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Predictors of repeated "no-showing" to clinic appointments☆

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ABSTRACT

Objective: To determine the variables that contribute to repeated patient non-compliance with showing up to clinic appointments.
Study design: Retrospective chart review.
Setting: Single tertiary care academic institution.
Subjects and Methods: Patients who did not show up to 3 or more clinic appointments in the otolaryngology department in the Henry Ford Health System in metro Detroit, Michigan between July 1, 2011 to June 30, 2012 area were compared to control patients randomly chosen from those who had appointments on the same day with the same provider as the no-show patients.
Results: 105 patients were identified who no-showed to 3 or more clinic appointments. Younger age, black race, and lower income were all found to be significant factors for patients missing appointments in a multiple variate model. On logistic regression, Medicaid insurance, closer distance from home to appointment, less bus transfers, and less time by bus travel were also found to correlate with no-showing.
Conclusion: Age, race, and income are significantly related to patient non-compliance with clinic appointments. Paradoxically, proximity to the clinical appointment location is also significantly related – we hypothesize this may be the result of significant income inequality in the metro Detroit population distribution. Follow up studies include analyzing factors that precluded patient access and interventions to improve compliance and decrease cost.
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1. Introduction

The "no-show" patient is well known to every healthcare provider. They decrease healthcare delivery efficiency by limiting access to care for other patients and lowering provider productivity. With each no-show patient, not only is a clinic slot lost that could have been filled with a "showing" patient, but also potential operative procedures for the otolaryngologist may be missed.

Previous authors have analyzed factors that contribute to patients no-showing by looking at both patient factors as well as provider factors in otolaryngology clinics [1,2]. However, past studies have focused on non-attendance as a whole and have not stratified these patients into one-time offenders versus repeat offenders. These studies also focused primarily on scheduling factors rather than patient factors.

This is the first study to look specifically at patients who serially fail to attend clinic appointments with an emphasis

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Table 1 – Variable description for no-show and control patients.

Variable	Controls		No-shows		p-value
Female gender	48.1%		59.6%		0.047
Black race	34.2%		73.1%		0.001
Medicaid insurance	31.8%		45.2%		0.016
	mean	SD	mean	SD	
Age	54.6	21.9	43.6	20.5	0.001
Miles to appointment	16.6	27.0	13.3	11.6	0.612
Minutes by car	21.0	26.2	18.2	12.3	0.491
Minutes by bus	87.5	50.5	73.0	40.0	0.030
Number of bus transfers	1.2	0.9	0.9	0.7	0.002
Income level	50853	22771	29588	16510	0.001

on identifying patient-specific factors that might help predict those at higher risk for missing appointments. By being able to predict patients who are at risk, measures can be taken to better help these patients obtain the medical care they need, maximize access to care across the board, as well as increase provider productivity.

2. Methods

Patients who missed three or more clinic appointments in the otolaryngology department in the Henry Ford Health System in metro Detroit, Michigan, between July 1, 2011, to June 30, 2012, area were analyzed. Only patients scheduled for a physician or mid level provider (nurse practitioner or physician assistant) appointment were included. Audiologic appointments were excluded.

No-showing was defined as missing a scheduled appointment that was not cancelled ahead of time. All appointments were scheduled by patients and missed appointments were not automatically rescheduled. All four otolaryngology clinic sites were included in the analysis: Detroit, Dearborn, Sterling Heights, and West Bloomfield.

To generate a control cohort of "showing" patients, three days missed by each no-show patient were selected. A patient with the closest appointment time to the no-show patient for the same provider who showed up to their clinic appointment was selected to the control group for each of the days missed.

Parameters analyzed included: age, sex, race, median income of zip code, miles from appointment (from patient's address), minutes by car, minutes by bus, number of bus transfers, and insurance type (Medicare, Medicaid, or other). Uninsured patients were not accounted for in the analysis as uninsured patients are unable to be seen in the outpatient clinics. Google maps (http://maps.google.com) was used to map each patient's address to their clinic appointment location. The number of minutes by car was estimated with Google maps, selecting the route offering the shortest travel time to the appointment location. Current traffic conditions for that particular time of day were not adjusted for, as it was Henry Ford's policy at that time to see patients even if they were late.

Minutes by bus and number of bus transfers were also determined with Google maps. Because of the variability in bus schedules depending on the time of day, the bus route was determined assuming patients would take bus routes aiming to arrive at their appointment on time. If multiple bus options were available, the bus offering the shortest time to appointment location was selected. For some patients living very far away from their appointment location, bus service was sometimes not available.

Median income of the patient's zip code was determined through the United States Census American Community Survey data compiled by the University of Michigan for census data between 2006 and 2010 (http://www.psc.isr.umich.edu/dis/census/Features/tract2zip/index.html). This is a well-established method for approximating income level of patients [3,4].

The two groups, no-show and control patients are described in Table 1. The categorical variables are compared between the two groups using a Chi-squared test while the continuous variables are analyzed using a Wilcoxon two-sample test. The nonparametric method was used as the normality of the variables was in question.

A logistic regression was used on each variable individually to estimate an odds ratio of no-showing for the appointment. For minutes to the appointment location by bus, the odds ratio is a change for 10 minutes and for income, it is for a change of $10,000. A multivariable model was then implemented using a stepwise routine to find the most parsimonious model where each variable was significant. All analyses were performed using SAS 9.2 and a p-value less than 0.05 was considered significant.

This study was approved by Henry Ford's Institutional Review Board.

3. Results

Out of 6311 total appointments that were no-shows between July 1, 2011, to June 30, 2012, 105 patients were identified who missed 3 or more clinic appointments within that year. Sixty-three appointments were located in Detroit, 19 in Dearborn, 15 in Sterling Heights, and 8 in West Bloomfield clinic locations. The Detroit and West Bloomfield clinics are located within a larger hospital. The Dearborn and Sterling Heights clinics both have ambulatory surgery centers but no in-patient services connected (the Dearborn facility also has an emergency department).

The two groups are described and compared in Table 1. The no-show group had a higher proportion of female, black, and patients with Medicaid insurance and the difference is statistically significant. The no-show group also had a statistically lower mean age,

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