**Problem Statement**

LMICs lack equitable access to life-saving healthcare products, devices, and diagnoses. One resource PATH focuses on is medical oxygen equipment. Oftentimes, many LMICs will acquire many makes and models of the same device; this acquisition is also known as equipment proliferation.

**Why is Proliferation a Problem?**

The diagram highlights the drawbacks of equipment proliferation. Full diagram with benefits and drivers can be seen using the QR code.

**Managing Spare-parts Inventory**

**Goal:** quantify the impact of equipment proliferation on annual inventory costs and forecasting accuracy.

**Major Model Assumptions**

- Demand can be adequately captured through historical order quantities
- Device spart parts can be ordered as homogenized kits
- Brands can be consolidated together
- Spart-parts inventory will not roll over between periods for analysis simplification

**Devices**

- POX
- bCPAP
- X-ray
- PSA

**The Cost of Proliferation**

**Objective:** model spare parts purchase and holding costs as the level of proliferation decreases while maintaining a 95% service level.

**Device Specific Costs**

<table>
<thead>
<tr>
<th>Device</th>
<th>Spare Parts Cost</th>
<th>Holding Cost (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POX</td>
<td>$40</td>
<td>10%</td>
</tr>
<tr>
<td>bCPAP</td>
<td>$100</td>
<td>10%</td>
</tr>
<tr>
<td>X-Ray</td>
<td>$3500</td>
<td>10%</td>
</tr>
<tr>
<td>PSA</td>
<td>$2500</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Brand Consolidation**

For analysis, the smallest brands were combined into the largest brand to create a perceived level of proliferation

- Top 10 smallest brands
- Largest brand

**Insights from Other Consolidation Orders**

- When consolidated, larger brands will show increased savings
- Brands with higher variance in their demand will also see increased savings when consolidated

**Impact and Recommendations**

Brand consolidation results in greater cost savings + forecasting accuracy, ultimately improving patient care and access to medical oxygen equipment.

**Long term goal:** find a sweet spot of equipment proliferation

**Future work:** spare parts inventory management through network facilities

**thank you to patty, michelle, elizabeth, priya, and alex :)**