion) ÷ total industry employees (32,423) =
$56,845 per employee × 31,133 actual employees = $1.77 billion (output)
This level of output was used in the IMPLAN model to estimate the direct
effects information in Table 2.

In order to validate the employment results, comparisons were made using information obtained from industry sources. The National Commission on Veterinary Economic Issues (NCVEI) estimates that in 2011, there were 2.4 veterinary technicians or assistants per

veterinarian and 2.3 other support staff members per veterinarian (Felsted, 2012). Based on

these estimates, there are an estimated 31,133 employees in private veterinary practice in Texas.

Based on data collected from the Bureau of Labor Statistics (BLS), private practice veterinarians

(5,462 employees) earned $94,040 on average per year, registered veterinary technicians and

certified veterinary assistants (13,109 employees) earned $28,330 per year, and all other support

staff (12,563 employees) earned $23,900 per year.[1] These data compared favorably to the

information in IMPLAN.

As a result of the presence of private veterinary practices, an additional 13,000 jobs

(indirect and induced employment) were linked to private veterinary practices (Table 2). In total,

private practices and their employees contributed $3.6 billion to the state's economy, including

$1.5 billion in wages paid. Private veterinary practices accounted for 94% of the economic

contribution of the veterinary medical industry in the state of Texas.

Academia

At Texas A&M University (TAMU), the College of Veterinary Medicine (CVM) and the

Veterinary Medical Teaching Hospital (VMTH) together employ faculty, veterinarians,

veterinary technicians, student workers, office staff, and many others. Positions such as custodial

and maintenance staff members were not included in this analysis because they are employed

directly by the university system, rather than the CVM. Additionally, there are several colleges

across the state that train veterinary technicians. In total, an estimated $36.4 million was paid in

labor income to 1,126 employees (Table 3). In 2011, the TAMU CVM and VMTH had

expenditures of more than $68 million in the following categories: teaching hospital, teaching

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[1] BLS, Occupational Employment and Wages: 29-1131 Veterinarians, 29-2056 Vet Techs, 31-9096 Vet Assistants, 2011.

and educational support, research, public service, institutional support, facilities and infrastructure, and scholarships and fellowships (TAMU, CVM, 2012).

The colleges who teach and train animal health care providers and assistants in Texas made a total economic contribution of $140 million. An additional 510 jobs were linked to academia with $59 million in total wages.

Government Veterinarians

FedScope, an online database of information on government employees, reports 287 veterinarians working for federal agencies in 2011 in Texas with total salaries of $19 million (Table 4). Additionally, 36 veterinarians worked for state agencies and with total salaries of $3.8 million.

The economic contribution analysis of government veterinarians was assessed by evaluating their total compensation. Because government veterinarians often work in areas not directly related to the veterinary industry, the spending effects of their income were limited to their employment and labor income only. The salary data for the government veterinarians was adjusted by a factor of 1.623 to convert salaries to total compensation, which allowed for proper analysis in the IMPLAN model (Table 5).

The 323 veterinarians employed by state and federal agencies contributed to an additional 208 jobs in Texas and total labor income of $35.6 million. Total economic output of government veterinarians was $54 million.

Private Industry Veterinarians

Veterinarians are also employed in private industries, such as companies that make and sell veterinary pharmaceuticals or medical devices. Other companies hire veterinarians to work

in their animal research and development laboratories. And, some veterinarians are self-employed, selling products or services to private veterinary practices.

Based on American Veterinary Medical Association (AVMA) records, 99 veterinarians described themselves as employees in various areas of private industry (Table 6). Since many of these veterinarians were highly skilled, the authors used the upper 90th percentile range of available wage data from the Bureau of Labor Statistics to calculate total labor income for private industry veterinarians. The average estimated salary for these veterinarians was $131,570 per year (BLS, 2011).

Similar to the government veterinarians' section above, economic contribution was assessed by evaluating their employee compensation and the spending effects of this income. Their labor income was also adjusted by a compensation adjustment factor, resulting in total compensation (labor income) of $15.1 million (Table 7).

A total of 217 people were employed because of veterinarians involved in private industry. The total output from this industry was estimated at $30.8 million with total wages of $20.2 million.

Total Economic Contribution

The total economic contribution of the veterinary medicine industry in the state of Texas in 2011 was an estimated $3.85 billion (Table 8). The industry supported more than 44,000 jobs with labor income estimated at $1.67 billion annually. These jobs represented direct, indirect, and induced employment in the economy supported by the four sectors of the veterinary medicine industry in Texas.

Summary

The veterinary medicine industry plays a critical role in not only the welfare and health of the state but also the overall economy. As shown in the results of this study, the total economic contribution of the veterinary medicine industry in the state of Texas in 2011 was an estimated $3.85 billion. Furthermore, the industry supported more than 44,000 jobs with labor income estimated at $1.67 billion annually.

Other key highlights from this study include:

- In 2011, there were 6,050 veterinarians with active licenses and Texas addresses.

- There were 1,173 registered and 1,314 certified veterinary assistants in Texas.

- The veterinary medicine industry also contributed $2.2 billion to Texas' Gross Domestic Product (GDP). As a result of this industry, approximately $1.6 billion in labor income was paid to 44,700 employees.

- Private veterinary practices and clinics made up 94% of the total economic contribution in Texas in 2011. These practices directly employed over 29,000 individuals in 2011, of which nearly 5,500 were veterinarians. This sector contributed $3.6 billion to the state's economic activity and $2 billion to Texas' GDP. Additionally, 13,000 jobs with $593 million in labor income were linked indirectly to private practices.

- The next largest sector consisted of veterinary medicine in academia, including the Texas A&M College of Veterinary Medicine (CVM), the Veterinary Medical Teaching Hospital (VMTH), and various state colleges that train veterinary technicians. Together, these institutions employed 1,100 people and were linked to an additional 500 jobs in the state of Texas. The total economic output, including expenditures from the CVM and VMTH, was an estimated $140 million.

- Government veterinarians in Texas serve to protect animal and human health. In 2011, 323 veterinarians worked in either state or federal agencies located in Texas and contributed $54 million in economic output and $43 million to the state's GDP.

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Table 1: Estimated Private Veterinary Practice Employment in Texas

Actively Licensed Veterinarians	5,462
Registered Veterinary Technicians	1,173
Certified Veterinary Assistants	1,314
Approximate Veterinary Assistants	8,619
Approximate Other Support and Office Staff	12,563
Total Employment	29,131

Sources: Texas State Board of Veterinary Medical Examiners (SBVME), IMPLAN

Table 2: Estimated Total Economic Contribution of Private Veterinary Practice in Texas

	Direct	Indirect	Induced	Total
Output	$1,769,762,864	$669,617,640	$1,188,489,876	$3,627,870,380
Employment	29,131	4,193	9,003	42,327
Labor Income	$941,405,857	$210,080,377	$382,987,705	$1,534,473,939
Value Added	$1,008,418,444	$379,090,373	$706,095,201	$2,093,604,017

Table 3: Estimated Total Economic Contribution of Academic Veterinary Medicine in Texas

	Direct	Indirect	Induced	Total
Output	$68,383,155*	$25,873,843	$45,922,933	$140,179,931
Employment	1,126	162	348	1,635
Labor Income	$36,375,666	$8,117,449	$14,798,543	$59,291,658
Value Added	$38,965,014	$14,647,949	$27,283,331	$80,896,294

*Direct output is equivalent to the TAMU College of Veterinary Medicine (CVM) expenditures

Table 4: Government Veterinarian Employment in Texas

Air Force	1
USDA: Ag. Research Service	1
USDA: APHIS	171
USDA: FSIS	81
Army	28
Dept. of Health & Human Services	4
Dept. of Homeland Security	1
AgriLife Extension Service	2
Tx Veterinary Medical Diagnostic Lab	21
Tx Animal Health Commission	13
Total Employment	323

Sources: FedScope (2012), Texas Tribune (2012)

Table 5: Estimated Total Economic Contribution of Government Veterinarians in Texas

	Direct	Indirect**	Induced	Total
Output	$26,698,964	$0	$27,603,183	$54,302,148
Employment	323	0	208	531
Labor Income	$26,698,964*	$0	$8,893,895	$35,592,859
Value Added	$26,698,964	$0	$16,383,596	$43,082,561

*Adjusted by factor of 1.1623 to include benefits

**When assessing impacts of the spending of employee income, there are no indirect effects as all effects are induced.

Table 6: Estimated Private Industry Veterinary Employment in Texas

Agriculture/Livestock Production	12
Business/Consulting Services	22
Feeds/Nutrition	8
Laboratory	16
Pharmaceutical/Biological	41
Total Employment	99

Sources: American Veterinary Medical Association (AVMA), Member Center

Table 7: Estimated Total Economic Contribution of Private Industry Veterinarians in Texas

	Direct	Indirect**	Induced	Total
Output	$15,139,867	$0	$15,652,612	$30,792,479
Employment	99	0	118	217
Labor Income	$15,139,867*	$0	$5,043,356	$20,183,223
Value Added	$15,139,867	$0	$9,290,453	$24,430,320

*Adjusted by factor of 1.1623 to include benefits

**When assessing impacts of the spending of employee income, there are no indirect effects as all effects are induced.

Table 8: Estimated Total Economic Contribution of the Veterinary Medical Industry in Texas

	Output	Employment	Labor Income	Value Added
Private Practice	$3,627,870,380	42,327	$1,534,473,939	$2,093,604,017
Academia	$140,179,931	1,635	$59,291,658	$80,896,294
Government	$54,302,148	531	$35,592,859	$43,082,561
Private Industry	$30,792,479	217	$20,183,223	$24,430,320
Total	$3,853,144,938	44,711	$1,649,541,678	$2,242,013,191