Chilmark Research is a research and advisory firm whose sole focus is the market for healthcare IT solutions.

We follow a pragmatic, evidence-based research methodology with a strong emphasis on primary research.

Areas of current research focus include: Population Health Management, Electronic Health Records, Health Information Exchanges, Analytics, and Consumer-facing Technologies.
AGENDA

- Expanding Definition of PHM
- Macro Market Drivers & Challenges
- Data Integration Woes
- Risk Stratification
- All Eyes on the Physician
- Vendor Landscape
- Re-Inventing Workflow
ABOUT THE RESEARCH

- 100 page market trends report released August, 2013
- 14 Vendors profiled, numerous end users interviewed
- Research is ongoing for the next iteration of this seminal report
Value Based Reimbursement (VBR)

Care Mgmt & Coordination
- Workflow
- HIE
- Transitions
- Referrals

Financial Analytics
- Supply Chain, Staffing, Cost accounting, RCM, Contracts, Actuarial, ...

Population Health Management
- Quality measurement, patient engagement, outcomes analysis, ...
- Physician Engagement, care management, sepsis detection, ....
- Utilization, network leakage, risk stratification, cost attribution
- ...

POPULATION HEALTH MANAGEMENT
An ever-expanding definition
## POPULATION HEALTH MANAGEMENT

Data-driven PHM: Three Buckets of Interest

<table>
<thead>
<tr>
<th>Workflow &amp; Engagement: “Take Action”</th>
<th>Physician</th>
<th>Care Manager</th>
<th>Patient</th>
<th>Social Worker</th>
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<tbody>
<tr>
<td>Longitudinal Record</td>
<td>Care Mgmt Workflow</td>
<td>Utilization Mgmt</td>
<td>Readmissions Mgmt</td>
<td>Patient Engagement</td>
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<tr>
<th>Population Analytics</th>
<th>Risk Mgr.</th>
<th>CFO</th>
<th>Physician Leader</th>
<th>CMO/CMIO</th>
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<tbody>
<tr>
<td>Network Referrals &amp; Leakage</td>
<td>Physician BenchMking</td>
<td>Cohort Analysis</td>
<td>Risk Strat.</td>
<td>Quality &amp; Compliance</td>
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<tr>
<th>Data Integration</th>
<th>ETL</th>
<th>ODS/Staging</th>
<th>EDW</th>
<th>Longitudinal record</th>
<th>Metadata</th>
<th>Data Mart</th>
<th>Data Mart</th>
<th>Aggregate De-ID’d SuperMart</th>
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<tbody>
<tr>
<td>EHR</td>
<td>LIS</td>
<td>eRX</td>
<td>HIE</td>
<td>CMS Claims</td>
<td>...</td>
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MACRO MARKET DRIVERS

Goodbye, fee-for-service

Hello, ever-proliferating quality metrics

Hello, cost containment

Goodbye, cost-plus business model

FFS
- CMS Penalties

FFS + P4P
- All-Upside P4P
- Potential-downside
- PCMH
- Clinical Integration
- FFS scrutiny

Experimental Risk
- ACO Shared Savings, MSSP
- All-upside
- Potential-downside
- Bundled Payments

At-Risk
- Capitation, full, partial
- Employees
- Narrow Networks
- Providers launching health plans
- Payers owning providers
MARKET CHALLENGES

Getting Physicians on Board

Getting Patients on Board

Advanced Technology requires Expensive Talent

ICD9, HIPAA, MU, CMS, ...

Data Integration Woes

What’s the ROI?

FFS

FFS + P4P

Experimental Risk

At-Risk
ANALYTICS TECH IN USE
Mostly retrospective analysis ongoing

Retrospective Analytics
- Reports, dashboards, scorecards, OLAP, Query & Search
- “20% of patients managed on Diabetes registry have HbA1c < 8%”

Predictive Analytics/Data Science
Real-time Surveillance
DATA INTEGRATION WOES
Analytics Sandwiched In

Length of Stay  Patient-Clinician attribution  Disease State definitions  Cohort Attribution  Care Gaps
Readmissions definition  Mortality definition  Registry exclusions  “Cost” attribution  ...

Analytics Solution: ”Sandwiched” In

EHR  LIS  eRX  HIE  CMS Claims  User Gen.  Social  ...

Data Integration Churn
Lengthy, services-intensive implementations & maintenance
Ongoing modifications to master data, ETL, data model, configuration files..
DATA SOURCES
An explosion of data

Claims Data: Scrubbed and standardized over decades

Clinical Data & Beyond: Scattered throughout department silos, sparse, varied formats, differing ontologies, questionable data quality (DQ)
PHM BUSINESS RULES

Highly variable, lack standards

Ever changing body of clinical evidence. Impacts registry definitions, quality measures; disease state-definitions, ...

Multiple & overlapping denominators, courtesy of claims & clinical data conflicts, payers, CMS

Non-standard ways to calculate key measures: ... LOS, Mortality, Utilization, Patient Cost Attribution, ...

Politically sensitive business rules tied to financial incentives & subject to change: physician attribution, quality measure exclusions, registry exclusions, ...
PHM BUSINESS RULES
Today’s solution is two-pronged

(1) Painstakingly establish Single Source of Truth
“My diabetics have ICD9 250 or HbAIC>7% or taking diabetes Meds or Problem List, Drs. Notes mentions “diabetes”, ...

Needed For:
• Longitudinal Record
• (certain) Risk Stratification
• Workflow Tools
• Automated outreach

(2) Enable “do it yourself” business rule creation.
Enable access to underlying data/lineage. highly complex, customization needs.

Needed For:
• Different payer contracts, numerators, denominators, exclusions, registries
• Ad-hoc cohort analysis
• CMS reporting
• Claims vs. Clinical analytics
DATA INTEGRATION WOES
Light at end of tunnel?

- **It will get worst before it gets better.** On horizon: M&A, explosion of data sources, user-generated data, ongoing PHM business rule evolution

- **The Hope:**
  - Clinical data will gradually become more structured, of higher quality, closer to source of truth
  - Downstream market will adopt business rules established by early adopters, via Platforms & app ecosystem plays

- **In Meantime:** Continue living in this messy world. Establish single source of truth for business rules; enable full complexity of data to be accessed otherwise
A Note on “Big Data”

- **Big Data is not being leveraged for PHM...** closest is genomic data. HCOs still can’t integrate structured clinical data at hand!

- **Unstructured data & NLP:** parsing out items of interest, e.g. ejection fraction

- Vendors using Hadoop/Extract-Hadoop-Load, to prepare for Big Data, and to avoid relational db licenses

- **Future sources of Big Data:** machine-generated, medical devices, remote monitoring, credit data, online purchasing data, social data
RISK STRATIFICATION

Commercial Claims-based:
Verisk, Truven, Milliman, Johns Hopkins, MedAI, ...

Free & Provider-Centric: Charleston, LACE, CMS HCCs, Framingham, ...

One-Off: Black box, proprietary, clinical variables

Healthy

Rising Risk

High Risk
RISK STRATIFICATION

Trends

- “Risking-risk” vs. “sickest-of-the-sick”
- Socio-demographic data: living alone, education level, comorbidities
- Multiple sources of truth for risk score
- User-generated data? Far future

Predicting patient health risk will need to get more sophisticated!
VENDOR LANDSCAPE
Everyone is Pivoting

Clinical Best of Breed Analytics Platforms

Claims-Based Analytics & Pivoting

Care Management Workflow

Large, Horizontal

ACO-In-A-Box, Services & Change Mgmt Focused

Large HIT Vendor + Secondary Analytics

Consultants

HIE+Analytics

Quality Measure-Centric

Payers
VENDOR LANDSCAPE
Analytics Platforms vs. Best-of-Breed

My platform will be ready for Big Data, when it arrives

Point Solution!

Data Hoarder!

I only integrate data that delivers real value

Analytics Platforms vs. Best of breed
VENDOR LANDSCAPE

Key Industry Trends

- Increased investment in data science groups, data quality
- Recent moves to offer change management services, directly or through partnerships
- Clinical & claims-based vendors coming together
- EHR+Analytics: strong pull for tightly integrated networks with dominant EHR
- Solutions to Data Integration Woes: late binding variants, client-specific datamodels, framework for creating business rules programmatically (outside of datamodel), more out-of-the-box content
ALL EYES ON THE PHYSICIAN
Elusive HCO-Physician Alignment

Thank you for turning into a data scribe. Next steps:

- Close those care gaps during the office visit!
- Code those important conditions!
- Can you tell me who your high risk patients really are?
- Why can’t you be more like your peers!
- Want to earn a panel bonus?
- You need to be the care team quarterback!!
- Can you help with exclusions?

(1) My patients are sicker
(2) I don’t trust your data
(3) Don’t tell me what to do!
Where we are Today

- **Care Pathways**: consultant-laden creation process. Highly variable across HCOs
- Data-driven workflow tools nearly non-existent: Generate patient list from analytics system, throw list over the fence to the nurses to “work it”; Quality measure registries w/ care gaps
- **Payer side**: high touch care management workflow, content-driven, UM/CM/DM

Open Road Ahead

- Workflow wide open for re-invention & innovation
- E.g. automation, optimizing high touch vs. low touch, predictive analytics, prescriptive analytics, crowd sourcing optimal evidence & workflow...
RE-INVENTING CARE MANAGEMENT

Care Management will become increasingly automated, informed by user generated data & predictive analytics.
Data analytics will become as pervasive to health care delivery as it is to other data-intensive industries such as banking and retail. This will be a very complex transition.

Important for near term:
- Data Integration
- Taking action on insight
- Closing the loop: did the outreach/intervention work?

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