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Improving Patient Access and Adherence to an Endocrine Program

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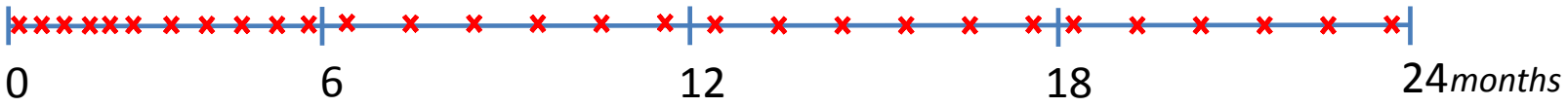
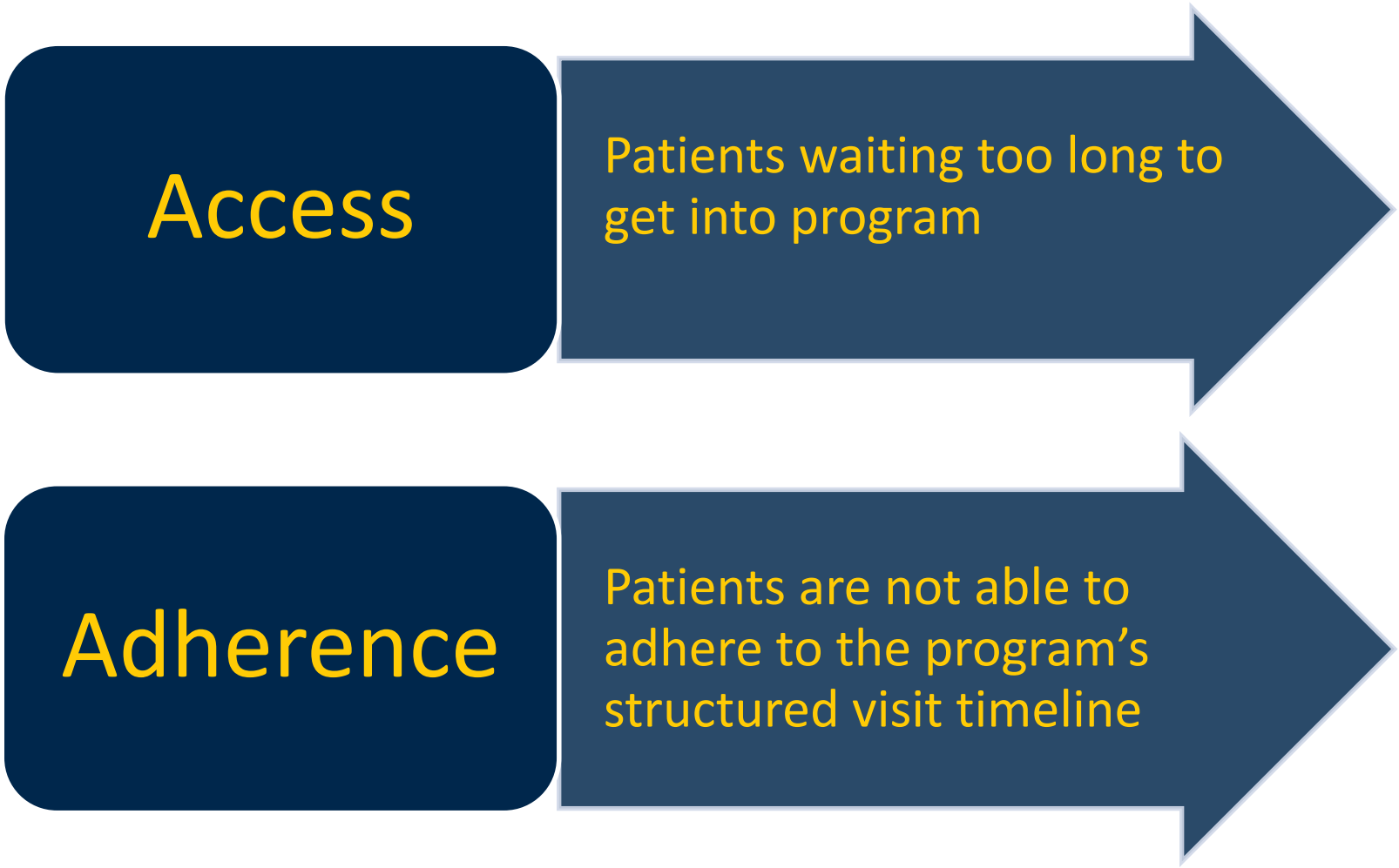
Background on the WMP Program

- The University of Michigan Weight Management Program (WMP) is a two-year program
  - Intense energy restriction
  - Behavioral change
- 26 total visits required over two years
- Patients must attend ≥80% of scheduled appointments
  - First month of program requires more frequent visits



[1]. Rothberg et al. BMC Obesity (2015) 2:11 DOI 10.1186/s40608-015-0041-9

Problem Statement



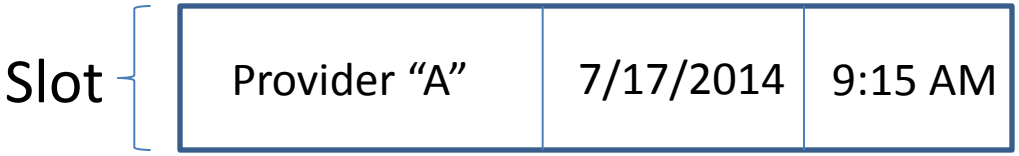
Approaching the Problem

- We designed a temporal database to analyze:
  - Capacity Dynamics
  - Patient Behavior

- The stages of the database are:
  1. Slot
  2. Appointment Opportunity
  3. Provider Template
  4. Appointment Schedule
  5. Appointment Schedule Snapshots

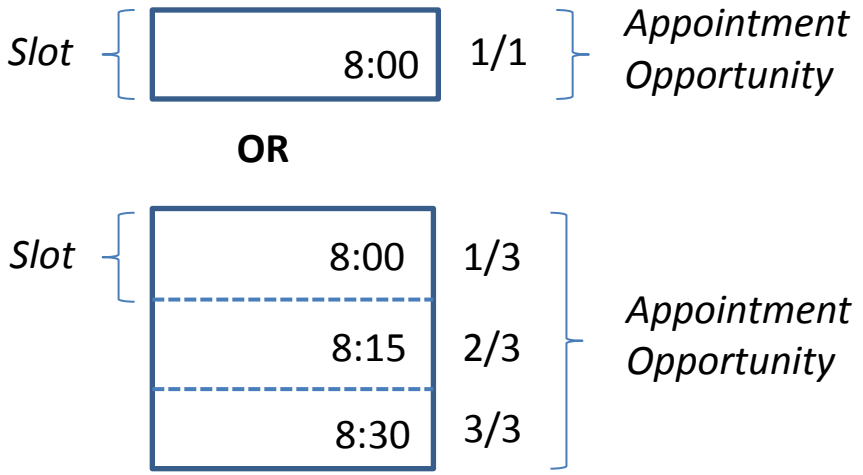
Slot

- Basic building block of the database
- Represents single 15 minute time period
- Corresponds to a single record in the database
- Defined by:
  - Provider Name
  - Slot Date
  - Slot Time



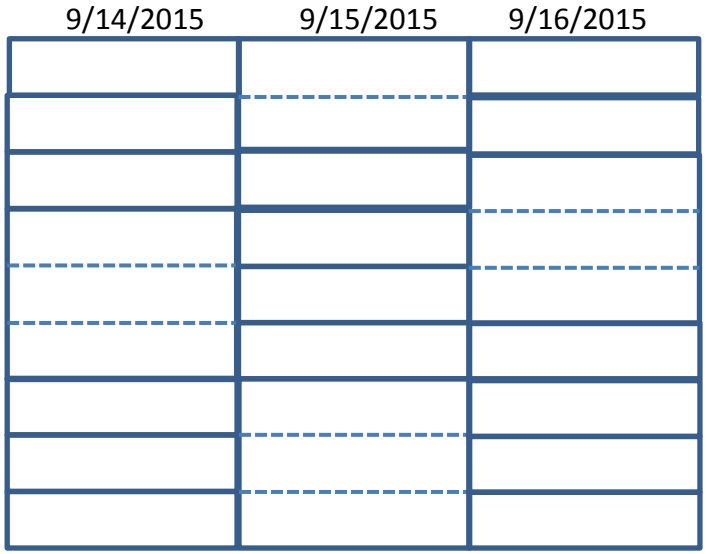
Appointment Opportunity

- *Appointment Opportunity* represents single placeholder for a patient appointment
- Appointment Opportunities are created expecting:
  - Return Visit (Single Slot)
  - New Patient (Multiple Slots)
- Defined by:
  - Appointment Length
  - Appointment Type
  - Slot Number in Appointment
  - Total Number of Slots in Appointment



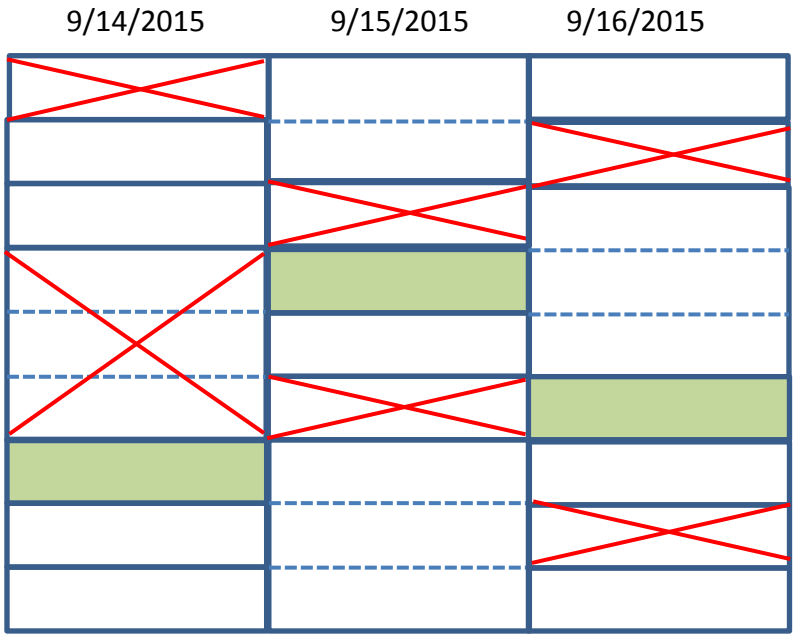
Provider Template

- Represents all possible *Appointment Opportunities* over a given timeframe
- This template is an aggregated schedule of each provider's general availability to see patients
- This excludes information about intermittent unavailability, e.g.
  - Out of office for conference
  - Vacation leave
  - Administrative duty



Appointment Schedule

- Represents *Provider Template* overlaid with:
  - Each provider's intermittent unavailability
  - Patient appointment data
- Some *Appointment Opportunities* are occupied by patient appointments



Appointment Schedule Snapshots

- On each day (M-F), we view the *Appointment Schedule*
- Each day's view represents an *Appointment Schedule Snapshot*
- We compare two consecutive Appointment Schedule Snapshots and capture changes from one to another, e.g.

What can we learn from the database?

From 7/15/2014 – 4/29/2016:

New Patients

- 25% of scheduled appointments were cancelled
- Of cancelled appointments, 90% were rescheduled

Return Visits

- 34% of scheduled appointments were cancelled
- Of cancelled appointments, 76% were rescheduled

Major Questions for Analysis

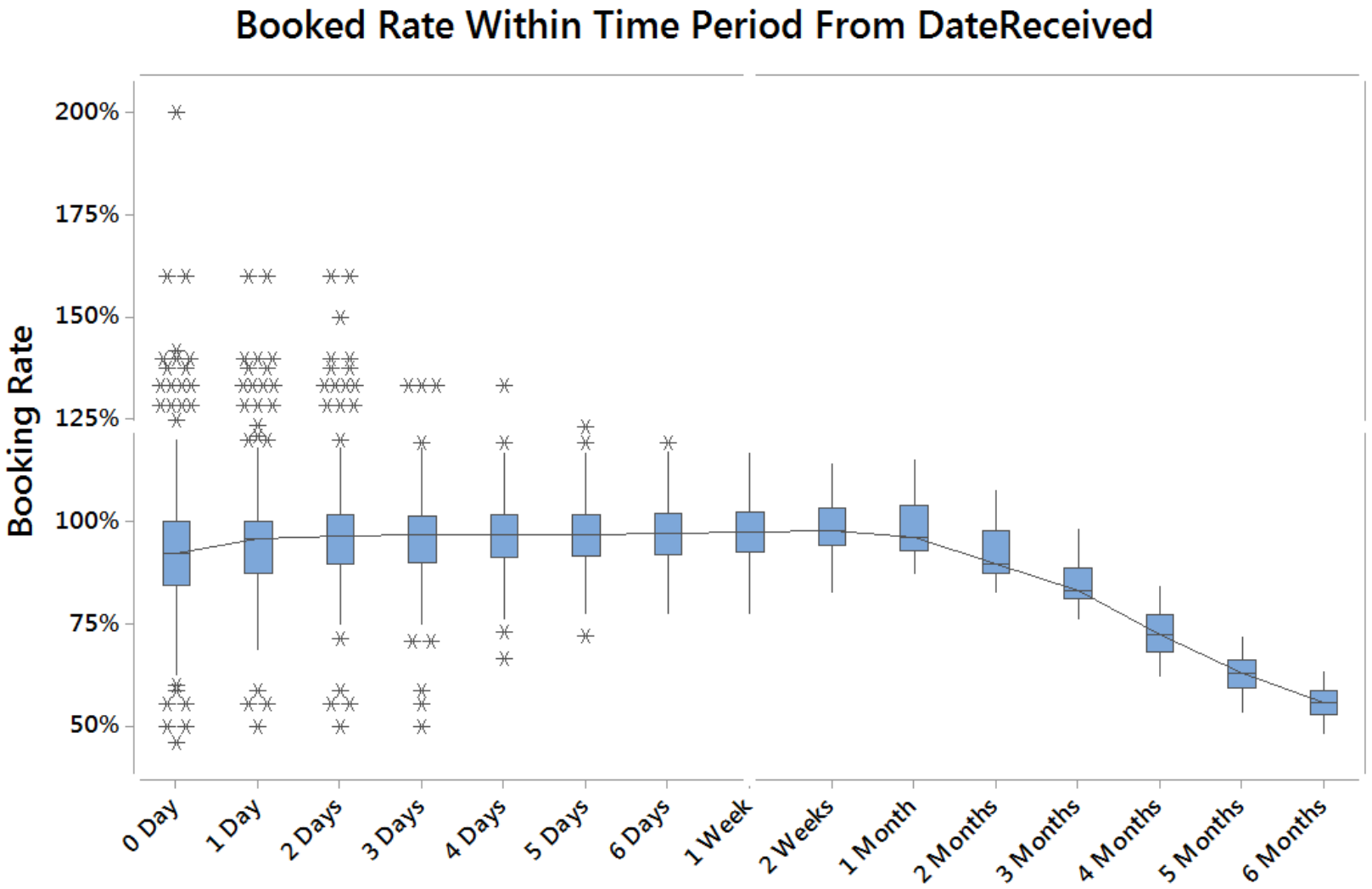
Capacity Dynamics

1. How easy is it to schedule an appointment "X" weeks into the future?
2. How far into the future are "X" slots available for scheduling?

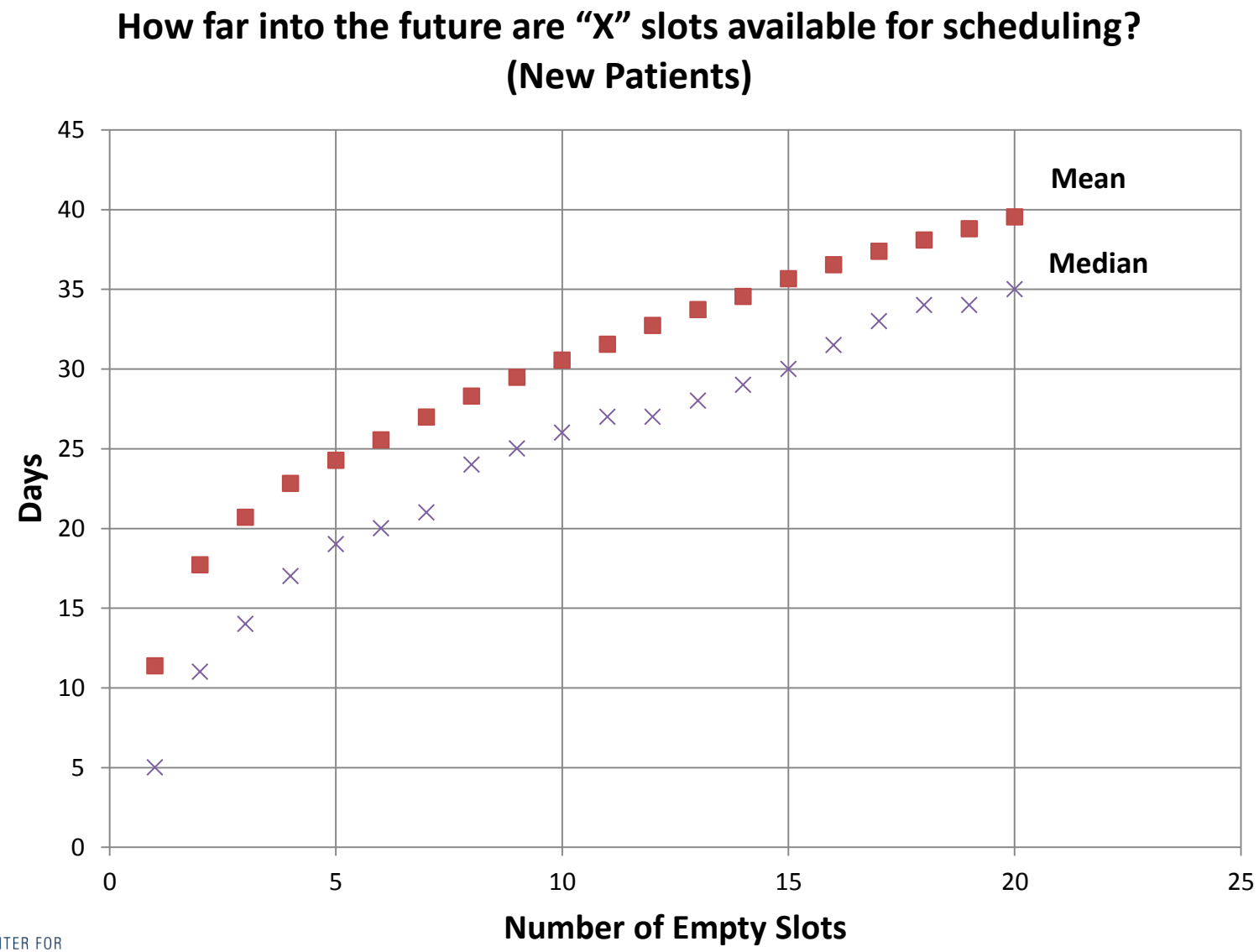
Patient Behavior

1. How long is an appointment held before it gets cancelled?

How easy is it to schedule an appointment "X" weeks into the future?

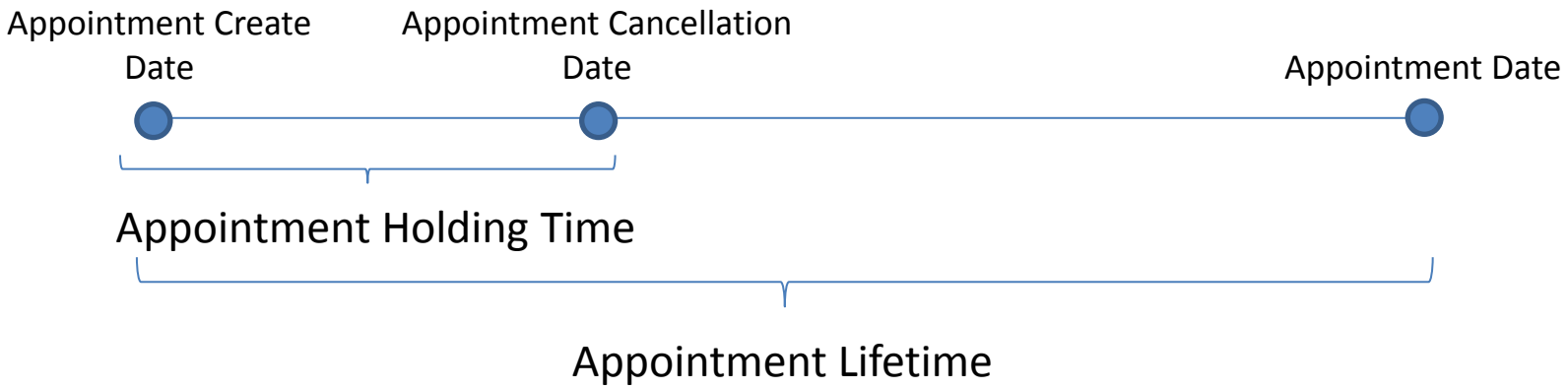


How far into the future are "X" slots available for scheduling?



Analysis (cont'd)

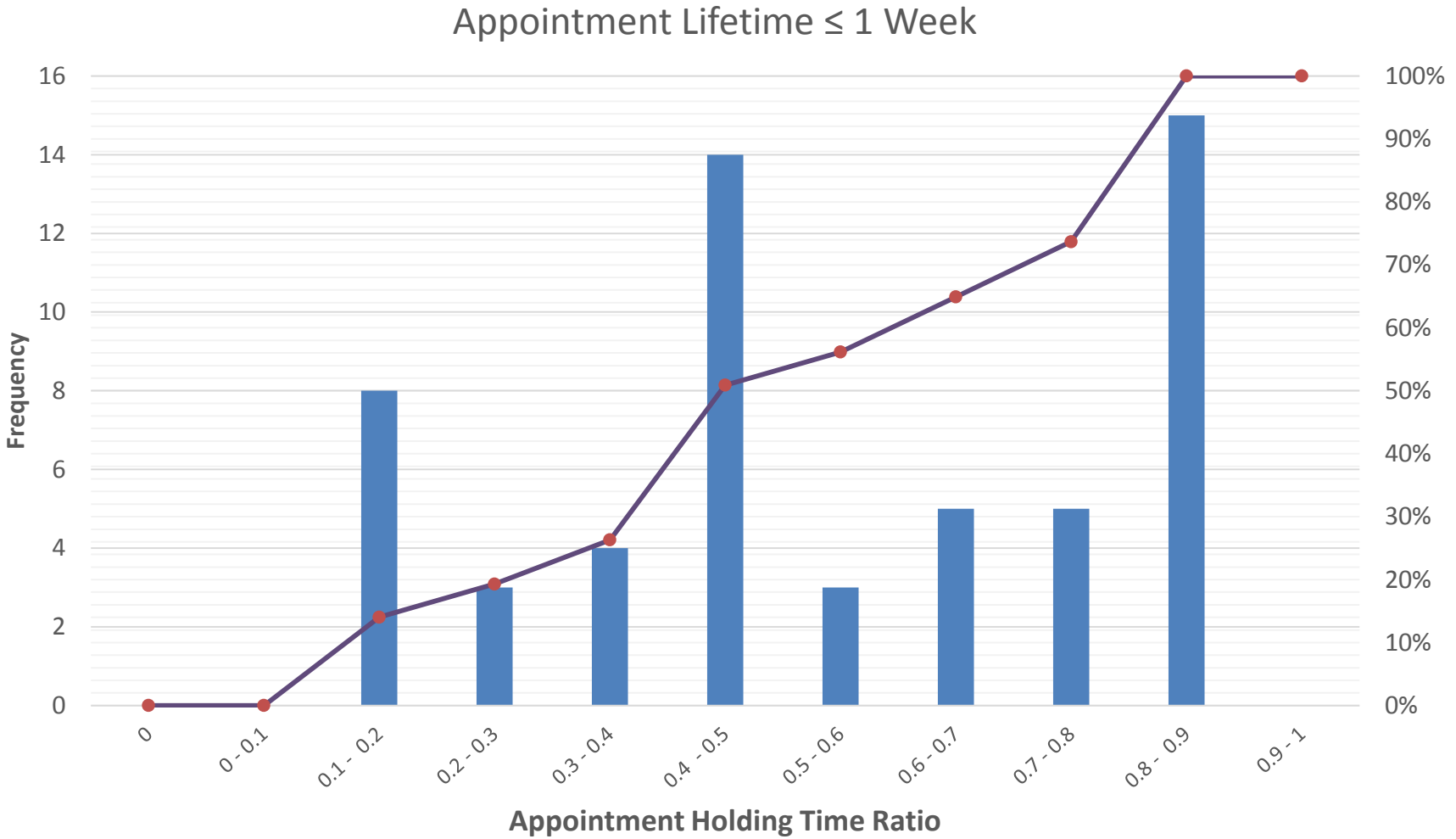
How long are people holding their appointments before they cancel?



$$\text{Ratio} = \frac{\text{Appointment Holding Time}}{\text{Appointment Lifetime}}$$

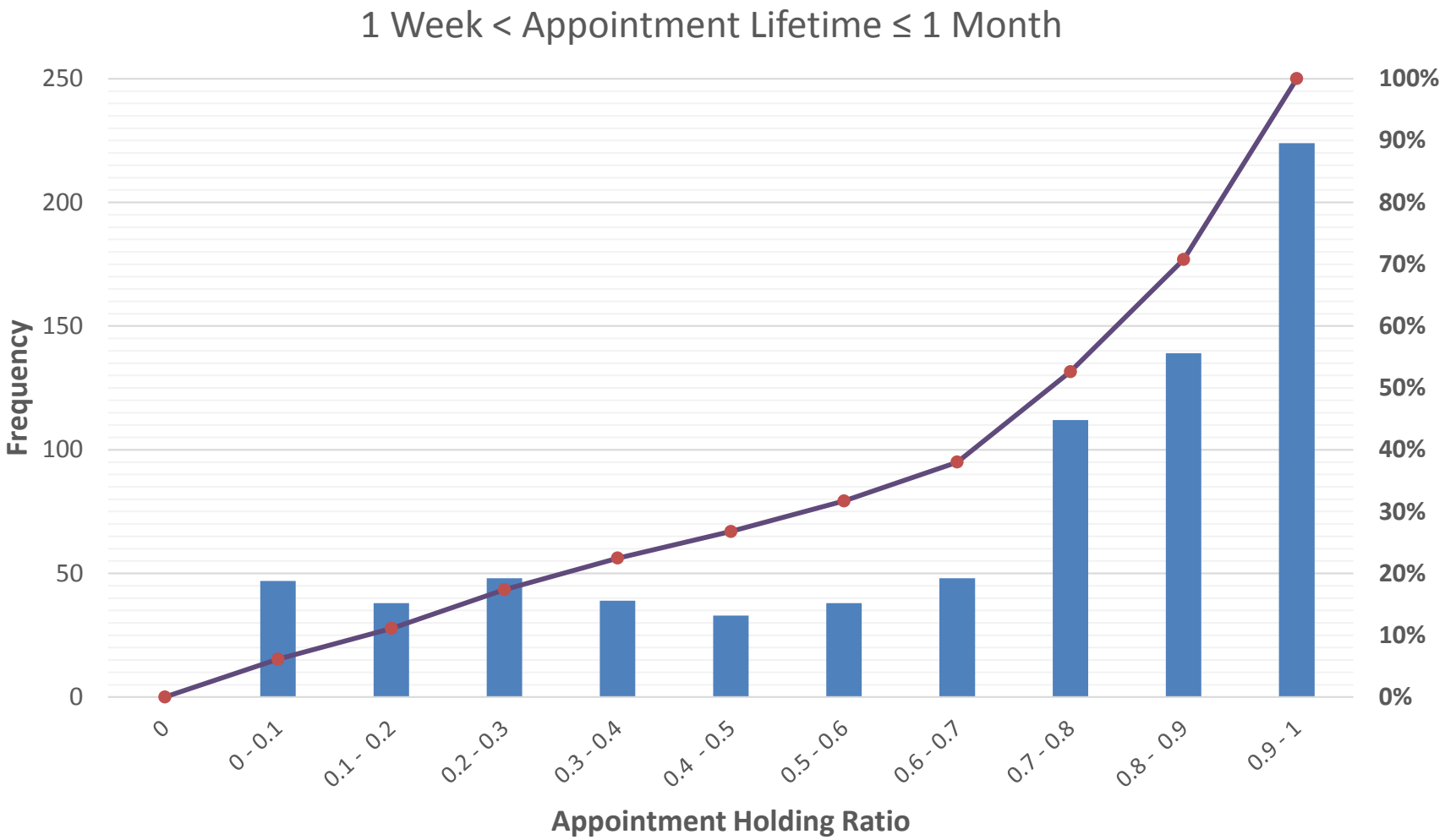
Analysis (cont'd)

N = 56



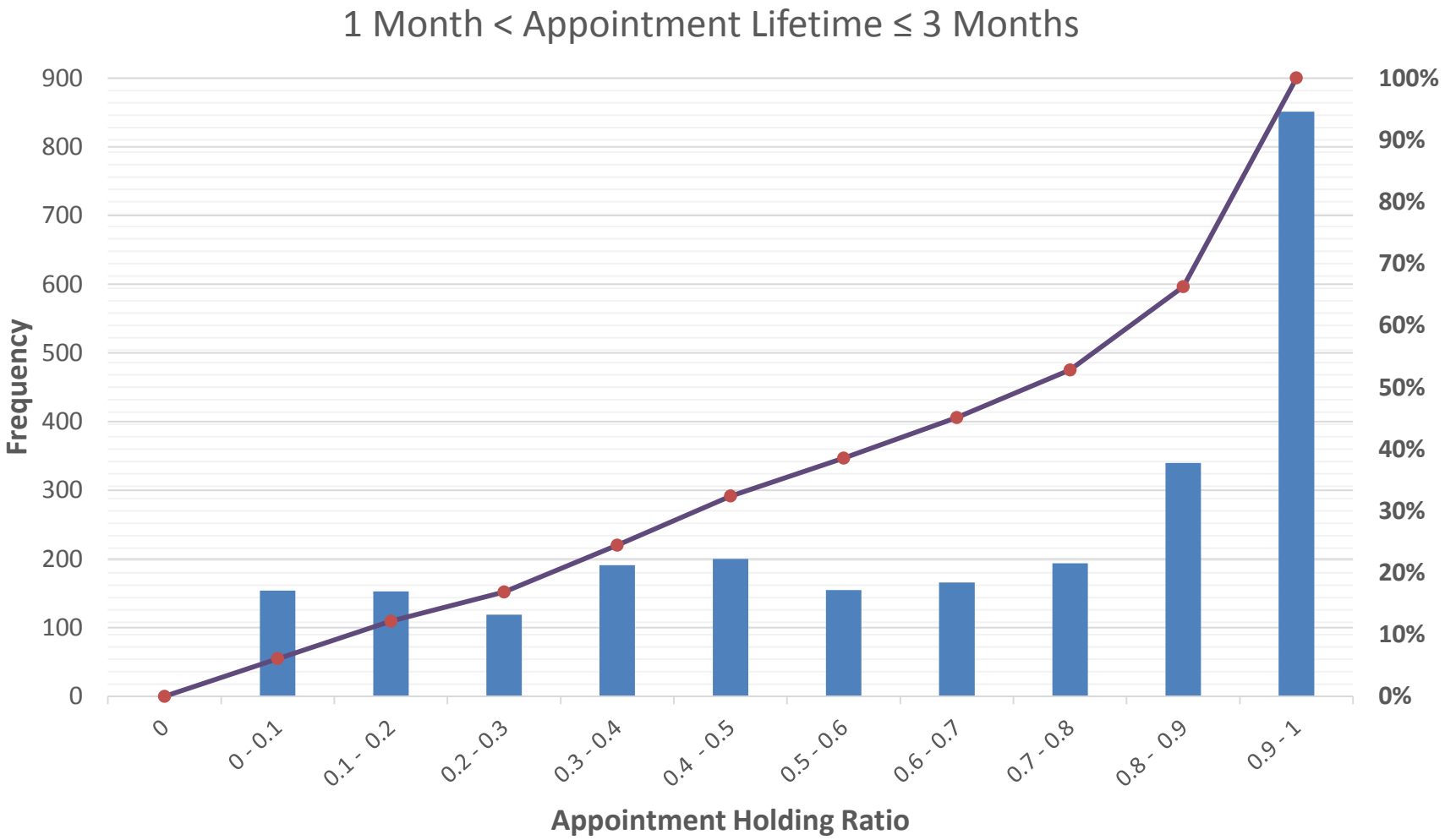
Analysis (cont'd)

N = 765



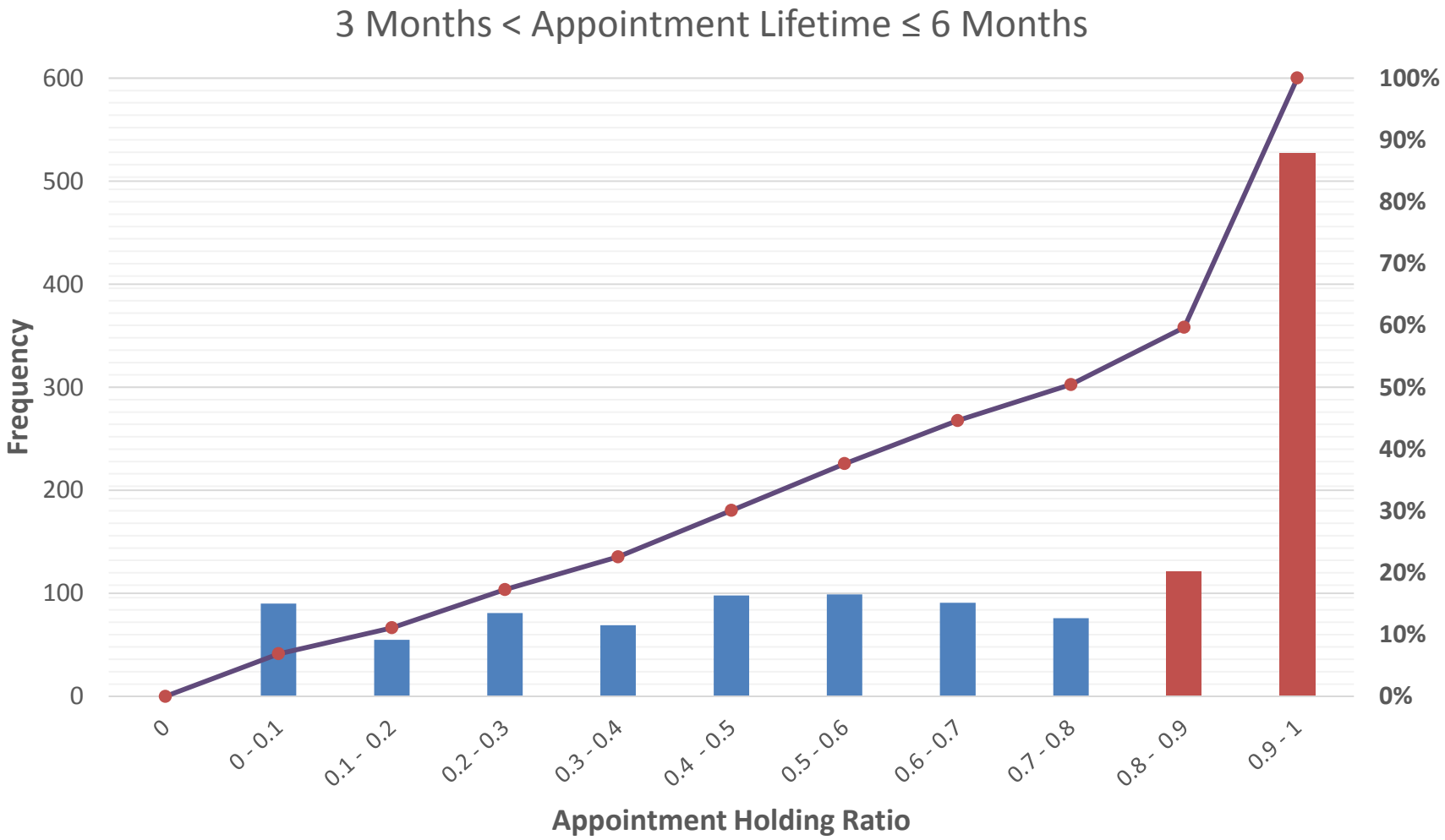
Analysis (cont'd)

N = 2522



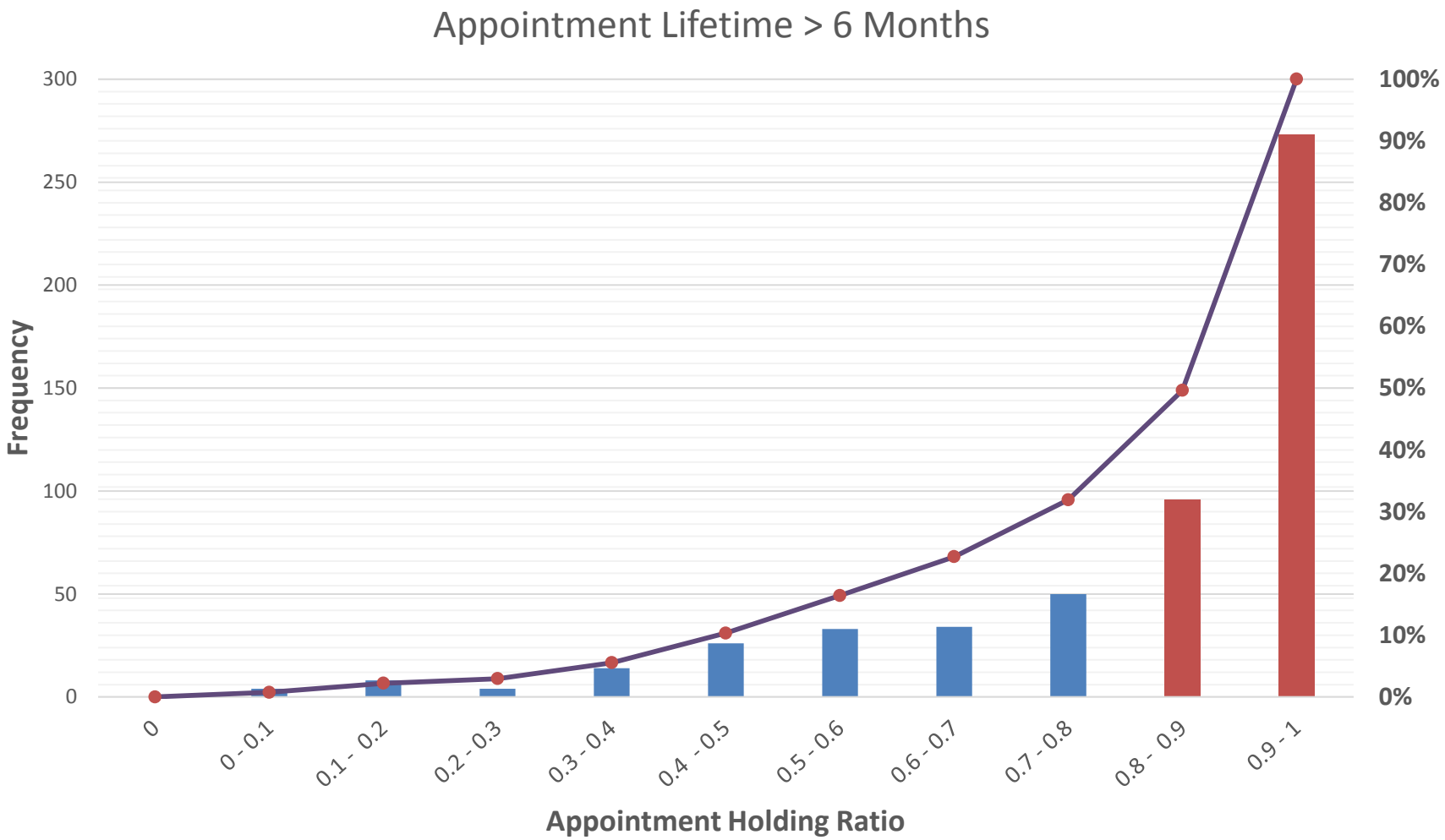
Analysis (cont'd)

N = 1306



Analysis (cont'd)

N = 541



Analysis Summary

- Difficult to see new patients within the first month of the clinic's schedule
  - Variability reduced in long term
- Utilization impacted by appointment holding times

Ongoing Work

- Look at the impact of seasonality on utilization metrics
- Track utilization of a particular slot over a specified duration of time
  - How is that slot changing?
- Look at priority of waitlists

Acknowledgements

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Thank you!

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