2021

A Program Evaluation of Direct Primary Care: Assessment of In-Person Visits, Phone and Text Message Utilization by Age, Gender, Family Status, and Risk Stratification

Kyle Poss
Medical University of South Carolina

A PROGRAM EVALUATION OF DIRECT PRIMARY CARE: ASSESSMENT OF IN-PERSON VISITS, PHONE AND TEXT MESSAGE UTILIZATION BY AGE, GENDER, FAMILY STATUS, AND RISK STRATIFICATION

BY

KYLE POSS

A doctoral project submitted to the faculty of the Medical University of South Carolina
in partial fulfillment of the requirements for the degree
Doctor of Health Administration
in the College of Health Professions

Abstract

Direct Primary Care (DPC) is one of the fastest growing models of care innovation in the United States. Despite such dramatic growth and national policy support, there is little to no research available to help understand this model. The purpose of this program evaluation is to better understand the emerging model of DPC as it is being delivered across 8 participating DPC organizations. A retrospective, longitudinal analysis has been performed utilizing electronic health record, telehealth, and membership data from full-years 2018 and 2019 to identify utilization patterns across stratified DPC patient populations. Patient records will be stratified by gender, age, risk, and family status to assess physical and virtual utilization patterns and statistically significant differences between each population segment. This evaluation was conducted to help direct primary care clinics better understand the staffing and technological resources required to best manage and care for their patient panels, better anticipate resource constraints when onboarding new patients, and better identify appropriate patient panel sizes.

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1 Chapter 1: Introduction

1.1 Background and Need

The purpose of this program evaluation is to better understand the emerging model of direct primary care (DPC) as it is being delivered across 8 participating DPC organizations. DPC is defined as "a primary care practice that

(1) charges a periodic fee for services,

(2) does not bill any third parties on a fee-for-service basis, and

(3) any per-visit charges are less than the monthly equivalent of the periodic fee" (Eskew & Clink, 2015). Essentially, instead of billing health insurance by submitting claims for medical services reimbursement, DPC physicians charge patients a flat monthly premium. Like a Netflix subscription for primary care. This change in reimbursement drastically reduces administrative oversight and effort needed to collect payment, allowing primary care providers more time and flexibility in how they manage their patients. Simultaneously, removing billing and insurance related (BIR) activity allows DPC practices to also drastically cut practice operational costs; no longer needing the staff and information systems dedicated to BIR.

These cost and time savings in DPC are passed on to patients to make access to primary care simple. DPC is transparently priced. Provider and patient flexibility allows for a more focused effort on long-term, proactive care needs instead of quick, short-term fee-for-service visits. Longer visits, less administrative burden, more flexibility in how care is accessed and provided, and complete transparency in pricing should also improve patient-provider relationships and satisfaction. In turn, if DPC positively impacts cost, access, the amount of care provided, and provider and patient satisfaction, overall quality of care and population health might also benefit. In summary, the model of DPC has potential to positively impact each of the

four pillars of the Quadruple Aim of improving patient experience, population health, cost of health care, and provider burnout within U.S. healthcare (Bodenheimer & Sinsky, 2014).

These potential impacts of DPC on cost, quality, patient satisfaction, and provider satisfaction have led to dramatic growth in DPC across the country. In 2015, researchers mapped 273 DPC clinics across 39 states in the U.S. (Eskew & Klink, 2015). Using the same mapper in February of 2021, 1,448 clinics are now spread across 49 states, an explosive increase (DPC Frontier Mapper, 2021). Amplifying support has come from Federal, State, and CMS policy support, and from large employers contracting with physicians directly to care for their workforce (McLellan, 2017). As of 2020, 32 states have passed laws clarifying the role and scope of service of DPC (Direct Primary Care Coalition, 2020b). On the Federal level, two White House Executive Orders, proposed bills in the U.S. House of Representatives and U.S. Senate, and from creation of new alternative payment models by the Centers of Medicare and Medicaid Services. In this time, we have also witnessed employers, hospitals, and health insurance companies creating or partnering with their own individual DPC clinics.

Problem Statement

Although there are many potential positive impacts of DPC, there are also many potential negative impacts. Despite such dramatic growth and national support, there is little to no research understanding the strengths and weaknesses of this model of care. Public health stakeholders and policy makers need to better understand the strengths and weaknesses of the model, yet, to date, no such body of evidence exists. Currently, all attempts at publishing DPC data appears to be circumstantial or for commercial endeavors only; these attempted studies offer no methodology or transparency in how they were conducted and measured. To date, no peer-reviewed study has been published. We do not know what the impacts of DPC are on healthcare costs, quality of

care, access to care, provider satisfaction, patient satisfaction, patient panel sizes, low socio-economic populations, overall healthcare staffing, appropriate membership pricing, financial sustainability of these clinics, and much more. All are important questions currently unanswered.

For this specific program evaluation, because these DPC clinics no longer work with insurance companies or CMS, they are no longer required to measure and submit quality or utilization metrics. However, the participating clinics in this program evaluation believe measuring and improving quality of care is still critical to best serve their patients. Through a data driven approach to understanding utilization patterns, this program evaluation aims to help the participating DPC clinics identify and predict utilization in different patient populations. These clinics will use these insights to fine tune quality improvement, patient care management, appropriate subscription pricing, staffing needs, and technology requirements to best manage their patients and operations.

1.2 Significance of the Current Program Evaluation

Considering the national reach and growth trajectory of DPC, DPC and public health stakeholders need to better understand the realized benefits and harms of so many primary care providers moving towards DPC. Some of the key questions to answer revolve around access, utilization, quality, cost, and patient and provider satisfaction. This specific evaluation will focus on just one of these aspects, utilization, to begin growing a body of evidence. Initiating the participating clinics' journey towards data driven clinical and operational excellence.

1.3 Program Evaluation Objective and Aims

The aims of this study are to observe physical and virtual utilization patterns across unique population segments for patients who participate in "Direct Primary Care" (DPC) of 8 individual DPC organizations. There are three primary questions we aim to answer.

1. What is the average amount of physical utilization among patients utilizing DPC, both in-office primary care visits and quick nurse visits?
2. What is the average amount of text and phone utilization among patients utilizing DPC?
3. Are there statistically significant differences in physical or virtual health utilization patterns across different populations segments when utilizing direct primary care? Populations will be segmented by age group, gender, family status, and risk.

Physical utilization will be measured through in-office primary care visits with a physician or mid-level provider, and nurse visits. Virtual health will be measured using text message and phone call data. In answering these questions, participating clinics aim to glean the following insights:

- Better understand and predict appropriate utilization of DPC for patient populations.
- Better understand appropriate telehealth utilization and access, including the advent of text messaging allowing continuous communication between patients and care teams.
- Predicting staffing needs for current patient panels and future business development growth strategies.
- Better understand which, if any, patient population segments DPC is more appropriate for, and which, if any, patient populations DPC is not appropriate for.
- Better calculate ideal membership pricing for clinic financial stability.
- Begin implementing a data driven approach to clinical and operational excellence.

1.4 Population

A consolidated, deidentified patient data set from 8 unique DPC clinics is being used for this study. These clinics are disparate entities spread out across 7 states. 4 clinics in the Southeast, 2 in the Southwest, and 1 in the Midwest. On average, these 8 clinics have been

operating since January 1, 2018 with the first clinic opening in 2015; the youngest clinic opening in 2019. The average active patient panel is 1,382 patients per clinic. Each of these clinics considers themselves a “Pure DPC”. They do not take health insurance in any form, including Medicaid and Medicare.

2 Chapter 2: Literature Review

This literature review aims to assess three main subjects. First, what literature currently exists on the model of direct primary care. Second, assess how other researchers have measured and evaluated in-person primary care utilization. Third, assess how have other researchers measured and evaluated virtual primary care utilization.

2.1 What is Direct Primary Care?

Direct Primary Care is defined as "a primary care practice that (1) charges a periodic fee for services, (2) does not bill any third parties on a fee-for-service basis, and (3) any per-visit charges are less than the monthly equivalent of the periodic fee" (Eskew & Clink, 2015, p. 793). Instead of billing health insurance companies and government programs for medical service reimbursement, DPC physicians charge patients an upfront, monthly premium. On average, this monthly premium is around $77.38 – $82.86 per patient, with higher premiums correlated to higher cost of living cities (Eskew & Clink, 2015; Hint Health, 2017). In return for the monthly subscription, patients receive unlimited access to their physicians and care teams through text, phone call, video chat, or same or next day in-person visits (KPI Ninja, 2020). However, not all DPC clinics are built the same. For example, some clinics may not provide text messaging or video chat. Certain clinics may also provide lower cost medications and various other services such as low-cost x-rays, labs, COVID-19 rapid testing, patient health education, and chronic conditions remote monitoring. Nextera Healthcare, a Colorado based DPC, provides the following table to describe their care services at a high level, while also including text, call, and video access (Table 1, KPI Ninja, 2020):

Table 1.

Nextera Healthcare DPC Services

Care Services Provided	
Acute and Chronic Disease Management	Women's Health
Allergy Testing and Treatment	Well Checks for Infants and Children
General Dermatology	Same Day Urgent Care Visits
Mental Health and Stress Management	On-site Workplace Patient Education
School, Sports and Workplace Physicals	Sleep Assessments
Sprains, Lacerations, and Broken Bones	Text, Phone, and Video Chat

2.2 Versions of Direct Primary Care

It is important to note there are different versions of Direct Primary Care. DPC clinics come in different shapes and sizes. They may have variations in services but they all revolve around primary care. They also may have different varying revenue schemes. Some DPC clinics only operate using the DPC revenue model, called a pure DPC, while other DPC clinics are a hybrid (DPC Frontier, n.d.). Whereas a pure DPC does not accept third party payment for any patients, a hybrid DPC has one cohort of patients utilizing the pure DPC reimbursement structure while another cohort of patients still utilizes traditional third-party insurance or government payer programs (Ibid.). This hybrid model is often seen in the start-up phase of a new DPC practice. As a new DPC clinic starts from scratch building their patient panel, they may choose to continue to see a cohort of fee-for-service patients to supplement their initially low DPC monthly membership revenue stream. As the DPC patient panel grows and revenue becomes more sustainable, DPC clinics may choose to phase out the fee-for-service patient panel, although there are still some who choose to keep both.

2.3 National Growth of Direct Primary Care

Direct Primary Care is spreading like wildfire. Over the past few years, DPC has grown from 273 clinics in 2015, to 1,448 in February of 2021 (DPC Frontier Mapper, 2021; Eskew & Klink, 2015). On average, DPC providers care for a panel of 445 patients (Busch et al., 2020). Because many DPC clinics have only opened in the past few years, they are young, and their patient panels may not yet be full. A recent survey of DPC clinics averaged a full patient panel target of 628 patients across respondents (Busch et al., 2020). Further fuel to the flame of national DPC growth continues to come from State, Federal, and CMS policy support, as mentioned above, and large employers contracting with physicians directly to care for their

employees (McLellan, 2017). A 2020 study by the Society of Actuaries survey of DPC physicians found about 25% of DPC patient populations belonged to employer contracts (Busch et al., 2020). What this means, is that employers sponsor and pay for the DPC membership fees for these patients, so that the DPC clinic may care for their workforce and families. In the case of the recent Nextera Healthcare study, these employers implement DPC to help reduce downstream high-cost claims, resulting in cost savings for their self-insured employee health plan (KPI Ninja, 2020).

Large health systems and national health insurance companies are also experimenting with DPC clinics. Examples of health systems with DPC programs include Johns Hopkins and CHI Health (CHI Health, 2020; Johns Hopkins Medicine, 2021). One hospital, Oregon Health and Science University, even had success implementing DPC as a part of their community benefit program for low income and uninsured patients, whose DPC monthly memberships were discounted depending on income levels (Saultz et al., 2010). Iora Health, a DPC practice geared towards Medicare Advantage patients with clinic locations across the country, received investment from Humana during a large round of funding, and also partnered with Humana to provide Medicare Advantage offerings to Humana members (Larson, 2018; Reuter, 2020). Blue Cross Blue Shield opened their own DPC clinic in Omaha, NE called Nurture Health in 2018, and has also partnered with Iora Health in at least two states to date (Cady, 2018; Reuter, 2020).

2.4 Distinguishing Direct Primary Care from Concierge Primary Care

When reviewing DPC literature, we found early DPC research articles struggling to differentiate DPC from concierge medicine. Some of these early DPC studies even considered the two models of care as interchangeable (Chappell, 2017). On the surface, DPC can be considered a form of concierge medicine. Yet the two models are not the same. Once the models

are compared, there are several important distinctions. Concierge practices charge higher membership premiums, still bill health insurance on top of these membership premiums, and traditionally cater towards high income patients; whereas DPC practices have more affordable membership rates, use the monthly premium as their primary revenue source, do not accept or bill insurance, and fees may be paid by either the patient or the patient's sponsor, such as an employer (American Academy of Family Physicians, n.d.a; Eskew & Klink, 2015).

2.5 Distinguishing Direct Primary Care from Employer On-Site Primary Care

As noted above, DPC groups often work with employers. For a DPC physician group, it can be easier to find one local employer population to care for rather than market to and sign hundreds or thousands of individual patients. However, when it comes to employer sponsored primary care, it is difficult for researchers to differentiate between a partnered DPC on-site or near-site for the employer from similarly structured primary care entities in different employer sponsored care arrangements. These employer primary care clinic structures come in all shapes and sizes. Some of these models are considered DPC, some are not. Two national examples are Paladina Health, a self-described DPC practice, and One Medical, a similarly structured employer onsite care clinic.

Paladina Health boosts the following features on their website:

- After recent acquisitions, Paladina expects to have 350 clinics across the country.
- Direct access to a PCP, longer visits, and 24/7 hour phone line for urgent care.
- Does not bill fee-for-service.
- No co-pay or co-insurance for patients.
- Telemedicine.
- Little to no wait time for scheduling and seeing a doctor.

- Convenient locations, including some employer on-site locations (DPC Mapper, 2021; Paladina Health, 2021).

The other example is One Medical. A publicly traded primary care network with over 90 locations across the country. The One Medical website states they offer all of the same benefits as DPC, yet they have a small annual membership fee and still bill insurance in some cases or bills the employer in other cases (One Medical, 2021a). Their website states that they are an employee benefit for over 7,000 companies (One Medical, 2021a). It is unclear as to what fee-for-service services One Medical bills to insurance or to the employer.

Other similar organizations include, Vera Whole Health, OnSiteCare Inc, Crossover Health, ChenMed, CareMore owned by Anthem, Marathon Health, Premise Health, ProactiveMD, and dozens, perhaps hundreds, of others. Tracking whether these organizations are pure DPC, hybrid DPC, or even a payment hybrid between DPC and traditional fee-for-service has proven challenging. Further, although a distinction between DPC and concierge medicine can be found in the literature, a distinction between DPC and employer on-site care cannot be found. We consider the inability to distinguish DPC from employer near-site and on-site care as a data limitation in our literature review.

2.6 Federal and State Policy

Although it is not entirely clear when DPC first began, two of the earliest pioneers are Dr. Brian Forrest and Dr. Garrison Bliss. Dr. Garrison Bliss founded Seattle Medical Associates in 1997, which eventually grew the headline capturing clinic, Qliance, while Dr. Brian Forrest founded Access Healthcare in 2001 in Apex, NC (John Locke Foundation, n.d.; Von Drehle, 2014). As the model developed by DPC pioneers continued to grow, concerns of ethics, legalities, and policies around this model arose (Chappell, 2017). A legal study in 2017 describes

four main concerns which arose from outside parties which are: insurance categorization and regulations, patient discrimination, patient abandonment, and access to care (Ibid). Because of these growing concerns, DPC proponents began lobbying for legal definition, clarification, and protection to set precedent for what exactly DPC is and how it may operate. For added motivation to get DPC legal protections in place, a Washington State insurance commissioner in 2007 declared concierge practices, which included DPC, should be regarded and regulated as insurance companies (Ibid). Such classification would require DPC's to follow the same operating requirements as a health plan, such as maintaining a minimum net worth of $150,000,000 in order to operate; an unreasonable requirement for individual doctors trying to practice medicine in their own clinic (Ibid).

Since 2006, when the first DPC state law was passed in West Virginia, 32 states have now passed some form of legislation providing clarity of structure and practice of DPC, with another 12 states awaiting pending legislation as of 2020 (Chappell, 2017; Direct Primary Care Coalition, 2020b). The primary purpose of these laws are to help clarify DPC's legalities, scope of practice, determine if DPC would be treated and regulated by state insurance commissioners, define consumer and patient protections, specify maximum membership charges allowed, and in some instances, birth DPC pilot programs for populations such as Medicaid or government employees (Chappell, 2017; Direct Primary Care Coalition, 2020b). The DPC Frontier, a DPC advocacy group, rates each state legislation as good or bad. At the time of this writing, only one state's legislation, Oregon, is labelled as "bad" in the eyes of this group (DPC Frontier, 2020c). The DPC Frontier's reasoning is that Oregon state law does not distinguish DPC from insurance or concierge medicine; the law provisioned the Oregon Department of Insurance the ability to oversee DPC practices; and DPC practitioners must obtain a unique license and registration to

operate a DPC arrangement (DPC Frontier, 2020b). The advocacy group believes this is unnecessary bureaucracy. Comparatively, the states rated as "good" clarify that DPC is not insurance, clarify patient protections, and do not require any sort of DPC registration or special governance (DPC Frontier, 2020a).

At the federal level, DPC legislation has moved much slower. The initial federal legislative framework comes from a tiny blip in the Affordable Care Act, which simply permits qualified direct primary care medical homes to exist (Chappell, 2017). Since that time, there have been several proposed rules, legislative efforts, and Presidential Executive Orders in favor of DPC. However, to date, none have passed through all policy hurdles required to enact. Each of these proposed federal changes, including Donald Trump's Executive Order on Price and Quality Transparency in 2019 (Exec. Order No. 13877, 2019), proposed congressional bills in both the House of Representatives (H.R. 3708) and Senate (S.2999) titled "The Primary Care Enhancement Act" (H.R. 3708, 2019; S.2999, 2019), and a second President Trump Executive Order in 2020 (Exec. Order No. 13951, 2020), have all aimed towards adding further legal clarifications and protections, which might allow the free market to further expand DPC. The primary targets of these proposed federal laws are amendments to Internal Revenue Service (IRS) classifications of what DPC is and how health savings account (HSA) holders may engage in DPC for tax purposes.

First, proposed legislation to amend the Internal Revenue Code to ensure DPC is not classified as a health plan (H.R. 3708). Currently, the IRS considers DPC as a health plan, which disqualifies HSA users already covered by a high deductible health plan (HDHP) from utilizing DPC. For background context, the IRS has 4 requirements to be eligible for an HSA. The individual must be covered under a HDHP, have no other health coverage, not be enrolled in

Medicare, and is not claimed as a dependent by another tax filer (Internal Revenue Service, 2019). In the instance of DPC, the IRS classifies DPC as additional health coverage, or in other words, health insurance, which makes the HDHP individuals ineligible to use DPC. The comments of the IRS on the matter are as follows,

> "The Treasury Department and the IRS understand that direct primary care arrangements typically provide for an array of primary care services and items, such as physical examinations, vaccinations, urgent care, laboratory testing, and the diagnosis and treatment of sickness or injuries. This type of DPC arrangement would constitute a health plan or insurance that provides coverage before the minimum annual deductible is met and provides coverage that is not disregarded coverage or preventive care. Therefore, an individual generally is not eligible to contribute to an HSA if that individual is covered by a direct primary care arrangement" (Certain Medical Care Arrangements, 2020, p. 35402).

Lobbyists state DPC is providing only primary care related services as a contract, so it should not be considered a full health plan (Direct Primary Care Coalition, 2020a). Passage of this proposed legislation would clarify that DPC is not health insurance, which would allow HSA and HDHP individuals to use DPC. Essentially allowing these individuals access to enhanced primary care yet still keeping a HDHP for wrap around insurance coverage and an HSA for outside medical expenses or investment.

In addition to federal legislation, the Centers for Medicare and Medicaid Services (CMS) continue to release and experiment with new types of alternative payment models. Most recently, CMS has released a handful of model options called "Direct Contracting" which are similar to DPC. The Direct Primary Coalition had this to say about these new models,

> "While the Primary Care First Payment Model will not exactly mirror the Direct Primary Care model, it represents an important step by CMS in support of delivering primary care outside of the fee-for-service structure. The incoming Biden Administration will inherit the operational aspects of this and we expect ongoing dialogue on future iterations of the model. The model will be adopted by 916 primary care practices and 37 regional partnerships with commercial, State, and Medicare Advantage plans across 26 regions as of January 1, 2021. The model includes a flat, primary care visit fee based on population outside of traditional administrative requirements and seeks to provide participants with performance transparency." (Direct Primary Care Coalition, 2019, para 1).

Because these Direct Contracting models are so new, it is not yet clear what the differences are between DPC and Direct Contracting; yet it appears they are somewhat related.

2.7 Removing Billing and Insurance Related Activity

Changing the reimbursement mechanism from fee-for-service to a monthly subscription significantly reduces the administrative effort required to collect payment, known as billing and insurance related activity (BIR). By changing the reimbursement structure, DPC physicians are no longer required to submit a claim for each service they provide. They also no longer rely on prior authorization or reimbursement policies and processes of individual health plans. In short, by removing BIR, DPC organizations have more time and flexibility as to who provides care, how they provide care, what care they provide, and where care is provided.

BIR is generally defined as the labor and capital needed to move money between payers and providers. On the provider side, this consists of activity such as: validating patient insurance, coding and submitting claims, prior authorizations, managed care contracting, payment processing and disputes, and more (Jiwani et al., 2014; Kahn et al., 2005; Sakowski et al., 2009).

In fee-for-service, for every full-time physician, about 0.67 full-time employees work on BIR activity (Sakowski et al., 2009). Alongside staffing, providers also spend money on software and information systems to assist with coding, billing, and revenue cycle management.

In 2012, the U.S. healthcare system spent an estimated $471 billion on BIR activity, almost 17 percent of the total 2012 National Health Expenditure (NHE) of $2.8 trillion (CMS, 2017; Jiwani, Himmelstein, Woolhandler, & Kahn, 2014). A recent study within a large academic medical center used time-driven activity-based costing accounting to calculate an estimated $20.49 in BIR staff and processing costs per primary care visit (Tseng et al., 2018). However, there are a number of data limitations and methodology factors which likely drive this estimated number even higher. For example, large BIR costs were not included such as payor contracting, adding employee benefits costs on top of wages, time spent training physicians on billing needs, and information systems for insurance eligibility tracking, claims submissions, and revenue cycle management (Ibid).

Notably, defined BIR also does not include quality improvement activity, which is increasingly becoming more embedded within BIR activity due to the growing movement of value-based quality payment programs (American Academy of Family Physicians, n.d.b; Healthcare Payment Learning and Action Network, 2018). These value-based quality payment programs add quality improvement into the contracting and reimbursement process, as well as extensive health information systems to extract and measure quality for value-based quality payment reporting and reimbursement. If quality and the information systems required to operate quality payment programs were included in BIR, this also would add significant time and money for providers to operate BIR requirements.

In an overall assessment of BIR in the United States, Jiwani et al., observed the

complexity of our current payment system is one of the largest drivers of BIR burden, "reducing BIR costs by adopting a simplified financing system would provide substantial recurring savings and produce an unequivocal benefit from a societal perspective" (2014, p. 7). This complexity is in part driven by the numerous and disparate health insurance plans that providers must interact with, each one having unique contracts, coverage, plan design, processes, policies, and reimbursement rates (Ibid). Navigating this complexity is a task shared by both the provider and the patient. Direct primary care removes this complexity by billing patients, or their plan sponsor such as an employer, directly, via a monthly subscription through an automated payment system. By removing the administrative time, cost, and information systems required for fee-for-service and quality payment programs from BIR activity, DPC can significantly reduce overhead.

2.8 Potential Benefits of Direct Primary Care

Although there are no peer-reviewed research studies on DPC, proponents publicly share theories as to the benefits of DPC. There are four main categories described, each aligning with the four goals of the quadruple aim. These categories are: benefits for the provider, benefits for the patient, improved quality, and lower cost.

2.8.1 Benefits for the Provider

Physician burnout is well documented in the U.S. healthcare system and has a direct correlation with the amount of time spent on administrative duties (Rao et al., 2017; Tawfik et al., 2019). Reducing administrative burden and oversight and allowing more flexibility in how to care for patients, should reduce a considerable portion of the stressors and frustrations providers have with the current system, enhancing provider satisfaction. DPC providers can be more flexible in how many patients they manage, how long they see patients, how they provide care, what kind of care they provide, the role and scope of support staff, and use only the technology

systems they find most valuable. In the fast-moving world of today, flexibility, nimbleness, and autonomy is valuable. DPC offers these traits.

Flexibility of care also extends into specialist and technology supplemented care, broadening a DPC physician's ability to care for patient needs, if they choose. Examples of broadening scope of care include using machines to document and assess skin moles for cancer, checking heart health with EKG's, providing mental health support, intravenous therapy, weight management programs, using and discussing fitness tracker data, discussing nutrition, shared medical visits for patient groups, and more depending on how the clinic is structured. Last, through use of specialist consulting services, such as RubiconMD, DPC physicians can consult with more than 120 specialties about patient needs instead of referring patients to schedule an entire appointment with a specialist at a higher cost.

Another perk for providers moving to DPC, is the opportunity for better work-life balance. A survey by the AAFP found that the average target panel for DPC physicians is around 600 patients, drastically lower than the estimated 1,200 to 1,900 patient panels seen in traditional primary care studies (Martin, 2018; Raffoul et al., 2016). Having fewer patients offers DPC doctors easier hours, if they choose, and more time with patients, allowing them to build stronger relationships and take the time each patient needs instead of rushing to the next appointment. Yet despite the significant drop in patient panel size, DPC practitioners state they make similar money as they did in traditional primary care. In a Facebook post, Dr. Josh Umbehr, CEO of AtlasMD, a DPC network operated in Wichita, KS, states their DPC doctors make $200,000 per year plus benefits for 600 patients (Umbehr, 2021). In his book, "The Official Guide to Starting Your Own Direct Primary Care Practice", Dr. Douglas Farrago, located in Lynchburg, VA, states a DPC physician can make $240,000 per year (Farrago, 2016). Comparatively, traditional

primary care physicians are estimated to earn between $208,000 and $237,000 per year, on average (U.S. Bureau of Labor Statistics, 2019; Medscape, 2019).

2.8.2 Benefits for the Patient

For the patient, DPC is simple. Payment is transparent and upfront. Access to a physician is quick and direct. Patients can access their care team wherever and whenever via text messaging, phone, e-mail, or quick access visits without a waiting room. Many of the same benefits for the provider listed above also benefit the patient. Clinical teams can put more time and energy to focus on preventative medicine through longer visits for whole person health. Increased patient-centered care, and having access to a consistent source of care in a timely manner, are shown to improve health outcomes, reduce downstream utilization with specialists visits and hospitals, and in turn, lower overall costs (Bertakis & Azari, 2011; Klemes et al., 2012; KPI Ninja, 2020; Petterson et al., 2009; Uscher-Pines et al., 2013). Longer visits means patients can discuss all medical concerns instead of just discussing pressing concerns.

2.8.3 Cost and Quality Benefits

By removing the overhead associated with BIR, DPC clinics immediately shave off money from their operational costs. Savings which can be passed on to the patients. More patient-centered care, improved access, and more time spent on preventative, proactive care may help further reduce expensive downstream care needs such as specialists, surgeries, emergency visits, and admissions. This model of care also allows for routine touch points, such as a weekly text message to check in on patients to answer questions on medications, have a patient send a blood pressure or diabetes reading and monitor their chronic conditions, or to be in continuous touch if a patient undergoes something more serious such as an emergency, an admission, or a surgery. These quick touch points should assist with chronic condition monitoring, medication adherence

and safety, and readmissions.

2.8.4 Non Peer-Reviewed Studies

A handful of commercially published studies of DPC claim lower overall costs, emergency room visits, admissions, and specialist visits for DPC patient populations compared to fee-for-service populations (KPI Ninja, 2020; Qliance, 2015). An example, of these studies mentioned includes a press release by Qliance. In the press release, Qliance analyzed two years' worth of medical claims data and found 20% in cost savings for patients choosing DPC over the study comparison cohort of non-DPC patients (Qliance, 2015). A laudable feat, if true; however, this study does not have rigorous or transparent methodology, does not risk-adjust the cohort populations being analyzed, is not peer-reviewed, and has a clear conflict of interest.

Other commercial studies come from Nextera Healthcare and Chen Med. In 2020, Nextera published a case study which found $913 in Per Member Per Year savings when comparing Nextera DPC patients to a cohort of fee-for-service patients they claim is comparable (KPI Ninja, 2020). The main cost savings drivers in this study stemmed from significant reductions in urgent care, emergency, inpatient, and outpatient visits for the DPC cohort. However, again, this study does not have transparent methodology, is not peer-reviewed, and has conflicts of interest. ChenMed, a DPC type organization which focuses on high-risk senior care, claims their model of high touch primary care has helped lower hospital admissions in seniors by 50%, in turn lowering per member healthcare costs by 28% (Meyer, 2018).

On the academic side, a 2015 Master's degree thesis studied the use of a Direct Primary Care model to help care for uninsured patients using a monthly membership fee as a part of a hospital system's community benefit program. Members in this program paid for their membership via a sliding fee based on the members income level and chronic conditions, with

some members receiving up to four months of DPC for free. This study evaluated the impacts of DPC on downstream utilization and costs, and found a 37% reduction in emergency department encounters, a 64% decrease in inpatient admissions, and a 220% increase in outpatient and ancillary encounters (Degnin, 2015). Though it is not clear what is included in the outpatient and ancillary encounters category; this substantial increase may come from areas such as labs, pharmacy, imaging, therapy, and care management, which may overestimate the use of actual care provided.

2.9 Potential Arguments Against Direct Primary Care

Direct Primary Care is very young. Too young to have a foundation of peer-reviewed research to demonstrate short-term or long-term impacts of DPC on cost, quality, health outcomes, or patient satisfaction. Nor do we know how financially viable this model of care reimbursement really is. Notably, one of the early pioneers and lauded headline names of DPC, Qliance, declared bankruptcy in 2017 after touting a decade of operations in the Seattle, Washington area (McGrane, 2017). The bankruptcy of Qliance is a concerning event and indicates financial risk for DPC practices if they over-extend themselves. In addition to financial viability, there are other questions and concerns yet to answer. Examples of these concerns include:

- DPC may further fragment an already fragmented US healthcare system.
- DPC may further incentivize physicians to accept healthy, wealthy patients, and disregard low socioeconomic populations, Medicare, and Medicaid patients; further harming health equity (Adashi, Clodfelter, George, 2018).
- The current trend of DPC is to shorten patient panels compared to fee-for-service, this may exacerbate primary care physician shortages (Adashi, Clodfelter, George, 2019).

- DPC clinics come in all shapes and sizes. If one clinic is successful, it does not guarantee another clinic would also achieve success.
- There is no clinical reporting in DPC to determine what care, or what kind of care, is being provided. The quality of care provided by DPC physicians is unknown, and DPC physicians are not held accountable (2018). This could lead to bad-actor physicians swindling patients out of money or providing inappropriate care.
- We do not know the most appropriate or inappropriate patient populations to utilize DPC. Different populations require different levels of care. Chronic disease management patients may be appropriate for DPC, or they may be too difficult or timely to manage for small clinics without support staff. Whereas, a healthy, young college swim team may be too healthy for DPC to make financial sense, especially if sponsored by an employer thinking it could help them save money.
- For individual and employer patients, DPC is often paired with a wrap-around health insurance plan. Any potential cost savings may be confounded by the health plan design, which is known to already help lower healthcare costs when requiring patient cost share (Agarwal, Mazurenko, Menachemi, 2017). Further, as mentioned above, the IRS currently defines DPC as its own health plan, so patients and employers need to monitor these policy efforts, especially if they hold a HDHP.
- Through removing co-pay and co-insurance, promoting nearly unlimited primary care, and having nearly unlimited access to care teams via telehealth, patients could be incentivized to obtain too much care, placing significant burden on DPC staff. Also known as moral hazard (Einav and Finkelstein, 2018).
- By no longer submitting claims, DPC inhibits the ability of health plans to monitor

population risk which they use for actuarial analysis to determine premium rates.

- Although DPC physicians still would need to carry the same licensures and insurance around practicing medicine and medical malpractice, DPC clinics could be open to higher legal and lawsuit risk through the additional services provided and from contracting directly with patients instead of third-party health plans.
- DPC clinics are low in capital and may not invest as heavily into technology information systems for population health, data sharing, and care management, leading to them falling behind compared to health systems who are making substantial information system investments.

2.10 Direct Primary Care Clinical Studies

Literature on the model of DPC is lacking in general. To date, the majority of DPC oriented articles focus mainly on legalities, definition, distribution, and the reimbursement structure of DPC. There is a host of editorial and commercial analysis claiming cost savings, higher quality, and higher patient and provider satisfaction; however, these without rigorous methodology and peer-review, these are merely professional opinions or marketing materials. There currently is no peer-reviewed evidence to evaluate these claims. As the model of DPC continues to expand across the country and receive policy support, this lack of DPC research is a growing concern.

From the current DPC literature, what is known so far are the legalities, definition, distribution, and operational structure of DPC. Currently, literature defines DPC, differentiating DPC from concierge medicine, and discussing average membership costs (Bunker, 2012; Eskew & Klink, 2015; Palumbo, 2017). One study provides an ongoing framework to measure practice distribution across the country, which can be used today to measure national growth over time

(Eskew & Klink, 2015). Additional literature provides initial federal and state legal reviews of laws clarifying what DPC is and how it may legally function (Chappell, 2017). In summary, when reviewing the literature, all that is known about DPC is that it exists, that it is not concierge care, and what legal boundaries and protections are codified in law. What is not known are the impacts of DPC on utilization patterns, patient health outcomes, cost of care, patient satisfaction, and provider satisfaction. From a public health and policy perspective, these questions are much more important to answer.

Only one study, to date, provides a statistical analysis specific to DPC patient data, "Modeling the Personas of Primary Care Communication Modality Usage: Experiences from the R-Health Direct Primary Care Model" by Sun et al., in 2019. However, this study only looked at differences in patient personas of patients who utilized physical care more than virtual care compared to patients who utilized virtual care more than physical care. This study did not provide overall utilization patterns, nor did it compare DPC against any outside comparison group. One interesting find in this study demonstrated that a change in health status within the last 6 months lead to predicted increased utilization of primary care (Sun et al., 2019). So, in summary, there is no evidence showing either positive or negative impacts of DPC.

2.11 Traditional Physical Primary Care Utilization Literature

A first step in building an understanding of DPC is evaluating primary care utilization as a whole for patients utilizing this model, both physical and virtual. Since no other DPC study has specifically looked at utilization patterns, we performed a literature review of utilization patterns and metrics in traditional primary care. Despite lack of research specific to DPC primary care utilization, there are many studies on utilization patterns in normal primary care settings which we can use for guidance. These studies typically use retrospective medical claims or electronic

health record (EHR) databases to track primary care utilization, then performed descriptive and statistical analysis to help answer study specific research questions (Beehler et al., 2013; Kurtzman and Barnow, 2017; Weigel et al., 2016). Some of the common metrics these studies use are patient demographics; count of primary care visits, labs, diagnostics, medications, and referrals; and use of statistical analysis models to compare these metrics across different population segments (Basu et al., 2020; Beehler et al., 2013; Kurtzman and Barnow, 2017; Weigel et al., 2016). Metrics are often converted into either a per patient average or a per 1,000 average, such as 0.5 visits per patient or 500 visits per 1,000 patients. Additional metrics regarding primary care often revolve around care quality or downstream utilization, such as: blood pressure measurement and care, use of influenza vaccines, cholesterol measurement and care, colonoscopy, depression treatment, smoking cessation, emergency room visits, inpatient admissions, and outpatient visits (Kurtzman and Barnow, 2017; Meyers et al., 2019; Vaidya et al., 2012).

The specific methods of these primary care utilization studies vary depending on the data available and research question, but the processes and metrics are similar. Regardless of data source, EHR or claims, these studies analyze data in a similar manner to identify the primary care utilization across groups of interest (Table 2). The evolution and quantity of these studies have grown in lockstep with ease of access to patient health data. As EHR, telehealth, and claims data becomes more available and better structured for data analysis, researchers can more easily ingest large quantities of data, identify practice patterns, and identify changes in lab values, vitals, and health status. The statistical analysis in primary care studies often looked into visit counts adjusted by age, sex, visit type, count of chronic conditions, chronic condition category and severity, provider type, additional services used during these visits such as labs or pharmacy,

or reason for visit depending on the data available. (Table 2).

The subjects of these studies vary. Ranging from high level, overall primary care utilization, to smaller scale specific program evaluations. For example, one study projecting primary care workforce demand used a nationwide sample of patients to find that on average, civilian, noninstitutionalized patients see a primary physician 1.60 times per year (Petterson et al., 2012). Perhaps the most appropriate study for our purposes looks at a new way to measure primary care utilization, using a metric titled "Accumulated Annual Duration of Time" which takes into account not only visit count but also visit duration (Nathan, Cohen, & Vinker, 2017). Notably, the study does not say how visit duration was measured. The authors state use of the EMR for data collection but did not specify how time duration was measured (Ibid).

There are two reasons why this method of measuring primary care utilization is more appropriate for DPC to follow. First, some primary care visits can be as short as 5 minutes, while others are up to 60 minutes. This is a drastic difference in care received. Second, research has shown increased primary care visit duration correlates to improved quality and patient health outcomes (Landau et al., 2008; Nathan, Cohen, and Vinker, 2017). This metric of primary care duration is important for DPC. Without the administrative needs required for third-party claims reimbursement, DPC clinicians can provide visits which are both shorter and longer than fee-for-service primary care. DPC proponents like to claim they provide longer visits, but this claim has not been proven. Measuring Accumulated Annual Duration of Time will help them do so.

Table 2.

Primary Care Utilization Studies Reviewed

Article Title	Authors	Year Published
Utilization and Cost of an Employer-Sponsored Comprehensive Primary Care Delivery Model	Basu et al.	2020
A new marker of primary care utilization - annual accumulated duration of time of visits	Nathan, Cohen, and Vinker	2017
Primary care utilisation patterns among an urban immigrant population in the Spanish National Health System	Calderón-Larrañaga et al.	2011
Health service utilization patterns of primary care patients with osteoarthritis	Rosemann et al.	2007
Impact of a chronic disease self-management program on health care utilization in rural communities: a retrospective cohort study using linked administrative data	Jaglal et al.	2014
A Comparison of Nurse Practitioners, Physician Assistants, and Primary Care Physicians' Patterns of Practice and Quality of Care in Health Centers	Kurtzman and Barnow	2017
Multimorbidity, health care utilization and costs in an elderly community-dwelling population: a claims data based observational study	Bähler et al.	2015
Gender Differences in Utilization of Preventive Care Services in the United States	Vaidya, Parha, and Karmakar et al.	2012
Association of Team-Based Primary Care With Health Care Utilization and Costs Among Chronically Ill Patients	Meyers et al.	2019
Retail Clinic Utilization Associated With Lower Total Cost of Care	Sussman et al.	2013
Retail Clinic Visits and Receipt of Primary Care	Reid et al.	2013

2.12 Traditional Telehealth Utilization Literature

In addition to physical in-person care, DPC also provides patients with access through various telehealth options. Although the services provided by each individual DPC clinic may vary, DPC clinics often provide virtual access to care via text messaging, electronic mail, phone calls, and video chat all through an application on a patient's mobile phone. These supplemental telehealth services allow for easier communication connecting patients and providers, quick status updates between in-person visits, and ongoing care continuity. Additional benefits of telehealth include:

- Helps patients reduce travel time,
- Allows additional access to the care patients need no matter where they are,
- Reduces time required to take off from work,
- Can be made available any time of day,
- Can be used for both acute care and long term care such as chronic condition remote monitoring,
- Photo and video messages can help a provider determine if more care is needed for wounds or physical concerns,
- Is increasingly available through individual mobile phones (Ashwood et al., 2017; Dorsey and Topol, 2016; Gordon, Adamson, and DeVries 2017).

Within these studies, utilization metrics measured include count of physical visits, count of phone calls, count of email or website portal messages, count of virtual video visits and count of text messages (Ibid).

The application of telehealth for chronic condition care management is a great example of how telehealth helps supplement in-person care. Using diabetes as an example, research has

shown that the progression of diabetes can be mitigated through well-designed care management programs (Wu et al., 2018). More recent evidence supports the use of routine virtual remote monitoring as a part of these care management programs of blood glucose and blood pressure can play a convenient role for the patient and the provider (Randall et al., 2020). In DPC, a diabetic patient can simply text their provider their readings or device measurements on a weekly basis, and the provider can dose adjust their treatment plan virtually or schedule an in-person meeting if more touch is needed. Although this virtual care does not fully replace in-person care, it is a great supplemental tool. In the case of chronic care management, supplementing in-person care with telemedicine has been preliminarily shown to help improve health outcomes for hemoglobin A1c, blood pressure, and cholesterol (Wu et al., 2018).

As for how DPC practices might use telehealth, we look to a case study published by Nextera Healthcare in 2020. Nextera states that their DPC members have unlimited access to virtual health services, which includes clinician and care team interactions through text messaging, photos, phone calls, and video calls (KPI Ninja, 2020). These services are included in the DPC membership. Nextera then further provides specific examples of virtual health use cases. These include:

- Urgent care communications, such as for a rising fever or a joint sprain,
- Sending prescriptions to a nearby pharmacy,
- Health system navigation to direct patients to the correct care needs,
- Chronic condition remote monitoring,
- Following up on serious health events, such as a surgeries or admissions,
- Continuous remote coordination of care,
- Access outside of office hours (Ibid).

Essentially, depending on the patient, Nextera health is able to tailor the type of virtual care provided based on patient needs. Without having to submit claims for each service or communication, DPC allows more freedom and flexibility in how virtual care is used.

2.13 An Analogue to DPC: One Medical Studies

Although there is limited research surrounding DPC specifically, there have been studies on similar models of primary care. For example, One Medical, a California based network of on-site and near-site clinics, does not label itself as either Direct Primary Care or concierge care (One Medical, 2020a). The payment structure is different than DPC but the type of care provided is described as similar. These model similarities are listed below in Table 3. In the case of the program evaluated by Basu et al., a clinic was located on-site at the employer's facilities to provide enhanced primary care to patients at no cost or co-payment to the patient (Ibid.). The article states additional costs for on-site care were subsidized by the employer. One Medical also provided a network of additional near-site clinics; however, the near-site clinics charged co-payment and co-insurance fees to the patients (Ibid.). All virtual care was provided at no cost to the patient (Ibid.). The main difference between this arrangement and DPC, is that this clinic is still billing either the employer or insurance for care on top of the patient membership fee, listed as $199 annually on their website (One Medical, 2020b).

Table 3:

Direct Primary Care Versus One Medical Model Comparison

Category	**Direct Primary Care**	**One Medical**
Subscription Membership	X	X
Bills Insurance		X
On-Site Care	In some cases	X
Near-Site Care	X	X
Includes Virtual Care	X	X
Virtual Care Nights and Weekends	In some cases	X
24 Hour Virtual Care	In some cases	X
Preventative Primary Care	X	X
Acute Primary Care	X	X
Disease Management	X	X
Physical Therapy	In some cases	X
Mental Health	In some cases	X
Same or Next Day Appointments	X	X
Patient Satisfaction Surveys	In some cases	X

In this recent 2020 study, Basu et al., evaluated the impact of the enhanced primary care provided by One Medical to the SpaceX employer population through their on-site and near-site clinics (Basu, et al., 2020). One Medical provided enhanced primary care to patients at no cost or co-payment for on-site care but charged co-payment and co-insurance for near-site utilization (2020). The employer was billed for on-site care while insurance was billed for near-site care. So although it has some commonalities with DPC, the One Medical model does have distinct differences. Ultimately, the findings of this study point to One Medical patients had lower total medical spend, largely stemming from lower emergency visits and hospital visits, despite having higher primary care spend (Ibid). However, this research team also stated these findings are not conclusive, as lower spend may stem from the One Medical population potentially consisting of lower risk patients.

One important special interest from this study for future DPC research was how member months were calculated. Because DPC is a subscription-based service, researchers need a plan for handling members who terminate their subscription and would become study drop-outs. In the Basu study, researchers used a mean of member months for average length of enrollment.

2.14 Recapitulation

In summary, DPC is a new, yet growing model of care. To date, available research on DPC is lacking. What research does exist mostly focuses on the definition of DPC, its legalities, and differentiating it from other concierge care models. Unfortunately, although we can safely classify DPC and concierge medicine as two different methods of practice, it becomes more difficult to differentiate DPC from the various models of employer on-site and near-site care. Because there are so many different shapes, sizes, and reimbursement structures in employer on-site care, we were unable to find clarifying literature around the definitions and differences in

various versions. For example, Paladina is a large DPC network, whereas One Medical, albeit similar, has differences which result in us classifying One Medical as not DPC. Most importantly, as of today, there is little to no available research or program evaluations on the impact of DPC on clinical, financial, patient and provider satisfaction, or health outcomes.

3 Chapter 3: Methodology

3.1 Specific Aims and Hypotheses

The aims of this program evaluation are to observe physical and virtual utilization patterns across unique population segments for patients who participate in "Direct Primary Care" (DPC). A retrospective, longitudinal, observational design will be used to measure physical and telehealth utilization patterns of direct primary care clinic patients, stratified by age, sex, and risk. All patients who do not have at least 6 months of continued enrollment will be excluded from this study. There are three primary research questions we aim to answer in this program evaluation.

1. What is the average amount of physical utilization among patients utilizing direct primary care within these 8 participating DPC clinics? This will be broken out into two metrics, in-office primary care visits with a physician or mid-level provider, and nurse visits.
2. What is the average amount of virtual health (text and phone) utilization among patients utilizing these 8 participating DPC clinics?
3. Are there statistically significant differences in physical or virtual health utilization patterns across different populations segments when utilizing DPC? Populations will be segmented by age group, gender, family status, and risk.

Answering these questions will allow us to evaluate the service-mix at these 8 DPC clinics to help identify and predict utilization patterns in different patient populations. These participating

clinics can then use this information for quality improvement activity, and to fine tune patient care management, practice patterns, appropriate subscription pricing, staffing needs, and technology requirements to best manage their current patient populations and operational costs. This information will also assist these clinics better understand internal needs before expanding their patient panels or onboarding new patients.

3.2 Data Sources

A third-party analytics vendor has extrapolated patient data from 8 DPC clinics for calendar years 2018 and 2019. Three data sources were extracted for analysis for each clinic.

1. Electronic Health Records (EHR).
2. A telehealth data application which includes text messages and phone calls.
3. A membership and billing application which provides generic patient demographics, membership eligibility dates, and employer.

Prior to receiving this data for this program evaluation, patient health information was deidentified by the third-party analytics vendor using the Safe Harbor Method. All patient identifying information is removed, including patient names, phone numbers, address, and zip code. Date of birth was changed to a general age bracket, such as 48 – 64 years old. This deidentified data, and the activities of this evaluation, have been reviewed and authorized by the DPC clinics and third-party analytics vendor. Use of this data for program evaluation activities comply with the Permitted Uses and Disclosures for Health Care Operations rules of the Health Insurance Portability and Accountability Act which allows for quality assessment and improvement activities, and evaluating performance of providers (Permitted Uses and Disclosures: Exchange for Health Care Operations, 2016). Using the Medical University of South Carolina Quality Improvement and Program Evaluation Self-Certification Tool, it was

determined that this program evaluation does not require Institutional Review Board approval.

3.3 Study Population

De-identified patient data from 8 unique DPC clinics was used for this study. These clinics are disparate entities spread out across 7 states. 4 in the Southeast, 2 in the Southwest, and 1 in the Midwest. On average, these 8 clinics have been operating since January 1, 2018. The oldest clinic opened in 2015 and the youngest in 2019. The average active patient panel is 1,382 patients per clinic. Each of these clinics define themselves as a "Pure DPC". They do not take health insurance in any form, including Medicaid and Medicare. These clinics have the following shared characteristics:

1. Each clinic considers itself as a "Pure DPC".
2. These 8 clinics had data readily available through their shared analytics vendor.
3. Data sources are standardized. These 8 clinics each use the same EHR, virtual health, and membership application vendors. Meaning data was more readily transformed in the same manner.

By utilizing the same three data sources across each of the 8 clinics, this helps minimize differences in data entry, definitions, extraction, and transformation. By using different clinics located in different states, this may better control for clinical operational differences between disparate DPC organizations and patient populations.

3.4 Assembly of Dataset

Data was extracted and de-identified by a third-party analytics vendor into multiple tables. Data tables received are listed in Table 4. To assemble the data for analysis, a single table will be produced with each deidentified patient being an individual row (Table 5). The data fields

for this new table build are below. Data from Table 4 will be analyzed to enter in the appropriate calculations into this new analysis table, Table 5.

Patients will be grouped into population segments by age, gender, family status, and risk. Risk will be defined by using Charlson Comorbidity Index score using ICD-10 diagnosis codes from EMR data (Charlson et al., 1987; Deyo et al., 1992; Sundararajan, 2004). Dates of service from 01/01/2018 – 12/31/2019 will be used. Measures are defined in Table 6.

Table 4.

Data Tables Received From Third-Party Analytics Vendor

Table Names
EMR Patient Demographics
EMR Procedures
EMR Staff
EMR Encounters
EMR Diagnosis
Virtual Inbound Calls
Virtual Outbound Calls
Virtual Messages
Patient Master Key

Table 5.

Program Evaluation Analysis Data Fields Table

Data Fields
Patient Identifier
Gender
Family Status
Age Bracket
Count of Physical Visits
Count of Non-Visits
Count of Phone Calls
Count of Virtual Messages
Charlson Comorbidity Index

Table 6.

Program Evaluation Measure Definitions

Category	Measures	Definition
Physical Visit	Office Visits	Documented Office Visit with Provider
Physical Visit	Non-Visits	Documented Nurse Visits. Provider is not involved.
Telehealth	Text Messages	Patient text messages sent to providers
Telehealth	Phone Calls	Phone calls from patients directly to providers
Demographics	Age Group	0 - 11 Years
Demographics	Age Group	12 - 17 Years
Demographics	Age Group	18 - 32 Years
Demographics	Age Group	33 - 47
Demographics	Age Group	48 - 64
Demographics	Age Group	65+
Demographics	Gender	Male
Demographics	Gender	Female
Demographics	Family Status	Employee
Demographics	Family Status	Spouse
Demographics	Family Status	Child
Patient Risk	Mild	CCI Score of 0 - 2
Patient Risk	Moderate	CCI Score of 2 - 5
Patient Risk	Severe	CCI Score greater than 5

3.5 Statistical Analysis

The aim of this statistical analysis is to identify the average utilization of each patient population segment, and to identify if any differences in utilization patterns exist across these different patient population segments. For example, do older patients utilize physical care more versus younger patients. If so, how much? Doing so will allow DPC clinics a better understanding of the amount of care and touch points they are providing to each population group. This information can then be used for quality improvement, patient care management, and fine-tuning subscription pricing, staffing needs, and technology requirements to best manage their patients and operations.

Once data was assembled in accordance with Tables 5 and 6, descriptive statistics were used to identify physical and telehealth utilization counts across variables of gender, age, family status, and risk categorization. Differences in utilization between the categorical or binary variables assessed were examined using chi-square test. The Kolmogorov-Smirnov (KS) test was used to determine normality of data distribution. In instances where the KS test showed the distributions for number of visits were not normally distributed, the Kruskal-Wallis test was utilized. To examine differences in utilization of care (in-person, virtual, or both), two models were examined: a Poisson and a negative binomial generalized linear regression models were examined, with the deviance closest to unity (1.0) selected; in all count models, a negative binomial model was utilized. Covariates were used to predict utilization for each variable of gender, family status, age, and risk category. All statistical analyses were performed using the PROC GENMOD procedure (Version 9.4 SAS Institute Inc., Cary, NC)

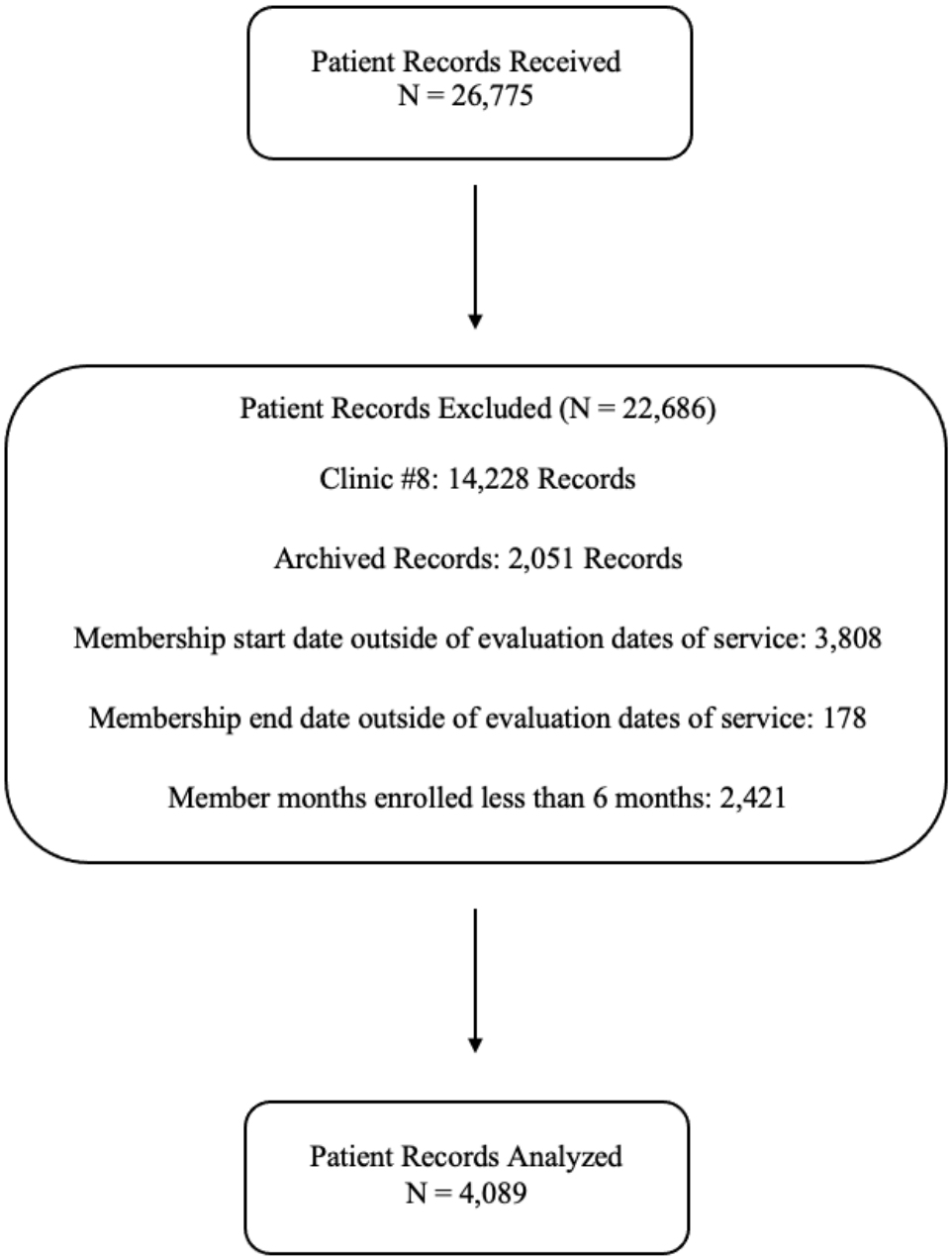
4 Chapter 4: Results

4.1 Construction of Data Set

Upon receipt of data for these 8 clinics, 26,775 de-identified patient records were received. Only 4,089 patient records were used for analysis. A figure demonstrating patient record exclusions can be seen below in the CONSORT Flow diagram of Figure 1 (Schulz, Altman, & Moher 2010). One clinic was removed entirely from data analysis. In practice, this clinic has no more than 3,500 active patients; however, upon receipt of their data, this clinic was found to have thousands of dummy and duplicate entries which inflated their number to 14,228 patient records. Cleaning this data was not possible in the de-identified format we received it in; therefore, this clinic was removed entirely due to this amount of dirty data.

In addition to clinic 8 being removed, 2,051 archived patient records were removed. Archived records are either former patients, dummy test accounts, corporate accounts, or other. Again, with de-identified patient data, assessing which archived records should be kept, if any, is not possible. 3,808 records were removed due to their membership start dates being in 2020, outside of the 2018 and 2019 dates of service assessed. 178 records were excluded due to their memberships ending prior to 2018. 2,421 records were removed for having fewer than 6 months of enrollment. In total, 4,089 DPC patient records were used across 7 clinics for our analysis.

Figure 1. CONSORT Flow Diagram for Patient Record Exclusions



4.2 Results Overview

After data set construction was completed, 4,089 DPC patient records were assessed across 7 clinics for full-year 2018 and full-year 2019. A breakdown of patient demographics from these records can be found in Table 7. The population was evenly split between male and female, 51% to 49%, respectively. 75% of the population was between the ages of 18 – 64, with the most frequent age group being 48 – 64 (30%). During the assessment, it was found that 89.6% of patients had Charlson Risk Scores of 0, so Elixhauser categorical conditions were computed for additional insight as to patient health characteristics. The most common Elixhauser comorbidities found were hypertension (16.4%), obesity (12.2%), and depression (8%).

Family status shows 79% of the population were adults, and 21% were children; however, this does not match up with the expected child age groups of 0 – 17, which shows a combined 16.5% of the population was under the age of 18. It is possible there are adult records being marked as children, such as special needs dependents, but it is also possible that the data documentation behind this category has discrepancies. For example, Table 7 also shows there are 2,168 patients labelled as spouses, but only 1,047 employees. It is not plausible that there would be 2 spouses for every 1 employee. Considering these questions surrounding family status, we believe the accuracy of family status data documentation is unreliable for our program evaluation purposes. This data category's documentation must be reviewed in detail with each DPC clinic and the third-party analytics vendor who supplied data.

4.3 Utilization by Gender, Age Group, Risk, and Family Status

Table 8 provides a breakdown of gender findings. The program evaluation population was evenly distributed among males and females at 51% male and 49% female. On average, nurse visits (0.5 versus 0.3), office visits (4.6 versus 2.9) , phone calls (5.0 versus 2.9), and text

message (9.7 versus 4.1) utilization categories were all higher among female patients. In summary, there is a clear distinction that females had more utilization per patient in every category assessed.

Table 9 provides details of DPC utilization across the defined age groups. Over the time period analyzed, increased age strongly correlates to increased utilization in all categories. The age group 65+ leads all categories with only one exception, text messages peak with the 33 – 47 age group. Conversely, the teenager group, aged 12 – 17, has the lowest utilization of all age groups (3.5), even less than infants and children aged 0 – 11 (5.4). Interestingly, teenagers even had less text messaging utilization compared to infants and children (0.1 versus 1.1), though it's unknown what sort of data limitations are hidden here on how text messages are attributed to patient accounts. Parents likely are doing most communication on behalf of their young children and it is unclear how texts are attributed to patients within the same family.

Table 10 depicts utilization by Charlson score. As would be expected, higher risk patients, those with a Charlson score of 1 or higher, have more DPC utilization across all categories when compared to lower risk patients, those with a score of 0. It is important to note that 89% of patients assessed had a Charlson score of 0. It is unknown if this is an accurate assessment of how healthy the patient population is, or if there is a lack of diagnosis documentation leading to some patients appearing healthier than reality within the EMR data received and analyzed.

Table 11 depicts utilization by family status. Patient records denoted as Spouse have the highest utilization in each category, especially when it comes to virtual utilization phone calls and text messages. However, as noted above, the accuracy of documenting family status appears to be suspect based off of age brackets and the ratio of spouses to employees.

Table 7.

Demographics and Characteristics

Characteristic		Count of Patients
n		4,089
Gender	Male	2,076 (50.8)
	Female	2,013 (49.2)
Age Group	0 - 11	429 (10.5)
	12 - 17	246 (6.0)
	18 - 32	764 (18.7)
	33 - 47	1,080 (26.4)
	48 - 64	1,236 (30.2)
	65+	334 (8.2)
Family Status	Employee	1,047 (25.6)
	Spouse	2,168 (53)
	Child	874 (21.4)
Charlson Risk Score category	0 - 1	3,664 (89.6)
	1+	425 (10.4)
Elixhauser Conditions		
COPD		248 (6.1)
Cardiac Arrhythmia		104 (2.5)
Coagulopathy		31 (0.8)
Congestive Heart Failure		28 (0.7)
Deficiency Anemia		26 (0.6)
Depression		329 (8.0)
Diabetes, Complicated		26 (0.6)
Diabetes, Uncomplicated		184 (4.5)
Hypertension, Uncomplicated		669 (16.4)
Hypothyroidism		242 (5.9)
Liver Disease		36 (0.9)
Obesity		498 (12.2)
Peripheral Vascular Disorder		26 (0.6)
Renal Failure		25 (0.6)
Rheumatoid Arthritis		56 (1.4)
Solid Tumor w/o Mets		55 (1.3)
Valvular Disease		49 (1.2)

All values expressed as n(%)

Table 8.

DPC Utilization by Gender

Characteristic	Female	Male
n	2,013	2,076
Nurse Visits	0.5 ± 1.0	0.3 ± 1.0
Office Visits	4.6 ± 5.0	2.9 ± 3.9
Phone Calls	5.0 ± 10.9	2.9 ± 8.3
Text Messages	9.7 ± 29.5	4.1 ± 22.8
Total Touches	19.7 ± 36.1	10.3 ± 27.3

All values expressed as mean ± s.d.

Table 9.

DPC Utilization by Age Group

Characteristic	0-11	12-17	18-32	33-47	48-64	65+
Patient Count	429	246	764	1,080	1,236	334
Nurse Visits	0.3 ± 0.7	0.3 ± 0.7	0.2 ± 0.7	0.4 ± 1.3	0.5 ± 1.0	0.6 ± 1.0
Office Visits	3.1 ± 3.1	2.3 ± 2.4	2.3 ± 3.5	4.0 ± 5.1	4.2 ± 4.9	6.1 ± 5.0
Phone Calls	0.9 ± 2.1	0.8 ± 4.5	2.3 ± 5.9	4.1 ± 9.3	5.1 ± 10.9	9.1 ± 17.0
Text Messages	1.1 ± 9.1	0.1 ± 0.9	5.1 ± 23.8	11.0 ± 35.3	7.5 ± 24.9	7.6 ± 26.3
Total Encounters	5.4 ± 10.9	3.5 ± 6.0	9.9 ± 28.4	19.5 ± 40.7	17.3 ± 31.7	23.3 ± 35.5

All values expressed as mean ± s.d.

Table 10.

DPC Utilization by Charlson Risk Category

Characteristic	Charlson Score = 0	Charlson Score = 1+
n	3,664	425
Nurse Visits	0.4 ± 1.0	0.7 ± 1.2
Office Visits	3.4 ± 4.3	7.0 ± 5.6
Phone Calls	3.4 ± 8.4	8.6 ± 16.8
Text Messages	6.0 ± 25.0	14.2 ± 35.7
Total Encounters	13.1 ± 30.1	30.5 ± 44.4

All values expressed as mean ± s.d.

Table 11.

DPC Utilization by Family Status

Characteristic	**child**	**employee**	**spouse**
n	874	1,047	2,168
Nurse Visits	0.3 ± 0.7	0.2 ± 0.6	0.5 ± 1.2
Office Visits	2.7 ± 2.9	1.6 ± 3.3	5.2 ± 5.1
Phone Calls	1.0 ± 3.3	2.1 ± 6.2	6.0 ± 12.1
Text Messages	1.3 ± 10.0	1.9 ± 9.0	11.5 ± 34.6

All values expressed as mean ± s.d.

Table 12.

DPC Utilization by Encounter Type

Utilization Category	**Encounters**
Nurse Visits	0.4 ± 1.0
Office Visits	3.7 ± 4.6
Phone Calls	3.9 ± 9.7
Text Messages	6.9 ± 26.4

All values expressed as mean ± s.d.

Table 13.

Mean Number of Encounters by Modality and Population Segment Controlling for All Other Factors

Characteristics		n	Physical Encounters	Virtual Encounters	Total Encounters
Gender					
	Male	2,076 (50.8)	3.15	5.73	9.94
	Female	2,013 (49.2)	4.02	8.86	11.64
Age Group					
	0-11	429 (10.5)	3.85	3.16	7.76
	12-17	246 (6.0)	2.67	1.23	4.45
	18-32	764 (18.7)	2.49	6.75	9.17
	33-47	1,080 (26.4)	3.85	11.21	15.18
	48-64	1,236 (30.2)	4.48	9.74	14.25
	65+	334 (8.2)	3.98	8.50	12.62
Family Status					
	Employee	1,047 (25.6)	1.84	3.47	5.54
	Spouse	2,168 (53)	4.98	11.73	17.72
	Child	874 (21.4)	3.36	4.84	8.53
Charlson Risk Category					
	0	3,664 (89.6)	3.38	6.59	10.57
	1+	425 (10.4)	5.49	13.60	19.38

All predictors are statistically significant
All values expressed as n(%)

5 Chapter 5: Discussion

5.1 Program Evaluation Questions

The analysis results displayed in Tables 7 – 13 present findings for a retrospective longitudinal assessment of two years' worth of DPC patient utilization data. The purpose of this analysis is to understand utilization patterns for various patient populations partaking in DPC arrangements. There are three primary questions we aimed to answer.

1. What is the average amount of physical utilization among patients utilizing DPC, both in-office primary care visits and quick nurse visits?
2. What is the average amount of text and phone utilization among patients utilizing DPC?
3. Are there statistically significant differences in physical or virtual health utilization patterns across different populations segments when utilizing direct primary care? Populations will be segmented by age group, gender, family status, and risk.

Over the two year period measured from January 1, 2018 through December 31, 2019, DPC patients from these 7 clinics averaged 0.4 nurse visits, 3.7 office visits, 3.9 phone calls, and 6.9 text messages, respectively, per patient.

For question 3, we refer to the negative binomial results in Table 13, which evaluated statistically significant differences while controlling for all other factors. Defining significance by using $p < 0.05$, each of the predictors of age, risk, gender, and family status were found to be statistically significant. Females averaged 4.02 physical encounters and 8.86 virtual encounters compared to 3.15 and 5.73 in males. Patients with a Charlson Risk score greater than 0 utilize both physical and virtual DPC utilization more than those with a risk score of 0. About 1.6 times more physical care and 2.1 times more virtual care. Patients with a Charlson score of zero had total engagement of 10.57 versus 19.38 for patients with a Charlson score of 1+.

Patients categorized as a spouse were the biggest surprise findings of the results output. Spouses use substantially more care, both physical and virtual, compared to employees and children. About 2.7 times more physical care and 3.4 times more virtual care when compared to employees. When compared to children, those multiples change to 1.5 and 2.4, respectively.

The results of differences between age groups is not as straightforward. While it does appear utilization correspondingly creeps higher as age increases, variations within Table 13 that break up this pattern. Teenagers aged 12 – 17 had the lowest utilization in both physical (2.67) and virtual (1.23) categories, even lower than infants and children 0 - 11. The 33-47 age range had the highest rate of virtual (11.21) and overall total utilization (15.18) among all age groups. Meanwhile, patients between 48 – 64 had the highest rate of physical utilization (4.48). Interestingly, those older than 65 had less utilization in both categories of physical and virtual compared to those aged 48 – 64.

5.2 Interpretation of Results

Over the two year period measured from January 1, 2018 through December 31, 2019, DPC patients from these 7 clinics averaged 0.4 nurse visits, 3.7 office visits, 3.9 phone calls, and 6.9 text messages, respectively, per patient. Based on results of the negative binomial model, each predictor of gender, age group, risk score, and family status are significant. In tables 8 – 10, there are strong correlations of increased age, being female, and being a spouse corresponding to an increase in utilization in both physical and virtual service categories. With a slight exception of the text messages category peaking with the 33 – 47 age group.

Trying to understand why texting peaks in this age range raises additional questions. First, it is possible that older generations are less comfortable with virtual cell phone applications and text messaging as a form of communication in general, which may be why their virtual

utilization is lower. Second, it is probable that the 33 – 47 age range has a higher percentage of parents who are raising young children. They are likely using virtual health not only for themselves but also on behalf of their children. Unfortunately, it is not clear how virtual care is attributed to each unique patient in the data set received. For example, there still is virtual utilization, both text messages and phone calls, being observed for infants and children aged 0 – 11 even though it is likely that their parents are the ones communicating on their behalf.

When controlled for all predictors, increased age correlating directly to increased utilization slightly changes. In Table 13, patients over the age of 65 are no longer the highest predicted utilizers of physical utilization (mean of 3.98). Instead, the age range 48 – 64 is highest (4.48). When interpreting this finding, one thought which comes to mind is the unknown question of how patients over the age of 65 utilize and supplement their DPC membership with Medicare coverage. Although there are some DPC organizations who work with Medicare and Medicare Advantage, the 7 DPC clinics evaluated in this assessment do not. The additional Medicare coverage, which helps cover care outside of DPC, may help explain why increased age correlating increased utilization drops off for those over the age of 65 when compared to patients aged 48 - 64. Perhaps Medicare eligible patients are using DPC for some care needs, and Medicare coverage for other care needs, which would lower their overall DPC utilization compared to patients relying more heavily on DPC.

The finding which is most difficult to interpret is that of spouses having such high utilization compared to employees and children. In an uncontrolled data analysis, such as Table 11, perhaps spouses simply skew female and older, which is associated with increased utilization as shown in the findings. However, even when controlled for each of the other variables in Table 13, spouses still used 2.7 times more physical care and 3.4 times more virtual care when

compared to employees. Why spouses use such high utilization is not immediately clear. For the virtual healthy utilization, perhaps spouses are also communicating more on behalf of young children compared to the employees. One thing is for certain when interpreting the family status portion is that this data field in general is suspected of being inaccurate, as mentioned in section 4.2 of this paper. It is unlikely that there are twice the number of spouses as there are employees. With this in mind, interpreting this result is not appropriate. Instead, a deeper dive involving interviews and data documentation audits of the participating clinics is recommended first before attempting to interpret this result.

In summary, the main findings of this analysis are that being female, being a spouse, having higher risk, and older age all help predict DPC utilization. Though the correlation of age and utilization is not necessarily linear. Understanding this information will allow the participating DPC clinics to better identify, optimize, and predict staff and resource needs. For example, when assessing new employer health plans to work with, obtaining a population demographics file will provide a DPC clinic with a better understanding of the corresponding care needs required to care for that population. Through further internal discussions, they may also be able to identify ideal patient panel sizes and ideal monthly subscription prices in order to optimize their operations and revenue. Internal discussion must also discuss data quality concerns to help clarify some of the remaining questions found. For example, the family status category does not seem accurate, and the attribution of virtual health to a patient record is important to understand, such as for adults communicating on behalf of their children.

5.3 Limitations

There is still much to learn about the DPC model of care. This program evaluation would be better served with additional evidence and research to supplement and interpret these findings

with. Because this evaluation studied an emerging subject without a host of existing literature to use as a guide, and there is much to discover on the topic of DPC, a large amount of study and data limitations do exist. These limitations include:

1. One of the foremost limitations of data analysis is not knowing how trustworthy the family status category is. As mentioned, having two spouses for each employee is unlikely.
2. Data from one of the eight clinics was removed from this analysis entirely. Unfortunately, this was also the largest participating clinic, having more than 3,500 active patients. Removing this clinic significantly reduced the patient population assessed, which weakens the overall strength of findings and statistical outputs.
3. Office visits, nurse visits, and phone call lengths were not captured in the data provided. While DPC clinics may claim they provide longer visits, due to their flexibility, they may also be providing a number of short visits in certain cases. For example, a quick in and out flu shot or blood draw. Therefore, understanding visit length is crucial to understanding exactly how much care is being provided and how much staff time is being used by patients. There is a pronounced difference between a 5 minute visit and a 60 minute visit.
4. Downstream utilization was not captured in the data sources provided. We do not know what the impact of DPC is on specialist utilization, outpatient care, urgent care, emergency department visits, inpatient admissions, or other services. This prevents us from more fully evaluating total patient utilization for patients in DPC arrangements, and how patients supplement their total care needs with DPC. One such example are patients of Medicare age and a lack of understanding on how they are using DPC to supplement

their Medicare coverage.

5. Patient health outcomes were not assessed. We do not know the impact of DPC on biomarkers of health such as blood pressure, weight, blood sugar, cholesterol, and other health outcomes. Without patient health outcomes, it is difficult to assess the quality of care being provided.
6. Since DPC providers no longer bill for each individual service, nor participate in quality reporting programs, they are no longer required to document services and diagnosis as strictly as in Fee-for-Service and quality payment programs. Therefore, documentation is no longer the priority that it is in other settings. DPC clinics may have minimal documentation practices leading to significant gaps or flaws in data pulled from an EMR. This is a concern for interpreting the Charlson Risk Score seen in Table 10, which may not be accurate.
7. This program evaluation did not assess the membership rates, patient responsibility, or health benefit plan design of the participating patients. Depending on membership rates, benefit plan design and wrap around insurance, patient self-selection may lead to more engaged patients than in normal primary care or other DPC clinic settings. It is not known what the patient financial responsibility was for patients in this evaluation, or if these patients had supplemental wrap around insurance. Further, the model of DPC itself may inherently attract proactive, engaged patients who want to live healthier, and may push away patients who do not like to engage in their health. Therefore, it is not known if the predicted utilization findings from this evaluation can be applied to future patients and employer health plans. A larger population sample size spread out across more clinics would help provide more confidence in these results.

8. Telehealth encounter types are not classified. We are unable to tell the difference between a patient texting “Merry Christmas”, versus simply setting up an appointment or actual care delivery texts. Therefore, the text message category may be overstating actual healthcare utilization depending on what the texting is used for.
9. Telehealth engagement may not be attributed to the correct patient in our data set. It is believed that the patient is identified by who has the virtual health application on their phone, though this assumption is not for certain. For example, in our analysis, we found a number of children aged 0 -11who had virtual utilization, though it is more likely that parents are the ones communicating on their behalf.
10. This program evaluation assessed calendar years 2018 and 2019. Telehealth in primary care changed drastically under COVID-19 during calendar year 2020. Although DPC already used flexible virtual health applications, changes in care delivery to a strictly virtual setting likely carried over into DPC as well. It is unknown how this may impact care delivery or patient preferences for accessing care moving forward. Predictions made from 2018 and 2019 utilization data may not apply to future years.
11. Three different data sources were provided via the third-party analytics vendor. Matching patients across each data source is a known challenge in healthcare (Just et al., 2016). For example, how do you ensure Jane Doe in the EMR is the same Jane Doe in the billing application? The third-party analytics vendor has an enterprise master patient index (EMPI) which attempts to automate this patient mapping process; however, it is unknown how accurate their EMPI system is. This is the main reason why data from the 8th clinic was removed entirely from the program evaluation data analysis in this study, and it may have unknowingly impacted other patient records as well.

12. DPC clinic revenue and operational costs were not assessed. We are unsure if the care being provided is financially efficient or sustainable to the patients or clinics participating in this evaluation. A more robust program evaluation would also include a financial assessment.
13. Differentiating DPC from similar models of care is a stated challenge, particularly among employer primary care vendors such as One Medical. A lack of distinction may cause confusion amongst stakeholders and future researchers attempting to interpret these findings or evaluate DPC in future studies.
14. Although the virtual application used by the participating DPC clinics states that it allows video chat in addition to text messaging and phone calls, video was not a part of the data provided by the third party analytics vendor. It's unclear how much additional utilization this would add, if any, or if video chat is already lumped in with phone call utilization.
15. Total DPC utilization studies should also assess the additional services provided by DPC clinics such as medications, labs, procedures, specialist consults, etc.
16. This program evaluation removed all patients with less than 6 months of DPC membership. It's unknown how much utilization patients with less than 6 months of membership would add to clinical workloads for the DPC practices evaluated.

5.4 Future DPC Research

While this program evaluation may provide a starting point for these participating DPC clinics to better understand their model of care, there is a large gap of knowledge when it comes to Direct Primary Care as a whole. Despite the continued national growth and support of DPC, important questions still go unanswered. Future evolutions of DPC research should focus on adding in more data sources, such as medications, labs, health outcomes, and claims data, and

comparing DPC patient cohorts to external non-DPC patient cohorts. Topics such as practice patterns, patient health outcomes, downstream utilization of other health services, impact on overall nationwide healthcare staff shortages, and much more should all be assessed. Additional suggested topics include:

1. Accumulated Annual Time Duration of primary care visits per DPC patient as defined by Nathan, Cohen, & Vinker in their 2017 article.
2. In addition to text message and phone data, researchers should include video telehealth data to understand utilization patterns, and the percentage of telehealth performed via text message versus calls versus video chat.
3. Duration of time in between touch points in DPC for physical utilization and virtual utilization.
4. Add in "Member Months" denoting the length of membership of each patient as a predictor for DPC utilization statistical analysis.
5. Add in "Distance to Clinic" denoting how far a patient lives or works from their DPC clinic as a predictor for DPC utilization statistical analysis.
6. Assess clinical variations across DPC providers and practices.
7. Utilization by provider type of physician, mid-level, nurses, and other.
8. Understand how non-primary care clinicians practice or partner with the DPC model such as mental health, physical therapy, pharmacists, labs, and specialists.
9. Understand the impact of DPC on downstream utilization on specialists, emergency departments, urgent care, outpatient facilities, inpatient facilities, and other services.
10. Moral hazard and how patients may over utilize providers who are providing "nearly unlimited" primary care.

11. Patient and provider satisfaction.
12. Medication adherence, care plan adherence, and overall patient engagement in DPC.
13. In accordance with the IRS restrictions, what is the ideal health benefit plan design for wrap around health insurance coverage.
14. What are the most appropriate membership subscription costs per person?
15. Further study and interview members who leave DPC practices, compare patients who left the practice versus those who stayed, and identify reasons why patients leave.
16. For all statements listed above, how does DPC compare against matched cohorts of patients from other models of care?

5.5 Conclusion

Direct Primary Care is one of the fastest growing models of care innovation in the country. Booming from 273 clinics in 2015 to 1,448 as of February of 2021 (DPC Frontier Mapper, 2021; Eskew & Klink, 2015). Despite such dramatic growth and national support, there is little to no research understanding the strengths and weaknesses of this model of care. Public health stakeholders and policy makers need to better understand the strengths and weaknesses of the model, yet, to date, no such body of evidence exists. With this in mind, this program evaluation was conducted in order to assess DPC patient utilization patterns stratified by gender, age, risk, and family status. During this evaluation, it was found that patients who are female, older, higher risk, and designated as a spouse all correlate to higher utilization of care. An equally important finding is that of data quality improvement needs. Because data documentation may not have been a priority, there are a number of documentation questions and concerns which must be explored further with the participating clinics. This evaluation was conducted in hopes that the insight gained from this study will help direct primary care clinics better understand the

staffing and technological resources required to best manage their patient panels, better anticipate resource constraints when onboarding new patients, and better identify appropriate patient panel sizes.

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