The Industrialization of Healthcare: Emerging Applications for Advanced Analytics

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Market opportunity

- **55%**: Patients receive recommended care less than 55% of the time.
- **$300bn**: Reducing the cost of treating 60% of high-cost patients with chronic conditions could yield savings of $300 billion over 10 years.
- **$12bn**: Medicare spends $12 billion per year for hospital readmissions deemed "potentially preventable".
- **21k AMI readmissions**: Roughly 13.4% of acute myocardial infarction Medicare admissions were followed by a readmission within 15 days, accounting for nearly 21,000 admissions at a cost of $136 million.
- **2 million people**: Roughly 2 million Medicare beneficiaries per year discharged from a hospital return within 30 days.
- **50% of Rx**: Over 50% of prescriptions are not taken as directed, estimated to drive up to $290 billion in additional care costs per year.

Sources:
5. AHRQ Healthcare Cost and Utilization Project, analysis for 2008
Industrialization

1. a historical phase, **producing overall change** in circumstances and resources of production or industry

2. characterized by **individual judgment**; **manual labor replaced** by mechanized mass production, use of **technological innovation** to solve problems, as well as **more efficient** division of labor

3. the large-scale introduction of manufacturing, **advanced technical enterprises**, and other **productive activity** into an area, society, country
New expectations of what’s possible

**Intelligent People**
- Point-in-time view
- Knowledge and experience via apprentice model
- Trial-and-error and cost-benefit judgments
- “Art of medicine”

**Intelligent Tools**
- Highly specialized professionals; advanced tools
- Technology & clinical advances using evidence produced and consumed by the community
- Vast number of options; informed intuition and best available information
- Disparate patient experiences; limited ability to compare

**Intelligent Systems**
- Patient-centered view across treatments, sites, providers
- Technology enabled
- Based on clinical evidence, driven by guidelines & protocols
- Reduced treatment variation and greater efficiency
Convergence of unmet need

Players and roles differ by geography or construct
Common themes across stakeholders and geographies
Key applications for advanced analytics

Four areas of greatest impact to improve value

**Engage Physicians and Patients**
- Measure, benchmark, and track performance to reduce wasteful variations and achieve best practice in care delivery

**Support Pay-for-Performance**
- Profile, segment, attract, and engage at the physician and patient level

**Coordinate Integrated Patient Care**
- Recognize and reward performance for risk sharing, value-based purchasing and other alternative Incentive models

**Reduce Wasteful Variations**
- Influence and optimize site, channel and resources with a longitudinal view of the patient journey
IMS data and analytics

A SINGULAR VIEW

• Near-census treatment insights
• Dynamic representation of total patient care
• Disparate data sources integrated
• Privacy protection, encryption

Medical Claims
Integrate 7 Billion Transactions / Year

Prescribers
1 Million Tracked Weekly

Healthcare Visits
9M Inpatient & 96M Outpatient / Year

Clinical Specialties
All, including cardiology, neurology, oncology

Groups/IDNs
760 Entities

Rx Information
3.0 Billion / Year

Longitudinal Rx
2.4 Billion / Year

Payers / Plans
8,000 Plans

Providers
1M+ professionals, 1M organizations & 2M affiliations

Consumers
130M Consumer Profiles

Unique Patients
260 Million / Year

Treatments
70+% Dispensed Prescriptions

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The power of linked, real-world patient data

Do you know what happens to patients before & after your interactions?

<table>
<thead>
<tr>
<th>Medical Office/Clinic</th>
<th>Pharmacy/Prescription Retail OTC</th>
<th>Behavioral &amp; Demographics</th>
<th>Hospital Inpatient/Outpatient</th>
<th>Laboratory/General EMR Labs</th>
<th>Long-Term Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient ID</td>
<td>Patient ID</td>
<td>Patient/Consumer ID</td>
<td>Patient ID</td>
<td>Patient ID</td>
<td>Patient ID</td>
</tr>
<tr>
<td>Physician IDs (referring &amp; rendering)</td>
<td>Prescriber IDs</td>
<td>Physician IDs</td>
<td>Physician IDs (referring &amp; rendering)</td>
<td>Physician IDs</td>
<td>Physician IDs</td>
</tr>
</tbody>
</table>

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Unique reference architecture for “Big Data”

Data Lifecycle

Stage 0
Data Preparation
- Identification
- Qualification
- Preparation
- Implementation
- Quality Assurance
- Validation / Certification
- Product Integration
- Training

Stage 1
Data Collection
- Medical / RX
- EMR
- Wholesaler
- Hospital
- Survey Data
- On-Site Clinic
- OTC
- Dental / Vision
- Lab Results Data

Stage 2
Data Transformation
- Privacy Protection
- Standardization
- Customization
- Enhancement
- Quality Assurance
- Quality Improvement
- Integration

Stage 3
Building Intelligence
- Proprietary Methods
- Episodes of Care
- Performance Measures
- Disease Staging
- Norms / Benchmarks
- Market Scan

Stage 4
Application Delivery
- Provider
- Clinical Measurement
- SFE
- Commercial Analytics
- R&D
- Pharmacy
- Pharmacy Benefit
- Strategies
- Consumer
- Program Integrity

Stage 5
Knowledge Management
- Data Analytics
- Consulting Services
Align resources and engage patients with targeted solutions to reduce readmissions

A multi-state health system

**Envision**
- Hundreds of daily discharges
- Under-staffed case managers, limited follow-up
- 18-25% readmit within 30 days of AMI, HF, PN admission

**Analyze**
- Track Rx fulfillment, compliance
- Match de-ID’d patients against Rx data
- Refresh daily, post-discharge

**Empower**
- Reduced follow-up by 53% day 1; +23% by day 3
- Intervened with week 1 non-fillers
- Concentrated resources
- Drug-drug adverse effects

Increased case management efficiency via target lists.
Reduced avoidable readmissions for FY2013-focus DRGs by 34%.
Track physician referral and prescription patterns to empower alignment strategies

Prominent health system, competitive market

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**Envision**
- Highly fragmented market
- Appetite for physician employment, alignment
- Poised for services uptake

**Analyze**
- PCP-to-specialist via claims
- ID key medical management relationships
- Translate to hospital procedures
- Track referrals across continuum

**Empower**
- Meaningful, quantitative goals for Physician Liaisons
- Targeted campaigns, tracked effectiveness
- Met service-line P&L targets via market share analytics

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Enhance relationships with key market champions.
Drive nearly $6M of annual top-line growth for target service lines.
Align payers, providers, manufacturers around real-world performance value

Integrated smoking cessation service - Germany

Envision
- Understand utilization and success
- Demonstrate value of drug
- Reduce utilization of health care

Analyze
- Impact study
- Orchestrate care delivery
- Continuous collection of real-world performance data
- Predictive analytics & modeling

Empower
- Cessation drug sales revenue
- Reduced HC utilization savings
- Insight into customer health needs and strategies

Win. Win. Win.
Outcomes-based payment - economics

**Client perspective**

Both, cessation service and drug sales generate revenue streams

** IMS perspective **

The service center generates revenues for IMS on a patient base

** Payer perspective **

Reduced utilization of healthcare by patients who quite smoking will generate considerable savings
Actively managing patient care quality and reducing cost per patient

PCMH of a large regional health plan

Achieved 2% admissions reduction & saved over $500k annually.
Actively managed catastrophic & multiple chronic conditions to save >$35k per patient.

Envision
- Improve patient quality, reduce spend
- Support providers’ care delivery
- Measure outcomes and ROI

Analyze
- Measure 73 performance KPIs
- ID high/low performers
- Calculate illness burden scores
- Disseminate care gaps

Empower
- Deliver patient-level results to HC practitioner
- Care alerts & patient registries help control costs
- Operational efficiencies, optimize spending & resources

Online Tools
Care Gap
Patient Insights
Physician Performance
Improved Patient Outcomes

KPI’s
Alerts

Shared Financial Benefits for Physician and Payer

Envision
Analyze
Empower
Increasing quality and efficiency in prescribing, ensuring appropriate Rx use and spend

A large national health plan’s pharmacy program

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**Envision**
- ID comparative benchmarks
- Demonstrate quality & efficiency
- Identify non-compliant, high cost patients
- Monitor prescribing patterns

**Analyze**
- Patient Rx compliance
- Rx utilization and costs
- Track utilization & costs for generic switch/formulary change
- Appropriate use, quality metrics

**Empower**
- Inform formulary strategies
- Continued cost and efficiency strategic objectives
- Monitor & manage chronic care Rx

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Efficiencies via better management of analytics. Identified over $10 Million in savings in program’s first year.
Examples of IMS proprietary research to improve healthcare

**IMS Institute: Unbiased information for policy and decision makers**

- Global health research program
- Treatment/drug utilization trends and expenditures
- Comparative effectiveness research
- Geographic variations in care
- Real-world practice

Drugs Shortages: A closer look at products, suppliers and volume volatility.

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Interconnected view across healthcare

If we did these 4 things well...what would be different?