

CLINIC NO-SHOWS AND OVERBOOKING: REFLECTIONS AND NEW DIRECTIONS IN APPOINTMENT YIELD MANAGEMENT

Linda R. LaGanga & Stephen R. Lawrence

Mental Health Center of Denver
4141 East Dickenson Place
Denver, CO 80222
(303) 504-6665
Laganga@colorado.edu

Leeds School of Business, UCB 419
University of Colorado at Boulder
Boulder, CO 80309-0419
(303) 492-4351
Stephen.Lawrence@colorado.edu

ABSTRACT

New insights and questions have been generated from the reactions to the recent dissemination of a decision-making model that considers the expected positive and negative impacts of overbooking clinical appointments to compensate for patient no-shows. We examine data from 1,769 appointments in 18 outpatient clinics and develop practical recommendations for expanding service capacity and improving the service experience.

Keywords: Appointment Scheduling, No-shows, Overbooking, Service Operations, and Utility Assessment.

INTRODUCTION

Appointments are used in service systems to attempt to meet the needs of customers and providers by matching customer demand to provider capacity throughout the course of a day (Fitzsimmons, 2006). Without appointments in healthcare clinics, patients would arrive in random clumps that would cause long waiting times for many of them and periods of idle time for healthcare providers (Vaillancourt, 2008). This problem has received considerable research attention for some decades (Bailey, 1952; Ho & Lau, 1992; Klassen & Rohleder, 1996). The emphasis of such studies has been on managing the variability in appointment service times by arranging appointment slots to minimize patient wait time and maximize provider productivity.

More recently, LaGanga (2006) and LaGanga and Lawrence (2007c) have proposed that increasing the yield of patients served and boosting patient access to care could be accomplished by overbooking appointments to compensate for provider utilization lost to no-shows, a practice that creates additional appointment slots to increase the number of utilized appointments. An overbooking utility model (LaGanga & Lawrence, 2007c) was developed to capture the trade-off between the expected benefits of serving additional patients and the costs of patient wait time and provider overtime. The model reveals that the net utility of overbooking depends on several factors specific to each clinic's operations. These include the costs or penalties of patient wait time and provider overtime, the revenue gain or non-monetary value of serving additional patients, the no-show rate, and the target number of patients the clinic seeks to serve each day.

Reaction to this line of research from clinical and medical providers, administrators, other researchers, reporters, and the general public has been vocal and varied (Deiter, 2008; Dolan, 2008; Greenberg, 2008; Tubbs, 2008; Vaillancourt, 2008; Warner, 2008). The ensuing discussion and debate has generated new insights and questions about how to approach overbooking and clinical yield management to expand service capacity. In this paper, we explore how to enhance the practical application of clinic yield management, scheduling, and overbooking approaches to satisfy the needs of multiple stakeholders such as healthcare consumers, providers, and payers.

REFLECTIONS AND INSIGHTS ABOUT APPOINTMENT YIELD MANAGEMENT

Everyone uses healthcare services and most people have had memorable experiences (typically negative) as consumers or providers when the scheduling and service delivery process did not meet expectations. When customers' perceptions of service fall short of their expectations, this gap leads to a negative perception of service quality (Zeithaml, Parasuraman, & Berry, 1990). In a 2007 *Consumer Reports* survey of 39,000 patients and 335 primary care doctors, the top patient complaint was about time spent in the waiting room (24% of patients), followed by 19% of patients who complained that they couldn't get an appointment within a week (Hitti, 2007). Fifty-nine percent of doctors in the survey complained that patients did not follow prescribed treatment and 41% complained that patients waited too long to schedule appointments. Thus, scheduling and waiting are important to consumers and providers, and as people hear and read about clinic overbooking, many have responded and offered feedback, suggestions, and strong opinions. Others have used it to explore how overbooking could be applied to a variety of settings including general medicine, dentistry, university student health clinics, and advocacy services for children.

Response to Proposals for Overbooking

Responses to academic research involving clinic overbooking have been varied. For example, one clinic director expressed a goal of almost doubling the number of patients seen per hour in his clinic. However, that same director denied that overbooking was ever used or would be considered in his clinic, even though patients reported waits of 15 – 20 minutes (Deiter, 2008). Later, a new administrator at the same clinic expressed interest in finding out more about overbooking and schedule management in order to relieve patient no-show problems.

People who have experienced excessive wait times for their doctor appointments question the possibility that overbooking could increase patient satisfaction by making more appointments available and expanding access to services, particularly for people who might be turned away indefinitely due to insufficient service capacity. One radio news interviewer began an interview by stating, "Overbooking leading to increased patient satisfaction? That just doesn't make any sense!" (Tubbs, 2008). An anonymous listener responded with the following instant message (Borgmann, 2008):

Overbooking at medical providers is unconscionable. Every provider I have gone to has a policy of charging a hefty fee to those who miss appointments. Providers rarely, if ever, take into consideration the time and effort a patient must expend to attend an appointment. Extended wait times mean that many patients have to use PTO time or risk losing their jobs in order to obtain adequate medical care. An

appointment should be considered a verbal contract. If the patient is a no-show then the provider should be allowed to charge for the visit. However, if the provider cannot see the patient within 30 minutes of the scheduled appointment then the patient should be compensated [sic] for their time. Providers seem to forget who is ultimately paying the bills. When I get poor service at Macy's I have the option of shopping at Dillard's. It is not so easy when it comes to medical care.

An explanation for this reaction is found in a warning from Kimes (1994, p. 23) about yield management in airline and hotel industries: “Focusing on efficient use of resources may take managerial attention away from service, resulting in a loss of customers at considerable financial cost.” Kimes and Noone (2002) recommend that to make yield management acceptable to hotel customers, hotel managers need to educate their customers about the practices because as customer view yield management as usual practice, they may find it more acceptable.

The listener’s expectation of fairness for the patient is further explained by Wangenheim and Bayón (2007, p. 37): “The harmful action (e.g., overbooking) must be viewed as a violation of some moral or ethical code (e.g., the hotel or airline should not make a service promise that it cannot fulfill). In other words, a service failure is perceived as unfair when the customer believes that the firm could have done something.” This suggests that if providers implement clinic overbooking, they must consider ways to compensate patients for excessive wait time and thereby increase the perception of fairness. Dolan (2008) considers the idea of paying patients when they end up waiting excessively for the doctor. Another viewpoint was demonstrated by a radio interviewer who more thoroughly explored how overbooking could increase access to healthcare in underserved populations and lower unit cost by serving more people while keeping costs relatively fixed (Warner, 2008). This interviewer focused on the benefit of serving more consumers, which is consistent with the viewpoint of many not-for-profit providers.

APPLICATION AND CASE STUDY

Analysis of 1,769 intake appointments at 18 outpatient clinics of a health center for the year November 1, 2006 through October 31, 2007 indicated that there were 314 intake and assessment appointment slots (17.75%) that were scheduled but unused because of no-shows. Intake and assessment appointments could occur at 18 different clinics, but 80% of such appointments occurred at four clinics, and two clinics account for over half of all the intake and assessment appointments. The high variability in no-show rates reflects not only different consumer populations with varying degrees of mobility, transportation issues, and initial commitment to engaging in services, but also the different practices and staff at each clinic. There is not an apparent relationship between number of appointments and no-show rate. Regression analysis with scheduled appointments as the independent variable and no-show rate as the dependent variable for the 18 clinics produced a coefficient of determination (R^2) of only .06 and the regression coefficient of no-show rate was not significant ($P = .349$).

Capacity Expansion Project

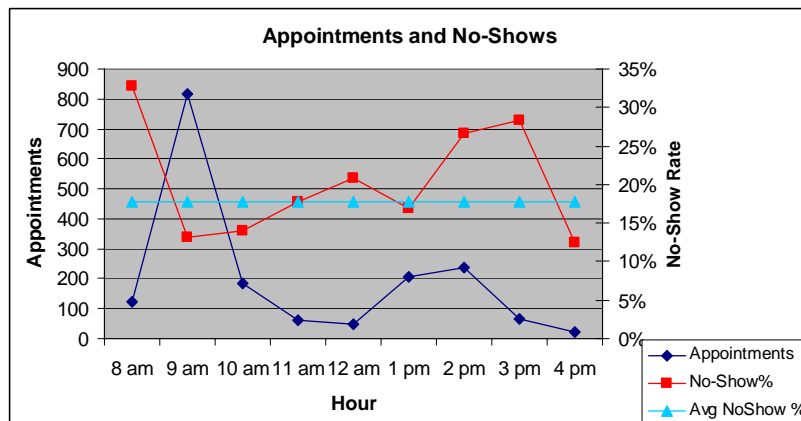
The program manager of the clinic where we performed our initial tracking of patient appointments also manages the central intake and access team for the entire health center, which includes multiple outpatient clinics. There are approximately twice as many people turned away as admitted, and the program manager resolved to eliminate the wasted capacity caused by no-

shows. In January, 2008, he convened a “Rapid Improvement Capacity Expansion” (RICE) cross-functional team, modeled after Denver Health’s “Rapid Improvement Events” (Nuzum, McCarthy, Gauthier, & Beck, 2007), based on lean thinking (Womack & Jones, 1996) and its application to healthcare processes (Young, Brailsford, Connell, Davies, Harper, & Klein, 2004; Black, 2008) to add value, streamline operations, and eliminate waste. The RICE team includes intake clinicians, program managers and directors, and consumer representatives to provide insight into the consumers’ experience when accessing services.

One of the clinics (clinic D) had developed effective alternative strategies that combine no-show reduction and a different form of overbooking, based on scheduling extra patients to group orientations that are immediately followed by individual intake appointments. This configuration boosts the intake appointment yield by eliminating a step where, prior to this change, an estimated 20% of consumers failed to show up when the intake was scheduled at a later date after the orientation. Another effective strategy was to use one clinician to conduct group orientations, which reduced the amount of time each clinician needed to spend in the individual intake appointment. In addition, flexible capacity was available in the form of pre-doctoral psychologist interns who could be readily deployed at little cost to handle intakes if overbooked clients showed up. With these approaches, this clinic increased its total intakes per year by 28% without increasing staffing.

Appointment data reveals opportunities for improvement throughout all 18 clinics. Hourly analysis of the no-show data, shown in Figure 1, for the 1,769 intake appointments showed that no-show rates vary with time of day.

FIGURE 1



Analysis of appointment and no-show data by day of week revealed that the highest number of intake and assessment appointments are scheduled on Tuesdays and the lowest no-show rate occurs on Thursdays. Mondays have the highest no-show rates.

Using the data and team members’ experience in the clinics, the RICE team agreed to take several new actions. These operational changes were implemented to begin in March, 2008, to increase intake appointment yield, which is measured by the number of completed intakes per week. First, the initial orientation groups were changed from once a week on Mondays to twice a week on Tuesdays and Thursdays to allow for pre-appointment notification and to increase

same-week access. Then, to eliminate the possibility of no-shows that were occurring when individual intakes occurred at a later date than orientation, the team adopted the successful approach used by clinic D to schedule intake appointments to occur immediately after orientation. Next, each intake team systematically allocated extra appointment slots to compensate for no-shows. For A = appointments scheduled, N = appointments utilized, and S = show rate, the number of allocated appointments was set to $A = N/S$.

Then, the RICE team developed a welcome letter and a process to call patients a day before the appointment to welcome them, provide transportation information and directions, tell them what to bring (e.g., insurance cards, prescription information), answer questions, and remind them of the importance of keeping appointments. The patient participant on the team suggested that providing reassurance was helpful in engaging patients who had anxiety about starting treatment, and another participant indicated that emphasizing the value and importance of keeping the appointment seemed to instill accountability and responsibility that increased the patient's likeliness of showing up, so these elements were added to the "pre-engagement phone call" process. The average time to perform the intake service was 1.96 hours, so streamlining clinical documentation and reducing service redundancies among providers are important changes that help shorten the duration of intake appointments, which could make more slots available during the service day.

Analysis after the first month of operation showed encouraging results. Compared to the same month last year, the number of appointments scheduled increased from 166 to 186 (12.05% increase), and the number of appointments kept increased from 142 to 157, resulting in a 10.6% increase in monthly intake appointment yield. As clinicians and support staff gain experience with new scheduling and tracking processes, yield improvements are expected to accelerate, and the clinics expect customer satisfaction to increase as patients obtain more rapid initial access to services and improved initial service experiences in the clinics.

PRACTICAL RECOMMENDATIONS

From our involvement with the health center's RICE team and our interactions with other people who have asked for more information about our overbooking studies, several themes and issues have emerged. The first is the commonly held belief, particularly in physicians' services, that overbooking is synonymous with double-booking two (or more) patients into the same appointment start time. Although double-booking may be easy to implement in manual or electronic scheduling systems by making additional use of appointment times that already exist in the schedule, simulation studies have demonstrated that this approach favors providers but accumulates high levels of wait time for patients (LaGanga & Lawrence, 2007b). To alleviate congestion in the wait room and more fairly distribute the consequences of overbooking between patient and provider, we recommend either uniformly compressing the time between appointments (the average service time) by a factor equal to the show rate, or staggering appointments in waves that accommodate the extra overbooked appointments and allow the provider to catch up after periods in which more scheduled patients showed up than expected.

The second recommendation is to accurately track no-shows to achieve the right compression factor for inter-appointment times and to make the most beneficial decisions about if and when

to overbook to achieve the highest utility. Our analysis of no-show data reveals differences between clinics, days of week, and times of day. Mismatches between show rates and booking levels can lead to unevenness in workload and pace throughout the day for providers and unnecessarily long wait times for patients. On the other hand, flexibility to vary schedules by hour of day combined with day of week could increase the yield of patients served. Shifting additional staffing to better-yielding day-time slots might increase patient access even without overbooking. The clinics involved in the RICE project found that accurate no-show tracking requires consistent practices in tracking, recording, and coding all appointment activities by front-desk staff and providers.

The third recommendation is to utilize appointment data and patient feedback to understand why and how no-shows occur to best prevent them and ensure full appointment utilization. The CEO of the health center recommends contacting patients who showed up for their initial appointments to find out what helped achieve that result and studying the schedules of the public transportation system, which is the most common means of getting to the clinics for the center's patients.

The fourth recommendation is to reduce service time variability as much as possible. Yield loss caused by no-shows can always be recovered on average by booking extra appointments, but overbooking always increases patient wait time and provider overtime on average. In addition, service duration variability causes wait time and overtime to increase even more, although overbooking can still achieve positive net utility even with highly variable service times (LaGanga & Lawrence, 2007c).

Fifth, when service duration is long, overbooking must be used with caution. The overbooking study (LaGanga & Lawrence, 2007c) sets service duration to one unit of time. The patient wait time and provider overtime that results from overbooking could become intolerably high to patients and providers when scaled proportionally by longer times. If a patient backlog builds up because fewer no-shows occur than expected, then patients could end up waiting through several prior patients' appointments.

Sixth, since patient waiting time is inevitable when overbooking is used, we recommend considering the psychology of waiting (Maister, 1985) to create a waiting experience that is as pleasant and productive as possible. In healthcare, this has often been accomplished by providing ancillary services such as nursing activities while the patient waits for the doctor or having patients fill out paperwork while waiting. Several companies have developed technological applications to provide waiting patients with Internet access and information about medical treatments (Paradis, 2008). Other possibilities include installing computer kiosks in the wait room for patients to engage with technology-driven self-assessment tools for physical or mental health, and offering patients self-service computerized satisfaction surveys to provide data to the provider for service quality improvement. We continue to investigate practical and analytical scheduling approaches to extend healthcare service capacity and balance consumer and provider needs.

REFERENCES: References available upon request from Linda LaGanga, Laganga@colorado.edu.