Is American Pet Health Care (Also) Uniquely Inefficient?[†]

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It is well documented that the level and growth of the US health-care sector is high relative to any other developed country, and that this higher spending is not associated with better health outcomes. Economists and policymakers frequently attribute these facts to idiosyncratic institutional features of the US health-care sector, focusing on generous health insurance coverage that insulates consumers from the direct financial consequences of their health-care consumption decisions, and public sector reimbursement and regulation that provides little incentive for providers to engage in efficient production (Weisbrod 1991; Fuchs 2014). Such features have been suggested to be the cause of what makes the American health-care system, in the words of Alan Garber and Jonathan Skinner, "uniquely inefficient" (Garber and Skinner 2008).

Naturally, the conventional wisdom is not without its skeptics. An alternative school of thought is that high and rising US health-care spending is an optimal outcome given individual preferences. For example, Hall and Jones (2007) argue that health care is a luxury good (i.e., with an income elasticity above one) and calibrate a dynamic utility model under which the observed rise in the US health share of GDP is optimal. A related line of argument emphasizes the dramatic technological progress in medicine and the value of life, suggesting that high and rising US health-care spending may be socially desirable (Murphy and Topel 2003; Cutler 2004).

These divergent perspectives are intriguing, and difficult to "resolve" with a single convincing answer. Indeed, it may well be that a single answer does not exist, and the unique spending patterns of the US health-care system result from a combination of factors, some of which reflect specific institutional features of the American system, and some of which reflect "deeper primitives" concerning individual preferences over health and health care or the nature of the supply-side of health care. Empirical progress on this question is challenging in light of the fact that trying to explain the "uniqueness of the US health-care system" typically comes down to the comparison of a single data point (the US health-care system over the last few decades) to similar data points in other countries.

In this paper, we offer a new data point by presenting some simple facts about a different industry, the American *pet* health-care industry. We show that many features of the American pet health-care sector are, qualitatively, remarkably similar to those of the American human health-care sector.

Despite all the obvious caveats when presenting human care spending and pet care spending in the same picture, the two industries share a common feature: the need to make decisions and trade-offs with respect to medical spending that may potentially improve or extend life. Yet institutionally they are quite different: insurance for pet health care is much less common,[1] and regulation (and public sector involvement more broadly) less prevalent. The similarities we find in the empirical patterns therefore point

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[1] Insurance rate appears to be less than one percent. The North America Pet Health Insurance Association reports that 1.6 million pets were insured in 2015 (https://naphia.org/news/naphia-news/state-industry-report-2016), while the American Pet Products Association reports on a national survey of pet owners, according to which there were more than 160 million dogs and cats owned as pets in 2015–2016 (http://www.americanpetproducts.org/press_industrytrends.asp).
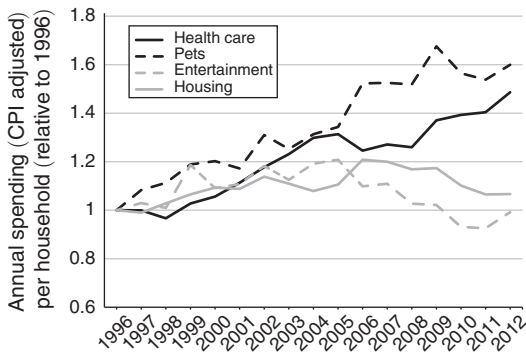
FIGURE 1. GROWTH OF PET CARE SPENDING

Notes: Figure plots annual out-of-pocket spending per household in four spending categories. Spending is CPI adjusted and normalized by the 1996 spending of each category. Sample includes all households in the CEX with positive spending on pets. See text for more details.

to deeper primitives that are also influencing demand and supply of health-related products.

In the rest of the paper we document four similarities between American human health-care spending and American pet health-care spending: (i) rapid growth in spending over the last two decades; (ii) a strong income-spending gradient; (iii) rapid growth in the employment of health-care providers; and (iv) a similar propensity for high spending at the end of life in pets and humans. More details on the data, variable definitions, and analyses are presented in the online Appendix.

We view the primary purpose of this short paper as bringing these facts into our collective consciousness to stimulate further discussion and insights. In the concluding section, we offer some initial thoughts of our own.

I. Patterns of Pet Care Spending Over Time and Across Income Groups

We use annual data from the Consumer Expenditure Survey (CEX) from 1996–2012 to document patterns of spending on pets, and compare it to three other spending categories: (human) health care, housing, and entertainment. (Human) health-care spending in the CEX represents out of pocket spending by the household on health insurance premiums and health care. We choose housing and entertainment somewhat arbitrarily, as two other normal

goods, that are likely to correlate positively with income, within and across households. The CEX measure of spending on pets is composed primarily of two roughly similarly-sized subcategories: spending on "pet purchases and medical supplies" and on "veterinary services." We group these together here, and show in the online Appendix that patterns are similar if we restrict to just veterinary services.

We annualize spending, so that our unit of observation is a household-year, and convert spending to 2012 dollars (using the CPI-U price index). We limit our analysis to pet-owners (who range between 31 percent of households in 1996 to 35 percent in 2012, with a peak of 39 percent in 2010) by conditioning on household-years that report positive spending on pets. All analyses use the CEX sampling weights, which attempt to make it representative of the US population. Our final sample covers 84,341 household-year observations, which cover 57,346 unique households.[2]

The growth of spending for each category is presented in Figure 1. We normalize each spending category by its 1996 level,[3] and present the growth pattern in each category over our observation period. While housing and entertainment spending have been fairly flat over the 1996–2012 period, health-care spending has been steadily rising, with spending in 2012 being almost 50 percent higher than in 1996. This rapid growth in health-care spending has, of course, been widely documented and commented on previously. The key observation from Figure 1 is that the growth in spending on pets has followed health-care spending remarkably closely, with 2012 spending being 60 percent higher than spending on pets in 1996.

We also explore how spending on each category varies with income. To do so, we use the same sample, and for each category compute the average annual spending by income (using

[2] The CEX conducts its interviews every quarter, with spending of participating households typically observed for four-consecutive quarters, which do not necessarily conform to calendar years. We aggregate quarters within a year, and then annualize to the calendar year level. Observations of the same household across calendar years are treated as independent observations.

[3] Spending levels across categories are naturally very different. Housing spending per household in 1996 is $10,558 (in 2012 dollars), health care is $2,900, entertainment is $3,230, and pets is $550.
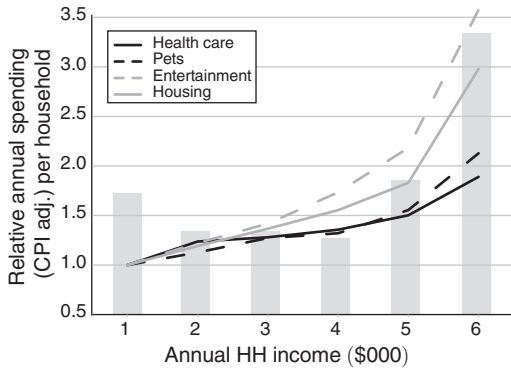
FIGURE 2. PET CARE SPENDING BY INCOME

Notes: Figure plots the relationship between household income and annual spending in four spending categories. Spending is CPI adjusted and normalized by spending of the lowest income bracket for each category. Gray bars report the share of households in the baseline sample in each income category. Sample includes all households in the CEX with positive spending on pets except for 8 percent with missing income data. See the online Appendix for more details.

the categorical income brackets available in the CEX). Figure 2 presents the results, normalizing each spending estimate by the average household spending of the lowest income bracket ($20,000 and less) for the corresponding spending category.

We make two observations based on the results. First, not surprisingly, all spending categories exhibit a fairly strong correlation between income and spending, with households in the highest income category (annual income greater than $70,000) spending between 113 percent (for pets) to 258 percent (for entertainment) more than households in the lowest income category. Second, again we find the spending patterns for health care by income to be similar to those of pets. This was not obvious a-priori; indeed, we expected that health insurance would flatten this relationship for human health care relative to pet health care, where insurance or other redistributional policies are less common.

II. Growth of the Pet Care Sector

In this section we use annual data from the County Business Patterns (CBP) from 1996–2013 to document employment and establishment growth for veterinarians and veterinarian-related services and compare it to
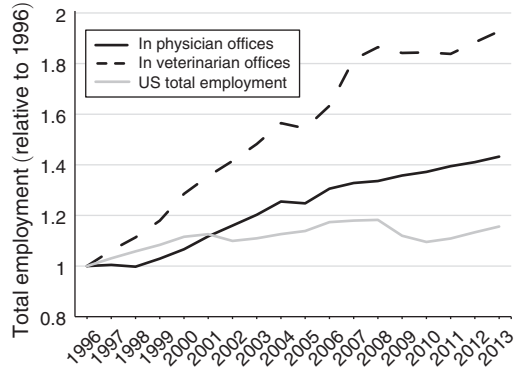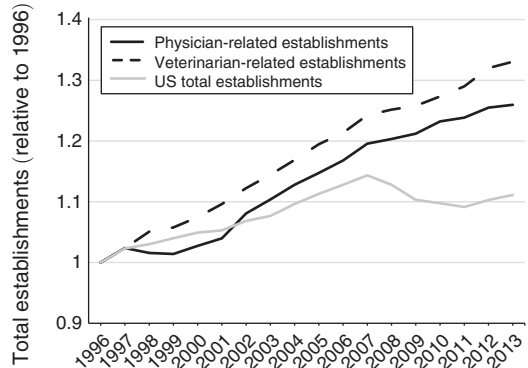

FIGURE 3. GROWTH OF THE PET CARE SECTOR

Notes: Figure plots annual employment (top) and annual number of establishments (bottom) in the two sectors and for the United States overall. It is based on data from the US census' County Business Patterns (CBP).

employment and establishment growth for physicians and physician-related services.

Figure 3 shows the results. We show employment in each sector and overall relative to its 1996 levels. Somewhat similarly to the growth in spending (Figure 1), we see that the supply of physicians has grown significantly faster than employment growth in other sectors (but, interestingly, slower than the spending growth). Yet, supply of veterinarians grew even faster: while the number of physicians in 2013 was about 40 percent higher than that in 1996, the number veterinarians almost doubled over the same period. The pattern of establishment growth appears similar.

III. End-of-Life Spending Patterns

We obtained a small extract of billing data from a single pet hospital in California. The hospital provided us with data on a randomly selected sample of 44 dogs who were treated for lymphoma between 2011 and 2014. We focus on 23 of these dogs who died within our observation period, obtained detailed information about their claim-by-claim bills, and aggregated total spending as a function of the number of months prior to death.

We then created a similar data extract for Medicare patients. Using data on beneficiaries in traditional, fee-for-service Medicare, we randomly selected 433 beneficiaries who were diagnosed with lymphoma and died in December of 2012, 2013, or 2014. Using detailed claim-level information, we construct in parallel total medical spending and used the claims data to aggregate total spending as a function of the number of months before death.

Figure 4 presents the main results. Separately for the small sample of deceased dogs and the larger sample of deceased Medicare beneficiaries, we normalize spending by the average monthly spending in the sample 10 to 12 months before death (which is $183 for the average dog and $3,520 for the average Medicare beneficiary), which we define (with all the obvious caveats) as a "regular month."

As one can see, there is a distinct end-of-life spike in spending for both populations. Average spending levels increase only mildly prior to death, and then spike up dramatically in the last month before death. Last-month spending is 5.3 times greater than a "regular month" for Medicare beneficiaries and 7.5 times of a "regular month" for dogs.

It may be interesting to note that last-month spending is more skewed for dogs. In contrast to the mean, the median last month does not show any sharp increase in spending for dogs, suggesting that, unlike Medicare beneficiaries, the majority of dogs die "cheaply" and the last-month spike in spending is driven by a smaller share of dogs.

Of course, although we find the patterns interesting, it is important to note that unlike the rest of the analysis in this paper—which uses standard, national data sources—the data on end-of-life spending for dogs with lymphoma relies on a very small sample of dogs from one specific pet
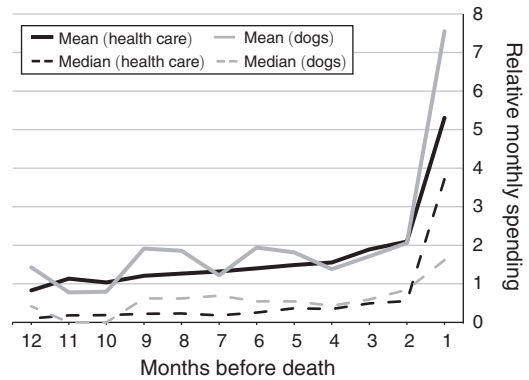

Figure 4. End-of-Life Spending Patterns

Notes: Figure plots monthly spending for the 12 months prior to death for a small sample of 23 lymphoma-diagnosed dogs and a larger sample of 433 lymphoma-diagnosed Medicare beneficiaries. Monthly spending is normalized by average monthly spending in the 10–12 months prior to death.

hospital which likely draws customers who are significantly richer than the average dog owner.

IV. Discussion

We presented several descriptive patterns about the pet health-care industry in the United States, which overall appear to be qualitatively similar to parallel well-documented and discussed patterns of the US (human) health-care sector.

All the obvious and appropriate caveats associated with the comparison of human health care and pet care notwithstanding, what drew us to the study of pet health care is the many similarities in the nature of the consumer choice problem, juxtaposed with sharp differences in the institutional environment in which the choice is made.

The two industries share many similarities. From a demand perspective, treatment decisions are triggered by health episodes that are often difficult to forecast, they are channeled by expert intermediaries who may not fully internalize the financial cost associated with treatment, and they often involve emotional and financial trade-offs. From a supply perspective, the nature of technological progress is similar, and provision is channeled by lengthy education and training and the requirement for occupational licensing.

However, in contrast to these similarities between pet health care and human health care in the nature of the consumer's choice, the institutional environment is very different. Most notably, insurance is much less common in pet care, and regulation, or government involvement more broadly, is not as prevalent.

The fact that despite these differences—often mentioned as potential explanations for the large and rapidly growing health-care sector in the United States—some pet health-care patterns appear qualitatively quite similar to the analogous human health-care pattern, strikes us as noteworthy. It should give us pause before attributing the large and rising health-care costs in the United States solely to the prevalence of insurance and government involvement.[4] The similar growth patterns in US human and pet health care may also suggest that technological change in human health care may have spillover effects on related sectors, including perhaps pet health care or human care in other countries.

Of course, more work is needed to explore this further. But at some broad level, these empirical similarities between pet and human health care follow the spirit of Chandra et al. (2016) who suggest that the US health-care sector may not be as unique as often is claimed, and may benefit from economic insights gleaned from studying other industries. Here, our study of another industry suggests the potential importance of further work seeking to understand preferences over health—in addition to the traditional study of insurance, incentives, and institutions—in understanding US health-care spending and treatment patterns.

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[4] The spirit of Tu and May (2007), who find limited shopping behavior by consumers in the context of health-related self-pay markets, is quite similar.