

Clinic No-Shows and Overbooking: Reflections and New Directions in Appointment Yield Management

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Additional information available at: <http://Leeds.colorado.edu/Overbooking>

Agenda



1. Background on Clinic No-Shows and Overbooking
2. Response to Overbooking
3. Application and Case Study
4. Practical Recommendations
5. Future Directions

1. Background on Clinic No-Shows and Overbooking



Motivation

- **Healthcare Capacity**
 - Funding restrictions
 - Demand exceeds supply
 - Serve more people with limited resources
- **Manufacturing Scheduling**
 - Resource utilization
 - Maximize throughput
- **Healthcare Scheduling** as the point of access
- Maximize appointment yield

2007 *Consumer Reports* survey of 39,000 patients and 335 primary care doctors (Hitti, 2007)

- 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
- 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.

Review of Appointment Scheduling

- Clinic appointment scheduling since the 1950s
 - Bailey (1952). A study of queues and appointment systems in hospital out-patient departments, with special reference to waiting-times. *Journal of the Royal Statistical Society, Series B*, 14(2), 185-199.
- Continued simulation studies
 - Ho & Lau (1992). Minimizing total cost in scheduling outpatient appointments. *Management Science*, 38(12), 1750-1763.
 - Klassen & Rohleder (1996). Scheduling outpatient appointments in a dynamic environment. *Journal of Operations Management*, 14(2), 83-101.
- Categorization of outpatient scheduling literature
 - Cayirli & Veral (2003). Outpatient scheduling in health care: A review of the literature. *Production and Operations Management*, 12(4), 519-549.

Appointment Scheduling, No-Shows, and Yield Maximization

- LaGanga & Lawrence (2007)
 - Clinic overbooking to improve patient access and increase provider productivity. *Decision Sciences*, 38(2).
- Qu, Rardin, Williams, & Willis (2007)
 - Matching daily healthcare provider capacity to demand in advanced access scheduling systems. *European Journal of Operational Research*, 183.
- LaGanga & Lawrence (2008)
 - Yield Management in Health Care Clinics to Improve Patient Service and Clinic Performance, working paper, Leeds School of Business, University of Colorado, Boulder CO (in review)

2. Response to Overbooking



Reactions to Overbooking Article (LaGanga & Lawrence, 2007)

- Utility model to capture trade-offs
 - Serving additional patients
 - Costs of patient wait time and provider overtime
- Contacted by
 - Newspapers
 - Radio
 - American Medical Association
 - Practitioners

Sample Responses

- Campus reporter's visit to student health center
 - "Not now and never will"
 - Patient waits 15 – 20 minutes
 - New administration, new interests
- Morning News Radio
 - "Overbooking leading to increased patient satisfaction? That just doesn't make any sense!"
- Public Radio Interviewer
 - Benefits of increased access at lower cost

Instant Message Response to News Radio

*“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.”***

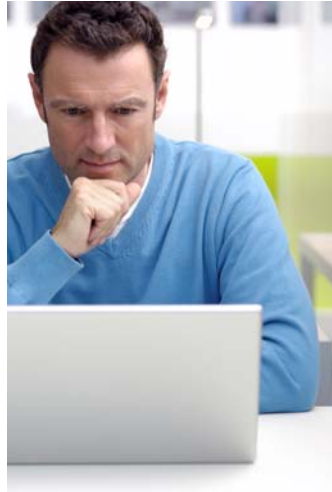
Other Responses

- Practitioners

- Dentists
- General medicine
- Child advocacy

- How should we overbook?

3. Application and Case Study

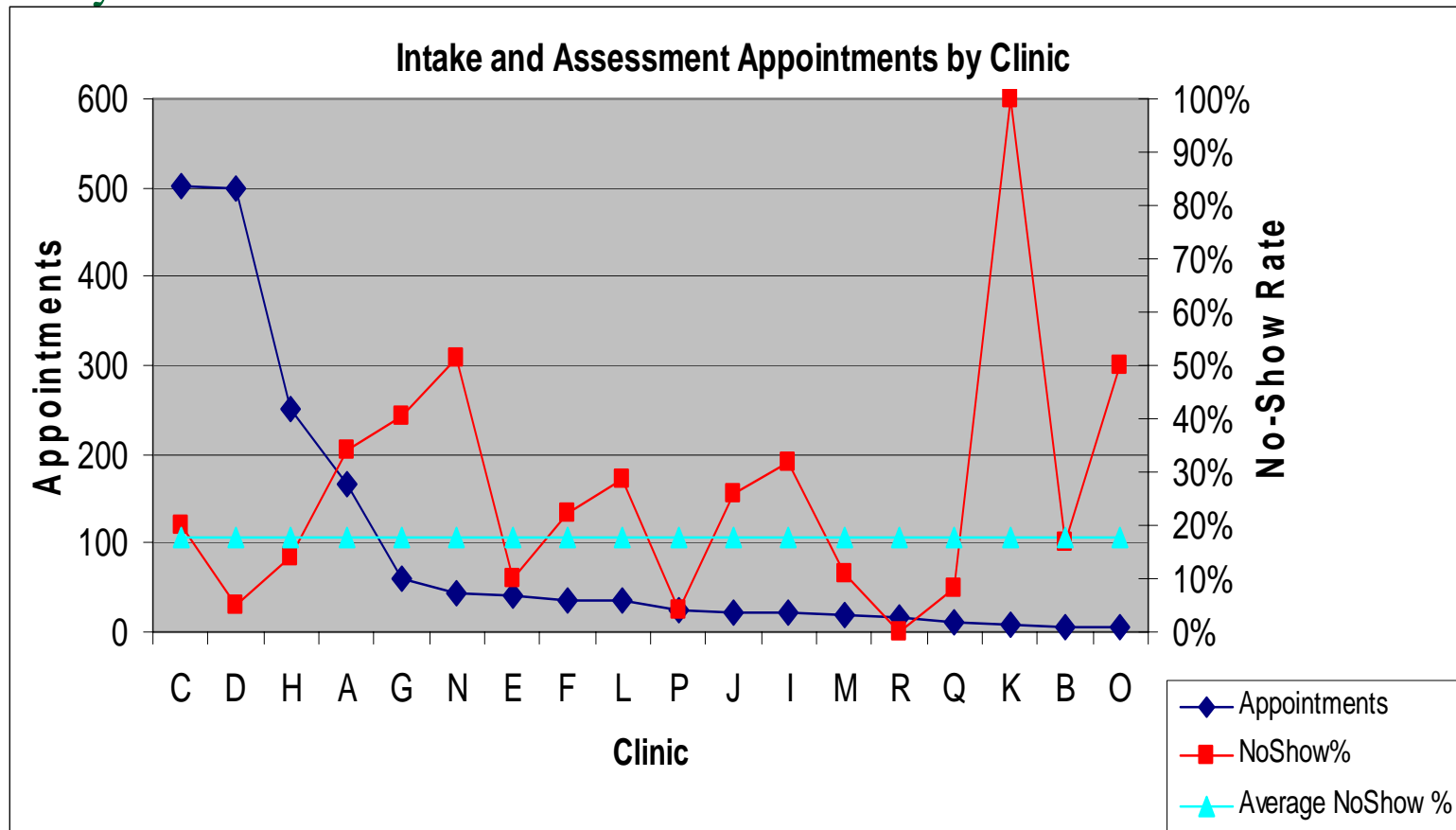


- Analysis of 1,769 intake appointments at 18 outpatient clinics
- 314 appointment slots scheduled but unused due to no-shows
- 17.75% no-show rate

Capacity Expansion Project

- Rapid Improvement Capacity Expansion (*RICE*)
- Cross-functional project team
- Lean rapid improvement event
- Current state: Must deny services often
- Target state:
 - Eliminate wasted capacity caused by no-shows
 - Increase number of consumers admitted and served
- Analyzed the process of scheduling consumers for initial intake and assessment appointments

Analysis of No-Show Data

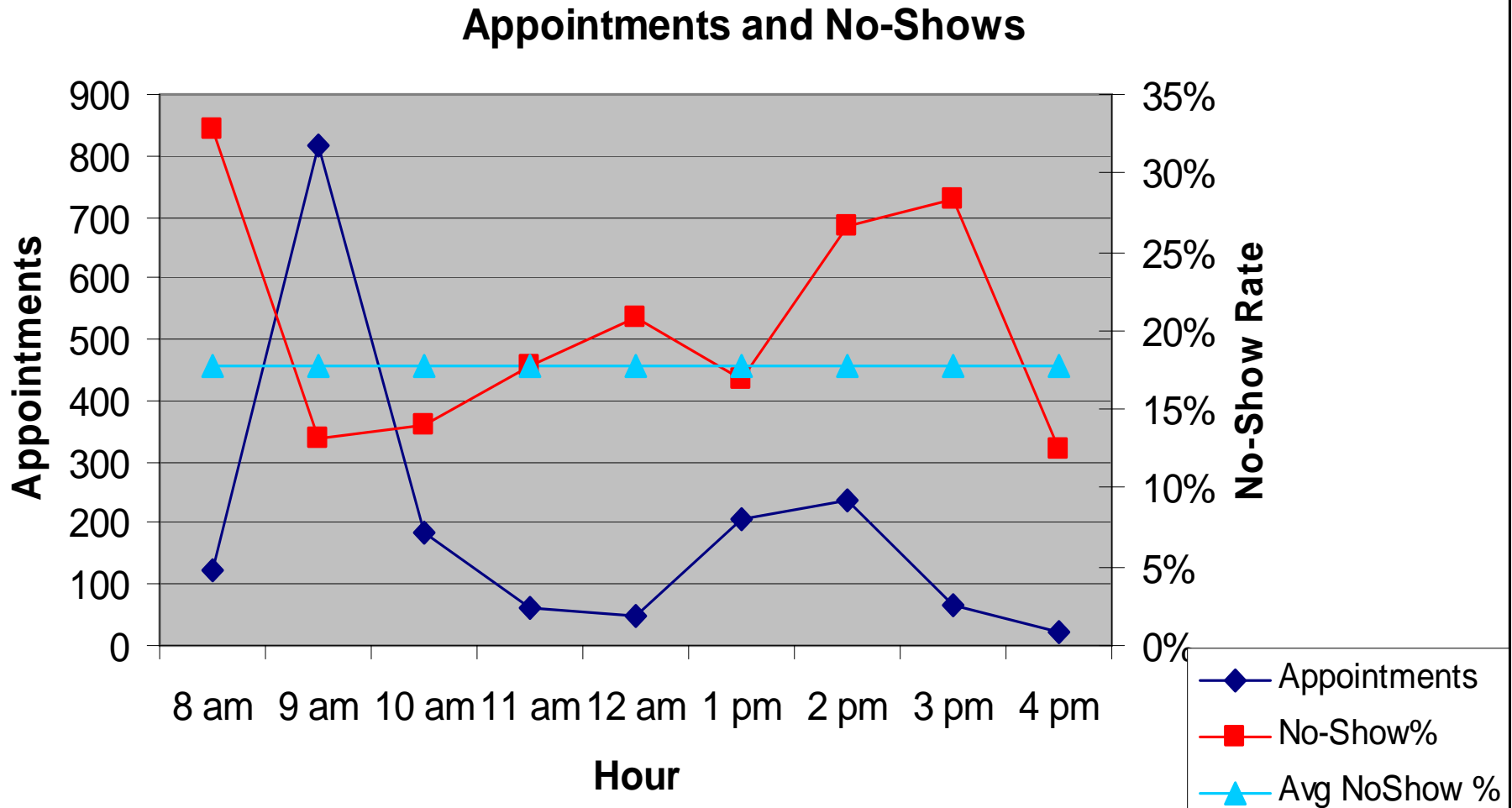


- No apparent relationship between number of appointments and no-show rate by clinic
- Clinic *D*'s approach

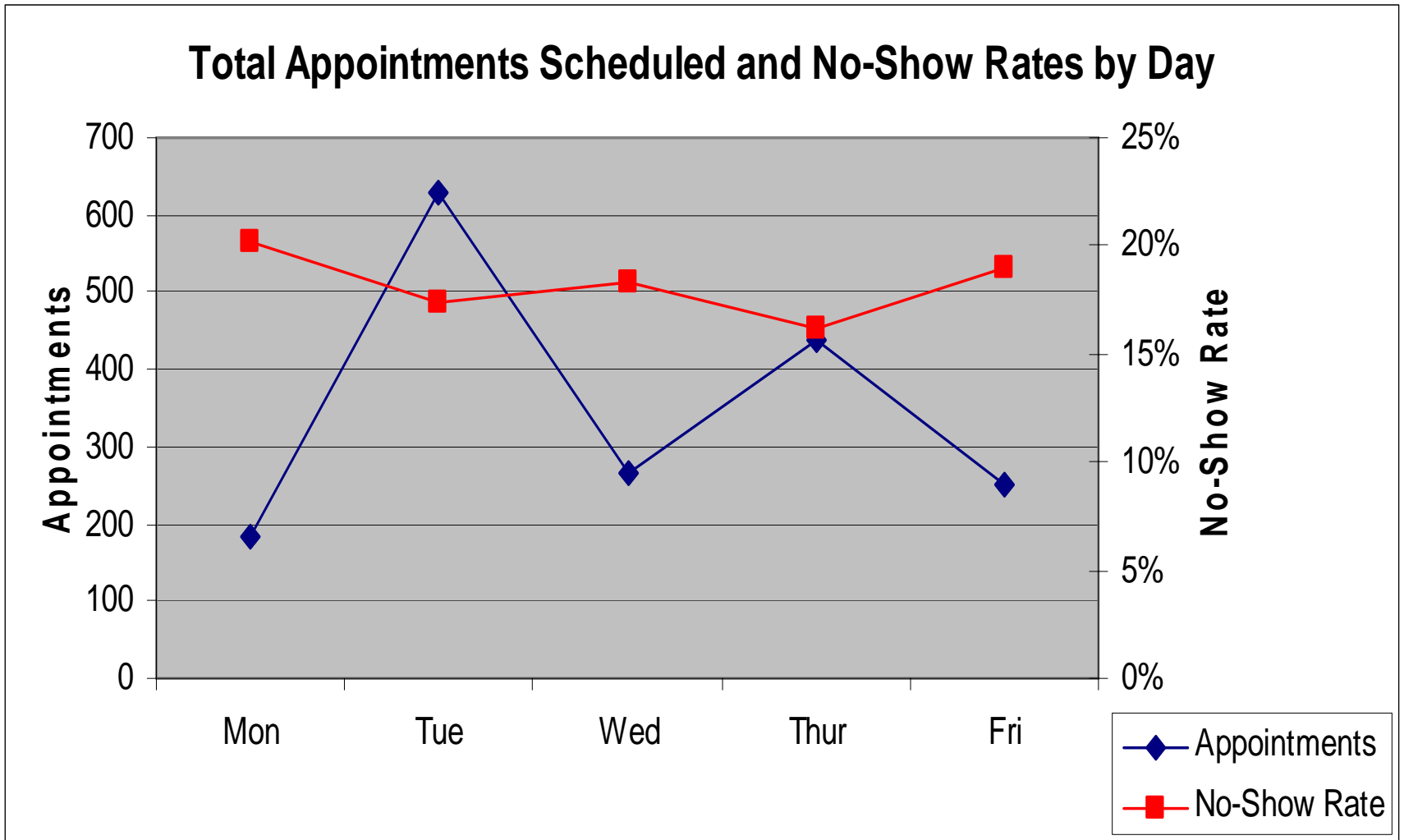
Clinic D's Yield-boosting Strategy

- No-show reduction and special overbooking
- Overbooks group orientations
- Individual appointments immediately follow
- Eliminates later opportunity for no-show (was 20%)
- One clinician conducts group session
- Flexible capacity to handle overbooking
- Total intakes increased 28% with no staffing increase

No-show Rates Vary by Time of Day



No-show Rates Vary by Day of Week



RICE Actions to Achieve Target State

- Initial appointments changed from once a week Mondays to twice a week Tuesdays and Thursdays
- Allows one-day advance reminders
- Increases same-week access
- Individual intakes immediately follow orientation
- Systematically overbook
- For A = appointments scheduled, N = appointments utilized, and S = show rate, the number of allocated appointments was set to $A = N/S$.

More *RICE* Actions

- Welcome letter, phone call
- Information, instructions, what to bring, transportation
- Provide reassurance
- Value and importance of keeping appointment
- Flexible service capacity
- Streamline service to create more slots

Results

- Monthly intake appointment *yield* increased 30%
- Increase in number of appointments *scheduled*
- Increased rate of appointments *kept*

4. Practical Recommendations for Effective Overbooking



I. Overbooking \neq Double-booking

- Double-booking
 - Favors providers
 - Long waits for patients
 - Unfairness
 - Congestion
- Overbooking alternatives
 - Compress time between appointments
 - Staggered “wave” scheduling

II. Understanding No-show Rates and Patterns

- Differences between clinics, days of week, hours of day
- Allocate appointments at the right time
- Shift staffing for better day-time yield

III. Understand and Prevent No-shows

- Ask patients
- What worked and why or why not?
- Track and utilize appointment data
- Synchronize to transportation schedules

IV. Reduce Service Time Variability

- Overbooking increases patient wait time and provider overtime on average
- These increase even more with service time variability

V. Beware of Long Service Times

- Models based on unit = service time
- Patient wait time may be intolerably long
- Shortening service time can create more appointment slots

VI. Consider the Psychology of Waiting (Maister, 1985)

- Create pleasant waiting experience
- Provide ancillary services
- Fill waiting time
- Technology for information and productive patient engagement

5. Future Directions



Happy Endings / New Beginnings

- Colorado Public Radio listener
- *RICE* success and monthly lean events
- Diversification of practitioner base
- Tuning realistic service practices
 - Advanced access
 - Walk-ins
 - Strategic/Selective overbooking

Questions? Comments?

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