Deloitte.

2018 Global Life Sciences Outlook

Innovating life sciences in the fourth industrial revolution: Embrace, build, grow

Global health care spending

is projected to reach

$8.7 trillion by 2020

up from $7 trillion in 2015.

Why?

- Aging and increasing populations
- Emerging market expansion
- Advances in medical treatments
- Rising labor costs

Spending is expected to continue to be uneven

Health care spending per person by 2021

Why?

- Better medical care, people living longer
- Falling infant mortality rate
- Lowering rates of communicable diseases

Diabetes expected to rise to 642 million people by 2040 due to:

- Rapid urbanization
- Sedentary lifestyles
- Changing diets
- Rising obesity levels

Number of people aged over **65** has increased to more than **656 million**, or **11.5%** of the total population

Economic overview and outlook

Pharma forecast to reach

$1.06 trillion worldwide by 2022

Growth rates

Some growth coming from emerging markets

- 8 emerging markets in top 20 countries in pharma sales
- China expected to reach #3 in sales in near future

Biologics and biosimilars to account for **25%** of pharma market by 2020

Issues that could impact growth?

- Pricing pressures, 2nd patent cliff (estimated **$194 billion** in sales could be at risk by **2022**;
- Consolidation in generics markets and increased budgets for high-priced treatments, including orphan drugs (could account for **595 billion** in **2022**;

Spending on R&D slows a bit but still steady (2.4%) until 2022

- Small-molecule companies, where the majority of new drugs are discovered, appear to be driving innovation.
- Less than a quarter of drugs are being discovered by large pharmaceutical companies.

Therapeutic trends

Oncology to continue to lead the way followed by diabetes, rheumatology, and antivirals

Medtech

- Forecast to reach **$521.9 billion** by 2022
- In vitro diagnostics is expected to remain the largest medtech segment
- By 2022, the top ten companies are expected to make up **37%** of the medtech market

The orphan drug market is expected to almost **double** in the next five years

Orphan drug approvals

2017 – 75

2016 – 27

2015 – 56

Embracing exponential changes in technology

AI, cognitive technologies, automation, and computing power are creating a transformation opportunity

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The industrialization of life sciences!

Impact

- Increasing data capabilities
- Adopting enterprise-wide, real-world evidence (RWE) strategies
- Advanced digital & cognitive computing
- Partnering with tech
- 3D printing
- Blockchain

Exponential technologies impact:

- Cloud can improve analytical systems' overall performance to manage Real-World Data
- Improving the speed and outcomes of clinical development
- Supply chain via connected "Digital Supply Networks"
- Assist in dealing with cyber threats

Life sciences companies need speed, scale, complexity and security solutions + cloud computing

New technologies are creating new roles in life sciences (i.e. 'Chief Data Officer')

Embracing geopolitical change

- Balancing the value and volume parts of the business
- Focus on consistent therapeutic areas (TAs) and few classes of high-value products
- Activity in some areas of R&D serving the smaller markets – particularly rare diseases – remains important

- Value in the eyes of patients and payers is expected to increasingly drive pricing
- Understanding the need for a good value proposition is vital
- Value-based contracts are contingent upon proving better patient outcomes over peer products to receive reimbursement
- Medtech companies are also in the early stages of value-based contracting

Regulatory impacts expected

- Stem cell therapies in regenerative medicine
- Prevent plots for software developers
- Digital innovation
- 21st Century Cures
- GMP
- Med Device
- GDPR

New geopolitical climate

Tax reforms worldwide are expected to create incentives and disincentives for the life sciences sector and impact future investments

US

- Passed a major overhaul of its tax law at the end of 2017, and most provisions are already in effect for 2018
- Extra capital may now be available to fund additional research, business expansion, job growth and capital expenditures, but some companies may take a conservative approach
- Expected to continue to advocate for policy changes to reduce drug prices
- Medtech is expected to continue to battle excise tax

UK

- Brexit
- Uncertain whether or how the UK's relationship with the European Medicines Agency (EMA) will change

Building an adaptable organization for the future of work

The future of work will be more networked, devolved, mobile, collaborative, team-based, project-based, and fluid

Old rules

- Job replaced by machines/AI
- Full-time employees
- Full-time & skills based
- Static & fixed skills
- Defined career ladders
- Robotics & cognitive tech are IT
- Narrow HR focus on change to automation
- Focus on 'jobs' & 'job descriptions'

New rules

- Human skills augmented by tech
- Contractors, gig employees, etc.
- Options across workforce & tech
- Constant conversation
- Portfolio of projects/experience
- Integration of people & tech
- HR has a strategic role
- Fundamental elements are 'tasks'

The challenges:

- The slow rate of adopting new technologies
- Too few understand the impact advanced technologies have, or will have

In a skills-based economy, talent will be a differentiator

In addition to new digital and analytical skills, there will be a demand for skills that are essentially human. Robotics, AI, sensors and cognitive computing will result in the redesign of almost every job.

Connecting on mission, ethics, and values will be critical

New model:

Less hierarchical

Greater autonomy at team

Able to see the big picture

Generalists skilled at breaking down silos and bridging knowledge across an organization

Building a culture of courage to help counter uncertainty

An ethics-driven culture will be a massive focus of regulators in the next few years. Regulators expect the life science sector to be proactive, rather than just react to inquiries or defend themselves.

Cyber attacks impact

- Patient care and safety
- Organizational assets
- Reputation
- Intellectual property
- Relationships with customers
- Shareholder value
- Regulatory compliance

Proactive cybersecurity, minimizing risk

"security by design"

……integrating cybersecurity into product life cycle –seen as an increasingly important solution

Cloud security becoming increasingly important

To mitigate cyber security risks, organizations need to be:

- Proactive near and real-time monitoring
- Threat pattern collection
- Cyber threat modeling and analysis
- Threat mitigation and remediation
- Incident management
- Threat intelligence reporting

Building data integrity, maximizing the value of data

Making data reusable and accessible across silos

Creating a working environment that values data integrity.

Data integrity = complete + consistent + accurate throughout data lifecycle

Data – all original records and true copies, including:

- Source (raw) data
- Metadata
- All subsequent transformations and reports

Priorities:

- High expectations for data quality
- Linking data and teams across silos
- Maximizing data value

Implementing data integrity across an organization

Building patient trust and centricity

Life science companies are embracing digital technology's potential for advancing patient-centricity

Impediments?

- Corporate reputation

76% Patients that had a 'high' or 'some' trust in health apps developed by patient groups

32% could say the same for apps produced by pharma

Reasons?

- Lack of trust
- Security issues/privacy protection

Areas that life sciences is focusing on to advance patient-centricity

- Clinical trials
- Personalized treatment optimization

Envisioning the future of connected patient journey of care

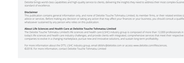
- Comprehensive comms platforms
- E-visits & telemedicine
- Bio-telemetry
- Quantified self, PHR
- Web-based portals for regulatory and patient engagement
- Hospitals designed to support patients and staff
- RPA/AI initiative & coordinate activities
- Gamification to encourage compliance
- RFID to optimize resources

Building a smart, cross-functional regulatory approach

Goals:

- Continually evaluate the individual and collective impacts of new regulations and take a proactive approach to managing regulatory change
- Look at speeding up the processes around regulatory, unifying the data standards in different departments, and automation.

While challenging, obtaining cross-functional regulatory governance will be key



A trend towards a holistic approach can be seen in the synergies between regulations- Example:

IDMP

Other regulatory mandates & standards

Regulatory will need to better coordinate the whole ecosystem

- Connected devices
- Products
- Services

Growing through partnerships and new operating models

Partnership trends

- Nontraditional deal-making in strong therapeutic areas
- Strong, harmonious partnerships with regulators
- Symbiotic partnerships with tech giants and startups
- Collaborative scientific partnerships with life science academia, nonprofits and governments
- Clinical partnerships

Collaborations with tech partners will become increasingly important to:

- Optimize patient treatment regimens,
- Manage and analyze increasing amounts of data
- Improve internal data accessibility to drive better informed decision-making

The **Chief Innovation Officer** will become one of the more important executives in the pharma C-suite, and key to leading fast, focused innovation

New operating models

Top issues transforming the operating model

Supply Chain organizations that adopt direct-to-patient distribution models could reduce distribution spend by **15-20%**, and improve patient experience

Patient moving from being a **passive** recipient of treatment to becoming a **central part** of the R&D process for new therapies