# Table of Contents

3  **Overview**: What is Digital Health?

6  **State of U.S. Healthcare**: What Drives Costs and Outcomes

10  **Employers and Payers**: Improving Outcomes and Lowering Costs

19  **Healthcare Systems and Professionals**: Impacting Care Delivery

26  **Healthcare Consumers**: Engaging Consumers, Empowering Patients

31  **Digital Health Outlook**: Mapping Digital Solutions for Advancing Healthcare

33  About the Authors

36  About Silicon Valley Bank and SVB Analytics
What is Digital Health?

The convergence of healthcare and technology has arrived. Healthcare stakeholders are seeking solutions to survive and thrive in a fast-changing regulatory and clinical environment. At the same time, enabling technologies are becoming widely adopted. The healthcare ecosystem is aligning around critical areas to bring widespread advancements through digital health solutions. SVB Analytics is examining challenges facing a wide range of stakeholders and identifying opportunities for digital technology.

This is the first in a series of reports on Digital Health. In this report, we will examine:

- What drives costs and outcomes of the U.S. healthcare system
- How employers and payers struggle to contain healthcare costs
- How healthcare systems and professionals are plagued by inefficiencies in care delivery
- How healthcare consumers find it challenging to be involved in and manage their own healthcare
# Healthcare Stakeholders Face Many Challenges

In this report, we look at some of the largest unaddressed markets in which digital technology can help solve key stakeholder challenges.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Challenge</th>
<th>Example Digital Health Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employers</td>
<td>Lowering healthcare costs and improving productivity with healthier employees</td>
<td><img src="image1" alt="Digital Health Companies" /></td>
</tr>
<tr>
<td>Payers</td>
<td>Migrating to value-based care and adjusting risk to maintain profitability</td>
<td><img src="image2" alt="Digital Health Companies" /></td>
</tr>
<tr>
<td>Healthcare Systems and Professionals</td>
<td>Reducing operational challenges and adapting healthcare delivery to the changing regulatory and clinical landscape</td>
<td><img src="image3" alt="Digital Health Companies" /></td>
</tr>
<tr>
<td>Healthcare Consumers</td>
<td>Gaining access to information and guidance to better manage healthcare decisions and disease treatment</td>
<td><img src="image4" alt="Digital Health Companies" /></td>
</tr>
</tbody>
</table>
High Costs, Dissatisfaction Drive Demand for Innovation

The Washington Post
To Your Health

Once again, U.S. has most expensive, least effective health care system in survey

By Lenny Bernstein  June 16, 2014  Follow @LennyMBernstein

CNN
Opinion +

Why our health care system is broken

By Marty Makary
Updated 2:05 PM ET, Mon December 28, 2015

(CNN) — Is health care in America getting safer? This is a question that we all think about as doctors and patients. The answer seems to be not really.

Bloomberg

Health-Care Check-Up: Whose System Is Least Efficient?

Health-care costs in the U.S. are surpassed only by Norway’s and Switzerland’s, the data show.

The New York Times

DOCTOR AND PATIENT

Spending More and Getting Less for Health Care

By PAULINE W. CHEN, M.D.  NOVEMBER 21, 2013 2:51 PM  98 Comments
In many respects, the U.S. healthcare system has fallen behind other developed countries – costs more but results in less satisfaction.
Despite higher per capita spending on healthcare in the U.S., the health outcomes are often no better. The U.S. system remains focused on sick-care rather than upon improving wellness and providing preventive care.
Administrative and Insurance Costs Contribute to Higher Healthcare Costs

U.S. Healthcare Expenditures by Category

1980

- Other (incl. Insurance and Administrative)*: 11.5%
- Nursing Home Care: 0%
- Other Medical Durables and Non-Durables: 10%
- Prescription Drugs: 30%
- Home Healthcare: 20%
- Other Professional: 40%
- Physician Services: 50%
- Hospital Care: 60%

2012

- Other (incl. Insurance and Administrative)*: 15.7%
- Nursing Home Care: 0%
- Other Medical Durables and Non-Durables: 10%
- Prescription Drugs: 30%
- Home Healthcare: 20%
- Other Professional: 40%
- Physician Services: 50%
- Hospital Care: 60%

$27.1 Billion

Annual administrative & insurance-related costs

$413.4 Billion

Increase in annual administrative & insurance-related costs

$386.3 Billion

"Other" includes net cost of insurance and administration, government public health activities and other personal healthcare.

Digital Health Report
Employers and Payers: Improve Outcomes and Lower Costs
## Overview:
**Employers Face High Healthcare Costs and Lost Productivity**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Opportunity</th>
<th>Example Digital Health Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing Cost of Healthcare Benefits</td>
<td>Implement platforms that improve healthcare benefit management and lead to employer cost savings</td>
<td>[Company Logos]</td>
</tr>
<tr>
<td>Competition to Attract and Retain Talent</td>
<td>Provide employees access to innovative services, such as telemedicine and genetic testing, to better manage their health</td>
<td>[Company Logos]</td>
</tr>
<tr>
<td>Productivity Loss Due to Employee Health Issues</td>
<td>Offer technology-based tools and services to emphasize wellness and preventive health</td>
<td>[Company Logos]</td>
</tr>
</tbody>
</table>

*Digital Health Report 11*
For most of the last decade, the cost of employer-paid healthcare benefits has been on the rise when measured as a percentage of total compensation. Implementing digital health platforms to improve healthcare benefit management and to increase price transparency will lower the overall cost burden of employers, a primary payer in the U.S. system.
Employers Increasingly Use Benefits to Attract and Retain Workers

Increasingly, employers are leveraging healthcare and preventive/wellness benefits to attract and retain employees. Employers are providing employees access to innovative services, such as telemedicine and genetic testing, to better manage their health.
Unhealthy Workforce Impacts Productivity and Bottom Line

Management
Supervisors spend 4.2 hours/week managing absences

Employees
Replacement Workers are 36.6% less productive

Bottom Line
Absences cost an average 15.4% of payroll

Improving employee health management can help reduce the impact of health-related productivity loss, which presents opportunities for digital health companies focused on wellness and preventive care.
# Overview: Payers Seek Solutions in Price Competitive Marketplace

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Opportunity</th>
<th>Example Digital Health Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumerism is Changing Insurance Market Dynamics, Increasing Pricing Pressure</td>
<td>Use technology tools to be more consumer-friendly and competitive</td>
<td>Clover, Healthx, eHealth</td>
</tr>
<tr>
<td>Lack of Insight and Tools to Accurately Measure Risk</td>
<td>Use big data and machine learning to improve risk management</td>
<td>Oscar, Welltok, OPTUM, Inovalon, Apixio</td>
</tr>
<tr>
<td>Shift from Fee-Based to Value-Based Care</td>
<td>Implement population health tools that manage care delivery and control costs by risk population</td>
<td>Aledade, remedy partners, HealthQx, Privia</td>
</tr>
</tbody>
</table>
Emergence of Public and Private Exchanges Increases Pricing Pressure on Payers

The Affordable Care Act created public exchanges; now employers are embracing private exchanges.*

**Public Exchanges**
- Public exchanges are expected to cover **15 million people** by 2017

**Private Exchanges**
- An estimated **20-30% of employers** plan to create private exchanges within 5 years

Consumers on exchanges tend to choose lower-cost plans, impacting payer revenues.

- **$322** is the potential annual savings for consumers actively shopping for coverage in 2016
- As many as **66%** of employees choose plans with lower premiums when switching to private exchange plans

Exchanges make it easier for consumers to change their health insurance plans, which creates pricing pressure on payers.

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*Private Exchanges: Healthcare exchange that is created by employers for their employees.*
Payers Face New Challenges in Cost Control and Risk Management

Regulatory Changes May Increase Medical Claims and Costs

World Health Organization: Implementation of ICD-10

U.S. Government: Minimum Medical Loss Ratio

Government regulations and standards are adding to challenges of controlling medical claims and costs.

Data Remains in Silos, Making Claims and Costs Difficult to Predict

Ongoing difficulty in capturing and measuring standardized data remains the biggest challenge for payers when assessing risk and medical claim costs. An opportunity exists for digital health companies that specialize in providing risk and analytics solutions.
Payers Struggle in Shift to Value-Based Care

Payers cite data standardization and analysis measures as major challenges in implementing value-based care, especially in pay for performance and shared savings models. Digital health solutions can help more accurately assess medical claims.

- **Fee for Service** – Fixed fee payment for service rendered
- **Pay for Performance** – Incentives to providers based on KPIs
- **Global Payments** – Fixed budget of care for population of patients with sophisticated risk adjustments incorporated
- **Bundled Payments** – Single payment per episode of care
- **Other (Shared Savings)** – Incentives to encourage cost saving

---

Payers Rate Value-Based Care Payment Models as More Difficult to Implement

<table>
<thead>
<tr>
<th>Payment Model</th>
<th>% of Payers Rating Model as Difficult to Implement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fee For Service</td>
<td></td>
</tr>
<tr>
<td>Other (i.e. Shared Savings)</td>
<td></td>
</tr>
<tr>
<td>Global Payment</td>
<td></td>
</tr>
<tr>
<td>Capitation</td>
<td></td>
</tr>
<tr>
<td>Episode of Care / Bundled Payments</td>
<td></td>
</tr>
<tr>
<td>Pay for Performance</td>
<td></td>
</tr>
</tbody>
</table>
Healthcare Systems and Professionals: Impacting Care Delivery
## Overview:
Healthcare Systems and Professionals Face Pressure to Improve Care Delivery

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Opportunity</th>
<th>Example Digital Health Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Administrative Costs</td>
<td>Digitize records and improve communications and workflows</td>
<td>MERGE Healthcare, Epic, medstatix</td>
</tr>
<tr>
<td>Shift to Value-based Care</td>
<td>Develop new ways to analyze costs and patient population risks to deliver more efficient care</td>
<td>KYRUUS, practicefusion, HealthCatalyst</td>
</tr>
<tr>
<td>Explosion of Data in Clinical Decision-Making</td>
<td>Implement clinical outcomes analysis and personalized medicine</td>
<td>HealthCatalyst, evolent HEALTH, PopHealthCare'</td>
</tr>
</tbody>
</table>

Digital Health Report 20
Healthcare Systems and Professionals Are Plagued by Operational Challenges

Estimated Annual Cost of Operational Inefficiencies on Healthcare System ($B)

- $248
- $192
- $177
- $131
- $128
- $35

Failures of Care Delivery
Failures of Care Coordination
Overtreatment
Pricing Failures
Fraud and Abuse
Administrative Complexity

$910 Billion
Estimated annual cost of inefficiencies in the U.S. healthcare system

Lack of automation is prevalent in the industry. The majority of the inefficiencies and waste in the healthcare system relates to administrative complexity, pricing failures and fraud and abuse. Overlaying electronic documentation support and data analytics tools across these disparate data silos will better identify outliers and lower total systematic costs.
Healthcare Systems and Professionals Struggle with Basic Communications

Estimated Time Wasted by Care Providers Due to Inefficient Systems and Workflow

Main Reasons Time is Wasted in Communicating with Colleagues

- Conducting Patient Care
- Communicating and Consulting with Colleagues
- Completing Documentation
- Prescribing and/or Administering Medications

- Pagers are not efficient
- Text messaging is not allowed
- Wi-Fi is not available
- Email is not efficient

Inefficient and outdated communications systems in clinical settings waste, on average, an estimated $1.7 million annually per hospital. Deploying and mandating modern digital health communication tools will improve health system profitability.
High Workload Leads to Increased Risk of Medical Error

Today the healthcare professional...

Is Stressed

74% of Nurses cite stress and overwork as top concerns

Only 6% of Doctors describe their morale as positive

Faces High Workload

Over 20% of Physicians report workload has likely contributed to patient transfers, morbidity or even mortality

Adding a nurse FTE leads to a 16% reduction in the odds of death in a surgical setting

Healthcare professionals often work long shifts, which correlates with a higher frequency of medical errors. Digital health opportunities include electronic medical records, improved workflow management and better communications tools to help reduce medical errors.
Value-Based Care Creates New Challenges for Systems

Shift to value-based care is coming...
50% of Medicare payments expected to be value-based in 2018

But healthcare systems are unprepared:
Only 20% of healthcare CEOs say they are ready to fully implement value-based care

Adopting value-based care requires improving outcomes while controlling costs. Healthcare systems also face difficulty in allocating payments in value-based care models. Digital health companies can help create tools to analyze patient risk and generate actionable insight on how to provide more efficient care.

Fee for Service – Fixed fee payment for service rendered
Pay for Performance – Incentives to providers based on KPIs
Global Payments - Fixed budget of care for population of patients with sophisticated risk adjustments incorporated

Capitation – Fixed budget of care for population of patients
Bundled Payments – Single payment per episode of care
Other (Shared Savings) – Incentives to encourage cost saving
Clinicians Face a Deluge of Medical Information

Alert fatigue
Over 80% of primary care physicians believe they receive an excessive number of alerts.

More treatment & diagnostic options
Increasing drug approvals (~1600 cumulative in 2015)

Increased academic literature & research
~2M articles published in a single year

Increased genomic & mutation data
>187M DNA sequences recorded (200 terabytes of data)

Imprecise clinical judgment
Impacts decision-making, causing errors

Increased clinician stress

Clinicians struggle to keep up with rapidly advancing medical research. They and their patients can benefit from effective data analysis and personalized medicine to improve clinical outcomes.
Healthcare Consumers: Engaging Consumers, Empowering Patients
### Overview: Empowering Patients Is Key to Fixing Healthcare System

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Opportunity</th>
<th>Example Digital Health Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of Choice and Price Transparency</td>
<td>Provide tools and services to access quality healthcare at a reasonable cost</td>
<td>Care.com, Stride Health, healthgrades, ZocDoc, eHealth</td>
</tr>
<tr>
<td>Poor Health Literacy</td>
<td>Create access to online educational material and training to improve decision-making</td>
<td>everyday HEALTH, patientslikeme, WebMD</td>
</tr>
<tr>
<td>Lack of Tools to Manage Health and Wellness</td>
<td>Empower patients to manage their own health, including disease treatment and wellness</td>
<td>myfitnesspal, HEALTH LOOP, TELADOC, omada, PEAR Therapeutics</td>
</tr>
</tbody>
</table>
Patients Are Often Uninformed on Costs, Treatment Options

Today the patient...

**Lacks information on disease**

- As few as 13% of patients with chronic disease were provided health education

**Lacks information on cost**

- Only 13% of patients were given a range of treatment prices

**Lacks health literacy**

- Up to 35% of patients have no or only basic health literacy

Healthcare consumers and patients struggle to manage their own healthcare due to limited access to relevant healthcare information. Digital health companies can empower patients through better search tools, pricing transparency solutions, disease management apps and other patient engagement solutions.
Engaged Patients Correlate with Lower Costs and Better Outcomes

Healthcare costs for the **least-engaged patients** are **21% higher** than those for the **most-engaged patients**

- **Higher Costs**
  - Least Engaged: $966
  - Most Engaged: $799

- **Lower Costs**
  - Least Engaged: $840
  - Most Engaged: $783

**Poorer Outcomes**
- Higher rates of medical errors
- Less likely to follow healthcare professional's advice

**Better Outcomes**
- Lower readmission rates
- Higher survival rates
Patients Want to Be Active Decision-Makers

Asked how much they want to be involved in their healthcare decisions, patients wanted...

- To Be Completely in Charge: 24%
- To Make Final Decision with Doctor Input: 38%
- To Make Joint Decision with Doctor: 31%
- To Give Input with Decision Made by Doctor: 6%
- For Doctor to Be Completely in Charge: 1%

More than 90 percent of adults say they want to be actively involved in decision-making with their doctors, and 24 percent want to be completely in charge. Looking ahead, patients’ interest in their own healthcare represents opportunities for digital health technologies that empower patients.
Digital Health Outlook: Mapping Digital Solutions for Advancing Healthcare
Digital Health companies are innovating in the healthcare space by focusing on improving outcomes and reducing costs. In the next report, we will evaluate the most promising opportunities and solutions that address the needs of patients and healthcare consumers.
Steve Allan, CFA

Steve Allan is the Head of SVB Analytics, responsible for the three areas of information services provided to the innovation economy: Strategic Advisory Services, Compliance Valuations, and Insights. Strategic Advisory Services provides consultative guidance around valuations, benchmarking and inorganic growth strategies. Compliance Valuations issues valuation opinions for private companies. Insight focuses on studying trends and opportunities in the private venture-backed innovation ecosystem. Steve brings a strong financial background and passion for entrepreneurship to his role at SVB Analytics.

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Scott holds a master's degree in business administration from the Haas School of Business (University of California at Berkeley), and a bachelor’s degree in human biology from Occidental College.

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Scott holds a master's degree in business administration from the Haas School of Business (University of California at Berkeley), and a bachelor’s degree in human biology from Occidental College.

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Appendix: Sources

Slide 7: U.S. Healthcare Expenditures Far Outpace Other Countries
  • “OECD Health Statistics 2015.”

Slide 8: But Health Outcomes Are No Better, Despite Investment
  • “OECD Health Statistics 2015.”

Slide 9: Administrative and Insurance Costs Contribute to Higher Healthcare Costs
  • Centers for Medicare & Medicaid Services, Office of the Actuary. Data released January 7, 2014

Slide 12: Healthcare Benefits Become Bigger Part of Employee Compensation

Slide 13: Employers Increasingly Use Benefits to Attract and Retain Workers

Slide 14: Workforce Impacts Productivity and Bottom Line

Slide 16: Emergence of Public and Private Exchanges Increase Pricing Pressure on Payers

  • “Private Health Insurance Exchanges.” Kaiser Family Foundation.
  • “The Budget and Economic Outlook: 2016 to 2026.” Congressional Budget Office.

Slide 18: Payers Struggle in Shift to Value-Based Care

Slide 21: Healthcare Systems and Professionals Are Plagued by Operational Challenges

Slide 22: Healthcare Systems and Professionals Struggle with Basic Communications

Slide 23: High Workload Leads to Increased Risk of Medical Error
Appendix: Sources (continued)

Slide 24: Value-Based Care Creates New Challenges for Systems
- “Just 20% of health care CEOs are ready to get rid of fee-for-service.” The Advisory Board Company. 2015

Slide 25: Clinicians Need Tools to Tackle Information Overload
- FDA
- “GenBank and WGS Statistics.” National Center for Biotechnology Information. August 2015.

Slide 28: Patients Are Often Uninformed on Costs, Treatment Options
- “America’s Health Literacy: Why We Need Accessible Health Information.” US Department of Health and Human Services. 2008

Slide 29: Engaged Patients Correlate With Lower Costs and Better Outcomes
- “Chronic Care: A Call to Action for Health Reform.” AARP Public Policy Institute.

Slide 30: Patients Want to Be Active Decision-Makers
About Silicon Valley Bank
For more than 30 years, Silicon Valley Bank has helped innovative companies and their investors move bold ideas forward, fast. SVB provides targeted financial services and expertise through its offices in innovation centers around the world. With commercial, international and private banking services, SVB helps address the unique needs of innovators.

About SVB Analytics
SVB Analytics, a non-bank affiliate of Silicon Valley Bank, serves the strategic business needs of entrepreneurs, corporates and investors in the global innovation economy. For more than a decade, SVB Analytics has helped global business leaders make informed decisions by providing market intelligence, research, and consulting services. Powered by proprietary data, SVB Analytics has a unique view into the technology and life science sectors.