



Schedule Optimization at a Community Health Center in the COVID-19 Pandemic



MIT Sloan Course 15.777 - Healthcare Lab, Fall 2020
In partnership with Family Health Center of Worcester (FHCW), Worcester, MA

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Impact of COVID-19 on FHCW

COVID19 has hit FHCW in terms of total # of visits under current operating conditions...

... but, as the aphorism goes, never waste a good crisis

- Federally mandated **space constraints** within the clinic
 - Airflow restrictions limit providers to **3 in-person patient sessions**
- Staff shortages** across the board increase scheduling complexity
- Change in the underlying types of consultations **increasing variability** in types of appointments
- COVID testing, contact tracing, and vaccine distribution **add responsibility** to a full workload

- Opportunity to **re-evaluate its core operating processes**
 - Build on current efforts to simplify schedule and pilot shorter appointments, and revamp EMR functionality
- Increased utilization of **telehealth visitations**
 - Patients and providers more willing
 - Medicaid policy adoption eases reimbursements
- Staff rebalancing** due to turmoil can lead to more efficient human capital allocation

Designing a Scheduling Optimization Model

Model Setup

For each provider team, visit type (in-person/telehealth), session, and day for a month... schedule the number of (a) provider hours, (b) patients scheduled, and (c) patients waitlisted

Objective

Maximize the total visits achieved in one month (28 days)

Constraints

- Maximum visits per provider hour
- In-person / telehealth visit types not available for some provider teams
- Maximum in-person visits in each team per session
- Capacity through the main entrance
- Number of provider hours available for each shift (discounted by provider cancellation rate)
- Bounds on providers' weekly working hours and monthly target visits
- Total number of patient visits achieved cannot exceed
 - total number of scheduled visits (including no-shows)
 - Total number of scheduled and waitlisted patients who show up to visits

Project Goal & Approach

GOAL

Support FHCW to **increase patient volume to an annual run rate of 90,000 visits** by end of -2021

OBJECTIVE

Optimize the **capacity of the center** and **availability of existing providers**, under existing COVID-related spatial constraints

POTENTIAL SUPPLY-SIDE APPROACHES

- Ensure providers are available during times of highest demand
- Change the length of appointment and type of appointment (telehealth) to maximize visits
- Reallocate utilization of physical resources (rooms / equipment)

POTENTIAL DEMAND-SIDE APPROACHES

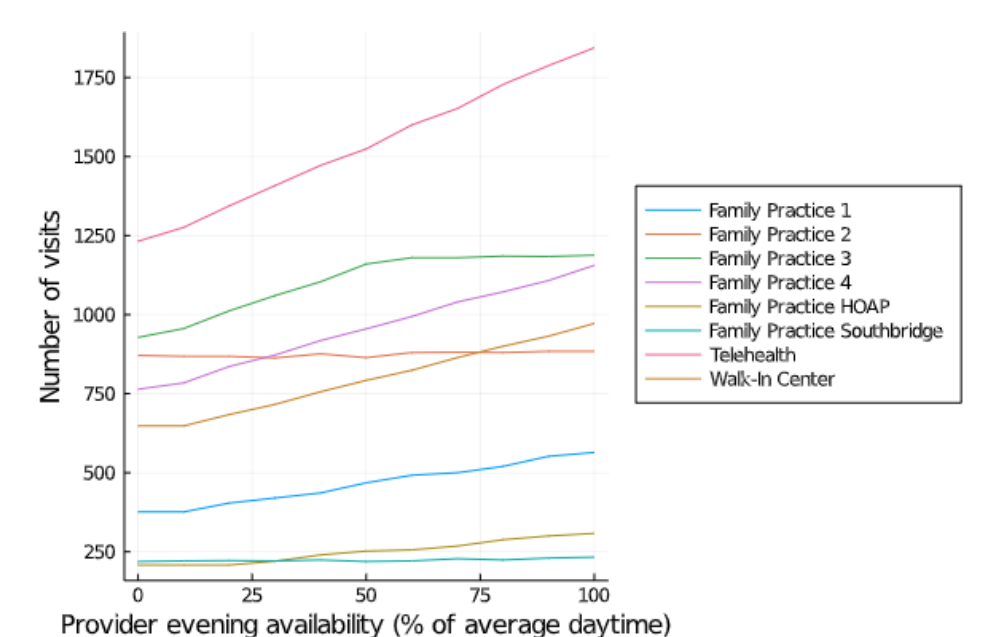
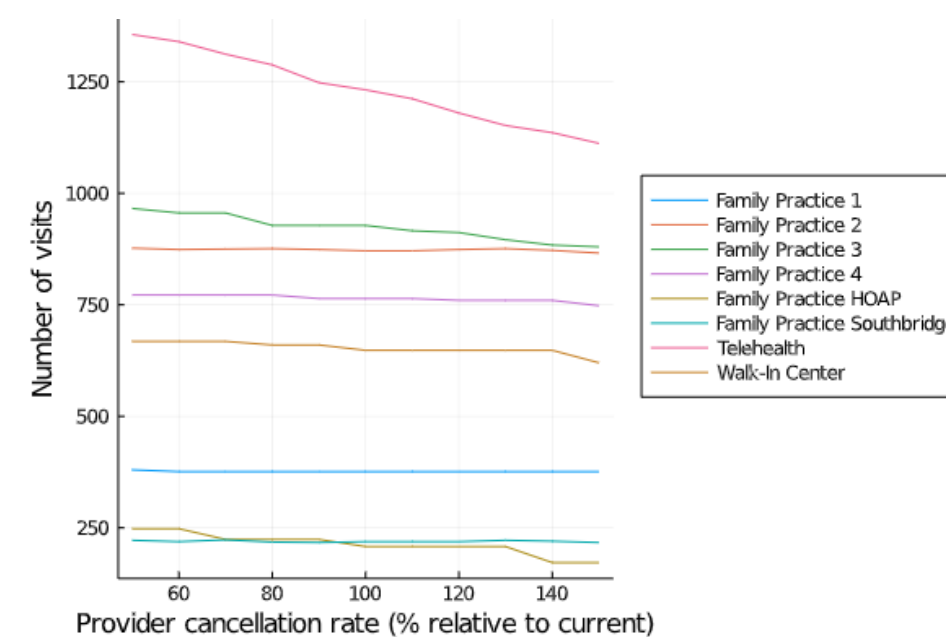
- Increase patient outreach to meet excess capacity (call/email/application)
- Improve patient access to scheduling systems (simplify schedule/shorten call center waiting time/ create an online self-schedule option)
- Ensure continuity of care to increase re-appointment rate (i.e. those who need care continue to get it at FHCW)

We scoped down to **most actionable hypotheses** based on initial conversations

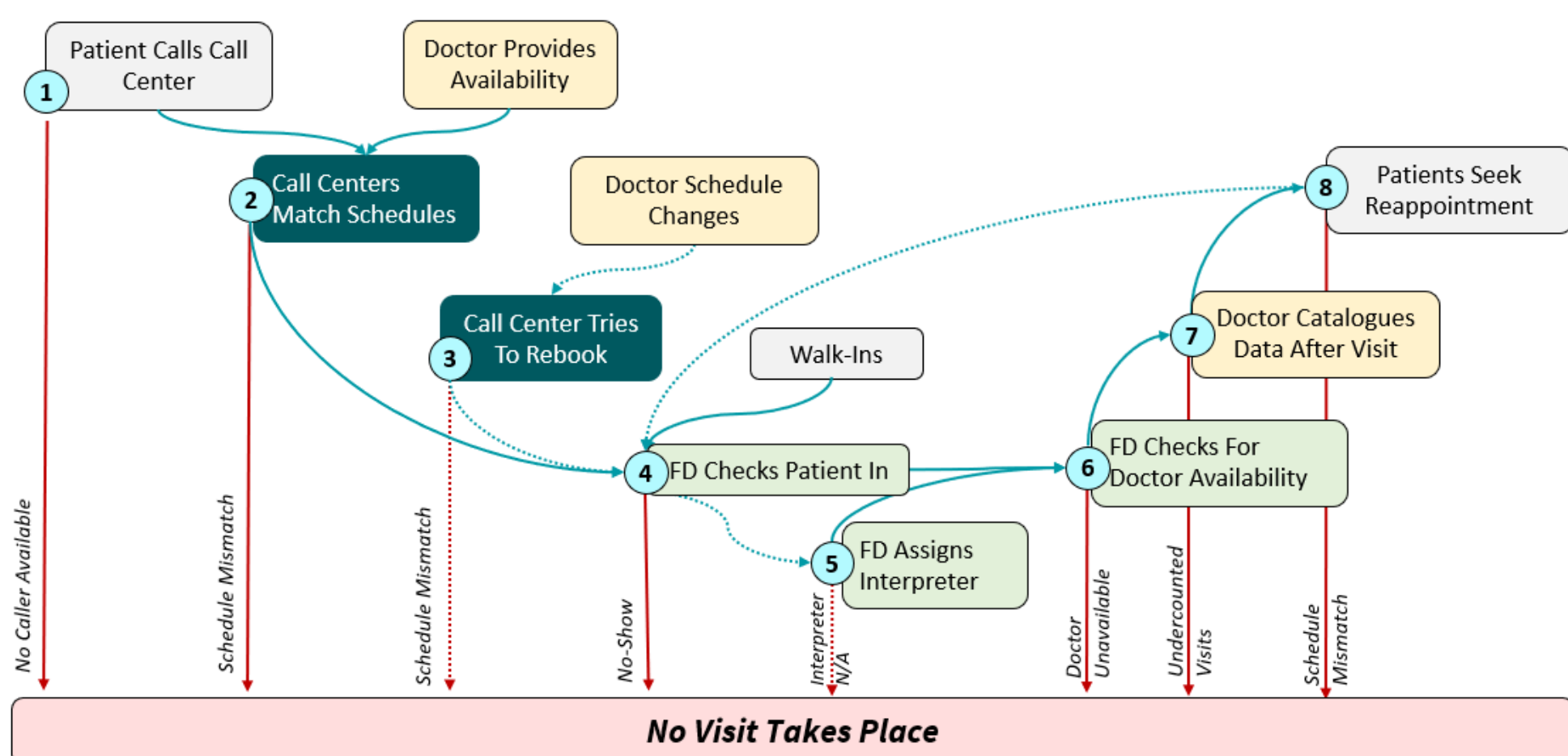
Sensitivity Analysis

How many more patient visits can we achieve if we ...

- Add evening shifts besides morning / afternoon shifts? Add weekend shifts?
- Add waitlist to fill no-show visits instead of canceling?
- Improve no-show rates (by increasing call center resources to set up reminders and follow-ups)?
- Change capacity (shorter visits, different phases of COVID, or reallocation of space)?
- Providers have more flexible availabilities and make less last-minute changes?



Current State Scheduling Process Flow

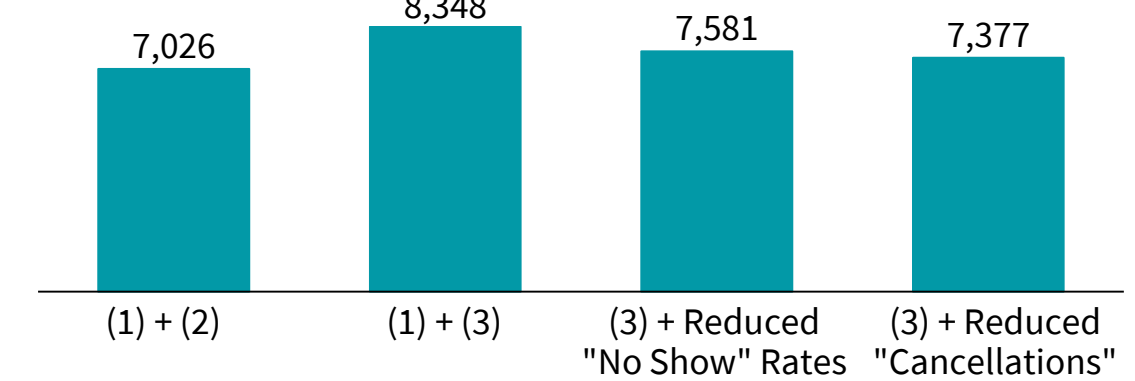
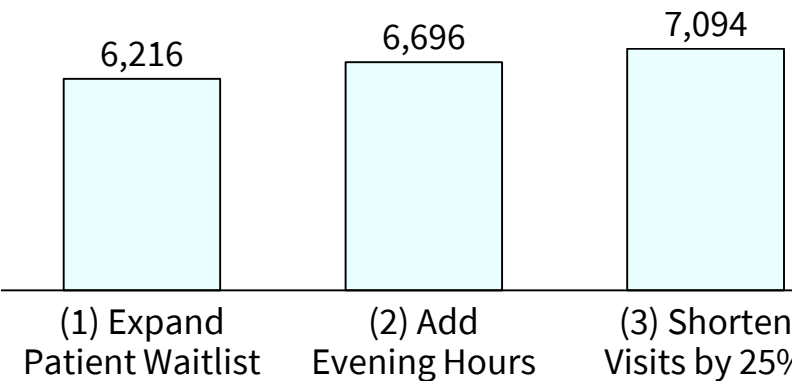


Achieving 7,500 Visits per Month

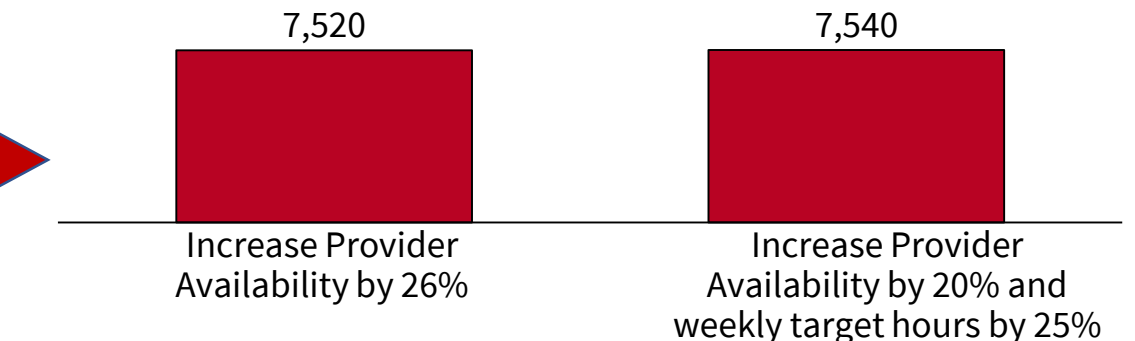
How many interventions (and to what degree) are needed to achieve 7,500 visits per month?

Even the most effective interventions cannot single handedly get us to 7,500 patient visits

But certain combinations of interventions can get us a long way...



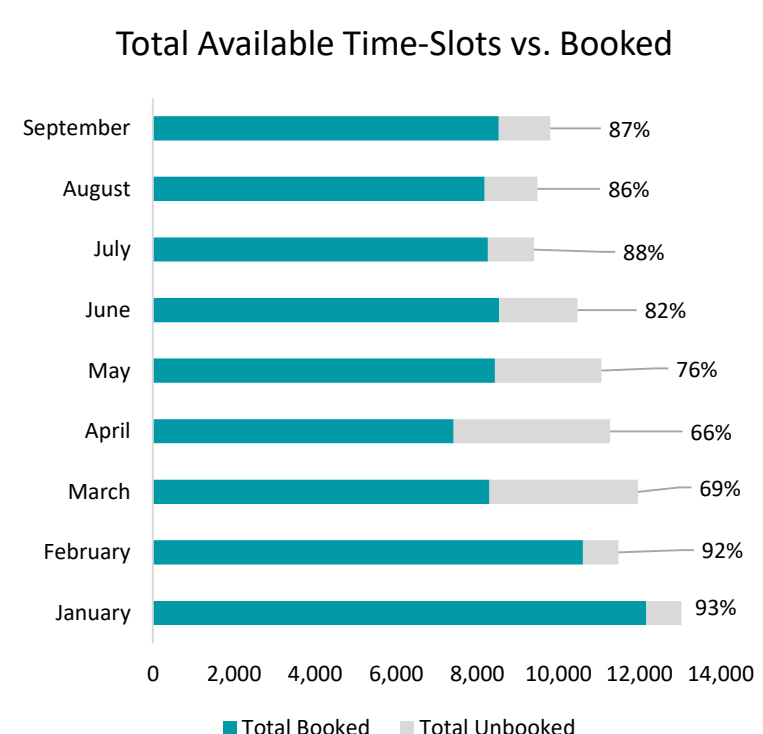
Increasing provider availability and / or target hours is relatively costly and requires a nearly 25% increase in supply under current efficiency rates



Initial Data Analysis

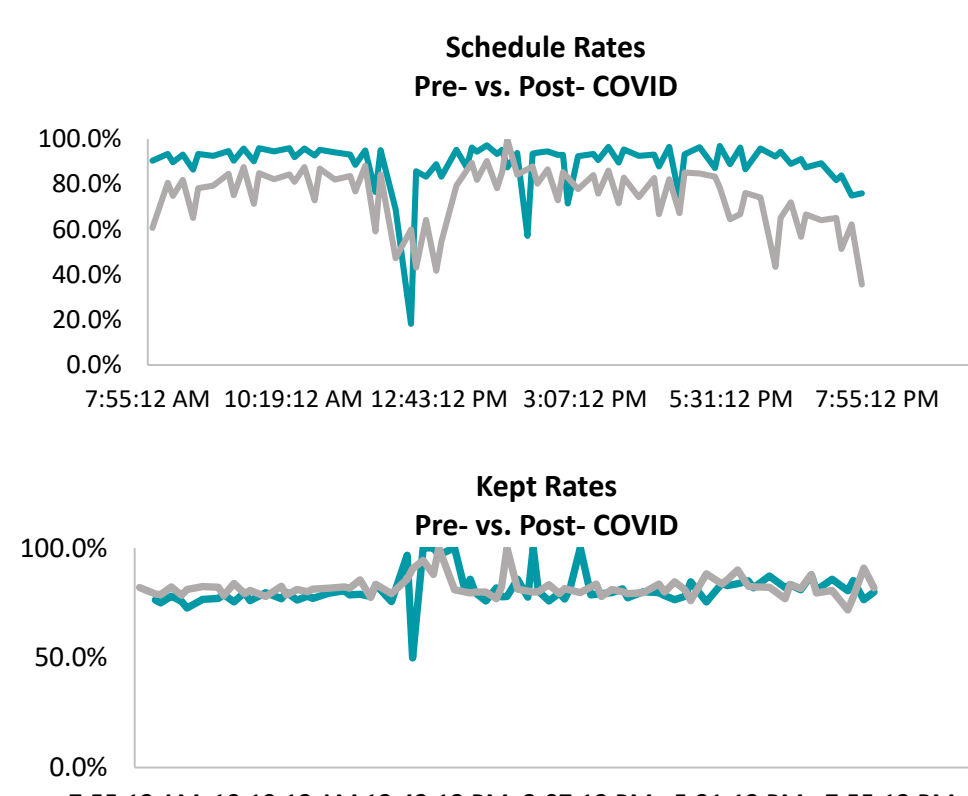
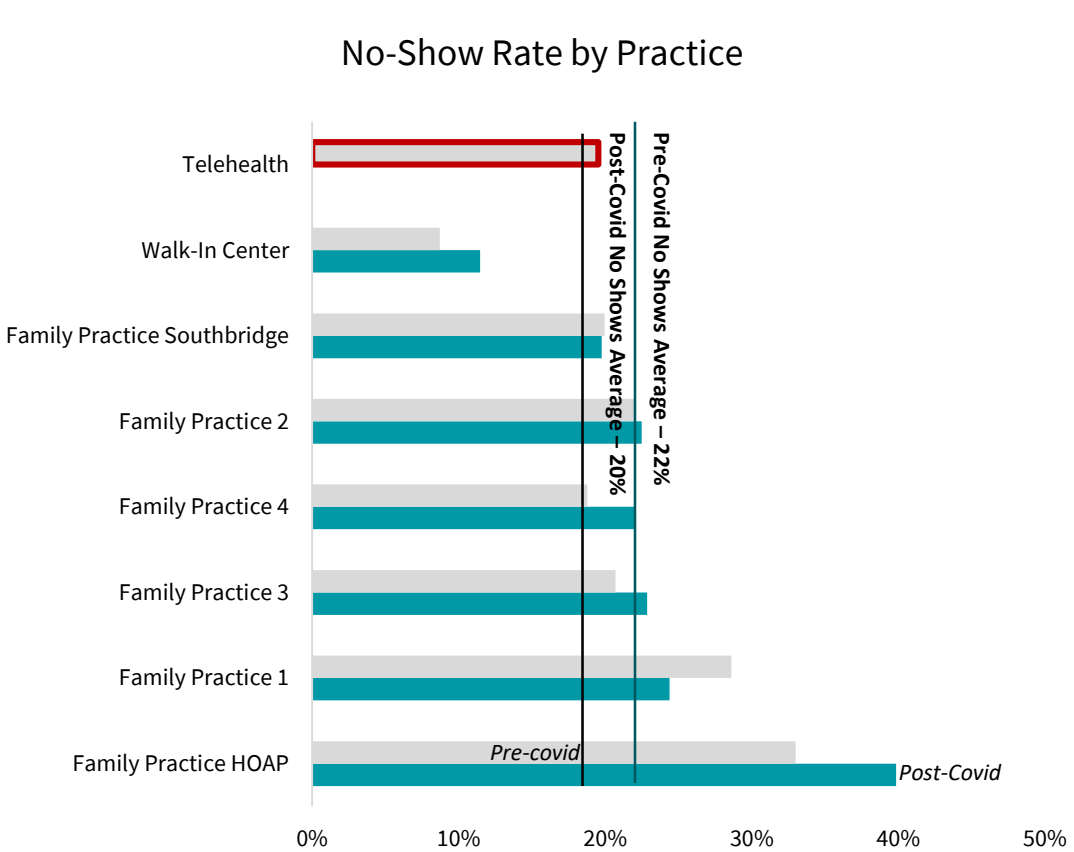
Kept rates of <80% mean current schedule rates are not enough to hit target...

... but there is capacity to increase number of scheduled visits in existing schedules



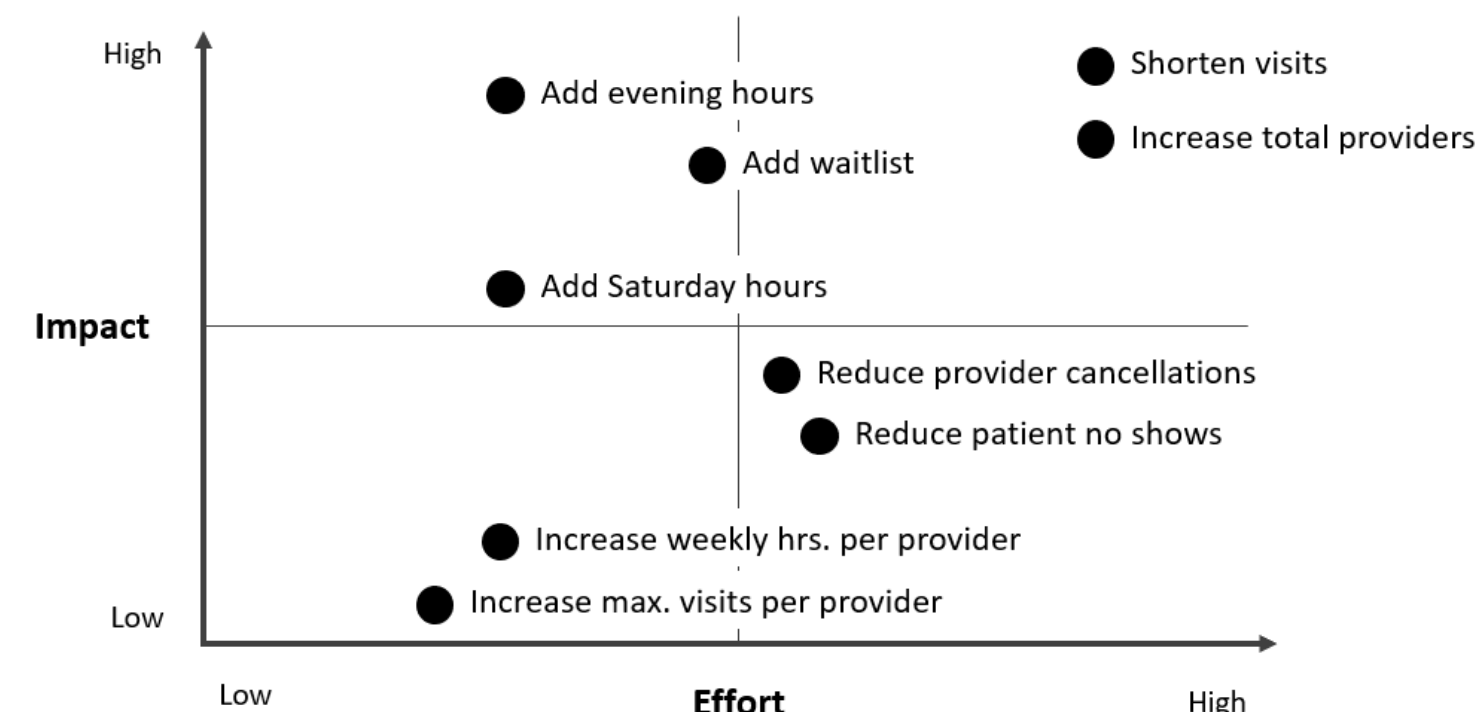
No-show rates vary by practice around average - telehealth not significantly more efficient

While kept rates (1 - "no-show") are relatively stable throughout the day, schedules are underutilized in evenings and around lunch...



We recommend FHCW pursue high-impact, relatively low-effort interventions first. These include adding evening and Saturday hours and implementing a waitlist to fill in no shows and late cancellations.

A pilot of adding evening hours would not only test for increased total visits, but also for decreased patient no shows and staff shortages due to additional schedule flexibility.



Project Description

Family Health Center of Worcester, Inc. (FHCW) is a federally-qualified community health center in Worcester, MA. The organization's mission is to improve the health and well-being of Worcester's residents—a culturally and racially diverse, multilingual, and underserved population. FHCW is dedicated to maintaining and improving the health of its patient population, and seeks to increase access to its services within the community. However, the ongoing coronavirus pandemic has placed significant time and space constraints on FHCW's daily operations. This project seeks to understand these constraints and to incorporate them into tools supporting the optimal scheduling of patients.

With the goal of increasing FHCW's patient visits to 7,500 visits per month, our team approached this work in three phases. In Phase 1, we use staff interviews and data analysis to develop a current state process flow chart and identify the key constraints impacting the scheduling process. In phase 2, we develop a model that seeks to optimize the total number of patients that can be scheduled per week. Then, we evaluate the impact of operational changes via sensitivity analyses. Phase 3 provides an opportunity to consolidate findings and develop high-level pilot plans for key initiatives identified in the first two phases.

Final deliverables include initial data analyses, a current state model simulating the patient scheduling process at FHCW, sensitivity analyses outlining the impact of addressing individual constraints, and a prioritized list of improvement opportunities. Our team demonstrates that 7,500 visits per month is achievable in multiple ways through implementation of one or more improvement opportunities.