Why is My Doctor Always Late??

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Radiation Oncology
Physicians assess many patients each day in their clinics

On average, physicians will see 20 to 30 patients in an outpatient setting per day

Although physicians wish to accommodate all patients that need to be seen, many times patients wait for > 20 minutes past their scheduled appointment time
Patient Satisfaction

- Longer wait times inversely associated with clinical provider scores of patient satisfaction

Figure 1. The Relationships Between Waiting Times and Average Satisfaction Scores Across All 13 Study Questions

Physician Wait Times

- Doctor wait times the source of discussion in many medical journals
Cancer Clinic Wait Times

- Wait times to see physicians in cancer clinics may be longer than in primary clinics
  - More complicated patient population
  - Longer discussion about treatments
  - Discussion of side effects of therapies
    - Chemotherapy
    - Radiation
    - Surgery
Study Goals

- Estimate the proportion of cancer physicians who are > 20 minutes late in the cancer clinics located at the Medical College of Wisconsin

- Place a bound on the estimation
Medical College of Wisconsin

- Over 15,000 new cancer patients each year
- 85 cancer clinics housed within the hospital and outpatient cancer center
- Each clinic is large and accommodates up to 10 physicians at a time
Methods

- Each cancer clinic has a board which lists the physician and # of minutes they are behind.

- Method: PPS with Cluster sampling.

- Simple Random Sample of 15 clinics and surveyed to assessed number of physicians that were > 20 minutes late.

- Assessed mid morning and mid afternoon times, which are the busiest clinic times:
  - 10 AM-11 AM and 2 PM-3 PM

- Assessed Monday through Friday:
  - Evaluated over the course of 2 weeks.
<table>
<thead>
<tr>
<th>Physician</th>
<th>Minutes Behind</th>
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<tbody>
<tr>
<td>Smith</td>
<td>30</td>
</tr>
<tr>
<td>Charlson</td>
<td>0</td>
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<tr>
<td>Bedi</td>
<td>15</td>
</tr>
<tr>
<td>King</td>
<td>25</td>
</tr>
<tr>
<td>Taylor</td>
<td>10</td>
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<td>Robots</td>
<td>15</td>
</tr>
<tr>
<td>Clarke</td>
<td>5</td>
</tr>
<tr>
<td>Mogil</td>
<td>35</td>
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</table>
Sampling Units

- Frame: List of all doctors and their clinics
- Population: All cancer clinics located at the Medical College of Wisconsin
- Sampling Units: Individual Clinics
- Elements: Minutes physician in clinic is behind
## Raw Data

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Number_of_Providers (mi)</th>
<th>Number_of_doctors &gt;20 minutes_late (ai)</th>
<th>p</th>
<th>p*m</th>
<th>(ai-pmi)</th>
<th>(ai-pmi)squared</th>
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<td>Sum</td>
<td>117</td>
<td>63</td>
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<td></td>
<td>34.95147</td>
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</table>


**Results**

- Proportion of cancer physicians that are late in clinic
  
  \[ \hat{p} = \sum \left( \frac{a_i}{m_i} \right) \]
  
  - 0.538

- \[ \text{V} (\hat{p}) = \left[ \frac{(N-n)}{N} \right] \left[ \frac{1}{\bar{M}_i^2} \right] [\text{sp}^2/n] \]
  
  - \( \bar{M}_i \approx m_i = \left( \frac{1}{n} \right) \sum m_i \)
  
  - \( \text{sp}^2 = \frac{(a_i - \text{pm}_i)^2}{(n-1)} \)

\( M=117 \)
\( N=85 \)
\( n=15 \)
Results

• $M_i \approx m_i = \frac{1}{n} \sum m_i$
  - $\frac{117}{15} = 7.8$

• $sp^2 = \frac{(a_i - pm_i)^2}{(n-1)}$
  - $\frac{34.95}{14} = 2.49$

• $V(\hat{p}) = \left[ \frac{(N-n)/N}{1/M_i^2} \right] \frac{sp^2/n}{\left[ \frac{(85-15)/85}{1/7.8^2} \right] \left[ 2.49/15 \right]}$
  - $\left[ 0.823 \right] \left[ 0.0164 \right] \left[ 0.166 \right] = 0.00224$

• Bound = $2 \sqrt{V(\hat{p})}$
  - $2 \sqrt{0.00224}$
  - 0.095

• 53.8% +/- 9.5%
Results

- Thus, the proportion of doctors who are running > 10 minutes late is 53.8% +/- 9.5%
Study Limitations

- Sampled 15 clinics via SRS on various days of the week
  - Proportion of physicians who are late vary with time of day and day of the week
    - Although attempted to keep time of day constant, other times of day could be more or less busy for providers
    - Days of the week could also be more or less busy for providers
    - Physicians who were on an inpatient service over the 2 weeks assessed could have had a higher chance of >20 minute wait times
    - Physicians in certain cancer clinics could be more busy than others, depending on cancer type or services provided
    - Certain cancer clinics may be more busy than others, depending on if they have enough ancillary staff (RNs, CNAs, schedulers, etc)
Study Improvements

- **Study Quality Improvements**
  - Assess clinics over the course of the year, perhaps 1 week per month
  - Increase sample size
  - Stratify the clinics into those who specialize in various cancers, as procedural based clinics may have more providers who are behind
    - Gastrointestinal Cancers
    - Head and Neck Cancers
    - Gynecologic Cancers
    - Genitourinary Cancers
Conclusions

Physician wait times are an increasing problem leading to patient dissatisfaction.

Identifying proportion of physicians and clinics that have increasing wait times could lead to identifying ways to address this issue:

- Schedule times for patients
- Increase support staff
- Adjust clinic times