Frost & Sullivan Is On The Forefront of Tracking Industry Convergence Globally

- Leveraging insights into the present and future of industry convergence
- Built on a foundation of market and technology analysis
- Supporting our clients to see the future of their industry via the lens of global shifts

- Founded in 1961
- Over 1,800 Consultants/Analysts, across 42 global locations on six continents
- 10,000+ clients worldwide, including emerging companies, the global 1000, and the investment community
MEGATRENDS DRIVING CHANGE IN HEALTHCARE

KEY TAKEAWAYS

• A framework to evaluate the mega trends that will change healthcare over the next ten years

• Insights on the changing competitive and end user market medical device companies will be selling into in 2020

• Guide to leveraging the changes brought by mHealth and HCIT
**Megatrends Impacting the Entire Spectrum of Care**

A modern health care system is on the horizon, demanding a paradigm shift

<table>
<thead>
<tr>
<th>From...</th>
<th>To...</th>
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<tbody>
<tr>
<td>One Size Fits All</td>
<td>Personalized Medicine</td>
</tr>
<tr>
<td>Fragmented, One-way</td>
<td>Integrated, Two Way</td>
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<tr>
<td>Provider Centric</td>
<td>Patient Centric</td>
</tr>
<tr>
<td>Centralized, Hospital-based</td>
<td>Decentralized, Home-based</td>
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<tr>
<td>Invasive</td>
<td>Less Invasive</td>
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<tr>
<td>Procedure-based</td>
<td>Outcomes-based</td>
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<tr>
<td>Treating Sickness</td>
<td>Preventing Sickness (Wellness)</td>
</tr>
</tbody>
</table>
Shifting Spending from Sickcare to Healthcare

The financial gravity of healthcare spending will reverse

Continuum of Care:
- Healthy
- “At Risk”
- Undiagnosed
- Chronically Ill Managed
- Chronically Ill Unmanaged
- End of Life

Source: Frost & Sullivan analysis
More Emphasis on Diagnosis, Monitoring, and Prevention

Healthcare Spending by Type of Activity

<table>
<thead>
<tr>
<th>Year</th>
<th>Prevention</th>
<th>Diagnosis</th>
<th>Treatment</th>
<th>Monitoring</th>
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<tr>
<td>2007</td>
<td>5</td>
<td>15</td>
<td>70</td>
<td>0</td>
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<tr>
<td>2012</td>
<td>7</td>
<td>17</td>
<td>66</td>
<td>0</td>
</tr>
<tr>
<td>2025</td>
<td>12</td>
<td>21</td>
<td>51</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Frost & Sullivan analysis
Shifting Emphasis From Sickcare to Healthcare

**Prevention/Wellness**
- **Goal:** Keep People Healthy Longer

**Disease/Care Management**
- **Goal:** Manage or Mitigate Risk
- **Goal:** Diagnose and Reduce Treatment Delay
- **Goal:** Move to More Interaction and Self-Mgmt
- **Goal:** Manage
- **Goal:** Informed Decisions

**Continuum of Care**
- **Healthy/“Worried Well”**
- **“At Risk”**
- **Undiagnosed**
- **Chronically Ill Managed**
- **Chronically Ill Unmanaged**
- **End of Life**

**Improving Efficiency**
- Early identification and prevention
- Access to new forms of care delivery to improve patient knowledge, self-help and health
- Connection to benefits design to increase coverage for those services which prevent disease and improve health over long term
- Reducing administrative and clinical waste

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Source: Frost & Sullivan analysis
Megatrends Impacting Providers

HOSPITALS
• Focus on Health IT infrastructure driven by HITECH & PPACA
• Rise in integrated delivery systems and increased competition
• Financial pressures rising with deadlines for incentives, penalties, new system implementation
• Disruption means new business models needed

DOCTORS
• Workforce shortage, particularly for primary care
• Financial and administrative pressures, as well as need for technology infrastructure, driving physician realignment
• 50% of physicians are now employees
• Greater patient cost sharing creates financial risk

COMPETITIVE CHANGES AMONG PROVIDERS
• Enlarging and managing patient populations
• Recruiting + retaining the best physicians, nursing and tech staff
• Improving cash flow – RCM, HIM, coding, claims processing
• 100% focus on meeting care, quality and operational metrics
Megatrends Impacting Patients, Payers, and Vendors

PATIENTS
- Cost sharing driving greater responsibility and shared decision-making
- Cultural shifts leading to demands for higher levels of service
- Growing consumer involvement/awareness of health IT including mobile solutions

PAYERS
- Move away from fee-for-service to bundled payments based on quality of care
- Increased use of analytics and evidence-based care protocols
- Health Insurance Exchanges
- Decline of employer-sponsored health insurance

TECHNOLOGY VENDORS
- IT at center of facilitating health system change
- Mandated standards for data transmission, EHR user interface, and greater regulatory involvement to ensure safety
- Threat of commoditization drives need to focus on value added and customer satisfaction
2012 – 2016 IT Investments

- Oct 12, 2012 Medicare Readmission Tracking
- Revenue Cycle Management Focus
- ICD-10 Deadline
- ACO Formation
- HIPAA 5010 Billing Standard
- Meaningful Use: Stage 2
- Information exchange emphasis

- Need to coordinate care between hospital – physician - home
- Coding and claims processing, real time claims adjudication, bundled payments
- Emphasis on HIT infrastructure and managing risk – How will funds be divided?
- Appropriate coding – in-house training and learning curve versus outsourcing options

- Review and adjust any data collection that will impact claims submissions

[Diagram with icons and text]
**Targeting Chronic Conditions**

**Better Management of Chronic Disease is a Key Focus of U.S. Health Policy**

Increased longevity is accompanied by increased prevalence of chronic conditions and associated pain and disability.

In 2005, almost 1 out of every 2 adults had at least one chronic illness.

The most common, costly, and preventable of all health problems are heart disease, stroke, cancer, diabetes, and arthritis.

7 out of 10 deaths among Americans each year are from chronic diseases. Heart disease, cancer, and stroke account for more than 50% of all deaths each year.

1 in every 3 adults is obese, and almost 1 in 5 youth between the ages of 6 and 19 is obese.

Modifiable risk behaviors are responsible for much of the illness, suffering, and early death related to chronic diseases.

Source: CDC and Frost & Sullivan analysis
Defining a Complex Industry—Telehealth

Telehealth Industry: Telehealth Matrix (North America),

- **Core Telehealth**
- **Traditional Healthcare and Telemedicine**

- **Professional**
- **Customer Focus**
- **Consumer**

Information Communication Technologies

Industry Focus

Source: Frost & Sullivan analysis.
Defining a Complex Industry—Telehealth (continued)

Telehealth Industry Markets: Telehealth Matrix (North America), 2012

- **Core Telehealth**
  - Continuing Medical Education
  - Simulation/Training
  - Drug Reference
  - Health Education

- **Consumer/Nonhealthcare Approaching Telehealth**
  - Social Health Network Apps
  - Health Games
  - Fitness Applications

- **Consumer**

- **Professional**

- **Industry Focus**
  - Healthcare
  - Mobile Telemedicine
  - Teleimaging
  - Telepharmacy
  - Sleep Apnea
  - Mobile Monitoring

- **Information Communication Technologies**
  - EMR/EHR
  - HIE
  - Remote Video Consultation
  - Mobility/Tablets

- **Telehealth Industry Markets**
  - Telemedicine
  - Personal Emergency Response
  - Activity Monitoring
  - Health Games
  - Patient Portals
  - Medication Dispensing
  - PHR
  - Remote Monitoring
  - Diabetes Monitoring

Source: Frost & Sullivan
All Stakeholders Must Focus on Patient Engagement

Collaboration with payers and providers to drive technology innovation, All devices connect remotely

FAMILIES

Strongest center of influence on behavioral process change

MEDTECH VENDORS

Direct to consumer applications, advice, quality ratings, etc.

CONSUMER INFO and APPS

New era of collaboration, communication, engagement

EMPLOYERS

Emphasis on wellness programs and financial based incentives

PROVIDERS

Data and information for shared decision-making, Direct patient engagement

PAYERS

Payers
Patients Bring A Consumer Mindset To HC Interactions

Experiences in other markets influence consumer expectations for healthcare

Retail & Finance
- Customer service focus
- Comparison shopping
- Self-service, online shopping
- Special offers

Entertainment & Media
- Customized products
- Home services
- Variety
- Engaging interface

Manufacturing & Distribution
- Faster time to market
- One stop shop
- Anytime anywhere care

Real time info at point of use
Info comes to consumer
High levels of interaction and Q&A online and in person

Ability to control and customize
Flexibility and convenience

24/7/365 support
One stop resolution or call back
Proactive outreach to address issues affecting consumers

Source: Frost & Sullivan analysis
GLOBAL MEGATRENDS IMPACTING HEALTHCARE
By 2025, emerging markets will dominate top urban areas

- The number of people living in urban areas is expected to be more than 5 billion
- Over 260 urban areas will have populations exceeding 2 million

Of the top 30 urban areas with populations over 2 million, only 6 will be in industrialized countries, 12 each will be in BRIC and in other emerging economy countries (ME-Asia-Africa)
- Tokyo will still be the largest, followed closely by Jakarta and Manila
- Africa is growing the fastest, at an average of 5% per year
Urbanization adds to the increased burden of chronic diseases

- Increased urbanization has gone hand in hand with the increase in both the incidence and prevalence of noncommunicable diseases (cardiovascular diseases, cancers, diabetes and chronic respiratory diseases)
- Changes in diets (tied to the availability and increased mass marketing of packaged foods and junk foods) and physical inactivity contribute to this higher rate of “lifestyle diseases” among urban populations

According to the WHO
- One in three urban dwellers lives in slums, or a total of 1 billion people worldwide
- Urban air pollution kills around 1.2 million people each year around the world, mainly due to cardiovascular and respiratory diseases.
- Tuberculosis (TB) incidence is much higher in big cities. In New York City, TB incidence is four times the national average. In the Democratic Republic of the Congo, 83% of people with TB live in cities. (WHO)
Middle class accounts for 52% of global population in 2020. 65% will be from Africa, China, and India.

Note: Middle Class is defined as people with Incomes between $6,000 and $30,000. However, this definition differs marginally by country.
Growing middle class changing demand for healthcare
Which hospitals can address them?

• Creation of “healthcare elite”: those that can, will spend money out of pocket for elective procedures, executive and personalized levels of care
• Have nots utilize public facilities. Wealthier patients will pay out of pocket or use premium coverage plans for elective procedures in top-tier facilities
• Tier 2 hospitals in urban areas need to become stronger, develop competitive edge to survive
• Emergence of "medical cities", in the Middle East, India, APAC
• Specialized facilities tied to development of medical tourism in some countries

Value Proposition:
Don’t know what’s wrong?
– We can address any problem you bring

Value Proposition:
Need care for a specific condition?
– Specialist, experience, world-class facilities
Virtual World 2020: 3D simulated environment for interaction and therapy

Virtual Reality Therapy Used to Treat PTSD, Depression, Severe Pain, Phobias, Addiction, Neuro Rehab

Virtual Classes, Laboratories and 3D Field Trips

Virtual Surgeries and Medical Training

Virtual Conferences

Social Networking: 3D Avatars Allow Social Interaction, Support for Gaming For Behavior Change
Healthcare Avatars to support diagnosis, personalized medicine, training

- Virtual patients
- Pocket doctor or physician assistant
- Next-gen diagnostician
- Combination of virtual technology, mathematical modeling, patient records, & healthcare databases
- Use patient genome & physiology to tailor drug therapy
- Software that can answer simple queries, give drug reminders & results of medical tests
- Computer assisted diagnostics (CAD) in hospitals
- Training tool for health professionals & students

- Reduce time spent on routine questions to focus on treatment
- Reduce chances of misdiagnosis
- Prepare for emergencies & epidemics
- Visual method to navigate patient records
- Diagnosis via evidence-based medicine
- Doctors provide personalized therapy & treatment regimen based on genetically identical virtual patient
- Virtual therapy (cybertherapy)
New business models of the future: “Value for many”

“Value for Many” will replace “Value for Money”

Aravind Eye Hospital: Conducts 286,000 assembly-line type cataract operations per year

Tata Nano: Products for the masses at low prices

EChoupal Initiative by ITC: Leveraging the internet to empower rural populations

Social networks and online communities of doctors, patients, consumers of HC services

Start with the need, not with the technology
Sharp shooter, not shotgun
Medical tourism is here

Mexico
- Hospital group infrastructure expansion (StarMedica, AmeriMed, GrupoAngeles)
- Cosmetic, dentistry and hip replacement are the most popular procedures among tourists

Costa Rica
- One in five visitors is a medical tourist
- Plastic Surgery, General and Cosmetic Dentistry and Bariatric Medicine are the most popular procedures among tourists

Brazil
- Oncology, cardiology and neurology are the most popular procedures among tourists
- Medical tourism grows 30% per year

Thailand
- One Bangkok hospital (Bumrungrad) served over 500,000 health tourists annually

Hungary
- Treatment cost is half that of west Europe – Alternative to Asia

India
- Government investing $3.6 Billion in medical tourism infrastructure.
- Estimates show Indian medical tourism at $2.3B by 2012

Singapore
- More internationally accredited hospital facilities than any other country

Source: Frost & Sullivan, Burrill & Co.
What will the future look like?

- Healthcare increasingly data driven and customized
- Healthcare more like other service industries
- Globalized care delivery
- New care models focused on collaboration, information exchange/awareness, achieving health outcomes, especially with chronic disease care
- Increased development of standards of care and incentives to adopt them
- Providers and payers will leverage systems to document process of care and document outcomes → Tracking of care, results
- Increased patient engagement to manage disease via remote monitoring and mobile apps
- Increased leveraging of tech and non-physicians
- More “generics” – technologies providing same value at lower price, stripped down feature sets
- Increased use of analytics, care protocols
Thank You

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