Human-Technology Frontier

• Advances in technology change care delivery prospect

• The human reaction to these advances is often overlooked

• Mismatch threatens care quality and patient outcomes

• My focus: Human-centric solutions to healthcare operations problems
What is Sepsis?

The body’s overwhelming and life-threatening response to an infection which can lead to tissue damage, organ failure, and death.

3rd LEADING CAUSE OF DEATH
claiming over 28,000 lives every year in the U.S.

# 1 COST
of hospitalization in the U.S.

> $24 Billion in annual cost in the U.S.

Every hour of delay in providing appropriate treatment leads to an 8% increase in mortality

CHALLENGING to detect at early stages
common symptoms (e.g., fever, difficulty breathing, increased heart rate) with several other conditions

Source: Center for Disease Control and Prevention (CDC), Agency for Healthcare Research and Quality (AHRQ), Sepsis Alliance, Kumar et al. (2011)
A Typical Sepsis Alert System

Routine Collection of Measurements
- Body temperature
- Heart rate
- Respiratory rate
- White blood cell count

≥ 3

Diagnostic and Treatment Measures
- Lactate measurement
- Blood culture
- Antibiotics
- Fluids
Project I: Our Improved Sepsis Alert System

Personalization of alerts based on patient characteristics

Accounting for caregivers’ compliance behavior

Personalized & compliance-aware alert system

A 5.4% reduction in sepsis mortality
Project II: Alert System and Team Dynamics

• How nurses’ timely response to alerts impacts physicians’ compliance with guidelines

• Nurses improve physicians’ decision making and compliance

• Improved compliance reduces length of stay and ICU admissions
What Should We Do?

People Operations:

How people affect the performance of operational processes?
Thank You!

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