Identifying and Measuring Radiography Ordering Errors Using a Web-Based Event Reporting Tool and RIS to Analyze Errors and Identify Opportunities for Improvement

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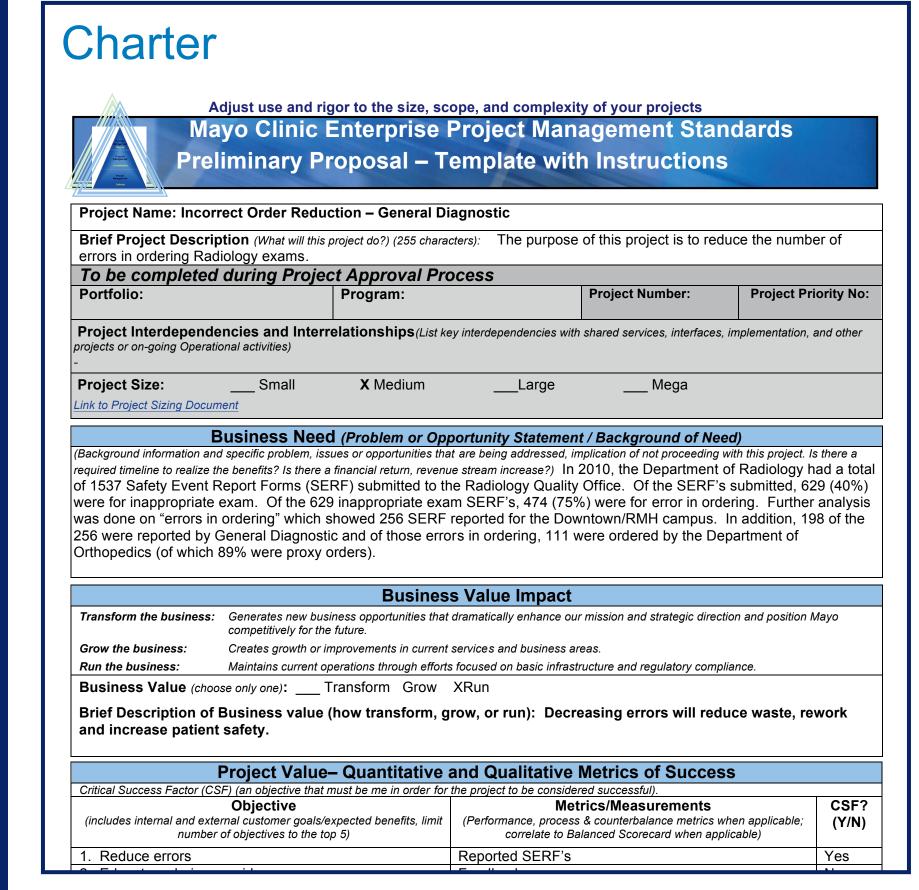
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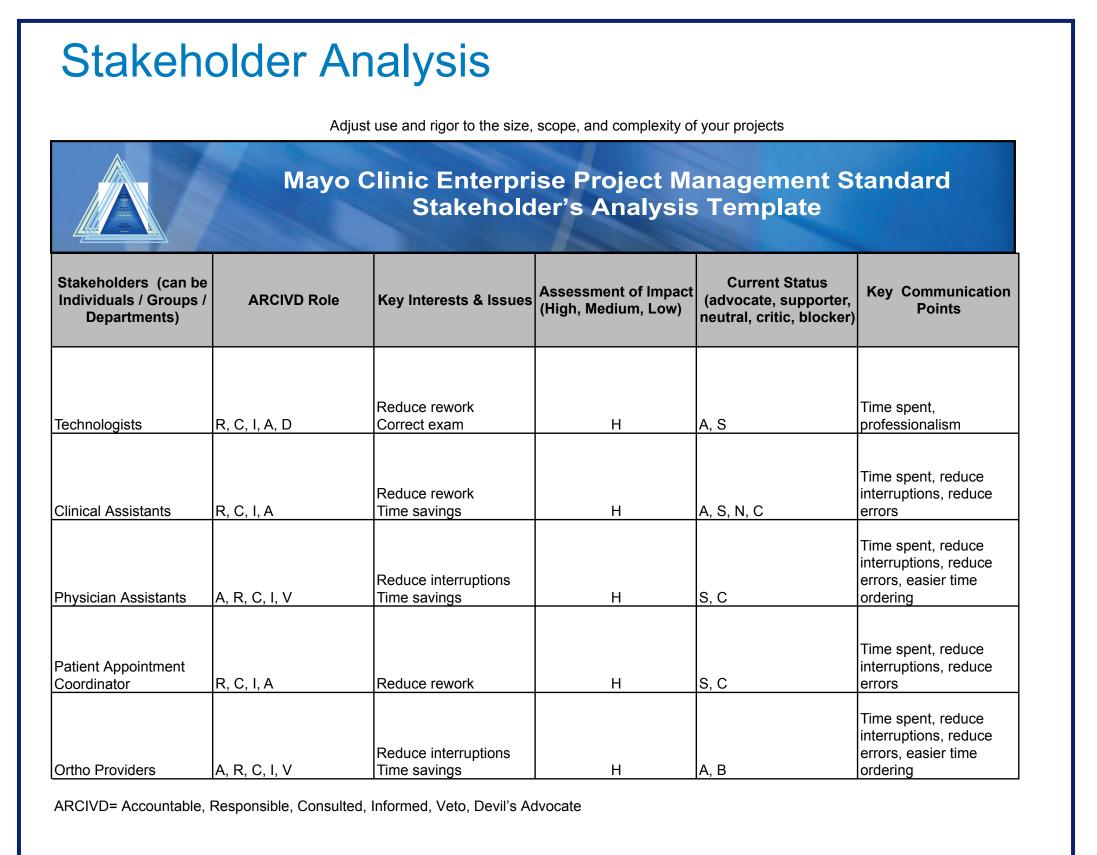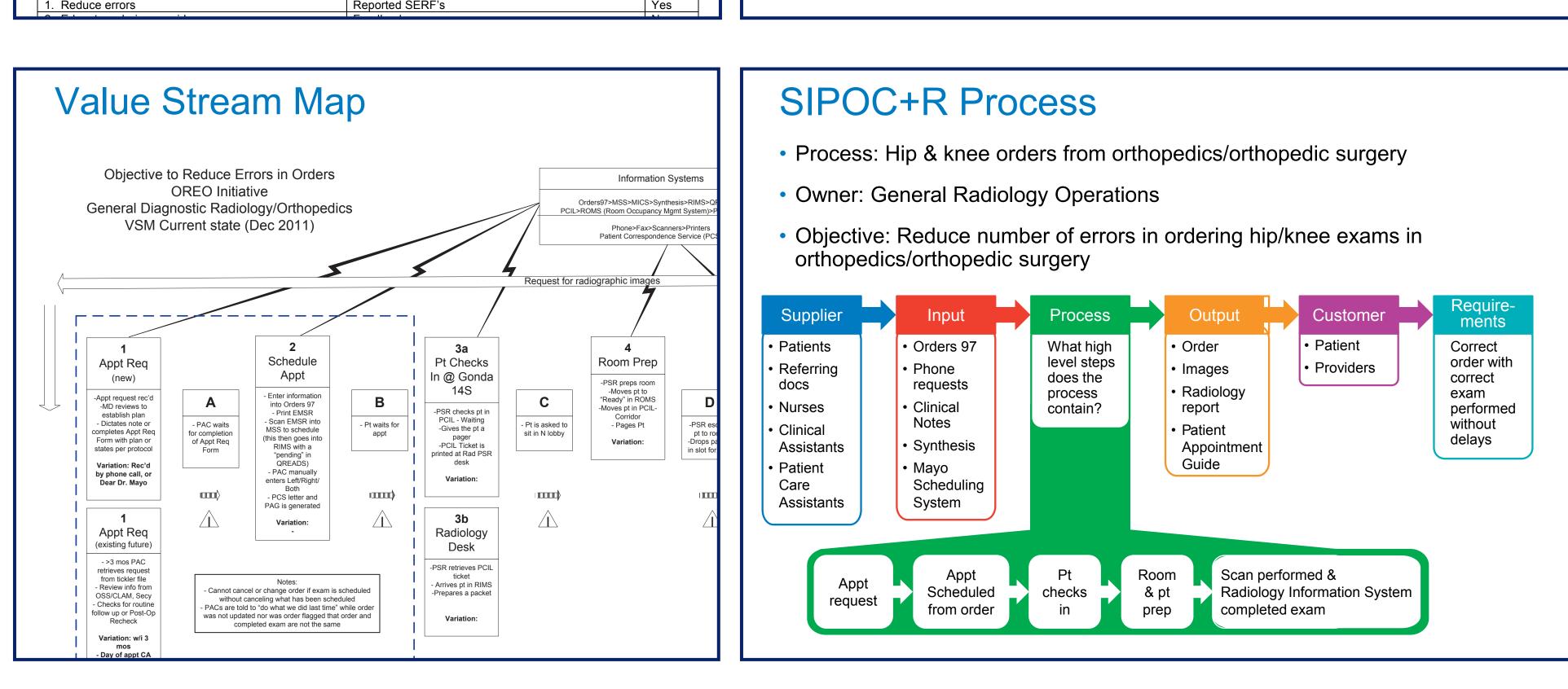
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Purpose

Performing the correct examination is a fundamental goal in good patient care. Our internal voluntary Safety Event Reporting Form (SERF) indicated an opportunity for improvement in accurate ordering of radiographic exams.
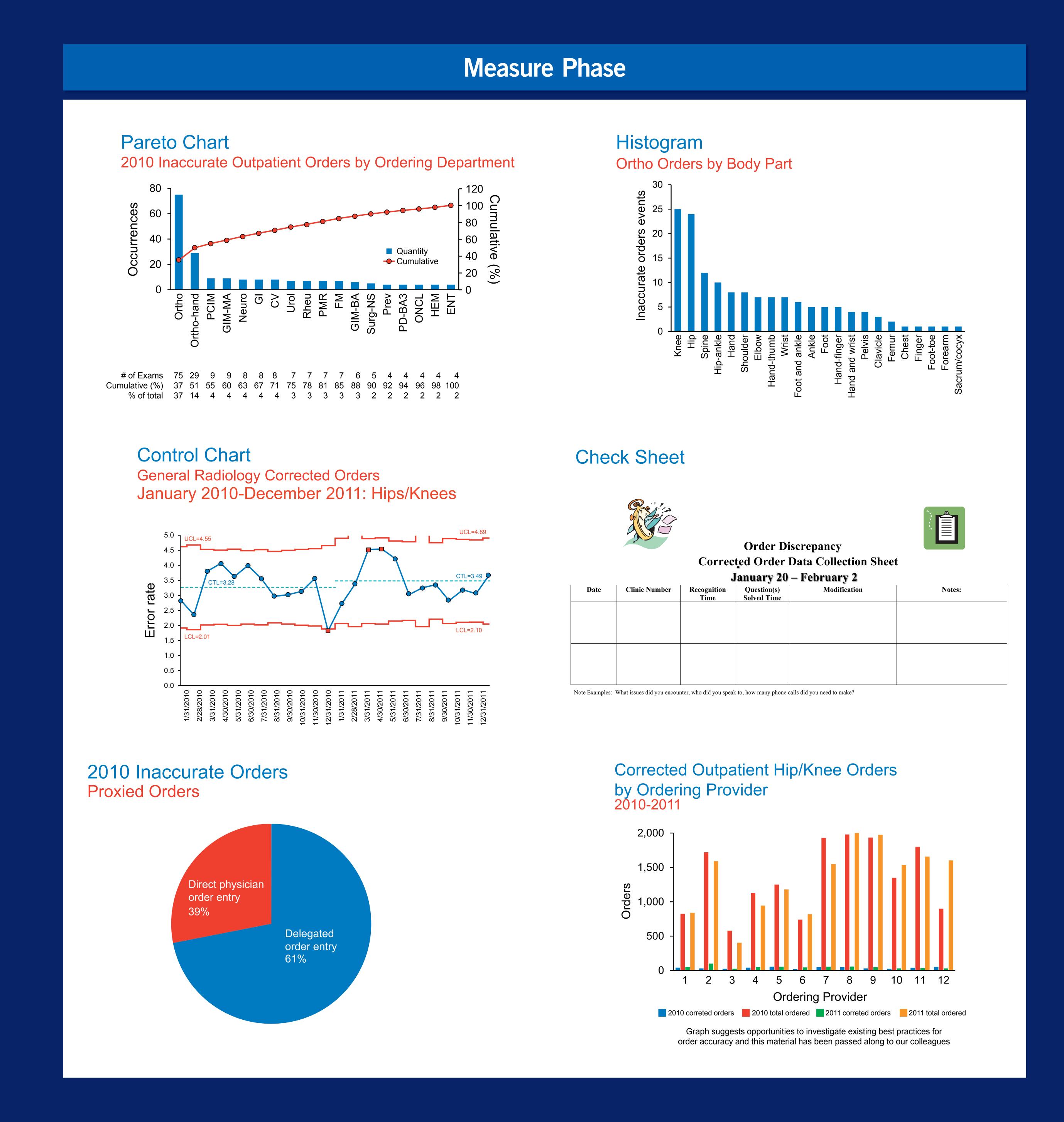
We sought to understand the nature and severity of this problem, assess opportunities for change, and implement change where appropriate.

Define Phase (partial snapshots)

Charter

Stakeholder Analysis

Value Stream Map

SIPOC+R Process

- Process: Hip & knee orders from orthopedics/orthopedic surgery
- Owner: General Radiology Operations
- Objective: Reduce number of errors in ordering hip/knee exams in orthopedics/orthopedic surgery

Measure Phase

Pareto Chart
2010 Inaccurate Outpatient Orders by Ordering Department

# of Exams	75	29	9	9	8	8	8	7	7	7	7	6	5	4	4	4	4
Cumulative (%)	37	51	55	63	67	71	75	78	81	85	88	90	92	94	96	98	100
% of total	37	14	4	4	4	4	4	3	3	4	3	2	2	2	2	2	2

Histogram
Ortho Orders by Body Part

Control Chart
General Radiology Corrected Orders
January 2010-December 2011: Hips/Knees

Check Sheet

Order Discrepancy
Corrected Order Data Collection Sheet
January 20 – February 2

2010 Inaccurate Orders
Proxied Orders

Direct physician order entry 39%

Delegated order entry 61%

Corrected Outpatient Hip/Knee Orders by Ordering Provider
2010-2011

Graph suggests opportunities to investigate existing best practices for order accuracy and this material has been passed along to our colleagues

Technologist Time

- Corrected exams 2010 - 2011
  - 1,948 corrected cases
  - 5 avg minutes to investigate and correct discrepancy
  - $0.67 avg tech compensation per minute
  - $3,250 assuring correct exam per year

2010 Sigma Level

- 37,888 Ortho exams ordered
- 264 corrected orders
- 10 **actual** wrong radiographs (4.8 sigma)

Conclusion & Lessons Learned

1. Stable order error rate of 3.5%
2. Radiology work flow "time out" process reduces actual rate to 0.04%
3. Cost of in-process error correction is low at a mean $3,250 per year
4. Providers with a high volume of orders appear to have better accuracy

Future Opportunities

1. Delegated ordering appears to increase order errors
2. Ordering providers statistics suggest opportunity to find "best practice"