**Conclusions**
A data quality improvement initiative significantly improved accuracy of data used to monitor maternal progress of this MNH Collaborative in Ethiopia.

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**FROM NO SHOW TO ARRIVED: USING MACHINE LEARNING TO BOLSTER PATIENT ATTENDANCE FOR RESIDENT CONTINUITY-CLINIC APPOINTMENTS**

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**Background**
Resident continuity-clinic (RCC) is a crucial component of ambulatory training in primary care. The no-show rate (NSR) in a large academic center with 60 residents averaged 27% in academic year (AY) 2018, despite an automated phone/text reminder system 3 days prior to appointment, resulting in fragmented care, reduced access and decreased learning opportunities for residents.

**Objectives**
To determine whether telephone outreach targeting patients predicted to be at high-risk to no-show can reduce NSR for RCC appointments.

**Methods**
A validated machine-learning prediction model developed by data scientists at UPMC for Primary care, generated a daily list of high-risk patients (i.e. ≥20% risk to no-show).

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### Table 1 Patient characteristics: resident clinic. Unique patients scheduled in AY 2019

<table>
<thead>
<tr>
<th>Pt Demographics AY 2019</th>
<th>Unique Scheduled Patients (N/%)</th>
<th>No Shows (Unique Patients) (N/%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique patients</td>
<td>6230 (100%)</td>
<td>1532 (25%)</td>
</tr>
<tr>
<td>Age 18-39 Yrs</td>
<td>2990 (48%)</td>
<td>710 (46%)</td>
</tr>
<tr>
<td>Age 40-64</td>
<td>2430 (39%)</td>
<td>693 (44%)</td>
</tr>
<tr>
<td>Age &gt; 65</td>
<td>810 (13%)</td>
<td>157 (10%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3606 (58%)</td>
<td>841 (55%)</td>
</tr>
<tr>
<td>Male</td>
<td>2624 (42%)</td>
<td>691 (45%)</td>
</tr>
<tr>
<td>Ethnicity/Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>2618 (42%)</td>
<td>941 (61%)</td>
</tr>
<tr>
<td>White</td>
<td>2817 (45%)</td>
<td>466 (30%)</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>2625 (48%)</td>
<td>376 (28%)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>1568 (29%)</td>
<td>608 (45%)</td>
</tr>
<tr>
<td>Medicare</td>
<td>1093 (20%)</td>
<td>287 (21%)</td>
</tr>
</tbody>
</table>

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**Abstract Figure 1** Determinants of machine learning algorithm

- Algorithm developed and validated using 1.7 million office visits within the UPMC Health System
- Each day, the model generates prospective predictions about all appointments in the upcoming week.
- Threshold for assigning a high no-show probability was 20% for GIM-resident clinic
Abstract 22 Figure 2  Sample daily report

Phone Call Outcomes (n=2,046)

- Reached 59%
- Not Reached 41%

Reach outcomes (n=1,206)

- Confirmed 89%
- Rescheduled 4%
- Canceled 3%
- Other 28%

Not reached outcomes (n=840)

- Left VM 68%
- Other 28%
- Mailbox full 3%
- Not in service 1%

Abstract 22 Figure 3  Outcome of Phone calls: Reached or Not reached. If reached, appointment confirmed, canceled, rescheduled, or other (language barriers/hospital admissions). If not reached, other includes: no answer/ no voice mail set up, phone number wrong in chart, & no active phone

Abstract 22 Figure 4  Analysis of Resident clinic Appointments: AY 2018 and AY 2019. No-show rate (NSR) calculated against completed + no-shows. * P value using Chi-Square test. ** Canceled visits include same day cancellation and cancelled rate calculated against 'All' visits. ±±±
Starting Oct 2018, these patients received a phone-call reminder from a clinical staff, 48 hours prior to their scheduled appointment. The outcomes of the call recorded were confirmed, cancelled, rescheduled, voicemail, not reached. Monthly NSR was tracked from July 2017 through June 2019 and analyzed using control charts.

| Revenue Generated | $359,177 | $399,533 | + $40,000 |

**P Chart- No Show Data 2017-2019**

![P chart showing no show data from July 2017 to June 2019.](image)

**No Show rate: Pre (AY 18) & Post Intervention (AY-19)**

![No show rate chart showing pre and post intervention data.](image)

**Run Chart: Model Predicted No Show, Pts Reached (N%) and No-Show Rate**

![Run chart showing model predicted no shows and patient reach rates.](image)

Abstract 22 Figure 5  (A) Control Chart (P chart): Resident Clinic No-Show data from July 2017–June 2019. (B) Control Chart Showing: No-show rate, pre (AY 2018) and post intervention (AY 2019). Intervention start date -Oct 2018

Abstract 22 Figure 6  Run Chart (Oct 18–June 19): Model Predicted No Shows (N), patients reached (N&%), monthly NSR%. Apr->Jun; lower percentage of patients reached and higher no-show rates
Results Fifty-nine percent (1206/2046) of targeted patients were reached. Of those 89% confirmed and 10% canceled or rescheduled their appointment. The overall no-show rate for RCC appointments in (AY) 2019 decreased to 23%, p<0.01, 95% CI [21.6% to 25.0%], resulting in additional 283 completed visits and $40,000 in revenue. Higher no-show rates correlated with lower percentage of patients reached. Patients on government-assisted insurance (76%) and African-Americans (61%) had higher no-shows and a major barrier was transportation.

Conclusions To our knowledge this is the first study showing that targeted phone outreach for high-risk patients can decrease NSR for RCC appointments, augmenting resident learning opportunities and revenue.

OUTCOMES OF CREATING AN AUTOMATED REPEAT LACTATE RULE IN SEPSIS PATIENTS WITH LACTATE LEVELS ≥2
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Background Sepsis is a complex disease process that possesses a socioeconomic burden in the U.S. Serum lactate and lactate clearance form an important component of the sepsis resuscitation bundle and high levels correlate with worse outcomes. Previous studies emphasized the importance of utilizing lactate monitoring to guide resuscitation to improve mortality.

Objectives We aimed to enhance lactate monitoring and lactate guided resuscitation in sepsis patients with lactate levels ≥2 mmol/L in order to improve outcomes.

Methods An EMR automated Q2 lactate repeat orders for sepsis patients who have an initial lactate level ≥2 mmol/L was implemented. Lactate dashboards showing all patient-level lactate values during initial resuscitation was incorporated into Hospital Sepsis Committee Multi-Disciplinary meetings.

Results We included 1774 adult sepsis patients admitted from the ED to MICU from October 2014 to September 2018 who had an initial lactate level ≥2 mmol/L. We aimed to compare the median time from ED arrival to lactate reduction to <2 mmol/L, median time from 1st elevated lactate result to lactate <2 mmol/L and the median length of stay (LOS). Post-intervention, the time from ED arrival to lactate <2 mmol/L for those patients with an elevated lactate significantly reduced by 10.56 hours and the time from first elevated lactate to lactate <2 mmol/L significantly reduced by 9.51 hours. LOS reduced by 3 days post intervention.

Conclusions Implementing an automated repeat lactate order for sepsis patients along with a multi-disciplinary review of dashboards resulted in an improvement in lactate clearance and a reduction in LOS. Further studies are needed to investigate this finding.

QUALITY IMPROVEMENT PROJECT TO INCREASE COMMUNITY TB DETECTION IN WACHA PRIMARY HOSPITAL
Biniam Teshome, Nebiyou Wendwessen. Wacha Primary Hospital, Ethiopia; iHI, Ethiopia
10.1136/bmjqo-2019-ihi.24

Background Wacah primary hospital is located in Ethiopia 513 km away from the capital. Tuberculosis is a major public health problem posing significant deleterious health impacts by affecting the productive segment of the population and resulting serious burden to the health system and exploiting the individual's/household economy. Community TB detection plays crucial role to control its transmission in the community but our hospitals community TB detection rate is at 19%.

Objectives To increase our community TB detection rate from a baseline of 19% to 50% by the end of April 2019.

Methods 1. Refreshment course for HEW (health extension workers) were given 2. Sputum smear preparation: One big problem identified was patients were refusing to be referred because of the distance and lack of transport. So our change idea was to train HEW on how to prepare sputum smear slides for suspected patients, after the slides were prepared they bring it to the hospital. If patient is positive he will be recalled from the community to get treatment. 3. Flyers about sign and symptom of TB were prepared and deployed for the general public 4. Health education on Tb was given by nurses