Journal of Health Economics 34 (2014) 131–143

Contents lists available at ScienceDirect

Journal of Health Economics

journal homepage: www.elsevier.com/locate/econbase

Effects of occupational regulations on the cost of dental services: Evidence from dental insurance claims☆,☆☆

Coady Wing[a,*], Allison Marier[b]

[a] Health Policy and Administration, University of Illinois at Chicago, 1603 West Taylor, Chicago, IL 60612, United States
[b] Abt Associates, Inc., 55 Wheeler Street, Cambridge, MA 02139, United States

ARTICLE INFO

Article history:
Received 3 February 2013
Received in revised form 29 October 2013
Accepted 10 December 2013
Available online 3 January 2014

JEL classification:
I12
I18
J3
J4
K2

Keywords:
Occupational licensing
Healthcare costs
Dental care
Quasi-experimental research methods
Labor market regulation
Health workforce
Work tasks

ABSTRACT

In the United States, occupational regulations influence the work tasks that may legally be performed by dentists and dental hygienists. Only a dentist may legally perform most dental procedures; however, a smaller list of basic procedures may be provided by either a dentist *or* a dental hygienist. Since dentists and hygienists possess different levels of training and skill and receive very different wages, it is plausible that these regulations could distort the optimal allocation of skills to work tasks. We present simple theoretical framework that shows different ways that such regulations might affect the way that dentists and dental hygienists are used in the production of dental services. We then use a large database of dental insurance claims to study the effects of the regulations on the prevailing prices of a set of basic dental services. Our empirical analysis exploits variation across states and over time in the list of services that may be provided by either type of worker. Our main results suggest that the task-specific occupational regulations increase prices by about 12%. We also examine the effects of related occupational regulations on the utilization of basic dental services. We find that allowing insurers to directly reimburse hygienists for their work increases one year utilization rates by 3–4 percentage points.

1. Introduction

Occupational licensing has been an important institutional feature of the US health economy for a long time. Friedman and Kuznets (1945) argued that physician licensing regulations were a barrier to entry that pushed the wages and prices associated with medical care above efficient levels. Likewise, in one of the earliest papers in health economics, Arrow (1963) also discussed the implications of physician licensing regulations. Arrow was dismissive of proposals to allow free entry to medical professions. But – like many economists since – he suggested that voluntary certification might be a preferable regulatory framework. He pointed out that licensure does more than simply restrict the supply of the services of the regulated profession: it also reduces the range partial substitutes for existing services, which could be very costly in the long run.

Arrow went on to suggest that a system of *graded licensing* could reduce the pernicious effects of licensing while still maintaining a high standard of quality. He does not elaborate on the proposal, but the logic of the idea is easy to understand. Under graded regulations, people could be licensed to provide subsets of medical services. The regulations would allow overlap in the work tasks that workers with different levels of training and skill could perform. In principle this kind of arrangement could allow more substitution opportunities. It might also make health service product and labor markets more competitive. And it seems likely that graded regulations would make it easier for workers to allocate their time to tasks that make the most productive use of their skills. Changes like these could affect the cost and quality of health services available in the market in ways that might

☆ We thank Morris Kleiner, Surrey Walton, Kevin Stange, Tony Lo Sasso, Bob Kaestner and seminar participants at the Upjohn Institute and the Institute for Research on Government Affairs for helpful comments and suggestions.
☆☆ Research for this article used healthcare charge data resources compiled and maintained by FAIR Health, Inc. The authors are solely responsible for the research and conclusions reflected in this article. FAIR Health, Inc. is not responsible for the research conducted, nor for the opinions expressed, in this article.
* Corresponding author. Tel.: +1 3123550652.
E-mail addresses: coady.wing@gmail.com (C. Wing), allison.marier@gmail.com (A. Marier).

0167-6296/$ – see front matter © 2014 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jhealeco.2013.12.001

mitigate the distortionary effects of conventional all-or-nothing licensing.

In the 50 years since Arrow's paper, occupational regulations have become pervasive in the United States. In the 1950s licensing regulations covered 5% of workers. By 2006, it was 29% (Kleiner and Krueger, 2008). The health sector is particularly heavily regulated. Members of the conventional health service occupations – physicians, nurses, and dentists – are universally required to hold licenses. And over 76% of non-physician health workers also require a license (Kleiner and Park, 2010). One interesting development is that the graded licensing arrangements that Arrow envisioned are becoming more common.

In the dental sector, state governments have expanded the legal scope of practice afforded to dental hygienists. It is still true in every state that dentists and hygienists are required to hold licenses, and that only a dentist may legally perform most dental procedures. But in recent years, licensed dental hygienists have gained the authority to perform a smaller list of *basic procedures*. The content of the list of services that may be provided by *either* a dentist or a hygienist varies across states and over time. In some cases, allowing hygienists to perform a service may open the possibility of hygienist-led firms. However, the regulations usually restrict what hygienists are allowed to do with and without the direct supervision of a dentist, which suggests that the overlapping regulatory framework is likely to matter most to firms that employ both dentists and hygienists.

Simple economic theory suggests that increasing the independent scope of practice of hygienists should put downward pressure on the prevailing price of dental services that can be produced using hygienist labor. The price effect is plausible whether the regulations are framed as a barrier to the entry of hygienist-led dental service firms, or as a restriction on the production function of firms that combine hygienist and dentist labor inputs to produce dental services. Although the end result is similar, the production function framework is more revealing about the ways that scope of practice regulations might affect market outcomes in the health sector. For instance, regulations might represent monitoring requirements that function as an implicit tax on the use of hygienists. Another possibility is that task limitations are a type of factor de-augmenting technology, which lowers the productivity of hygienists. More broadly, scope of practice regulations may alter the elasticity of substitution between hygienists and dentist in the production process. In each case, the regulations bind when at least some firms are forced to adopt a more dentist intensive production process then they would use in the absence of regulation. The upshot is that scope of practice restrictions – either entry barriers or production constraints – could lead to higher equilibrium prices relative to an unregulated or less regulated environment.

In this paper, we study the effects of licensing regulations on the transaction prices of seven basic dental services: prophylaxis, fluoride treatment, local anesthesia, nitrous oxide, sealant application, amalgam restoration, and X-rays. These services are regulated differently across states and we use the variation across service categories, states, and time periods to estimate the effect of the licensing regulations on prevailing prices. We estimated service prices using a large database of private dental insurance claims, and we linked the price data with regulatory information in order to estimate the effects of the regulations using generalized difference-in-differences (DD) and triple differences (DDD) regressions. We found that regulations that constrain the practice authority of hygienists increase the price of basic services by about 12% relative to a counterfactual market in which both dentists and dental hygienists are legally allowed to provide the service.

The main price results stand up to a variety of sensitivity analyses that probe key assumptions related to the method of aggregating prices from the claims data, the correlation structure of the error distributions that provides the basis for statistical inference, and the potential for spillovers across geographical areas. We also found evidence that regulatory changes that give more freedom to hygienists led to increases in the utilization of basic dental services. In particular, we found that when insurers are allowed to directly reimburse hygienists for their services, the proportion of people who utilize dental services within the past year increased by 3–4 percentage points.

Our main purpose in choosing to focus on seven specific dental services is that comparing prices in these markets can help us identify the causal effects of licensing regulations on equilibrium prices. The bulk of the paper is devoted to making such comparisons and to ruling out alternative interpretations of our basic findings. However, the dental services that we examine also are important for at least three substantive reasons.

First, these seven services may represent the "regulatory margin" for state governments considering changes in the regulatory status of dental hygienists. That is, several state governments have shown a willingness to grant hygienists the authority to perform these seven tasks. But there is little evidence that states are willing to grant them authority to perform very many other services, perhaps because other services are considered too complicated or risky. Our study of the seven regulated services is informative about policies that are feasible options in various states.

Second, most dental care is basic dental care. The seven services we study represent a huge fraction of the dental services consumed in the United States each year. In the large database of dental insurance claims that we used in our main analysis, there are over 770 million dental claims spread almost evenly across three years (2005–2007). In each year, almost 40% of the insurance claims involved one of the seven dental services on our list. The social costs of a regulation that increases the price of these services by 12% are likely to be very large simply because the services are widely consumed. There are also wide disparities in dental health and utilization of basic dental services in the US (Mouradian et al., 2000). Regulations that limit the supply of dental services and that generate higher service prices may exacerbate these problems. And in a more general sense, occupational regulations that increase prices run counter to efforts to control rising health care costs in the United States.

Third, the graded regulations in place for the provision of dental services could be a useful model for other parts of the health economy. It seems unlikely that many licensed occupations will converted to certified or free entry occupations. But it is possible that expanding the scope of practice of occupational groups with different overall skill levels represents a way to reduce the distortionary effects of licensing regulations. In practice, it may be easier for legislatures to expand the scope of practice of a lower skill occupation than to de-license incumbent occupations. Although scope of practice regulations are relatively common (especially in the health sector), the issue has not received much attention in the economics literature. Our paper offers evidence that graded licensing arrangements can help reduce the distortionary effects of conventional single-occupation licensing regimes.

2. Background

2.1. Economic models of licensing

Friedman and Kuznets (1945) and Friedman (1962) are early economic studies of licensing. In that early work, physician