Zip Code as a Predictor of Day of Surgery Cancellation
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Introduction
Cancellation of surgery on the scheduled day is a significant problem at children's hospitals, affecting between 4.5-18% of scheduled cases1. This leads to emotional distress for both family and child, and carries economic implications to both family and hospital system. Tait et al found that families drive on average 160 miles and 30% of family members miss at least one day of work (often unpaid)2. Also children may fail to receive appropriate and timely surgical care.

At Cincinnati Children’s Hospital Medical Center (CCHMC) 5.7% of total OR time is lost due to such cancellations. The most common reason is patient illness, followed by failure to show up, then violations of eating/drinking instructions. In addition to facilitating family well-being, reducing last-minute cancellation rates improves OR utilization by allowing add-on and emergency cases to be accommodated. To decrease the rate of day-of-surgery cancellation, it is important to identify individuals at highest risk.

Methods
With IRB approval, using the open-source R statistical package and a year of data available from the electronic medical record on the day prior to surgery (n=18910), multiple logistic regression was used to identify predictors of day-of-surgery cancellation at the CCHMC Burnet campus.

Both completed and canceled cases within the Greater Cincinnati metro area (n=9271) were plotted on a city map (OpenStreetMap) with each case represented by one dot, color coded according to the cancellation rate in the local zip code district and grouped by quartile (Figure 1). A similar map was constructed for non-commercial payer rate (Figure 3).

Results
Both zip code of residence and non-commercial payer status independently strongly predict cancellation on the day of scheduled surgery (p<0.0001). Within the area depicted, day-of-surgery cancellation rates by zip code vary from 0 to 25%, and non-commercial payer rates from 0 to 100%.

Discussion
Comparison of maps showing day-of-surgery cancellation (Figure 1) and non-commercial payer rates (Figure 3) by zip code supports that socioeconomic status is an important predictor of access to medical care. However there are notable areas where cancellation rates are higher than would be expected if insurance status were the underlying reason for case cancellation.

These results will be used to target interventions towards patients most likely to have surgery cancelled on the scheduled day. In follow up, these interventions will be tracked to determine if the day-of-surgery cancellation rate is reduced as a result.