The CEO’s 360 Degree Perspective

Healthcare 2020
Today’s Presenters

Dorman Followwill
Partner
Executive Committee Director
Frost & Sullivan

Konstantinos Nikolopoulos
Director, Health Economics & Future Strategy Group
Frost & Sullivan

Sumit Sharma
Senior Vice President
Healthcare, EIA & MENASA
Frost & Sullivan

Tommy Doyle
Vice President Strategy
Elsevier Health Science
## Agenda

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<th>Introduction</th>
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| **Healthcare 2020** – Dorman Followwill  
  *Konstantinos Nikolopoulos*, | 13:50-14:30 |
| **Healthcare Growth Opportunities** – *Sumit Sharma*                        | 14:30-15:15 |
| **BREAK**                                                                   | 15:15-15:45 |
| **Implications for Businesses** – Tommy Doyle                                | 15:45-16:15 |
| **Panel Discussion on Who, How, Where and Why, will be Successful in the Future** | 16:15-17:15 |
Forces Shaping the Evolution of Healthcare

Molecular & Personalised Medicine

Access Cost & Quality Of Care

Proficient Use of Information (eHealth)

Technology

People

Processes
Europe (EU-25)
- 472M population
- 2.8M hospital beds
- 4.6 beds/1000 people
- 3.9 Doctors/1000 people
- 14,819 hospitals

USA
- 300M Population
- 1M hospital beds
- 3.2 beds/1000 people
- 2.6 Doctors/1000 people
- 5,794 hospitals

China
- 1.3B population
- 3M hospital beds
- 2.2 beds/1000 people
- 1.4 Doctors/1000 people
- 60,396 hospitals

Japan
- 127M population
- 1.8M hospital beds
- 9.9 beds/1000 people
- 2.7 Doctors/1000 people
- 7,785 hospitals

India
- 1.1B population
- 0.8M hospital beds
- 0.7 beds/1000 people
- 0.6 Doctors/1000 people
- 13,896 hospitals

Access to Care
Cost of Care

Private Per Capita Spending (2009)
Public Per Capita Spending (2009)
Spending as % of GDP (2009)
Spending as % of GDP (2050)

Compare with Defence spending...

Cost of Care

F R O S T & S U L L I V A N
United Kingdom
- 8% of UK patients believe that they were given the wrong medication in the last 2 years.
- Access problems due to cost – 13%
- Coordination problems – 20%
- Medication errors – 20%

Canada
- Aging hospitals need retrofit services to lower infectious disease risk
- Access problems due to cost – 25%
- Coordination problems – 25%
- Medication errors – 29%

U.S.
- Pneumonia and blood-borne infections - killed 48,000 patients and cost $8.1 billion in 2006
- Access problems due to cost – 54%
- Coordination problems – 34%
- Medication errors – 34%

Netherlands
- Access problems due to cost – 7%
- Coordination problems – 14%
- Medication errors – 17%

Australia
- Access problems due to cost – 36%
- Coordination problems – 23%
- Medication errors – 29%

New Zealand
- Access problems due to cost – 31%
- Coordination problems – 21%
- Medication errors – 25%
The Balance Between Young And Old Is Shifting
The Balance Between Young And Old Is Shifting

Source: United Nations, World Population Prospects 2006 revision, Medium Variant
The Balance Between Young And Old Is Shifting

European Region, 2020
The Balance Between Young and Old Is Shifting
Ageing Related and Chronic Diseases, Account for Significant Percentage of Healthcare Costs

30% of the population consumes 90% of health care resources
"We can’t wait for a cure for MS."

Myelin Repair Foundation’s new research model is speeding the way.

Give the gift of hope. Donate today.

The Myelin Repair Foundation is reducing the time it takes to discover and develop treatments for MS patients.

Myelin and Multiple Sclerosis

Myelin is the insulation that coats the nerve cells in the brain and spinal cord. Multiple sclerosis damages myelin, causing a range of symptoms from paralysis to cognitive disorders. Finding a way to repair damaged myelin has the potential to stop MS in its tracks.

Proven Methods, Stunning Results

The Myelin Repair Foundation Accelerated Research Collaboration™ (ARC™) model is a radical new research process designed to speed academic discoveries into commercially viable therapeutic targets and patient treatments.

To date, we are the only organization...
Globalisation is Changing Healthcare

- Healthcare – demand increases in Asia & developing world
- Pharma and Technology R&D migrates to Asia
- Regulations – International agencies collaborate
- Information – healthcare payors share data on performance (clinical & financial)
- Diseases know no boundaries
- Every Healthcare company is global from day one!
Percent of World GDP – Last 500 years
China, India, Japan, Latin America, Western Europe and United States

Share of World GDP in 2085
Shifting Shares of World GDP

United States 22%
China 12%
Western Europe 21%
Latin America 8%
Japan 7%
India 5%
All Other Countries 25%
Creation of “healthcare elite”: those that can, will spend money out of pocket for elective procedures, executive and personalized levels of care. Growing gap between have and have not's. Wealthier patients will pay out of pocket or use premium coverage plans for elective procedures.
Competition for people

Medical Migration
Circles represent percentage of doctors who leave to practice in the U.S., U.K., Canada, or Australia.
Consumer Demand for personalised Medicine:

**Safer, More Effective Drugs**
End of one-size-fits-all drugs. New drugs will be safe and effective for specific populations.

**Faster Time to a Cure**
Using genomic information to find disease targets. Speedier clinical trials based on high responder population.

**Cost-Effective Healthcare**
Reduced costs, due to avoidance of futile treatments and improved clinical outcomes.
How do we get the right treatment to the right person at the right time for the right disease?
One of the most widely prescribed drugs in the world

1/3 of patients metabolize warfarin more slowly than others and therefore experience a higher risk of bleeding

Warfarin is the 2nd most common drug (after insulin) implicated in ER visits for adverse drug events

2007 FDA approves updated warfarin prescribing information to recommend genetic test to estimate optimal use of warfarin
Many more “targeted” treatments coming…
Healthcare 2000 Years Ago vs. Today

2000 Years Ago

- Episodic
- Local healers / midwives
- Medicine “Man”
- Evidence in Ancient Egypt, publicly provided healthcare system with healers paid by the community
- Most people died of disease

Today

- Episodic
- Doctors / nurses / hospitals
- Pharmacists / pharmacies
- Governments provide and pay
- Most things don’t work and people die

Frost & Sullivan
## A Look At The Future: Patient Centric Health & Wellness Care

**Surgical Care Consumer Guide**

**Search Results:** Hip Replacement

**Summary**
- Average Cost in Network Facility: $11,249 - $15,695
- Out of Network Facility: $18,889 - $23,460

<table>
<thead>
<tr>
<th>Distance (Miles)</th>
<th>Facility Name</th>
<th>Patients per year</th>
<th>Quality</th>
<th>Cost Estimate</th>
<th>Insurer Pays</th>
<th>Patient Pays</th>
<th>Patient Assessment of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2</td>
<td>Clearwater General 14280 Bay Drive Clearwater, FL 22131</td>
<td>400</td>
<td>★★★</td>
<td>$15,695</td>
<td>85%</td>
<td>($13,511)</td>
<td>15%</td>
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<tr>
<td>13.2</td>
<td>All Saints Medical Center 138300 All Saints Drive Tampa, FL 22222</td>
<td>86</td>
<td>★★★★★</td>
<td>$$$</td>
<td>80%</td>
<td>($16,540)</td>
<td>20%</td>
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<tr>
<td>25.6</td>
<td>Good Samaritan Hospital 11111 E. Samaritan Drive Tampa, FL 22222</td>
<td>232</td>
<td>★★★★★</td>
<td>$15,695</td>
<td>90%</td>
<td>($14,306)</td>
<td>10%</td>
</tr>
<tr>
<td>26.3</td>
<td>Tampa Hip Hospital 1400 East Tampa Boulevard Tampa, FL 22211</td>
<td>170</td>
<td>★★★★★</td>
<td>$$$</td>
<td>75%</td>
<td>($15,525)</td>
<td>25%</td>
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<tr>
<td>27.3</td>
<td>Orthopedic Clinical Hospital 444 Goodie Drive St. Petersburg, FL 22113</td>
<td>432</td>
<td>★</td>
<td>$11,600</td>
<td>70%</td>
<td>($8,700)</td>
<td>30%</td>
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<tr>
<td>33.2</td>
<td>Valley General Hospital 1400 Tampa Bay Way Tampa Bay, FL 22031</td>
<td>310</td>
<td>★★★★★</td>
<td>$$$</td>
<td>85%</td>
<td>($13,796)</td>
<td>15%</td>
</tr>
</tbody>
</table>

*What's included in the cost?*
Wellness Is A Key Area For Increased Focus, And Is Driving A Shift From Remedial To Predictive & Preventative Care

Today’s world

Wellness

Personal Coaching
Communication/Information Services
Preventive Services
Education
Physical Exams
Disease Management
Clinical Diagnostics & Therapeutics

Healthcare today

Healthy → Vulnerable → Affected → Sick

Future system

Future healthcare

Wellness

Consumer Products
Medical Health Spas
Complementary and Alternative Medicines
Integrated Health Solutions

Healthcare

F R O S T & S U L L I V A N
In 2010...

• Apple iTunes app store had 185,000 apps → 5,000 (2.7%) categorized as HC apps
• Android had 38,000 apps → with 600 (1.5%) being Healthcare applications
• Blackberry App World had 6,700 apps → 235 are Health and Wellness applications

Source: Frost & Sullivan
Medical Tourism is Already Here...

**Mexico**
- StarMedica hospital groups built 7 hospitals in last 5 years;
- GrupoAngeles (largest private hospital group in Mexico) spending $700 million to build 15 hospitals in the next 3 years

**Costa Rica**
- One in five visitors is a medical tourist

**Thailand**
- One Bangkok hospital (Bumrungrad) served over 500,000 health tourists last year

**Taiwan**
- Government has identified medical tourism as one of six new industries to focus on
  - 85,000 medical tourists in 2010

**Singapore**
- More internationally accredited hospitals
  - 665,000 medical tourists in 2010

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

A modern healthcare system is on the horizon, demanding a paradigm shift.

From...
- One Size Fits All
- Fragmented, One-way
- Provider Centric
- Centralized – Hospital
- Invasive
- Procedure-based
- Treating Sickness

...To...
- Personalized Medicine
- Integrated, Two-way
- Patient Centric
- De-Centralized – Shift to Community
- Less Invasive, Image-based
- Episode-based, Outcome-based
- Preventing Sickness – “Wellness”
Many Stakeholders, Many Motivations…
Implications &
Possible Future Scenarios
Shifting the Financial Gravity of the System

Investment

Healthy: $$$$$
“At Risk”: $$$
Undiagnosed: $$
Chronic Ill Managed: $$$
Chronic Ill Unmanaged: $$
End of Life: $$

Continuum of Care
Shifting the Health Focus of the System

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

- **Disease/Care Management**
  - Goal: Manage or Mitigate Risk
  - Goal: Diagnose and Reduce Treatment Delay
  - Goal: Move to Self-Managed

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

- **Goals**
  - 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
Care Delivery will be provided in or near the home

Cost of care per day

Healthy, Independent Living
Community Clinic
Chronic Disease Management
Doctor's Office
Assisted Living
Specialty Clinic
Skilled Nursing Facility
Community Hospital
ICU

Quality of life

0%
100%

RESIDENTIAL CARE

HOME CARE

ACUTE CARE

Care Delivery will be provided in or near the home.
What Does This New Healthcare World Look Like?

More emphasis on diagnosis, monitoring, preventative care =
INCREASED COLLABORATION

Tighter cost constraints, declining reimbursement, more expensive tools =
BETTER FINANCIAL MANAGEMENT

P4P, more public scrutiny, evidence-based medicine =
TRACK AND DOCUMENT OUTCOMES

Greater info flows to support training, supply chain, patient education
COMMUNICATIONS AND CONTENT
Scenario 1: Competence based Network - Pyramid Structure

Primary Care
Linked only with general hospitals, in these structures only basic procedures will be carried out.

General Hospitals
Structures having E.R., A.C.U. and general medical departments. These will be linked for specialized topics Regional Facilities and Centers of Excellence.

Regional Facilities
General and specialized hospitals with a regional (and sometimes national) catchment area.

Centers of Excellence
Scenario 2: Technology based network - Satellite structure

For this scenario to become true, a technologic leap by all public and private HC structures is required.

**Satellite Hospitals**
Remote Hospitals where surgeries are carried out through technologies (Remote patient monitoring, telehealth) and robotics.

**Main Hospitals**
Centralizing hospital activities (Departments, E.R., A.C.U., etc.), research and academia.

**Territorial Units**
Home care units, assisting patients at their houses through advanced technologies such as Assisted Living systems.
Scenario 3: Resources based network - Spin-off structure

This scenario, in summary, places a greater weight on the private sector, following the lines of the American model.
Growth Opportunities & Implications for Markets, Companies & Products
Industry Focuses on Innovations in Products

Volume of innovation efforts across all industries

Volume of Innovation Efforts
Last 10 Years

Hi

Lo

Strategy | Process | Product | Delivery
---|---|---|---
Business model | Partnerships | Enabling process | Core process | Product performance | Product system | Service | Channel | Brand | Customer experience
But Product Innovations Produce the Lowest Yield

Value creation from innovation (all industries)

Cumulative Value Creation Last 10 Years

Hi

Lo
Ten Types of Innovation – across the entire value chain

1. Business Model
   - how the enterprise makes money

2. Partnership
   - enterprise’s structure / value chain & partnering

3. Enabling process
   - assembled capabilities you typically buy from others

4. Core process
   - proprietary processes that add value

5. Product performance
   - basic features, performance and functionality

6. Product system
   - extended system that supports an offering

7. Service
   - how you service your customers

8. Channel
   - how you connect your offerings to your customers

9. Brand
   - how you express your offering’s benefits and ideas to customers

10. Customer experience
    - how you create an integrated experience for customers
Example 1: Social business

- Grameen Danone Foods is a true social business with a primary objective of aiding the health of young children in Bangladesh while becoming self-sustaining, meaning almost all profits in the business are reinvested into the expansion of the business.

- Bring to market affordable, nutritious, yogurt to poor Bangladeshi children. The yogurt, called Shakti Doi is made from pure cream milk, fortified with vitamins and minerals specially suited for often malnourished Bangladeshi children.

- It is priced at Taka 5 (about 5 cents) and is affordable even to the poorest families.
Example 2: business approaches

- Aravind has probably contributed more to eradicating blindness amongst the poor than any other organisation in India but its net profits of almost US$8 million on annual revenues of US$20 million.

- GE developed the MAC 800 in 2008, a low-cost portable electrocardiogram in China for China. Two years later, physicians in America enthusiastically embrace the same machine, using it for community screenings for coronary disease.
### Business Models Permeating Healthcare...

<table>
<thead>
<tr>
<th>Company</th>
<th>Key Strategy</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>Start with the need, not with the technology</td>
<td>Phillips</td>
</tr>
<tr>
<td>Tata</td>
<td>Products for the Masses</td>
<td>Generic Drugs</td>
</tr>
<tr>
<td>Facebook</td>
<td>Social Networks and Online Communities to Exchange Ideas</td>
<td>Google Health</td>
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<tr>
<td></td>
<td></td>
<td>Microsoft Health Vault</td>
</tr>
<tr>
<td>Polaroid</td>
<td>Know when to fold</td>
<td>Kodak</td>
</tr>
<tr>
<td>Nintendo</td>
<td>Looking beyond your core customer base</td>
<td>Novartis, GSK</td>
</tr>
</tbody>
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**Apple, Tata, Facebook, Polaroid, Nintendo**

**Business Models Permeating Healthcare...**

- **Apple**: Start with the need, not with the technology
- **Tata**: Products for the Masses
- **Facebook**: Social Networks and Online Communities to Exchange Ideas
- **Polaroid**: Know when to fold
- **Nintendo**: Looking beyond your core customer base

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**Frost & Sullivan**
The new age health industry: very wide range of sectors, products, services...
$124B stimulus 2010/2011; will spend $170B in 2017 (from $26B 10 years earlier)

Approximately 400M people lifted out of poverty (active, capital rich, growing middle class)

Energy demands up 4x in next 10 years

Rampant capitalism – Public equity markets “hot”

3 biggest IPOs (in history) in China/Brazil

One 1M person city created every two weeks
Massive country with considerable variation in language and culture. China is best thought of as “Europe like” rather than one country.

Hunan: 63,260,000 – largely agricultural with a capital city, Changsha, of nearly 1.6 million inhabitants

France: 60,424,213 – traditionally agricultural with a capital city, Paris, of over 10 million inhabitants

Shandong: 92,480,000 – Source of significant portion of the military leadership, rapidly industrializing, home of Confucius.

Germany: 82,424,609 – Industrial engine of Europe

Beijing: 15,380,000 – Capital of China

Belgium: 10,348,276 – Capital of the European Union

Hong Kong: 6,860,000

Switzerland: 7,450,867 Both financial centers

Every year for Chinese New Year, the most important holiday in China, there are around 350,000,000 domestic travellers, which is equal to the population of Europe.
Growth Areas (China) 2010-2015

- Tier 2/3 City Hospitals
- eHealth
- Uptake of new Technologies
- Sophistication of rural Healthcare
- Access & Affordability

- Local acquisition targets
- Chinafication of MNCs – localised portfolio
- Dedicated R&D activities
- Improved IP protection
- Outsourcing
The Medical Infrastructure in India

Distribution of beds by hospital type, 2009

1 Private Nursing Homes
- 30-35,000 hospitals
- <30 beds
- Owned and managed by a physician
- Cater to mass affluent and high income patients

2 Medium Private Hospitals
- ~4000 hospitals
- 30-100 beds
- Traditional family owned hospital
- Cater largely to mass affluent and selective high income patients

3 Large Private Hospitals
- Mostly corporate hospitals
- Professionally managed
- 20-30% premium over other setups
- Cater to Premium and High income patients
- ~2500 hospitals
- > 100 beds

4 Government Hospitals
- Managed by medical officers
- ~4000 hospitals
- 50-500 beds
- Largely for low income patients; Select flagship hospitals have a positive reputation and a high income patient base

100% = ~1.5 mn beds
Growth Areas (India) 2010-2015

- Launch of global brands by MNCs
  - Eg. Viagra, Allegra

- Emergence of organized retail chains
  - Eg. Apollo, Medicine Shoppe, Reliance Retail

- Move to specialized care
  - Eg. SuperSuperspecialists-thyroidologists

- Increase R&D investment by local companies

- Emergence of private and corporate hospitals
  - Eg. Columbia Asia

- Changing legal framework

- Alliances on the rise
  - Eg. Roche with Cipla and Ranbaxy for prodn of TamilFlu vaccine

India
Health as a global economic driver: Kondratieff-Cycles

- Steam-Engine
- Steel, Train
- Chemistry, Electronics
- Polymers, Automobile
- Information Technology
- Wellness, Health Care Bio- and Medical Technology

1st Cycle: 1800 - 1850
2nd Cycle: 1850 - 1900
3rd Cycle: 1900 - 1950
5th Cycle: 2000 - 2050
Healthcare...

... it’s a fascinating area!