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THE DIRECT PRIMARY CARE MODEL: PRACTICE CHARACTERISTICS AND PATIENT EXPERIENCE

JAMES DAVID MILLER

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THE DIRECT PRIMARY CARE MODEL: PRACTICE CHARACTERISTICS
AND PATIENT EXPERIENCE

by

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AND PATIENT EXPERIENCE

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THE DIRECT PRIMARY CARE MODEL: PRACTICE CHARACTERISTICS
AND PATIENT SATISFACTION

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The Direct Primary Care practice model has been growing in both number of practices and public awareness. However, there has been little academic research about this emerging practice model. This research is aimed to describe the current state of the DPC practice model by examining the services provided, geographic distribution of practices, statistical distribution of membership fees, demographic characteristics of physicians using the model and to determine whether regional pricing variation existed. In addition, differences were analyzed between the patient satisfaction levels in DPC and fee-for-service practices.

A dataset was created by visiting the website of all known, non-corporate, DPC practices and gathering data points about the services, pricing structure, and medical providers in the practice. A second dataset was created using the Healthgrades.com patient satisfaction ratings for each DPC physician with seven or more reviews and matching each physician with two fee-for-service physicians, based on medical specialty, gender, age and location. The ratings for each of the eight Healthgrades patient satisfaction questions were classified as high, medium and low and then aggregated by region, physician gender, physician age and urban vs rural practice location.

Average monthly fees in DPC practices were found to range from \$36.00 to \$87, depending on patient age. DPC practices were found to offer their patients discounted labs, discounted radiology, direct physician access through personal email, and direct physician cell phone access. More than half of DPC practices offered visits to the patients' homes and just less than half dispensed discounted prescription medications from their office in states where it was legally permitted. The majority of DPC physicians were board certified in Family Medicine, with the minority certified in Internal Medicine and Pediatrics. A majority of DPC physicians were female, which is quite different from the percentage practicing in fee-for-service practices. This study found that regional variation in DPC monthly fees did exist, with the West and North Eastern regions of the US being more expensive than practices in the South and Midwest. Finally, based on Healthgrades ratings, DPC physicians had higher levels of patient satisfaction than fee-for-service physicians but neither group contained much intragroup variation in ratings.

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BACKGROUND

Most outpatient primary care in the United States is delivered by family medicine, internal medicine and pediatric physicians working in offices which bill private insurance companies and Medicare/Medicaid for their services (Ashman, Rui, and Okeyode 2018). In 2017, the average wait time for a new-patient physician appointment in 15 large metropolitan areas was 24.1 days (Merritt Hawkins 2017) and once inside a physician's office, the median length of an appointment with a general or family practice doctor was less than 15.8 minutes (National Center for Health Statistics 2015). During these 15 minutes, physicians are under pressure to both see the patient, and document their work. Given the growth in and complexity of electronic health record systems, the time physicians allocate to face-to-face interaction has declined (Tai-Seale et al. 2017).

Direct Primary Care (DPC) is an alternative practice model among office-based medical doctors delivering primary care. DPC is an option for Internal Medicine, Family Medicine, and Pediatric physicians who seek to provide a more personalized care delivery experience for their patients than is available in the traditional, insurance-based practices mentioned above. The model was developed as an alternative to the traditional primary care practice model, because many physicians and patients were frustrated with the constraints placed on the delivery of care by third-party payers, such as private insurance companies, Medicaid and Medicare (Huff 2015). Under the practice model, patients or their employers pay a monthly membership fee directly to the DPC practice, similar to a health club membership, which gives patients enhanced access to their doctor and allows them to use the services as much or as little as they need, at no additional cost (Noah 2014).

Some critics of the DPC model have claimed that it leads to patient abandonment and a greater physician shortage when physicians leave fee-for-service practices with larger patient panels to operate under the DPC model with smaller patient panels (Thomas 2017). Other critics have claimed that while DPC is typically less expensive than concierge medical practices, the model might exclude some without money to pay for their healthcare. Some have argued that DPC physicians will seek to only service healthier patients with larger financial resources. Another criticism of the DPC model is that some patients use a DPC membership as a replacement for an insurance policy, rather than as a compliment to insurance (Adashi et al 2018). This creates the potential for financial disaster if patients need surgery or have medical emergencies which are too complex for their DPC physician to handle.

Physicians working under the model believe that by removing private insurance and large third-party payers from the system, they are able to spend more time focusing on each patient because there is no need for billing, prior authorizations, deductibles or co-payments (Zimlich 2013). Many DPC physicians argue that the model allows them to deliver higher quality care, because they are working directly for the patient rather than a combination of the patient and a third-party insurance company (Noah 2014). Some DPC physicians have argued that if they had not transitioned to the DPC, they would have left the practice of medicine due to extreme mental and psychological burnout and that the model has prevented patient abandonment (Legg Corba 2019; Edwards 2019).

Some analysts predict that the DPC model will become a common alternative to the current insurance-based, fee-for-service-model, while others suggest that it could play a role in helping to resolve some of the current problems in the US healthcare system with respect to patient access to care, patient cost and physician burnout (Palumbo 2016; Scherger 2016).

Whether the model will eventually replace the traditional, fee-for-service model is uncertain, however, it is a growing practice model that is garnering more attention from patients, medical practitioners and policy makers.

Statement of the Problem

DPC is a practice model with the potential to play a much larger role in the delivery of healthcare within the United States, especially with the potential involvement of CMS. However, due to the relative newness and continued growth of the DPC practice model, little research has been done regarding the efficiency, effectiveness, and patient experience of this delivery model. This research seeks to better understand the structure, characteristics and patient perceptions of the medical practices currently operating under the DPC model, in order to help inform the medical community and researchers about the new model.

LITERATURE REVIEW

Direct Primary Care

Most articles about the DPC model are in the popular press, rather than in peer-reviewed journals. Popular press articles in publications such as The New York Times, Wall Street Journal, Forbes and Time Magazine provide a description of the model and compare it to the insurance-based, fee-for-service model (Japsen 2012; Chase 2013; Restrepo 2015; Von Drehle 2014; Beck 2017) or discuss advantages and disadvantage of the model (Englehard 2014). Articles in non-peer review medical journals, with a physician readership, focus on new practice financing, panel size, cost to patients and resources for building a DPC practice (Zimlich 2013; Colwell 2016; Scherger 2016; Carlson 2015). The small number of articles about the DPC

model that appear in peer-reviewed journal focus on the legal status of the model (P. Eskew 2017, 2016; Chappell 2017), physicians rights to practice in an alternative model (Noah 2014), or explain the model and consider the future of primary care in the United States (Kamerow 2012; Palumbo 2016; Doherty et al. 2015).

DPC differs from “concierge” medicine, because it operates outside of the fee-for-service and insurance-based system. The vast majority of concierge medical practices charge a monthly fee but also bill insurance companies or Medicare. The absence of insurance billing is what separates DPC practices from concierge practices, because it allows patients without insurance to access medical care at a more affordable price level. Some DPC practices have patient panels where as many as 90% of the patients do not have health insurance, but most have an equal mix of insured and uninsured patients. Some DPC patients combine a DPC membership with a high-deductible health plan or a medical health share plan (Forrest 2018). DPC is sometimes called “blue collar concierge medicine” or “concierge care for the masses,” because it offers services similar to “concierge” medical practices but at a much lower price level, especially for those individuals without health insurance (Huff 2015).

Research shows that many DPC practices provide unlimited visits, schedule appointments to last between 30-60 minutes, guarantee same or next day appointments, provide cell phone numbers and email addresses to patients for after-hours communication and have patient panels of between 500-1000 patients per physician (Carlson 2015). A commonly used definition of what it means to be a DPC practice, and one that will be used in this research, has three criteria. 1) Practices charge a periodic fee 2) Practices do not bill any third parties on a fee-for-service basis 3) Any per-visit charge must be less than the monthly equivalent of the periodic fee. Naturopathic, chiropractic, acupuncture and other alternative forms of medicine are

not generally included in this definition (P. Eskew 2018). Despite the operational variation in DPC practices, the growth in this delivery model is consistent. Less than ten years ago, there were fewer than 25 practices nationwide operating under the DPC model, whereas today there are between 750 and 1,000 (P. Eskew 2018).

While there is a common set of services and payment methodology that is used to describe the Direct Primary Care model, there appears to be some variation in the way these medical practices operate. For example, some practices use a tiered pricing system based on the patients' age, while others use a single membership fee for all patients, regardless of their age. Practices also vary based on physician characteristics and types of services provided (Doherty et al. 2015; Zimlich 2013). This lack of standardization could be caused by market forces in different geographic regions of the country, a lack of large payers expecting a uniform set of services or could be the result of entrepreneurial experimentation that will disappear as the model becomes standardized with age.

A service which some DPC practices offer is the dispensing of medications in their office. Physician dispensing of medications is currently legal in 47 states (Community Oncology Pharmacy Association 2019). These medications are typically sold at either the physician's cost, or with a small fee to cover supplies (Ramsey 2017), with the goal of helping cash-paying patients save money by avoiding the large mark-ups charged at retail pharmacies (Fein 2018). Studies have found that physician dispensing of medications is associated with lower pharmaceutical expenditures per patient (Trottmann et al. 2016). Other studies found that there are no more adverse drug reactions with physician dispensing than with pharmacy dispensing

and that physician dispensing can increase medication adherence (Munger et al. 2014; Moroshek 2017).

Patient Satisfaction

The literature on patient satisfaction is vast. A July 2019 search of PubMed, using the keywords “healthcare patient satisfaction” returned 97,808 results (National Institutes of Health 2019). While there are many researchers working in the area of patient satisfaction, these authors have been very inconsistent in the way they define patient satisfaction. For example, some measures of patient satisfaction include only factors related to physician patient communication, whereas others include environment, and pain control in their definitions (Cleary and Mcneil 1988; Berkowitz 2016). (Berkowitz 2016).

There has been disagreement as to whether patient satisfaction and patient experience should be considered to be quality measures themselves, or whether they should be considered because of their association with other accepted quality measures. Donabedian and other authors have argued that patient experiences are an integral aspect of the overall quality of care on their own and should be considered, even if they are unrelated to clinical process or outcomes (De Silva and Valentine 2000; Donabedian 2005; National Academies Press 2001). However, researchers have connected patient satisfaction measures to improved clinical outcomes in a variety of studies (Gary et al. 2005; Narayan et al. 2003; Bakar, Fahrni, and Khan 2016; Dang et al. 2013; Mahmoudian et al. 2017; Fenton et al. 2012). There has been criticism of the use of patient satisfaction as a quality measure, especially among practicing physicians. Some physicians are concerned that the connection between patient satisfaction and high-quality care has not been established and other argue that patients are not qualified to judge quality (Johnston 2013; Anhang Price et al. 2014; Sofaer and Firminger 2005; Kupfer and Bond 2012).

Factors Affecting Patient Satisfaction

A typical office visit involves a patient, a medical provider, and a large number of other elements including office staff, practice structure, the office design, and time constraints. Elements associated with the physician, the patients and the surrounding structure of the visit all play a role in determining the patients' level of satisfaction with their visit experience. Many characteristics, or physician factors, have been shown to be associated with greater levels of patient satisfaction. Physician interpersonal skills, verbal and non-verbal, are strongly related to positive patient experience ratings (Sitzia and Wood 1997; Senić and Marinković 2013; Rahmqvist 2001; Berkowitz 2016; Batbaatar et al. 2017; Mohammed et al. 2016). High levels of physician listening, thoroughness and clarity of instructions were all associated with higher levels of patient satisfaction (Trentman et al. 2013; Xiao and Barber 2008). Patient education and information provided by physicians was also found to be strongly associated with satisfaction in several studies (Robbins et al. 1993; Krishel and Baraff 1993; Bursch, Beezy, and Shaw 1993; Rahmqvist 2001; Brody et al. 2017; Sitzia and Wood 1997). However, one study found that there was a negative link between the quantity of information provided and the level of satisfaction; the more information that was provided, the less satisfied the patients were (Batbaatar et al. 2017).

More time spent with the doctor was also strongly associated with higher levels of patient satisfaction (Otani, Kurz, and Harris 2005; Camacho et al. 2006; Geraghty, Franks, and Kravitz 2007; Trentman et al. 2013; Batbaatar et al. 2017). However, one study found that this was not the case with surgeons (Teunis et al. 2015). In-office waiting time to see a physician was found to be negatively associated with patient satisfaction (Otani, Kurz, and Harris 2005; Camacho et

al. 2006; Senić and Marinković 2013). Reception area wait time and exam room wait time were each independently associated with overall patient satisfaction (Zopf, Joseph, and Thorne 2012). Interestingly, longer wait times were associated with lower patient satisfaction, but more time spent with physicians can make up for a longer wait. The time spent with physicians is a stronger predictor of patient satisfaction (Camacho et al. 2006). Shorter wait times to get an appointment with a physician are also associated with higher levels of patient satisfaction (Mohammed et al. 2016; Sitzia and Wood 1997).

The evidence of the effect of electronic medical record (EMR) systems and patient satisfaction is mixed. Some studies find no significant differences in patient satisfaction after adding an EMR, while others find that heavy computer use lowers patient satisfaction (Ratanawongsa, et al. 2016; Thornton et al. 2017). Negative effects of heavy computer use can be mitigated by using medical scribes, who are responsible for visit documentation rather than the physician. Patients report high levels of satisfaction when scribes are present during the visit, and report that it improves the patient experience (Nambudiri et al. 2018). Provider accessibility is another factor associated with patient satisfaction (Mohammed et al. 2016). Physicians who give their email addresses to patients have significantly higher overall patient satisfaction than those who do not; however the same effect was not found for other communications methods (Lee et al. 2017).

Some specific physician behaviors are associated with patient satisfaction and could have negative consequences for the larger healthcare system if they are abused. High antibiotic prescribing volume is a significantly positive predictor of patient satisfaction with their provider (Ashworth et al. 2016). Among patients with musculoskeletal conditions, those receiving prescriptions for opioids are more likely to report higher satisfaction (Sites et al. 2018). The

skills associated with higher patient satisfaction are learned during the first year of residency, because medical students and first year residents tend to have lower levels of patient satisfaction. However, beginning in the second year of residency, patient satisfaction ratings become similar to those of established physicians (Stewart et al. 2017; Monk et al. 2006).

Patient Factors Affecting Patient Satisfaction

Patients form expectations about their visit with a physician or provider, and whether those expectations are met plays a large role in patient satisfaction. Patients personal preferences, as well as their past experiences with the provider and with the healthcare system in general, are used in determining patients' expectations for future visits (Sitzia and Wood 1997; Kupfer and Bond 2012; Brody et al. 2017; Ware, John E.; Snyder, Mary K.; Wright, Russel W.; Davies 1983). However, whether patients' receive a specific test, medication or non-drug treatment that they were expecting to receive, is only minimally associated with levels of patient satisfaction (Brody et al. 2017). Patients that have seen a physician for a longer period of time report higher levels of satisfaction, but repeat visits for the same diagnosis reduce patient satisfaction (Thornton et al. 2017; Jackson, Chamberlin, and Kroenke 2001).

The age of the patient is strongly associated with patient satisfaction, with older patients being more likely to rate their satisfaction level as positive (Szecsenyi et al. 2011; Sitzia and Wood 1997; Cleary and Mcneil 1988; Xiao and Barber 2008; Hekkert et al. 2009; Voutilainen et al. 2014; Rahmqvist 2001; Schoenfelder, Klewer, and Kugler 2011; Batbaatar et al. 2017; Johnson, Rodriguez, and Solorio 2010; Cohen. G. 1996). One explanation for this is that older patients are more likely to skip survey items that they construe as negative (Voutilainen et al. 2014). Another possible explanation is that physicians are more likely to have patient centered

conversations with patients over 65 years of age. Older patients tend to be more satisfied with patient-centered encounters, and are therefore more likely to have higher satisfaction levels (Peck 2011).

Lower patient education level is also associated with higher levels of patient satisfaction (Sitzia and Wood 1997). However, there are conflicting studies on the effect of higher education levels and patient satisfaction (Johnson, Rodriguez, and Solorio 2010; Xiao and Barber 2008). Having higher incomes and health insurance are positively correlated with patient satisfaction, whereas being less affluent is negatively correlated with satisfaction (Szecsenyi et al. 2011; Xiao and Barber 2008). Race also plays a factor. Minority patients of African-American, South Asian and Chinese ethnicities report lower patient satisfaction than white Caucasian patients (Campbell et al. 2001; Paddison et al. 2012; Sitzia and Wood 1997). Patients tend to trust physicians of their own race and feel more comfortable with them (Batbaatar et al. 2017). Finally, self-reported physical and mental health status also plays a role in patient satisfaction. Patients with higher self-assessed health status report higher levels of patient satisfaction (Batbaatar et al. 2017; Hekkert et al. 2009; Scotti 2005). Recent recovery from a psychiatric disorder is also positively correlated with levels of patient satisfaction (Sitzia and Wood 1997).

Structural Factors Affecting Patient Satisfaction

Factors outside of the patient and physician play a role in patient satisfaction. Patients consistently rate the friendliness of non-physician staff as important in their levels of satisfaction. Higher job satisfaction by non-physicians is associated with high levels of patient satisfaction (Otani, Kurz, and Harris 2005; Szecsenyi et al. 2011). Practice size is inversely correlated with patient satisfaction levels. Patient satisfaction is higher for smaller practices, and larger practices

tend to have lower levels of patient satisfaction (Sebo et al. 2015; Szecsenyi et al. 2011). Patients also consider the physical attractiveness of buildings in which they receive care. Patients evaluation of the physical attractiveness of the office is positively associated with their level of satisfaction (Becker, Sweeney, and Parsons 2009; Becker and Douglass 2008; Senić and Marinković 2013; Batbaatar et al. 2017).

Online Physician Reviews as a Measure of Quality and Measure of Patient Satisfaction

Since the advent of the internet, patients have been using it to research and leave feedback about their medical care. Some consumer review websites, such as Yelp.com, allow users to leave feedback for services such as restaurants and electricians as well patient experiences with physicians and medical providers. Other websites focus on gathering feedback and ratings only for medical providers such as Healthgrades.com and RateMD.com. Based on monthly U.S. traffic in 2017, the most popular websites to review physicians were Google My Business, Facebook, WebMD, ZocDoc and Vitals.com, while Healthgrades.com, Vitals.com and RateMDs.com had the largest number of doctors listed and the highest average number of reviews per doctor (Irias 2017; Lagu, Metayer, and Moran 2017). These websites are popular because individuals perceive nonclinical ratings provided by commercial websites such as Yelp, RateMDs.com, HealthGrades.com, and Vitals.com, to be as important as clinical ratings provided by government websites such as Hospital Compare (Yaraghi et al. 2018).

The use of online physician reviews by patients to choose physicians has been an area of concern for some physicians, who have argued that online reviews are dominated by disgruntled patients, however that has not been found to be the case (Gao et al. 2012). Other physicians have argued that online reviews measure elements of patient interactions which are outside their

control and therefore are not a good measure of physician quality. A few studies did find that the questions asked on popular online review sites ask about factors outside the control of the physician and found that review websites weren't good measures of physician quality (Burn et al. 2018; Donnally et al. 2018; Chen et al. 2016).

However, the majority of studies found positive associations between online reviews and measures of quality (Liu et al. 2016; Lu and Rui 2018; Greaves et al. 2012; Yaraghi et al. 2018; Emmert et al. 2015). One study noted that while it was unable to find an association between online reviews and quality measures for most specialties, it did find a positive association for family medicine, internal medicine, pediatrics and allergists (Priestley and Mcgrath 2018). Studies of hospital reviews have also found quality measure information on review websites. One analysis of Yelp hospital reviews found that they revealed information similar to that covered by 7 of the 11 categories of patient satisfaction included in the Hospital Consumer Assessment of Healthcare Providers and Systems survey (HCAHPS), along with 12 categories not included in the HCAHPS, such as costs, billing, and scheduling (Ranard et al. 2016). Another study found that patient reviews on Yelp were correlated with quality measures including readmission rates and mortality rates of New York hospitals (Howard and Feyman 2017).

The association between online reviews and patient satisfaction is stronger. Patient satisfaction results from offline survey were shown to be significantly associated with the online ratings of physician review websites in several studies (Emmert et al. 2015; Gao et al. 2015; Greaves et al. 2012; Chen et al. 2016). One study found that online physician ratings did not correlate with the popular patient satisfaction metric, Press Ganey PSS Scores, but did find that physicians with lower online reviews had lower non-physician specific variable in the Press

Ganey PSS Scores (Widmer et al. 2018). These non-physician specific factors typically involve staff or billing issues. This is consistent with another study which found that favorable online reviews tended to be associated with outcomes and likeability, whereas negative reviews were often based on ancillary staff interactions, billing and office environment (Donnally et al. 2018). Ancillary staff, billing and environment are structural factors associated with patient satisfaction, as discussed in the third part of the Factors Affecting Patient Satisfaction section of this work. Medical practices also view online ratings as a measure of their patients' satisfaction, because over half of medical practices use online ratings to improve patient care, especially in the areas of communications with patients, the appointment scheduling process and organization of the office workflow (Emmert, Meszmer, and Sander 2016).

Public Health Significance

There are no published academic studies that provide details about the structure of DPC practices other than a single, small study published four years ago which provided limited data about practices' membership prices and geographic distribution (P. M. Eskew and Klink 2015). There have also been no published studies, to date, about patient experiences and satisfaction with the DPC practice model. As a growing alternative primary care practice model, with the potential to play a larger role in the delivery of health services to Americans, it is important that DPC be better understood by more people. The results of this study will be useful for policy makers considering legislation, researchers working to gain a better understanding of the market forces within the healthcare industry, and physicians considering entry into the field.

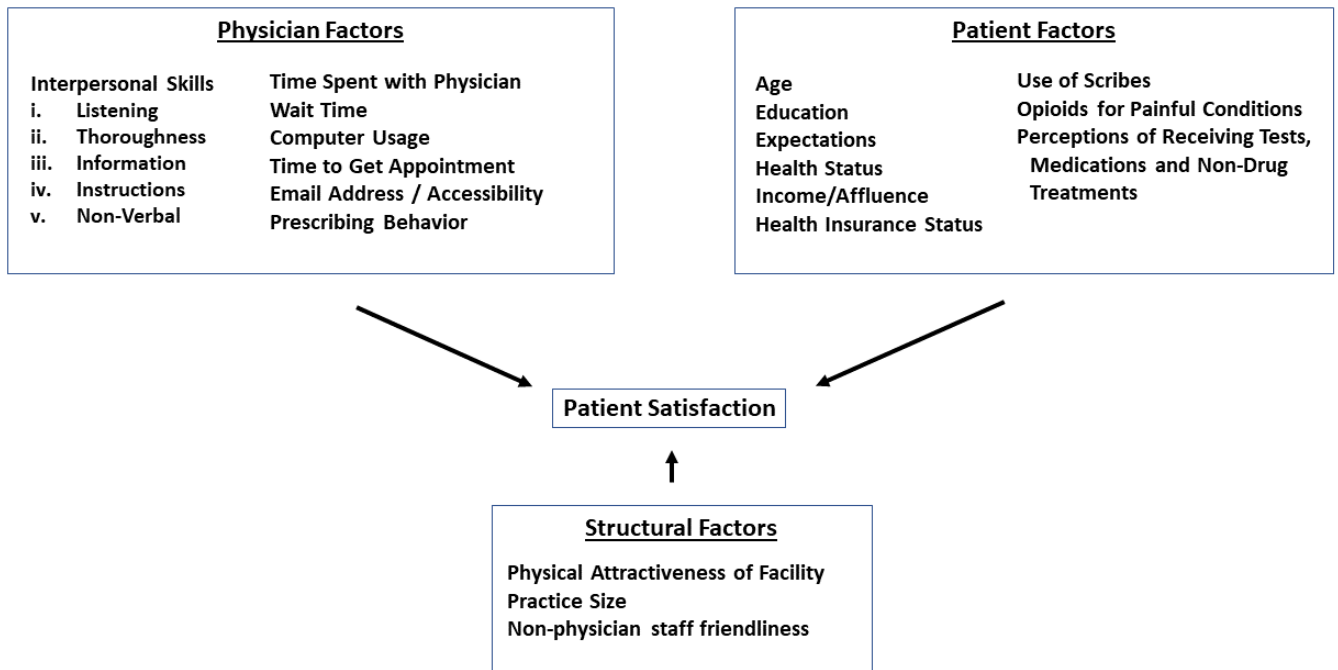
Financial Toxicity, defined as out-of-pocket expenses that diminish quality of life and impede delivery of the highest quality care, is a growing problem in the healthcare system (Goozner 2019). In an attempt to save money and avoid the potentially high cost of a doctor

visit, a growing number of people are forgoing preventative care visits and are waiting to seek treatment for problems until the problems are very advanced. DPC seeks to prevent this problem by providing unlimited visits and preventative care for patients for a fixed monthly charge.

The DPC model is not restricted to only urban areas. A number of DPC practices are located in rural areas and serve populations without easy access to a large number of medical providers. The continued growth of DPC practices in rural areas could also help provide medical care to populations without the financial resources to travel to larger cities with better healthcare resources.

Conceptual Model of Patient Satisfaction

Figure 1. Patient Satisfaction Conceptual Model



Research Questions and Aims

The aim of this dissertation is to understand the state of medical practices that identify as Direct Primary Care (DPC) practices in terms of the services provided, prices charged and the relative satisfaction level of the patients they serve. Specifically, the research aims are:

- 1) Describe the current state of the Direct Primary Care practice model and how it is different from other existing primary care models
 - a. Define services and variation in services offered by DPC practices
 - b. Describe the geographic distribution of DPC practices and explore whether geographic variation in pricing exists
 - c. Determine the statistical distribution of the membership fees charged by DPC practices
 - d. Assess the demographic characteristics of physicians working in DPC practices
- 2) Analyze intragroup differences in patient satisfaction levels among physicians using the DPC model and compare these differences with physicians in traditional, insurance-based primary care practices

SOURCES, VARIABLES AND STUDY SAMPLE

Study 1 – Direct Primary Care Physician and Practice Characteristics

A dataset will be constructed using all DPC practices listed on DPCFrontier.com, which offers the largest national DPC practice directory. The website is well respected in the DPC industry and is run by Philip Eskew, DO, JD, MBA, who created the website in an effort to increase price transparency within medicine. Each of the 897 practice websites will be reviewed and the following data will be recorded to construct the dataset: address, lists of

services offered, physician gender, physician specialty and the membership price for patients ages 5, 15, 25, 35, 45, 55 and 65. See Table 1 Aim 1a for each of the services being considered.

The DPCFrontier.com website includes some practices that describe themselves as “concierge” medical practices rather than direct primary care. However, because DPC is still not commonly understood by the average patient, some DPC practices describe themselves as “concierge” or “concierge direct primary care” to help viewers better understand their practice. This creates a problem in differentiating between true concierge and DPC practices. To resolve this problem for this research, practices that use the word “concierge” in their description but do not also include the words “direct primary care”, while also charging more than \$250 per month, per member will not be included in this study. Also, hybrid DPC Practices, practices which bill insurance in traditional, fee-for-service arrangements in addition to offering a DPC program to a separate group of patients, will not be included in this study. Hybrid practices often use income from insurance billings to subsidize the DPC practice and therefore the prices charged for the DPC services might not represent a true sustainable price that would need to be charged if the DPC services were required to support themselves. Practices without online pricing and non-functioning websites will also not be included in the study.

There are several large regional DPC practices, with offices in a large number of cities, which do not list prices or providers on their websites. These practices will not be included in this study because there is no way to determine the pricing levels they use or the characteristics of the physicians working for these practices. A list of these practices will be provided in Appendix B. The name and website address for each practice included in the study will be listed in Appendix A. All practices listed on DPCfrontier.com will be analyzed to make the study as robust as possible and therefore, a sample will not be used.

Study 2 – Physician Practice Models and Patient Satisfaction

A dataset will be created which contains the healthgrades.com patient satisfaction ratings for each physician working in a DPC practice which was identified in study 1.

Healthgrades.com is a for-profit, publicly accessible website designed to provide information to help patients find physicians. It is one of the most popular healthcare-specific review websites, which collects patient satisfaction information on its website using nine questions adapted from the Centers for Medicare and Medicaid CG-CAHPS survey (Yaraghi et al. 2018; Healthgrades.com 2019; Alexa.com 2019). Healthgrades.com’s patient satisfaction scores will be used for this study, because they have been shown to be correlated with Press Ganey offline patient satisfaction measures, and Healthgrades.com contains the largest number of DPC physicians of all of the medically-focused patient review websites (Chen et al. 2016).

Patients rate their providers on a scale of 1 to 5 for each survey item and the survey items can be seen below in Table 1, Aim 2. The website provides the average scores for each survey item, as well as selected comments from patients. This study will include each of these measures in its statistical analysis. A sample will not be created, because the population of all physicians working in DPC practices, which meet the conditions above, will be used in the study.

Table 1. Aims and Methods Matrix

Aim	Variable/Concept	Definition	Data Source
1) Describe the current state of the Direct Primary Care practice model and how it is different from other existing primary care models			
a. Define services and variation in services offered by DPC practices	In-Office Dispensing	Does practice dispense medications directly to patients? (where legal)	Practice Website Data

	Discounted Labs	Does practice provide arrangements for lab work at a discounted price?	
	Discounted Radiology	Does practice provide arrangements for radiology and imaging services at a discounted price?	
	Direct Provider Cell Phone number for Voice/Text/SMS	Does the physician give patients a direct cell phone number where they can be reached direct for voice, text messaging or image messaging?	
	Email Communication	Does the physician give patients an email address which will directly reach the physician?	
	Home Visits	Will the physician visit the home or work of a patient?	
b. Describe the geographic distribution of DPC practices and explore whether geographic variation in pricing exists	Practice monthly membership fee by region	Regions defined by US Census Division and Region	Practice Website Data / Regression Analysis
c. Determine the statistical distribution of the membership fees charged by DPC practices	Monthly fee for: 5-Year-Old (Child) 15-Year-Old (Minor) 25-Year-Old 35-Year-Old 45-Year-Old 55-Year-Old 65-Year-Old	Price points for patients of different age levels	Practice Website Data
d. Assess the demographic characteristics of physicians working in DPC practices	Medical Specialty	What is the specialty of the physician providing patient care?	Practice Website Data
	Gender	What is the gender of the physician providing patient care?	

2) Analyze differences between patient satisfaction levels in DPC practices and traditional, insurance-based primary care practices	Trustworthiness	Does the provider seem trustworthy?	Healthgrades.com
	Explains Conditions Well	How well provider communicates with patient?	
	Answers Questions	Does the provider fully answer patient questions?	
	Time Well Spent	Does the patient feel the visit with the provider was a good use of their time	
	Scheduling	Was the scheduling experience efficient and pleasant?	
	Office Environment	Was the office environment pleasant?	
	Staff Friendliness	Was the staff friendly?	
	Overall Patient Satisfaction Rating	Patient rating of overall satisfaction with the visit	

METHODS AND STUDY DESIGN

Two studies will be undertaken to achieve the research aims of the paper.

Study 1 – Direct Primary Care Physician and Practice Characteristics

The first portion of this study, Aim 1, will be accomplished through a descriptive statistical analysis and regression analysis of the practice websites of 789 “Pure DPC” practices. The percentage of DPC practices offering each type of enhanced service will be calculated and presented. The percentages of male vs female physicians and the medical specialty of each provider will be presented and compared with their traditional, fee-for service colleagues to identify whether the provider populations are different in the two models. The mean, median, standard deviation prices paid by DPC patients of different ages (5,15,25,35,45,55,65) will be calculated. The mean, median and standard deviation of the prices paid will also be calculated,

excluding the top and bottom deciles, to remove outliers and provide a better measure of the actual prices being charged in most practices.

Multiple linear regression will be used to determine if the regional variation in healthcare prices, seen in many other areas of healthcare, is also present in prices of DPC practices (Health Care Cost Institute 2017). Practices will be classified according to geographic location based on their US Census Region (US Department of Commerce Economics and Statistics Administration 2015) and dummy variables will be used for each geographic region/category. Regressions will first be run for each patient age in ten-year increments (5,15,25,35,45,55,65) categorizing each practice by its US Census region. The analysis will identify whether regional price variation exists in this unregulated market, which is also not subject to pricing standardization enforced by government or health insurance companies.

Study 2 – Physician Practice Models and Patient Satisfaction

The second study, which will accomplish Aim 2, will analyze and provide descriptions of the intragroup differences of online patient satisfaction scores for DPC physicians and for physicians practicing in traditional, insurance-based, fee-for-service model practices. Due to the larger number of physicians practicing under the traditional model, each DPC physician will be matched with two physicians working in a traditional model practice based on these factors in the following order: Specialty, Gender, Age, Location. When an exact match for age is not available, a physician with the closest age in the geographic area will be chosen.

All physicians, regardless of practice style, will need a minimum number of reviews to be included in the study. The minimum number will depend on the overall volume of reviews

available for DPC and insurance-based physicians and won't be determined until the dataset is constructed. Because DPC practices have significantly smaller patient panels, and do not have as many patients to place reviews, many DPC physicians do not meet this requirement. Also, due to the fact that DPC is a relatively new practice model, many current DPC physicians previously worked in insurance-based practices before starting a DPC practice. Because this study is only interested in reviews of the physician at the DPC practice, and not while they were working for an insurance-based practice, if a DPC physician is listed as currently working at a non-DPC practice, they will not be included in the study.

Both DPC and traditional practice physician physicians will be first categorized by whether they practice in a rural area, by US Census Bureau Region, by gender and by age. Then within each category, patient satisfaction will be described as high, medium or low based on major groups of factors from the literature. (See Table 2. Healthgrades Variable to Patient Satisfaction Literature Mapping) Physician factors will be measured by the Healthgrades variables Trustworthiness, Explains Conditions Well, Answers Questions and Time Well Spent. Structural factors will be measured by the Healthgrades variables Scheduling, Office Environment and Staff Friendliness. The Healthgrades variable Likelihood to Recommend will be used to measure patients' weighted synthesis of the other factors.

Table 2. Healthgrades Variable to Patient Satisfaction Literature Mapping

Healthgrades Variable	Patient Satisfaction Grouping from Literature
Trustworthiness	Physician Factor
Explains Conditions Well	Physician Factor
Answers Questions	Physician Factor
Time Well Spent	Physician Factor
Scheduling	Structural Factor
Office Environment	Structural Factor
Staff Friendliness	Structural Factor
Likelihood to Recommend	Summary Factor

For each Healthgrades variable, physicians are given a rating of between 1 and 5 stars. Ratings between 1 and 2.99 stars will be classified as Low Satisfaction, between 3 and 3.99 will be classified as Medium Satisfaction and ratings from 4 to 5 will be classified as High Satisfaction.

RESULTS

Membership fees at DPC practices increase with patient age, likely because of increased utilization of services as patients get older. There is a large amount of variation in pricing between practices. Table 3 provides the summary statistics of the membership fees by age group.

Table 3. Monthly Membership Fee

Patient Age	Population Median	Population Mean	Standard Deviation	n	Population Mean Excluding Top and Bottom Deciles
5-Year-Old *	\$30.00	\$41.45	31.74105	374	\$36.61
15-Year-Old*	\$30.00	\$40.27	30.24904	424	\$35.66
25-Year-Old	\$60.00	\$66.91	26.92538	461	\$63.33
35-Year-Old	\$60.00	\$70.86	27.35881	461	\$66.23
45-Year-Old	\$75.00	\$78.12	28.80166	461	\$73.30
55-Year-Old	\$75.00	\$81.66	29.45164	462	\$77.05
65-Year-Old	\$89.00	\$90.76	30.66813	458	\$87.03

* Price may require a parent/guardian to also be a practice member

Proponents of the DPC model often claim that the model provides increased patient access to their physician as well as savings in the area of lab work and radiology. In this study, 92.89% of DPC practices were found to offer discounted lab work and 65.95% of practices offer discounted radiology services to their patients. 45.89% of DPC practices offer highly discounted

in-office dispensing of prescription medications. In the area of increased patient access to providers, 93.75% of DPC practices offer direct email access to patients and 85.13% of practices provide the provider’s direct cell phone to patients. 58.41% of DPC practices offer home visits to patients at either no-cost or an additional charge. Table 4 provides the percentages of practices that offer enhanced services.

Table 4. Practice Provision of Services Results as Stated on Practice Website

Measure	n	Percentage of Practices
In-Office Dispensing ¹	183	45.87%
Discounted Labs	431	92.89%
Discounted Radiology	306	65.95%
Patient given Provider’s cellphone number for Voice/Text/SMS	395	85.13%
Email Communication	435	93.75%
Home Visits	271	58.41%

¹In office dispensing is illegal or extremely limited in Massachusetts, Montana, New Jersey, New York and Texas. Practices in those states were excluded for this measure. (myMatrixx 2017)

The large majority of physicians, 68.86%, working in DPC practices are Family Medicine physicians. Internal Medicine physicians are the second largest group accounting for 14.73% of DPC providers. Advanced Practice Registered Nurses and Nurse Practitioners make up the third largest group of providers at 9.21%, while Physician’s Assistants follow with 3.97%. Pediatricians account for only 2.12% of DPC providers. While Emergency Medicine physicians are not commonly considered to be primary care providers, 1.56% of DPC providers are Emergency Medicine physicians who deliver primary care. The next largest group of DPC providers are double board-certified physicians with Internal Medicine/Pediatrics representing

0.85%, Internal Medicine/Geriatrics accounting for 0.28%, and Family Medicine/Palliative Care specialists with 0.14%. OBGYN and Physician Medicine physicians make up the smallest groups of DPC providers with 0.14% each.

These results are markedly different than the specialty distribution found in non-DPC, office-based primary care. According to the American Medicine Association, Family Medicine providers represent 39.5% of primary care providers, while general Internal Medicine specialists represent 34.5% and Pediatrics accounts for 6.8%. (Pettersen et al. 2018). Table 5 provides the percentage of DPC doctors who are board certified in each specialty.

Table 5. Provider Specialty Results

Provider Specialty	n	Percentage of Providers
MD or DO - Family Medicine	472	68.86%
MD or DO - Internal Medicine	104	14.73%
MD or DO - Pediatrics	15	2.12%
MD or DO - Emergency Medicine	11	1.56%
MD or DO - Internal Medicine and Pediatrics	6	0.85%
MD or DO - Internal Medicine and Geriatrics	2	0.28%
MD or DO - OBGYN	1	0.14%
MD or DO – Family/Palliative	1	0.14%
MD or DO – Physical Medicine	1	0.14%
Advanced Practice Registered Nurse (APRN) and Nurse Practitioner	65	9.21%
Physician’s Assistant	28	3.97%

Women make up 53.97% of DPC providers while men make up 46.03%. These demographics are very different than the non-DPC primary care provider workforce. According to the American Medical Association, women make up 41% of Family Practice physicians and only 38% of Internal Medicine physicians. Even when geriatrics and pediatrics, a specialty with a strong majority of female providers are included, women make up just 45% of primary care physicians (Pettersen et al. 2018). The reasons why female providers make up the majority of

DPC providers is unclear and this represents an interesting area of future research. The percentages of DPC doctors by gender are provided in Table 6.

Table 6. DPC Provider Gender Results

DPC Provider Gender	n	Percentage of DPC Providers
Female	381	53.97%
Male	325	46.03%

The regression analysis suggests that there is regional price variation among DPC practices. In all regressions, the regional prices in the West, South and North East regions were compared to the Midwest region. In the West region, the 5-year old, 35-year old, 45-year old, 55-year old and 65-year old regressions have a p-value less than .01. The p-value for the West region is less than .05 in all regressions. In the North East region, the p-value is less than .05 for all but the 25-year old and 65-year old regressions. The p-value for the South region regressions are greater than .05 in all regressions.

This means that there are statistically significant differences in pricing in the West region in all age groups and in the North East region for all but the 25-year old and 65-year old regressions at a 95% or greater level. In the South, the price differences with the Midwest are not statistically significant at the 95% level. The coefficient for the dummy variable West, ranges between 8.87 and 13.5 while the coefficient for the dummy variable North East, ranges between 8.46 and 15.86 in the statistically significant regressions. This means that the monthly membership prices at DPC practices in the Western US are between \$8.87 and \$13.50 higher than in the Midwest. Monthly membership prices in the North East, are between \$8.46 and \$15.86 higher than in the Midwest. Tables 7 through 13 provide the regression results for patient ages 5 through 65 years old.

The reasons for this regional pricing variation are not immediately clear. The West and the North East are often viewed as having a higher cost of living, however additional research would need to be undertaken before it could be stated that cost of living is the only reason for regional pricing variation within DPC practices.

Table 7. Regional Price Variation Regression Results: 5-Year-Old Patient

D	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
West	13.532	4.752	2.85	0.005	4.187	22.878	***
South	5.479	4.114	1.33	0.184	-2.610	13.568	
NorthEast	19.811	5.807	3.41	0.001	8.392	31.229	***
Constant	33.761	3.301	10.23	0.000	27.270	40.251	***
Mean dependent var		41.343	SD dependent var			31.484	
R-squared		0.041	Number of obs			371.000	
F-test		5.197	Prob > F			0.002	
Akaike crit. (AIC)		3603.930	Bayesian crit. (BIC)			3619.595	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8. Regional Price Variation Regression Results: 15-Year-Old Patient

D	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
West	11.014	4.308	2.56	0.011	2.545	19.483	**
South	4.087	3.751	1.09	0.277	-3.287	11.461	
NorthEast	15.857	5.483	2.89	0.004	5.079	26.634	***
Constant	34.236	3.038	11.27	0.000	28.264	40.209	***
Mean dependent var		40.164	SD dependent var			30.245	
R-squared		0.028	Number of obs			421.000	
F-test		4.004	Prob > F			0.008	
Akaike crit. (AIC)		4060.448	Bayesian crit. (BIC)			4076.619	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9. Regional Price Variation Regression Results: 25-Year-Old Patient

D	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
West	8.879	3.727	2.38	0.018	1.554	16.204	**
South	0.975	3.244	0.30	0.764	-5.400	7.349	
NorthEast	6.723	4.720	1.42	0.155	-2.552	15.999	
Constant	63.660	2.642	24.09	0.000	58.468	68.852	***

Mean dependent var	66.805	SD dependent var	26.970
R-squared	0.018	Number of obs	457.000
F-test	2.780	Prob > F	0.041
Akaike crit. (AIC)	4306.948	Bayesian crit. (BIC)	4323.447

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 10. Regional Price Variation Regression Results: 35-Year-Old Patient

D	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
West	12.794	3.779	3.38	0.001	5.367	20.221	***
South	0.666	3.289	0.20	0.840	-5.798	7.129	
NorthEast	10.401	4.786	2.17	0.030	0.996	19.806	**
Constant	66.514	2.679	24.83	0.000	61.250	71.778	***

Mean dependent var	70.791	SD dependent var	27.652
R-squared	0.040	Number of obs	457.000
F-test	6.241	Prob > F	0.000
Akaike crit. (AIC)	4319.591	Bayesian crit. (BIC)	4336.089

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 11. Regional Price Variation Regression Results: 45-Year-Old Patient

D	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
West	11.485	3.975	2.89	0.004	3.674	19.296	***
South	0.382	3.459	0.11	0.912	-6.415	7.180	
NorthEast	8.462	5.033	1.68	0.093	-1.429	18.353	*
Constant	74.410	2.817	26.41	0.000	68.874	79.947	***

Mean dependent var	78.064	SD dependent var	28.919
R-squared	0.029	Number of obs	457.000
F-test	4.490	Prob > F	0.004
Akaike crit. (AIC)	4365.673	Bayesian crit. (BIC)	4382.172

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 12. Regional Price Variation Regression Results: 55-Year-Old Patient

D	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
West	12.328	4.069	3.03	0.003	4.332	20.323	***
South	1.731	3.538	0.49	0.625	-5.221	8.684	
NorthEast	8.783	5.152	1.71	0.089	-1.341	18.908	*
Constant	77.174	2.884	26.76	0.000	71.507	82.842	***

Mean dependent var	81.646	SD dependent var	29.577
R-squared	0.027	Number of obs	458.000
F-test	4.235	Prob > F	0.006
Akaike crit. (AIC)	4396.606	Bayesian crit. (BIC)	4413.114

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 13. Regional Price Variation Regression Results: 65-Year-Old Patient

D	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
West	11.585	4.249	2.73	0.007	3.233	19.936	***
South	1.150	3.707	0.31	0.757	-6.136	8.435	
NorthEast	4.244	5.381	0.79	0.431	-6.330	14.819	
Constant	87.139	3.012	28.93	0.000	81.219	93.058	***
Mean dependent var		90.738	SD dependent var			30.798	
R-squared		0.021	Number of obs			454.000	
F-test		3.277	Prob > F			0.021	
Akaike crit. (AIC)		4397.714	Bayesian crit. (BIC)			4414.187	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Among DPC practices, there is little difference in the patient satisfaction scores between urban and rural physicians. While the overall level of scores is lower in among fee-for-service practices, there is also little difference between the satisfaction levels between urban and rural physicians as seen in Table 14. It seems that patient satisfaction has little to do with whether practices operate in urban or rural areas.

Table 14 also shows that patient satisfaction does vary in the US by region. The summary score for patient satisfaction, Likelihood to Recommend, is highest in the Northeast Region in both DPC and Fee-For-Service models. 90.91% of DPC physicians received scores in the High group, followed by the South region with 85.54%, the Midwest Region at 75.61% and then the West region at 74.36%. Among Fee-For-Service practices, the Northeast Region is also the highest at 68.18% scoring in the High range, followed by the Midwest Region at 61.25%, the South Region at 57.83% and the West Region with the lowest at 44.74%. Within the Fee-For-Service physicians' group, for all variables except Staff Friendliness, the West region has the lowest percentage of physicians scoring in the High range. There is no similar regional trend within the DPC physician group. Statistical tests were not performed on the patient satisfaction data due to the nature of the data collected. Patients have the option to leave reviews on the

Healthgrades website, but the data does not represent a true sample of all patients in each physician’s panel.

While the patient satisfaction levels between male and female physicians in the DPC model are higher than in the fee-for service model, there is little in-group differences in patient satisfaction between male and female physicians. Within the DPC physician group, the only patient satisfaction variable with any significant differences between male and female physicians is the variable “Answers Questions.” 97.59% of female DPC physicians receive high satisfaction scores relating to answering patient questions, whereas 92.16% of male DPC physicians receive high scores for the measure. Interestingly, the opposite trend is true for fee-for-service physicians. 77.61% of male fee-for-service physicians receive high satisfaction for answering questions, while 71.17% of female fee-for-service physicians receive high ratings.

In both the DPC model and the fee-for-service model, younger physicians receive higher satisfaction on the “likelihood to recommend” variable than do older physicians. Within the fee-for-service group, this trend holds for each of the variables analyzed, even among the non-physician, structural variables of scheduling, office environment and staff friendliness. Within the DPC group, the trend is the same with scheduling and staff friendliness variables.

Table 14. Healthgrades Patient Satisfaction Variable Results – Trustworthiness

Category	DPC			Fee-For-Service		
	High	Medium	Low	High	Medium	Low
Urban	93.49%	5.92%	0.59%	76.42%	20.90%	2.69%
Rural	93.75%	6.25%	0.00%	76.67%	23.33%	0.00%
West Region	87.18%	12.82%	0.00%	65.79%	28.95%	5.26%
Midwest Region	92.68%	7.32%	0.00%	72.50%	25.00%	2.50%
South Region	96.39%	3.61%	0.00%	78.92%	18.67%	2.41%
Northeast Region	95.45%	0.00%	4.55%	90.91%	9.09%	0.00%
Male	93.14%	5.88%	0.98%	78.11%	19.90%	1.99%

Female	93.98%	6.02%	0.00%	74.85%	22.70%	2.45%
Age less than 42	97.44%	2.56%	0.00%	78.79%	21.21%	0.00%
Age 42-54	91.67%	7.29%	1.04%	76.04%	21.35%	2.60%
Age 55+	94.00%	6.00%	0.00%	76.42%	20.75%	2.83%
All Combined	93.51%	5.95%	0.54%	76.65%	21.15%	2.20%

Table 15. Healthgrades Patient Satisfaction Variable Results – Explains Conditions Well

Category	DPC			Fee-For-Service		
	High	Medium	Low	High	Medium	Low
Urban	94.67%	4.73%	0.59%	75.52%	22.09%	2.39%
Rural	93.75%	6.25%	0.00%	76.67%	23.33%	0.00%
West Region	92.31%	7.69%	0.00%	64.47%	30.26%	5.26%
Midwest Region	90.24%	9.76%	0.00%	70.00%	27.50%	2.50%
South Region	96.39%	3.61%	0.00%	78.92%	19.28%	1.81%
Northeast Region	95.45%	0.00%	4.55%	90.91%	9.09%	0.00%
Male	94.12%	4.90%	0.98%	77.61%	20.40%	1.99%
Female	95.18%	4.82%	0.00%	73.62%	24.54%	1.84%
Age less than 42	97.44%	2.56%	0.00%	78.79%	21.21%	0.00%
Age 42-54	93.75%	5.21%	1.04%	76.04%	21.88%	2.08%
Age 55+	94.00%	6.00%	0.00%	73.58%	23.58%	2.83%
All Combined	94.59%	4.86%	0.54%	75.82%	22.25%	1.92%

Table 16. Healthgrades Patient Satisfaction Variable Results– Answers Questions

Category	DPC			Fee-For-Service		
	High	Medium	Low	High	Medium	Low
Urban	94.67%	4.73%	0.59%	74.63%	22.39%	2.99%
Rural	93.75%	6.25%	0.00%	73.33%	23.33%	3.33%
West Region	94.87%	5.13%	0.00%	68.42%	25.00%	6.58%
Midwest Region	90.24%	9.76%	0.00%	70.00%	26.25%	3.75%
South Region	97.59%	2.41%	0.00%	75.90%	21.69%	2.41%
Northeast Region	95.45%	0.00%	4.55%	86.36%	13.64%	0.00%
Male	92.16%	6.86%	0.98%	77.61%	19.90%	2.49%
Female	97.59%	2.41%	0.00%	71.17%	25.77%	3.07%
Age less than 42	100.00%	0.00%	0.00%	77.27%	22.73%	0.00%
Age 42-54	93.75%	5.21%	1.04%	75.00%	22.40%	2.60%
Age 55+	92.00%	8.00%	0.00%	72.64%	22.64%	4.72%
All Combined	94.59%	4.86%	0.54%	74.73%	22.53%	2.75%

Table 17. Healthgrades Patient Satisfaction Variable Results – Time Well Spent

Category	DPC			Fee-For-Service		
	High	Medium	Low	High	Medium	Low
Urban	97.04%	2.37%	0.59%	77.91%	19.70%	2.39%
Rural	93.75%	6.25%	0.00%	80.00%	16.67%	3.33%
West Region	89.74%	10.26%	0.00%	71.05%	22.37%	6.58%
Midwest Region	95.12%	4.88%	0.00%	72.50%	26.25%	1.25%
South Region	98.80%	1.20%	0.00%	80.72%	16.87%	2.41%
Northeast Region	95.45%	0.00%	4.55%	88.64%	11.36%	0.00%
Male	96.08%	2.94%	0.98%	79.10%	18.41%	2.49%
Female	97.59%	2.41%	0.00%	77.30%	20.86%	1.84%
Age less than 42	100.00%	0.00%	0.00%	86.36%	13.64%	0.00%
Age 42-54	94.79%	4.17%	1.04%	77.08%	21.35%	1.56%
Age 55+	98.00%	2.00%	0.00%	75.47%	19.81%	4.72%
All Combined	96.76%	2.70%	0.54%	78.30%	19.51%	2.20%

Table 18. Healthgrades Patient Satisfaction Variable Results– Scheduling

Category	DPC			Fee-For-Service		
	High	Medium	Low	High	Medium	Low
Urban	92.31%	7.69%	0.00%	77.31%	20.60%	2.09%
Rural	87.50%	12.50%	0.00%	70.00%	30.00%	0.00%
West Region	97.44%	2.56%	0.00%	65.79%	30.26%	3.95%
Midwest Region	82.93%	17.07%	0.00%	75.00%	23.75%	1.25%
South Region	96.39%	3.61%	0.00%	78.31%	19.28%	2.41%
Northeast Region	95.45%	4.55%	0.00%	90.91%	9.09%	0.00%
Male	92.16%	7.84%	0.00%	80.60%	17.41%	1.99%
Female	91.57%	8.43%	0.00%	72.39%	26.38%	1.23%
Age less than 42	100.00%	0.00%	0.00%	84.85%	15.15%	0.00%
Age 42-54	90.63%	9.38%	0.00%	75.52%	22.92%	1.56%
Age 55+	88.00%	12.00%	0.00%	74.53%	22.64%	2.83%
All Combined	91.89%	8.11%	0.00%	76.92%	21.43%	1.65%

Table 19. Healthgrades Patient Satisfaction Variable Results– Office Environment

Category	DPC			Fee-For-Service		
	High	Medium	Low	High	Medium	Low
Urban	97.04%	2.96%	0.00%	88.96%	9.25%	1.79%

Rural	93.75%	6.25%	0.00%	76.67%	23.33%	0.00%
West Region	89.74%	7.69%	2.56%	81.58%	15.79%	2.63%
Midwest Region	90.24%	9.76%	0.00%	86.25%	11.25%	2.50%
South Region	98.80%	1.20%	0.00%	88.55%	10.24%	1.20%
Northeast Region	100.00%	0.00%	0.00%	97.73%	0.00%	2.27%
Male	96.08%	3.92%	0.00%	89.55%	8.96%	1.49%
Female	97.59%	2.41%	0.00%	86.50%	12.27%	1.23%
Age less than 42	100.00%	0.00%	0.00%	93.94%	6.06%	0.00%
Age 42-54	94.79%	5.21%	0.00%	86.98%	11.46%	1.56%
Age 55+	98.00%	2.00%	0.00%	86.79%	11.32%	1.89%
All Combined	96.76%	3.24%	0.00%	88.19%	10.44%	1.37%

Table 20. Healthgrades Patient Satisfaction Variable Results – Staff Friendliness

Category	DPC			Fee-For-Service		
	High	Medium	Low	High	Medium	Low
Urban	95.27%	4.14%	0.59%	78.51%	20.00%	1.49%
Rural	93.75%	6.25%	0.00%	66.67%	33.33%	0.00%
West Region	89.74%	7.69%	2.56%	76.32%	21.05%	2.63%
Midwest Region	92.68%	7.32%	0.00%	73.75%	25.00%	1.25%
South Region	97.59%	2.41%	0.00%	75.90%	22.29%	1.81%
Northeast Region	100.00%	0.00%	0.00%	90.91%	9.09%	0.00%
Male	94.12%	4.90%	0.98%	79.10%	19.90%	1.00%
Female	96.39%	3.61%	0.00%	76.07%	22.70%	1.23%
Age less than 42	100.00%	0.00%	0.00%	84.85%	15.15%	0.00%
Age 42-54	94.79%	5.21%	0.00%	77.60%	20.83%	1.56%
Age 55+	92.00%	6.00%	2.00%	73.58%	25.47%	0.94%
All Combined	95.14%	4.32%	0.54%	77.75%	21.15%	1.10%

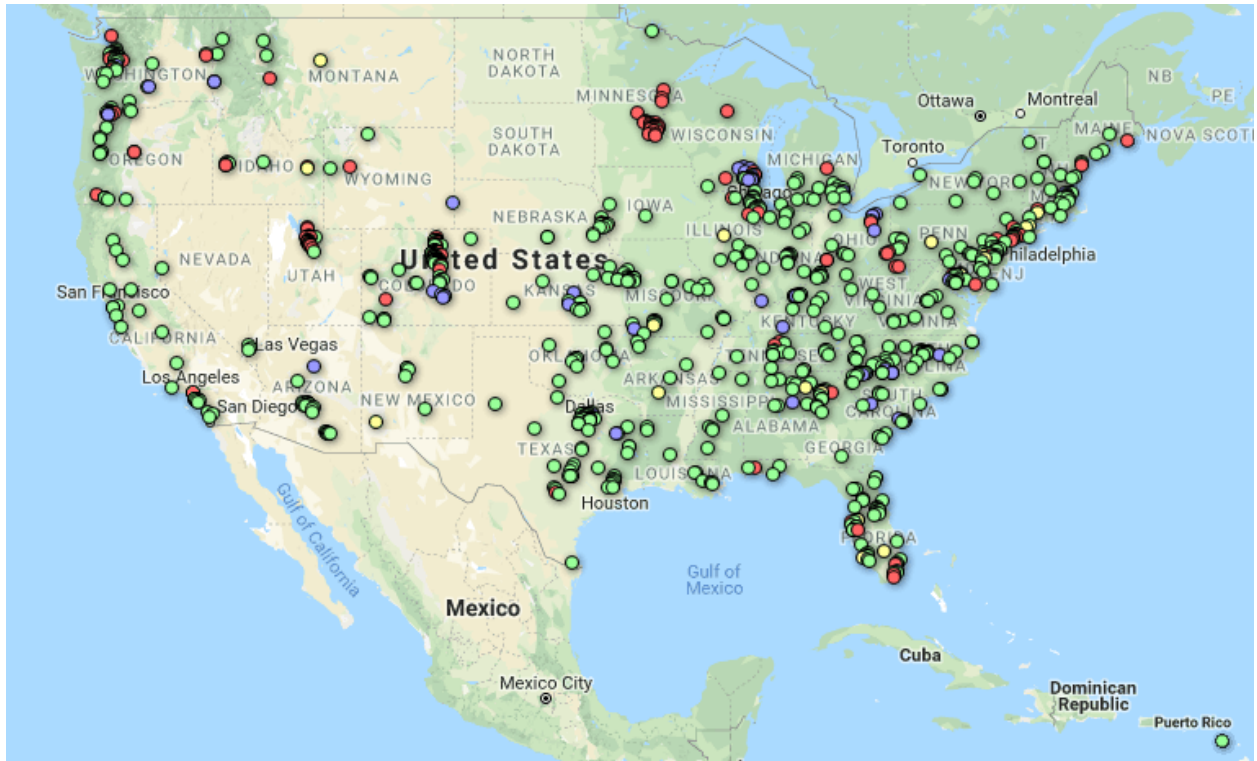
Table 21. Healthgrades Patient Satisfaction Variable Results– Likelihood to Recommend

Category	DPC			Fee-For-Service		
	High	Medium	Low	High	Medium	Low
Urban	81.66%	16.57%	1.78%	57.01%	36.12%	6.87%
Rural	81.25%	18.75%	0.00%	60.00%	36.67%	3.33%
West Region	74.36%	23.08%	2.56%	44.74%	47.37%	7.89%
Midwest Region	75.61%	24.39%	0.00%	61.25%	30.00%	8.75%
South Region	85.54%	13.25%	1.20%	57.83%	36.14%	6.02%
Northeast Region	90.91%	4.55%	4.55%	68.18%	27.27%	4.55%

Male	82.35%	15.69%	1.96%	60.70%	33.83%	5.47%
Female	80.72%	18.07%	1.20%	53.37%	39.26%	7.36%
Age less than 42	94.87%	5.13%	0.00%	60.61%	36.36%	3.03%
Age 42-54	79.17%	18.75%	2.08%	57.81%	36.46%	5.73%
Age 55+	76.00%	22.00%	2.00%	54.72%	35.85%	9.43%
All Combined	81.62%	16.76%	1.62%	57.42%	36.26%	6.32%

DPC practices are widely distributed throughout the continental US as seen below in Figure 2. Practices identified with a green dot are pure DPC practices that only operate on a membership fee. Practices identified with a red dot, are hybrid practices which accept fee-for-service patients, as well as DPC membership patients. Purple dots represent DPC practices that are located on the site of an employer. These practices are typically only available to the employees of a single company and the public is not eligible to join these practices. The yellow dots are practices that classify themselves as DPC, however, they don't meet definition of DPC as used in this research. The south, Midwest and Northeast contain the largest concentration of practices.

Figure 2. Geographic Distribution of DPC Practices



From www.dpcfrontier.com

- Pure DPC
- On-Site DPC (Not usually open to public)
- Hybrid DPC - Accepts insurance and offers DPC Service
- Other

Discussion

As the number of DPC practices are growing and the premiums for non-catastrophic insurance plans are increasing, more people are investigating DPC practices as an option to provide their primary medical care. More states are passing legislation to allow DPC practices to operate, free from regulation by state insurance commissioners and restrictions on the use of

flexible spending accounts to pay for DPC membership fees appear to be coming to an end in the near future (P. Eskew 2019). Given the high level of burnout among many fee-for-service physicians, future growth in the number of DPC practices seems likely. This research provides a clearer picture of the type of physicians using the DPC model, the services that DPC practices offer and the costs for those services.

Most DPC practices set prices based on the age of their patients and prices range from a monthly membership fee average of \$40 for minors to an average of \$90 per month for seniors. Membership prices also vary by region, with DPC practices in the West and Northeast charging higher prices than practices in the Midwest and South. This variation in pricing could be explained by regional variations in cost of living.

In addition to providing unlimited patient visits, most DPC practices offer a wide variety of enhanced services as compared to traditional fee-for-service medical practices. Almost all DPC practices offer discounted lab work (92.89%) and a majority offer discounted imaging services (65.95%). In addition to giving their email address to their patients (93.75%), most DPC physicians also give their patients their personal cellphone number for phone calls and text messaging (85.13%). In the states where in-office dispensing is legal, less than half of DPC practices dispense medications in their offices (45.87%). This is surprising, given that the DPC model emphasizes its ability to lower healthcare costs for patients. More than half of DPC physicians (58.41%) will also visit their patients in their homes, sometimes for an additional fee. Overall, it appears that DPC practices do provide the enhanced level of services that proponents of the model claim. This suggests that as the number of DPC practices increase, fee-for-service practices may feel pressure to begin expanding the variety of services that they offer. More

employers will also likely begin to view a DPC membership as an attractive addition to their employee benefit offerings.

This study also found that the majority of DPC providers specialized in the primary care fields of family medicine and internal medicine. Advanced practice nurses and physician assistants account for a small, but likely growing percentage of the DPC workforce. As mid-level providers play a larger role in the delivery of primary care in fee-for-service practices, it is also reasonable to assume that their role in DPC practices will also grow due to their ability to provide patient care at a lower cost than medical doctors.

This research found that the percentage of female doctors working in DPC practices is greater than in fee-for-service practices. Most DPC physicians work as solo practitioners or in small practices of two or three providers. One possible explanation is that female physicians might be less financially risk-averse than their male counterparts and are more willing to start their own medical practice. These women may also be more likely than their male counterparts to have spouses that can help share the financial burden of starting a new medical practice. Another potential explanation is that female physicians might face barriers to advancement, achievement and/or satisfaction in larger medical practices, which are typical of the fee-for-service model. Yet another explanation could be that because female physicians in the fee-for-service system tend to receive lower reimbursements, they view starting a DPC practice as a way to increase their income (Worth 2016). This should be the topic of additional research, because it could lead to a better understanding of the factors that motivate physicians to move to the DPC model,

Patient satisfaction of doctors practicing in the DPC model is quite high. While the aim of this research is not to directly compare satisfaction levels of DPC patients with fee-for-service

patients, it generally appears that DPC patients are more satisfied with their providers than are fee-for-service patients. One explanation for the difference in satisfaction levels might be that the patients of DPC practices visit their physicians' offices more often than fee-for-service patients. This increased contact makes them more likely to rate their physicians highly in surveys. Another explanation could be that DPC patients rate their physicians highly because it helps the patients internally justify their willingness to pay a monthly membership fee. Alternatively, the DPC model itself might allow physicians to spend more time with patients, allowing them to develop deeper relationships with patients and which allows patients to feel that they have a trusted partner focused on their health. Additional time with patients also allows DPC physicians to better understand patient concerns and prescribe treatments in a way that the fee-for-service model does not.

Within both DPC and fee-for-service models, there are no significant differences between the satisfaction levels of patients in rural and urban areas. There are also no significant differences between the satisfaction levels of patients with male and female physicians. Interestingly, in both practice models, the patients of younger physicians are more likely to recommend their physician than the patients of older physicians. This could be caused by changes that have been made to the training of physicians in medical schools and residency that attempt to develop better interpersonal skills and cultural competency (Novack, Volk, and Drossman 1993; Kripalani et al. 2006). Also, the personal motivations of doctors choosing to practice in primary care have changed over different generations. Among the millennial generation, physicians with greater focus on patient orientation and compassion were more likely to choose primary care than their older colleagues (Kiolbassa et al. 2011).

This research is one of the first attempts to better understand the DPC model and future research should investigate many aspects of the DPC model in greater detail. Future research should investigate the financial decision making of consumers as they combine DPC practice membership with high deductible insurance rather than purchase more expensive, lower deductible insurance coverage that can be used with fee-for-service practices. A better understanding of the economics of DPC practices combined with high deductible insurance could contribute to better insurance product design, as well as help policy makers better understand why specific groups of consumers are making the healthcare and insurance decisions that they are making. Another very important area of future research would be to better understand the effect that DPC practices have on the utilization of other more expensive care, such as emergency room visits and hospitalizations. DPC proponents claim that more frequent visits to physicians and easier access to primary care, as facilitated by the DPC model, greatly reduces patients' demand for the more expensive services of other parts of the healthcare system. There are no publicly available datasets that contain this data, so researchers will need work with many different parties such as insurers who cover DPC patients, EMR providers gather and construct this dataset.

As Value-Based methodologies become more popular, DPC practices will need to use data to support their claims of delivering higher quality healthcare to their patients. Employers that provide DPC memberships for their employees will expect to see research demonstrating that they are receiving value for their expenditures. DPC physicians should work through their national organizations, such as the DPC Alliance, to develop processes by which they can easily share practice data and more importantly, outcome data. Many DPC physicians were first attracted to the DPC model, because it eschewed the gathering and reporting of data, but for DPC

to ever become more than a niche practice model, its advocates will need to be able to support their arguments with data. The providers of the electronic medical record systems (EMR) used by DPC practices are in the best position to provide solutions to this problem. These EMR companies should embrace technological innovations, such as natural language processing, to extract outcome data from provider notes. This will allow DPC physicians to continue spending their time with patients, rather than wrestling with the over 70,000 ICD-10 codes themselves or raising prices to hire an army of professional coders to gather this data.

There are several policy issues that should be considered and explored more fully. As the number of DPC practices and the public profile of the model has grown, some policy makers and researchers have raised objections to the model. One common criticism is that as physicians leave the fee-for-service system, there will be fewer physicians left in the system to take care of the large number of patients. While it is true that DPC practices limit the number of patients in their practice to a smaller number than fee-for-service practices, this argument does not take into consideration that many patients join DPC practices, because they need the additional services offered by the DPC practices. While DPC practices do reduce the supply of physicians in the fee-for-service model, they likely remove many of the higher utilization patients from the fee-for-service system. Policy makers also need to consider that the typical DPC patient is not a wealthy person who joins a DPC practice to receive exclusive treatment or for status reasons. A significant number of DPC patients are individuals and families that have been effectively “priced out” of the fee-for-service system, because they cannot afford to purchase insurance with low deductibles and copays. Many DPC patients have chronic conditions requiring frequent medical attention. The relatively inexpensive DPC membership provides both physician visits and access to less expensive treatments through discounted lab work, imaging and

pharmaceuticals. In addition, because DPC patients have direct access to their physician after regular business hours, it is likely that the DPC model helps reduce the number of unnecessary ED visits by uninsured patients who have DPC memberships. Future research should examine the costs and benefits of combining DPC practice membership with non-traditional insurance options versus the cost and benefits of traditional insurance coverage. This research should investigate the ways that policy makers could use the DPC model to provide affordable access to medical services to many low-income families.

Limitations

There are several limitations to the present study. Many DPC practices use complicated pricing structures which include family discounts and employer discounts which are not included in this study because discount data is not publicly available. Transparency could also be a limitation because not all DPC practices provide complete lists of services on their websites. Other limitations include the use of Healthgrades data which might contain reviews of DPC physicians while they were working as fee-for-service providers. This could introduce bias into the results. Healthgrades data could also introduce bias because it does not represent a true sample of patients of either DPC or fee-for-service practices.

Conclusion

As DPC grows into a larger portion of the healthcare system, more research will need to be undertaken to better understand various aspects of the model. While this study demonstrated a

large variation in prices at DPC practices, it does not explain why the pricing variation exists. This study also found that females make up a larger percentage of the DPC physician workforce than is found in fee-for-service practices and suggested several potential reasons for this, but future research should seek to understand why this is the case, because the reasons could effect both DPC and potentially lead to changes in the fee-for-service model . This study found that regional variation in patient satisfaction scores exist in both DPC and fee-for-service practice models, but the reasons for this are also unclear. Future research should attempt verify if this trend is consistent with other sources of patient satisfaction data and seek to explain why the variation exists. Finally, future research should be undertaken to understand why the patients of younger doctors are more likely to recommend them to others. Several possible explanations for these finding was presented in this research, but the underlying reasons are important, because if the factors leading to this can be replicated through education, older doctors could learn to incorporate them into their practice of medicine and improve the satisfaction levels of their patients.

APPENDICES

Appendix A.

Practices Included in Study

307Health	http://307health.org/
3D Medical Direct Primary Care	https://www.3dmedicaldpc.com/
ABC Family & Lifestyle Medicine	http://www.abcfamilymed.org
Abundant Family Care	http://www.drheldridge.com/
Access Family Medicine	http://accessfamilymedicine.com/
Access Healthcare	http://www.letsimplify.com/
Access Healthcare	http://www.acchealth.com/
Access Med	https://www.accessmeddirect.com/
Access Private Medicine	https://accessprivatemedicine.com/
AccessMedicine	http://www.accessmedicine.md/
Accomplished Health & Wellness	http://www.accomplishedhealth.com/
Action Medicine, DPC	http://www.actiondirectcare.com
Active Choice Healthcare	http://activechoicemd.com/
Advanced Primary Care	http://www.advanced-primary.com/
Advent Healthcare	https://adventhealthcare.com/dpc/
Advocate Direct Care	http://www.advocatedirectcare.com
Affinity Wellness and Consultants, LLC	https://affinitywellnessco.wixsite.com/wellness
AffirmHD	http://www.affirmhd.com
Alere Family Health	http://www.alerefamilyhealth.com/
Alison Snider, MD	http://www.asnidermd.com/
Aloha Nui Family Practice	https://www.alohanuifamilypractice.com/
Alpenglow Family Medicine	http://www.alpenglowfamilymedicine.com/
Altucare Primary Medical Care	https://altucare.com/
Amarillo MD	http://www.amarillomd.org/
Anchor Medical Clinic	http://www.anchormedicalclinic.com
Anderson Family Medicine, P.A.	http://www.andersonfamilymed.com
Antioch Med	http://www.antiochmed.com/
Apex Direct Care	http://www.apexdirectcare.com/
Argyle Family Medicine	http://argylefamilymedicine.com/

Ark Family Health North Peoria	https://www.arkfamilyhealth.com/
Art of Health DPC	https://www.theartofhealthdpc.com
Ascent Direct Primary Care	http://www.ascentdpc.com/
Ashewell Medical Group	https://www.ashewell.com/
Aspire Health - Direct Primary Care	https://www.aspirehealthcenter.com/
Assurance Healthcare and Counseling Center	http://assurancehealth.org/
AtlasMD	http://atlas.md/wichita/
Austin Concierge Medicine	http://www.austinconciergemedicine.com/index.html
Avenu Health	https://www.avenuhealth.com
Balance Health	http://www.balanceclinics.com/
Balanced Physician Care	http://balancedphysiciancare.com/
Baskin Clinic	http://baskinclinic.com/
Be Healthy Family Medicine	http://www.behealthyfamilymedicine.com/
Benessere Wellness Center	http://www.benesserefamilywellness.com
Benton Integrative Medicine	https://www.bentonintegrative.com/direct-primary-care
Bethesda Integrative Medicine	http://www.bethesdaintegrative.com
Bethesda Medical Care	http://www.bethesdamedicalcare.com/
Betten, Karen MD	http://www.drkarenbetten.com/
Bianco Primary Care	http://www.biancoprimarycare.com/
Big Tree Medical Home	https://bigtreemedicalhome.com/
Black Bag Family Healthcare	http://www.blackbagdoc.com/
BlissMD	http://www.blissmd.com/
Bloom Direct Care	http://bloomdirectcare.com/
Blue Fire Med	https://www.bluefiremed.com/
Blue Lotus Family Medicine	https://bluelotusdpc.com/
Blue Ridge Family Practice	http://blueridgefamilypractice.org/
Blue Skies Family Medicine	http://blueskiesfamilymedicine.com/
Bluegrass Family Wellness	http://www.bluegrassfamilywellness.com/
Boston Direct Health	http://www.bostondirecthealth.com
Bountiful Health	http://www.bountifulhealthcare.com
BRAND NEW MED	https://www.brandnewmed.com/
Brengle Family Medicine	https://www.brenglefamilymedicine.com/
Bucks County Center for Integrative Medicine	http://www.bcimedicine.com/
Call Me Concierge	https://callmemd.herokuapp.com/serivceshow?doctor_id=1&service_id=1
Cara Direct Care	https://www.caradirectcare.com
Carah Medical Arts	https://www.carahmedicalarts.org/
Cardinal Family Medicine	http://www.cardinalfamilymedicine.com/
Carolina Holistic Medicine	https://www.carolinaholisticmedicine.com/
Carpenter Family Care	http://www.carpenterfamilycare.com
Celebrate Primary Care	http://www.celebrateprimarycare.com/
Center for Your Health	http://www.centerforyourhealth.com/

Chisholm Center for Health	http://www.chisholmcenterforhealth.com/
Choice Physicians Group	http://www.choicephysiciansgroup.com/
Christian Healthcare Centers	https://www.chcenters.org/
Ciampi Family Practice	http://www.ciampifamilypractice.com/
Cibolo Family Medicine	http://CiboloFM.com
Clarii Health Direct Primary Care	https://www.clarii.com/
Clarity Direct Care	https://www.claritydirectcare.com/
Click Family Healthcare	http://www.clickfamilyhealth.com
Cloud Medical	http://www.cloudmedical.io/
Coastal Direct Primary Care	https://www.coastaldpc.com/
Coho Medical Group	http://www.cohomedical.com/
Command Family Medicine	http://command.md/
Communitas Primary Care	http://www.communitasprimarycare.com/
Compass Healthcare	http://www.compasshealthcarear.com/
Complete Healthcare of Oklahoma	http://www.completehealthcareok.com/
Connected Health	https://www.chforu.com/
Core Family Practice	http://www.corefamilypractice.com/
Cornerstone Family Medicine	https://CornerstoneFamilyDirect.org
Cortez Pediatrics, LLC	http://cortezpediatrics.com
Coupet Quality Clinic	http://www.coupetqualityclinic.com/
CovenantMD	http://www.covenantmd.net/
Crescent Medical	http://www.crescentmedical.net/
Cross Care Direct Family Medicine	http://crosscaredirect.com/
Daniel Health & Wellness	http://www.danielwellness.com
Deborah Sutcliffe, MD	http://www.redblufffamilydoc.com/
DeKalb MD	http://dekalbmd.com/
Dekalb MD	https://dekalbmd.com/
Diamond Physicians Fort Worth	http://www.diamondphysicians.com
Dignitas Health	http://www.choosedignitas.com/
Direct Access MD	http://www.directaccess.md/
Direct Care	http://www.directcare.md/index.php
Direct Care Clinic of Northwest Arkansas	http://www.directcarenwa.com/
direct DOC, LLC	http://www.thedirectdoc.com
Direct Doctors Inc	http://www.directdoctors.org/
Direct Family Care of Northern Colorado	https://www.directfamilycareofnoco.com/
Direct Family Med	http://directfamilymed.com/
Direct MD Austin	http://www.directmdaustin.com/
Direct Medical Care	http://directmedicalcare.net
Direct Patient Care St Louis	http://www.directpatientcarestl.com/
Direct Patient Services	http://www.directpatientservices.com/
Direct Primary Care Clinics	http://www.dpcareclinics.com/

Direct Primary Care of Blacksburg	http://www.drmatthewmccarthy.com/
Direct Primary Care of Boca Raton	http://www.dpcboca.com
Direct Primary Care of Eugene	http://www.dpceugene.com/
Direct Primary Care of the Carolinas	http://www.DirectPCC.com
Direct Primary Care of West Michigan	https://www.dpwestmi.com/
Direct Senior Care PLLC	http://www.directseniorcare.com
DirectCare	http://directcarellc.net/
DirectCare Family Health	http://www.directcarefh.com/index.html
DirectcareMD (Heritage Family Medicine)	http://www.directcaremd.com/
DirectMed by Dr. Katrina Ikbal	http://www.directmed.care/
Doc Randy	http://www.docrandy.biz/
Dockside Pediatrics	http://www.docksidepediatrics.com
Doctor Direct	http://www.doctordirectmd.com/
Donald Condon, MD	http://www.doctorcondon.com/
Dove Family Health	http://www.DoveHuntsville.com
Dove Family Health	https://www.dovefamilyhealth.com/
DPC Healthcare	https://dpchealthcare.com/
Dr Stef On Call	http://www.drstefoncall.com/
Dr. Michel Accad	http://www.draccad.com/
Dunes Family Clinic	https://dunesfamilyclinic.com/
Eagle Medical Center	https://www.eaglemedcenter.com/
EBO MD, LLC	http://www.doyouebo.com
Edson Family Practice	http://www.edsonfp.com/
Elevated Health	http://www.elevatedhealth.md/
Elevated Healthcare	https://elevated.healthcare/
Emily MD, Direct Primary Care	https://emilymd.org
Empower Family Medicine	http://www.empowerdecatur.com/
Empower3 Center for Health	http://www.empower3cfh.com/
Encinitas Personal Healthcare, Inc.	http://www.martyschulmanmd.com/Home_Page.html
Epiphany Health	http://www.epiphanyhealth.org
Equality Healthcare	http://equality.healthcare/
Equinox Primary Care	https://www.equinoxprimarycare.com/
Evolve Medical Clinics	https://evolvemedicalclinics.com/
Exactus Physicians	http://www.exactusphysicians.com/
Fabacher Health Direct Primary Care	https://www.fabacherhealth.com/
Face Value Health DPC PLLC	https://www.facevaluehealthdpc.com , https://www.facevaluehealth.com
Fairfield Family Physicians	http://drleeforest.com/
Falls Medical Group	https://www.falls.md/
Family Doc Direct	http://www.familydocdirect.com
Family First Direct Primary Care	https://www.family1stdpc.com/
Family First Direct Primary Care	https://www.familyfirstdirectprimarycare.com

Family First Health Center	http://familyfirsthealthcenter.com/
Family First Medical Center	http://www.familyfirststif.com/direct-primary-care-dpc/
Family Matters Direct Primary Care	https://familmattersdpc.com/
Family Medicine of Pooler	http://www.familymedicineofpooler.com/
Family Physicians of St Joseph, PC	http://www.familyphysiciansDPC.com
Family Tree Primary Care	http://www.familytreeprimarycare.com
First Primary Care	https://www.firstprimarycare.com/
Fischer Clinic	http://www.fischerclinic.com
Fishers Direct Family Care	http://fishersdfc.com/
Focus Direct Family Medicine	https://www.focusdirectfamilymedicine.com/
Foothills Family Care, LLC	http://foothillsfamilycarellc.com/
Forest Direct Primary Care	http://forestdirectprimarycare.com/
Foundation Primary Care	http://www.foundationprimarycare.com/
Foward	https://goforward.com/
Franklin Family Medicine, LLC	http://www.franklinfamilymedicine.com
Free Market Physician	http://www.freemarketphysician.com/
Freedom Family Medicine	http://www.freedomfamilymedicine.com/
Freedom Family Practice	http://www.freedomfamilypractice.com/
Full Circle Direct Primary Care	http://fullcircledpc.com/
Functional Family Medicine	https://functionalfamilymedicine.net/
Gainesville Direct Primary Care Physicians, LLC	http://www.GainesvilleDPCMD.com
Georgia Wellness Solutions	http://vudomedicine.com/
Gianna Family Care	http://www.giannafamilycare.com/
Glacier DPC	http://www.glacierdpc.com
Glover Family Medicine	http://www.gloverfamilymedicine.com/
Go Private MD	http://www.goprivatemd.com/home.html
Gold Direct Care	http://www.golddirectcare.com/
GoodMed Direct Primary Care	http://goodmedclinic.com/
GracePointe Healthcare	http://gracepointehealthcare.com/
Grameen Vida Sana	https://www.grameenvidasana.org/
Grassroots Healthcare	http://www.grassrootstulsa.com/
Great Plains Family Medicine	http://greatplainsfamilymedicine.com/
Great Plains Family Medicine Yoder	http://www.greatplainsfamilymedicine.com
Green Hills Direct Family Care	http://www.greenhillsdirectfamilycare.com/
Grewal Center for Body and Mind	https://grewalcenter.com/
Gulf Coast Direct Primary Care	http://www.gulfcoastdirectprimarycare.com/
Gulrukh Rizvi MD LLC	https://docrizvi.com/
Halcyon Health Direct Primary Care	http://www.halcyonhealthdpc.com
Hansen Family Practice	http://hansenfamilypractice.com/
Hansen-Smith Family Medicine	http://www.hansen-smith.com/
Harmony Family Medicine	http://www.harmonyfm.net/

Harmony MD Direct Primary Care	https://www.harmonymddirectprimarycare.com/
Harris Internal Medicine	http://www.harrisinternalmed.com/
Harris Internal Medicine	https://harrisinternalmed.com
Hawkes Clinic	https://hawkesclinic.com/
Health Connections Direct Primary Care	http://www.healthconnectionsdpcc.com
Health Share Plan	http://www.healthshareplan.com/
Health Studio KC Direct Primary Care	http://www.healthstudiokc.com/
Health Suite 110	http://www.healthsuite110.com/
Hearthstone Family Medicine	http://www.hearthstonefamilymedicine.com
Hearthstone Health	http://hearthstone.md/
Heather Hyun, DO	http://www.drheatherhyun.com
Hector Family Medicine	http://www.hectormd.com/
Heightened Health S.C.	https://heightenedhealth.com/
Heritage Direct Primary Care	http://www.HeritageDPC.com
Hickory Direct Primary Care	http://www.hickorydpc.com/
Hill Country Direct Care	https://www.hillcountrydirectcare.com/
HIPnation-PrimaryCarePlus	http://www.HIPnation.com
Hitchcock Family Medicine	http://www.hfm.md/
Hoffman Family Medicine, PLLC	http://hoffmanfamilymedicine.com
Holton Direct Care	http://www.holtondirectcare.com/
Hometown Direct Care	https://www.hometowndirectcare.com/
Hometown Family Medicine	http://www.hometownfamilymedicinedpc.com
House Calls PLC	https://www.cvillehousecalls.com/
Howard County Direct Primary Care	http://www.drpolgar.com/
Hudson Family Medicine LLC	http://www.hudsonfamilymedicine.com
Humanizing Medicine	https://humanizingmedicine.com
IdealAccessMD	http://www.idealaccessmd.com
Imagine MD	https://imaginemd.net/
Independent Health Advantage	http://www.ihealthyork.com/
Infinity Family Care	http://www.infinityfamilycare.com/
Infinity Health	http://infinityhealth.md/index.html
InnerHealth MD	http://innerhealthmd.com/
Innova Medical Care	http://www.innovamedicalcare.com/
Innovative Healthcare and Laser Therapy	http://innovativehealthandlaser.com/
Innovix Medical Direct Primary Care	http://www.innovixmedical.com
Insight Primary Care	http://www.insightprimary.com/
Inspire Health Direct Primary Care	http://www.inspirehealthdpc.com/
Institute for Medical Wellness	http://www.drhorvitz.com/
Integrative Family Care	https://ifcdirect.com/
Integrative Family Medicine of Asheville	http://www.integrativeasheville.org/
Integrity Medicine	http://www.integritymedicine.com/

Integrity Medicine, LLC	https://www.integritymedicine.com
Internal Medicine Lipid and Wellness of Fort Myers	http://imlwp.com/
Iris Integrative Health	https://www.irisintegrativehealth.com/
Ivy Family Medicine	http://ivyfamilymedicine.com/
Izbicki Family Medicine	http://doctoriz.com/
Jackson Hole Direct Primary Care	https://www.jacksonholedpc.com/
Jared A. Wojnicki, DO	https://www.drjaredwojnicki.com
Jared Hendler, MD	http://www.hendlermd.com/
Jeanette M. Williams, MD	http://www.jwilliamsmd.com
Jessica Davis, MD	http://www.jessicadavismd.com/
John Furlow, MD	http://johnfurlow.com/
Just the Doc	http://www.justthedoc.com/
Kansas City Direct Primary Care	http://www.kansascitydirectprimarycare.com/
KAP Medical Group DPC and Family Medicine	http://www.kapmedicalgroup.com
Kaysville Clinic Family Medicine	http://kaysvilleclinic.com/
Kestrel Wellness	http://kestrelwellness.com/
Lamb Health Direct Primary Care	https://lambhealthdpc.com
Lancaster Personal Care Medicine	http://lancasterpcm.com/
LandmarkMD	http://www.landmarkmd.com/
LAURA C KNOBEL MD LLC	http://knobelmd.com/
LevMed Health	http://www.LevMedHealth.com
Liberty Family Medicine	https://libertyfamilymed.com/
Lifestyle Medicine of Idaho	http://www.lifemedidaho.com/
Lisa Larkin MD & Associates	http://lisalarkinmd.com/
Living Well Family Medicine	https://www.livingwellfm.com/
Lotus Family Practice	http://www.lotusfamilypractice.com/
Love Health	http://www.lovehealth.live
LumaDoc Health	http://www.lumadochealth.com/
Lynn Alonso, MD	http://www.dralonso.net/
Madsen Medical Direct Care	http://www.madsenmed.com/
Main St. Clinic	http://www.mainstreetdpc.com/
Main Street Family Medicine	https://www.mainstreetfamilymed.com/
Maple Primary Care	http://www.mapleprimarycare.com/
Maple Tree Healing	http://mapletreehealing.com/
Marable Personal Healthcare	http://sublimecare.com/
Marin Health Solutions	https://marinhealthsolutions.com/
Marquis Family Medicine	https://www.marquisfamilymedicine.com/
McGilligan MD Direct Primary Care	https://mcgilligan.md/
Med Club	https://medclub.clinic/
Medlogic	https://www.medlogicmd.com/
Megunticook Family Medicine	http://www.megunticookfamilymedicine.com/

Meridian Springs Primary Care	http://www.springsmd.com
Michael D Strickland, MD	http://www.direct-primary.healthcare
Mid-Valley Direct Primary Care	http://www.midvalleydpc.com/
Midwest Health Group DPC	http://mw-health.com/
Milepost Medical	http://milepostmedical.com/
Millcreek MD	https://millcreekmd.com/
Mira Direct Primary Care	http://www.MiraDPC.com
Modern Mobile Medicine	http://www.modernmobilemedicine.com/
Monarch Family Medicine	https://www.monarchfamilymedicine.com/
Mountain Medical Arts	http://mtnmedarts.com/
Mountain View Family HealthCare	http://www.mountainviewtlc.com
Mountainview TLC	http://mountainviewtlc.com/
MRMG All Access Medicine	http://www.mauryregional.com/maury-regional-medical-group/maury-regional-medical-group-practice-details?Practice=5
Mulberry Clinics	http://mulberryclinics.com/
MultiCARE Physicians DPC	https://multicaredpc.com/
Murdock Health	http://www.murdockhealth.com/
My Care	https://www.mycarewv.com/
My Country Doctor	http://www.mycountrydoc.com/
My Direct MD	http://mydirectmd.com/
My DPC Doc Family Medicine	http://riverjordandirectfamilymedici.vpweb.com/
My Way Medical - Direct Primary Care	http://www.mywaymedicaldpc.com
MyMD BCS	http://mymdbcs.com/
Nacogdoches Health Partners	http://www.nachealthpartners.com/nhp-direct-health.php
Naptown Priority Health	http://mynaptown.com/
Neighborly Family Medicine	https://www.facebook.com/Family-Health-Connections-Inc-189909857734932/
NeuCare	http://neucare.net/
New Freedom Family Medicine	http://www.newfreedomfamilymed.com/
NewCare MD	http://newcaremd.com/
NICC's Direct Primary Care	https://www.niccdpc.com/
NoCo Primary Care	https://www.nocoprimarycare.com/
North Idaho Direct Primary Care	http://richardsamuelmd.com/
North Okaloosa Family Medicine	http://www.nofmclinic.com
Nurture Health	http://nurturehealthclinic.com/
Oasis Family Medicine	http://www.oasisfamilymedicine.net/
Ochna Health	http://www.ochnahealth.com/
Octagram Direct Primary Care	http://www.octagramdpc.com
Olical Health, PLLC	http://www.olicalhealth.com
Olp Family Medicine of Carmel	http://olpfamilymedicine.com/
On Point Primary Care	http://www.onpointprimarycare.com/
One Family MD	http://www.onefamilymd.com/
One Focus Medical	http://www.onefocusmedical.com/

OneMD Direct	http://onemddirect.com/
Onsite MD	http://www.onsite-md.com/
Oodle Family Medicine	https://www.oodlemd.com/
Osteopathic Center for Family Medicine	http://www.ocfm.com
Osteopathic Healing Arts	http://ohadpc.com/
Our Town Medical	http://www.docgibb.com/
Ozarks VIP Medical Services	http://ozarksvipmedical.com/
Palmetto Proactive Healthcare	http://www.palmettoproactive.com/
Paradigm Family Health	http://www.paradigmfamilyhealth.com/
Paradox Health	http://www.paradoxhealth.org
Paragon Personal Healthcare	http://www.paragonpersonalhealthcare.com/
Patient Center Physicians Care PC	http://www.pc3md.com/
Patient Direct Care	http://www.ptdirectcare.com/
PatriotDirect Family Medicine	http://www.patriotdirectfm.com/
Peace of Mind Medical Care, PC	https://www.peaceofmindmedicalcare.com/
Peak Performance & Prevention	http://www.p3life.com
Pennington Primary Care	http://www.penningtonprimarycare.com/
Persona MD	http://personamd.com/
Personal MD	http://www.personalmd.net/
PhoenixDPC, Inc.	http://www.phoenixdpc.com
Pine Ridge Family Medicine	http://pineridgefamilymedicine.com/
Pinnacle Internal Medicine	http://pinnaclemedicine.com/
Platinum Healthcare DPC	http://www.platinumhealthcaredpc.com/
Plum Health DPC	http://www.plumhealthdpc.com/
Portola Direct Primary Care	https://www.portola.care/
Prairie Health & Wellness	https://prairiehealthwellness.com/
Preferred Family Medicine	https://PreferredFamilyMedicine.com
Premier Health MD	http://www.premierhealthmdtx.com/
Premier Medical Center	http://www.timkrusemd.com/
Premier Personal Healthcare	http://www.warshawmd.com/index.html
Premiercare MD	http://premiercare.md/
Preventive Primary Care ~ Select	https://maureenmays.com
Primary Care Simplified	https://www.primarycaresimplified.com/
Primary Health Partners	http://www.primaryhealth.partners/
Prime PLC	http://www.prime-plc.com/
Priority Health Family Medicine	http://www.priorityhealthmd.com
Proactive Health	http://proactivehealthbend.com/
Promina Health	http://www.prominahealth.com/
ProPartners Healthcare	http://www.propartnershealthcare.com/
Pure Primary Care	https://www.PurePrimaryCare.com
pureHealth DPC	http://www.purehealthdpc.com

Purely Pediatrics	http://www.purelypediatrics.com/
Quiet Corner Family Practice	http://www.quietcornerfamilypractice.com/
Real Family Care	http://www.realfamilycare.com
Redefined Healthcare	https://redefinehc.com/
reevoMD	https://www.reevomd.com/
Reinvent Your Health	http://www.reinventyourhealth.net/
Rekindle Family Medicine	http://www.rekindlefamilymedicine.com/
Relief Direct Primary Care, LLC	http://www.reliefdpc.com
Resolve MD: Direct Primary Care	http://www.resolvemd.org
Revolutionary Health Services	http://rhslivewell.com/
Roark Family Health	http://www.roarkfamilyhealth.com/
Rob Lamberts, LLC	http://doctorlamberts.org/
Rock Hill Primary Care	https://www.rockhillprimarycare.com/
Rockville Concierge Doctors	http://www.rockvilleconciergedocs.net/
Rockwall's Gem MD	https://www.rockwallsgemmd.com/
Rockwell Direct Primary Care	http://rockwelldirectprimarycare.com/
Rogue Direct Primary Care	https://roguedpc.com/
Ross Medical Care	http://www.rossmedicalcare.com//
Sabal Direct Primary Care	http://sabalpc.com/
Salt Lake Direct Primary Care	https://www.saltlakedirectprimarycare.com/about
Sandpoint Direct Primary Care	http://www.sandpointdpc.com/
Santa Cruz Direct Primary Care	http://www.santacruzpc.com
Schneider Medical Group	http://schneidermedicalgroup.com/
Schumacher Family Medicine	https://www.schumacherfamilymedicine.com/
Seattle Medical Associates	http://www.seamedassoc.com/
Sentinel Primary Care	https://sentinelprimarycare.com/
Sequoia MD	http://www.sequoiamd.com
Signature Primary Care and Wellness	http://www.signaturecare.co
Simple Way Care	http://www.simplewaycare.com/
Skyline Direct Care	http://www.skylinedirectcare.com/
Slough Medical Clinic	https://www.sloughmedicalclinic.com/
Slower Medicine	https://slowermedicine.com
SouthernCare Direct	http://www.directcare.clinic/
SparkMD	https://sparkmd.com
sproutMD	http://www.sproutmd.com
Square1 Healthcare	http://www.square1healthcare.org/
St. Luke's Family Practice	http://www.stlukesfp.org
Stahl Primary Care	http://www.stahlprimarycare.com/
Still Point Medical	http://www.stillpointmedical.com/
Story Family Medicine	http://www.storyfamilymed.com/
Sullivan Family Care	https://www.sullivanfamilycare.com/home.html

Summit Family Care	http://summitfamilycare.com
Summit Primary Care	http://www.spcdenver.com/
Suzanne Gehl, MD	https://suzannegehlmd.com/
The Bartlett Medical Clinic & Wellness Center	http://www.thebartlettclinic.com/
The Doc Shoppe	http://www.docshoppe.net/
The Family Doctor PLLC	http://www.familydoctor.md/
The Golden Stethoscope	https://www.thegoldenstethoscope.com/
The Healthy Human	https://www.healthyhumandpc.com/
The Practice	https://www.drmensink.com/
The Town Doctor®	http://www.towndoctor.com
Thrive Adult Primary Care	http://www.thriveapc.com/
ThriveDPC	http://www.thrivedpc.com
Tidal Wellness	http://www.tidalwellness.com
TLC Family Health	https://www.tlcfamilyhealth.com/
Total Family Wellness	http://www.totalfamilymd.com/
Total Primary Care	http://drp-kc.com/
Totoe Medical Group	https://www.totoemedicaldpc.com
Town Center Health	http://www.towncenterhealth.com/
Township Health DPC	http://townshiphealthdpc.com/
Trailhead Clinics	http://www.trailheadclinics.com/
Trinity Direct of Maryville	https://trinitydpc.com/
Trinity Medical Associates of Hardin Valley	http://www.trinitydpc.com
Trivas Family Medicine	https://trivasfamilymedicine.com
Trout Lake Clinic	https://troutlakeclinic.com/
Twardon Family Care	http://www.twardonfamilycare.com/
Uncommon Healthcare	http://www.uncommonhealthcare.com/
Unity Point Health	https://www.unitypoint.org/peoria/junction-medical.aspx
Unorthodoc	http://unorthodoc.com/
UpFront Health	http://www.upfronthhealth.com/
US Med Clinic	http://usmedclinic.com/
Valley Care DPC	http://www.valleycaredpc.com
Vanguard Direct Family Medicine	http://vanguardfamilymedicine.net/
Vantage Physicians	http://www.vantagephysicians.net/
Verity Primary Medicine & Lifestyle	http://www.veritymedicine.com/
Victors Care	http://www.victorscare.org/
Vienna Primary and Preventive Medicine	http://www.drjoffee.com
Vieux Care	http://vieuxcare.com/
Vineyard Health	https://www.vineyardhealth.care/
Vintage Direct Primary Care	http://www.vintagedpc.com/
Vital Med	https://www.vitalmeddpc.com
Viva Med	http://www.myvivamed.com/

Washington Park Direct Care	http://washingtonpark.md
WeCare Family Clinic	http://wecarefamily.com/
Well Life Family Medicine	http://www.welllifeabq.com/index.html
Well Primary Care	http://www.wellprimarycare.com/
Wellcare MD	http://www.wellcaremd.com/
Wellscape Direct MD	http://www.wellscapedirectmd.com/
Wendy Schilling, MD	http://www.wendyschillingmd.com/
Westfield Premier Physicians	http://westfieldpremier.com/
Whole Family Direct Care	http://www.wholefamilydirectcare.com/
Whole Family Health Medical Clinic, S.C.	http://wholefamhealth.com
Whole Family Medical Care	http://www.wholefamilymedical.com/
Whole Health Family Medicine Clinic	http://www.wholehealthfamilymedicine.com/
Wholecare Clinic	http://www.mywholecare.org/
WholeLife Direct Primary Care	http://wholelifedirectprimarycare.com
WholyWell Family Medicine Direct Primary Care LLC	http://www.wholywelldpc.com
Willow Pediatrics and Lactation	http://www.willowpeds.com
World of Wellness Healing Care	https://www.wowhealingcare.com/
Yapha Physician Services	http://www.yaphaphysicianservices.com/
Your Doctor, PLLC	https://www.yourdoctormn.com/
Your Family MD	http://www.yourfamilymd.com/
Your MD	https://www.yourmdmequon.com/
Your Personal MD	http://www.yourpersonalmd.net/
Your Wellness MD	http://www.yourwellnessmd.net
YourChoice Direct Care	http://www.yourchoicedirectcare.com/
Zia Access Healthcare	http://www.ziafamilyhealthcare.com/

Appendix B.

Large, Multi-site Practices without Provider Names Online Not Included in Study

Strada Healthcare	http://www.stradahealthcare.com
Proactive MD	http://proactive-md.com/
PeakMed Primary Care	https://peakmed.com/
Paladina Health	http://www.paladinahealth.com/
Nextera Healthcare (Digital Globe)	http://www.nexterahealthcare.com/
Irmo Primary Care	http://irmopc.com/
Iora Primary Care	https://ioraprimrycare.com/
R-Health Voorhees	https://www.r-health.md/

Vera Whole Health	http://verawholehealth.com/
HIPnation-PrimaryCarePlus	https://hipnation.com/
Primacare Direct	http://www.primacaredirect.com/
Appleton Clinics	https://www.appletonclinics.com/

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