Veterinary supply and demand

David K. Hardin

School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln, Lincoln, NE

The market forces that impact the economic status of the veterinary profession are complex and diverse. The recent AVMA report on veterinary markets describes the market for veterinary education, market for veterinarians and the market for veterinary services. Each of these markets is impacted by the forces of supply and demand often described as the “law of supply and demand”. The interaction of market forces and other factors within the veterinary profession impact the demand for veterinary services, supply of veterinarians and the level of compensation that veterinarians receive. This presentation will explore the economic relationships that are currently impacting the veterinary profession.

Introduction

In simple terms the law of supply and demand is a common sense principle that defines the generally observed relationship between demand, supply and price. The basic concept is that when the price of a good or service increases the consumer demand tends to decrease. Supply considers the relationship between the price and available supply from the perspective of the producer rather than the consumer. Increasing consumer demand for goods and services often drives the price up and producers generally respond to the increase in price by producing more goods and services. The degree to which demand or supply reacts to a change in price is described as elasticity. If a good or service is considered to be essential by the consumer the demand may not be negatively affected by increasing prices and is described as being inelastic. Factors that influence demand price elasticity are the availability of substitutes, consumer disposable income, access to capital and time. Another important economic principle is “utility”. Utility is an abstract concept regarding the satisfaction or benefit that an individual gains from consuming or using a good or service. In general, a high level of utility results in an increase in the demand for goods or services and would be considered inelastic. The utility for veterinary services is often high for individuals who have strong emotional attachments to the animals in their care.

Economists assume that there is competition in the marketplace, thus prices change in response to supply and demand. Substitutes can play an important role in the market. If a product gets too expensive, consumers often substitute a less expensive product. If there is only one company producing a product that does not have a substitute, the company is said to have a monopoly on the market.

Understanding market forces

Market forces that affect supply, demand and price come in many forms. Common forces encountered in today’s economy that affect the various markets in veterinary medicine include technological developments such as new products and equipment, along with the development of new communication, marketing and sales strategies. Political and governmental policies that influence regulations and tax rates affect how veterinary businesses operate. The position the profession takes on certain moral and ethical issues of our time can influence consumers’ view of the veterinary profession and affect consumer spending. Weather condition can impact the profession directly and indirect due to the economic impact that these forces have on the agricultural sector. These markets forces and many others impact the various markets that define veterinary supply and demand.

Price signals are important indicators in a free market economy. Rising prices generally indicate a decrease of supply or an increase in demand. However, if prices are influenced by government policies or other forces then changes in prices may not be a reliable indicator of shortages, surpluses, or consumer preferences. The 2015 AVMA Report of Veterinary Markets points out that there are three principal markets within veterinary medicine and each is influenced by supply, demand, and price. Outside forces such as governmental policies, state licensure, degree of public funding for institutions of higher education, federally backed student loan programs and many other forces can make the price signals difficult to interpret.
Another important concept to understand is the difference between need and demand. Demand is described as a consumer's desire and willingness to pay a particular price for a specific good or service. Demand often changes as the price goes up or down. Need is described as a consumer’s desire for a specific good or service, yet they may not be willing to pay the current price for the good or service. If the price goes down the consumer may be willing to pay the lower price and thus in this case need is turned into demand.

The 2006 Foresight Project: Envisioning the Future of Veterinary Medical Education stated that one of the most important principles (needs) for the future of the profession was that veterinary medicine must remain relevant to the changing needs of society. The report suggested that veterinary medical education could only respond to these changing needs by expanding the areas of education and that the number of graduating veterinarians should increase to address population growth and allow the profession to respond to new demands and roles. While many would agree with this vision for the needs of the future, it does point out the importance of understanding the difference between need and demand.

Supply represents how much the market can offer and often refers to the amount of a certain good or service producers are willing to supply at a certain price. An oversupply exists when the supply of a certain good or service exceeds the need. If the supply of a certain good or service exceeds the demand yet fails to meet the need then excess capacity exists. The correction for oversupply is to reduce supply. Corrections for excess capacity include turning need into demand, reducing the price or reducing the supply.

The supply and demand for veterinarians, veterinary services and veterinary education are somewhat independent markets that guide the allocation of resources for veterinary medicine and provide goods and services to owners of animals, the veterinary industry, government, academia and the general public. Each of these markets has a supply and demand that influences the price providing signals to those involved in the markets about the relative supply and demand conditions.

**Market for veterinarians**

The practice of veterinary medicine in the US is regulated by state statues that require certain standards be met to obtain a license, including the DVM degree or equivalence. Thus the supply of veterinarians is influenced by the market for veterinary education. In 2014 the AVMA estimated that 100,137 veterinarians were actively practicing veterinary medicine in the United States. The results of the AVMA survey of graduating seniors between 2010 and 2014 indicated that 16,267 new veterinarians (approximately 3,253 per year) were added to the veterinary workforce. Of those entering private practice, 64.5 % were employed in companion animal practice, 17.9% in mixed animal practice, 7.8% in food animal practice and 3.6% in equine practice.

The demand for veterinarians is influenced by the compensation employers are willing to pay and the level of compensation is linked to the market for veterinary services. As the demand for veterinary services increases, the price for veterinary services will likely increase, resulting in increased revenue for veterinary practices. Thus, veterinary practices have the ability to increase the level of compensation they could pay veterinarians. However, if there is an oversupply or excess capacity they may be able to employ new veterinarians without increasing compensation. If the demand for veterinary services is weak then price changes for veterinary services would tend to remain flat or decrease, negatively impacting practice revenue and reducing the level of compensation the veterinary practice owners can pay new veterinarians who are entering the workforce.

Three indicators for the demand for new veterinarians are level of compensation (starting salary), level of unemployment and level of underemployment. In 2001 the nominal mean salary was approximately $45,000. Starting salaries increased at a steady rate of 7.65% annually from 2001 to 2008 at which time the starting salary was $70,000. From 2008 through 2014 the nominal mean starting salary for new graduates has remained flat at $70,000. The AVMA reported the unemployment for 2014 at 3.9% and a negative underemployment that equates to room in the profession to employ an additional 951 full-time veterinarians.
Market for veterinary education

Veterinary education provides the necessary training for individuals entering the veterinary workforce. The veterinary educational supply chain can be viewed by the number of seats available at accredited veterinary colleges, both domestic and international, and the price (tuition and fees) institutions are charging to provide seats. The number of seats filled at veterinary colleges determines the number of graduates produced each year. The number of graduates from US schools in 1980 was 1746 and since then the rate of increase has been approximately 2% per year with 2977 new graduate expected in 2015.2 There are US citizens obtaining their veterinary training from accredited international veterinary schools. The number of US citizens graduating from accredited international veterinary schools was not available until 2012. In 2012 there were 538 graduates and in 2015 the projected number of US citizens graduating by accredited international colleges is expected to be 619. The combined number of veterinary graduates in 2015, foreign and domestic is estimated to total 3596. With two new US schools admitting their first class (fall 2014) the expect number of veterinary graduates is expect to rise to 3226 (US), 644 (international) for a total of 3870 new graduates in 2018.2 The AVMA projects that number of veterinary graduates will level out moving forward.1

The demand for the veterinary education market can be defined as the number of applicants who are willing to pay the current price for a seat. The price for a seat at a veterinary college varies significantly among institutions and whether or not the student pays resident tuition rates or non-resident rates. The median resident tuition for US Colleges of Veterinary Medicine, excluding the University of Pennsylvania, Tufts University and Western University of Health Sciences was reported in the 2014 AAVMC comparative data report as $21,753. The minimum was $16,546 and the maximum was $30,813. The median non-resident tuition was $45,910. The minimum was $25,809 and the maximum was $62,083.2 Over the last decade the median resident tuition has increase at a rate of 4.3% annually and the rate of increase or non-resident tuition was 2.9%.

Data for the number of applicants that apply for a seat at a veterinary college come from the American Association of Veterinary Medical Colleges (AAVMC). The AAVMC provides an applicant service in which students wishing to apply to a veterinary college can apply using a centralized service, VMCAS. Currently 90.5% of the first year seats at US colleges of veterinary medicine are represented in VMCAS data.2 The number of applicants per available seat as reported by AAVMC has remained steady at about 2.25 applicants per seat over the past decade.2 However, if you consider the number of available seats at international colleges, the ratio drops.

By the mid 1980’s the student debt to income was becoming an issue. In 1984 AVMA president Dr. Delano L. Proctor indicated that an in-house survey of 1984 graduates showed that 85 percent would have education related debt and the mean was $20,000. The mean starting for graduate was also about $20,000.5 In 1999 the JAVMA published the KPMG study which stated that increased student debt was a significant issue facing many recent graduates.6 At the time the mean starting salary for new graduates was about $42,000 and the mean debt had grown to $63,000. Since 2001, the debt of new veterinarians has been growing faster than starting salaries. The debt to income gap in 2001 was approximately $10,000 when adjust to 2014 dollars. The gap had increased to nearly $65,000 in 2014.1

Market for veterinary services

The general economic condition of consumers and their willingness to pay for goods and services has significant impact on market conditions for veterinary services. The amount of money that households have available for spending and saving after income taxes is referred to as disposable income.7 The rate of growth in household disposable income is an important indicator of the money consumers have available to spend on veterinary services. Since 2000 the rate of growth in disposable income has declined as compared to historic growth (1960-2000).1 Currently, 66.5 percent of active veterinarians are employed in companion animal practice and would be directly impacted by the level of disposable income for the consumers in their practice area. Six point three percent of the active veterinarians are in food animal practice and would be impacted by the profit margins associated with the various livestock sectors they serve. Three point nine percent are in mixed
practice and would be impacted by the level of disposable income and profit margins in the livestock sectors. Equine practice represents 6.1 percent of active veterinarians and would be impacted by profit margins in the equine sector, along with availability of disposable income.¹

The AVMA has been collecting aggregate economic data such as total revenue and expenses from US veterinary practices for more than two decades through the biennial economic survey. However, this survey did not contain information on the quantity and prices of specific veterinary services.¹ This information is needed to develop the supply and demand curves for specific veterinary services that can be aggregated to produce market supply and demand curves. Given the lack of data, the AVMA’s Veterinary Economic Strategy Committee concluded that the currently available data would not result in a sufficiently robust analysis to provide useful information regarding the supply and demand for veterinary services.¹

Implications

Socio-economic factors are believed to be directly correlated with lifestyle choices and are linked to patterns of drug use, disease prevalence and rates of mortality. The results from the first mental health survey of US veterinarians show that veterinarians are more likely to suffer from psychiatric disorders, experience bouts of depression and have suicidal thoughts compared with the US adult population.⁸ Common predictors of suicidal behavior include hopelessness, stressful life events, substance abuse, depression and anxiety.⁹ It has been reported that a high percentage of veterinary students have depression levels at or above the clinical cut-off.¹⁰ While I am not aware of any studies that have evaluate the effects of economic stress on veterinarians, it stands to reason that the widening debt to income gap could affect lifestyle choices and lead to an increase of mental health disorders.

As the future unfolds it is extremely important that as a profession we continue to gather good data and develop the necessary skills required to interpret the data and evaluate market signals. We need to develop a better understanding of how the market for veterinarians, market for veterinary education and the market for veterinary service interact and impact each other. While it is difficult to predict the future, having robust discussion regarding the factors that influence the markets of veterinary medicine and how the markets interact will be helpful to plotting the future of the profession.

Questions to consider for ongoing discussions: Can the needs of the profession, be turned into demand? How would this be accomplished? Understanding the elasticity of the many veterinary services offered and making appropriate price adjustments could improve efficiency and profitability. Should there be an adjustment in the supply of veterinarians? If so, how would this accomplished? Will the demand (ratio of applicants to seats) for veterinary education continue at same level? Will the debt to gap income continue to widen and if so at what point will applicant numbers be impacted? What are the socio-economic impacts of the growing debt to income ratio?

In closing, I would like to acknowledge the excellent work of the AVMA, Veterinary Economics Division and AAVMC for their on on-going efforts in collecting and analyzing data. Their reports are vital to understanding markets forces and how they impact the profession.

References
