How will you jumpstart innovation to unlock the power of data to deliver value-based care?

The better the question. The better the answer.
The better the world works.

EY
Building a better
working world

Five irrefutable facts are affecting the health care industry …

Socioeconomic forces

Care will continue to take an ever larger share of GDP as obesity, chronic disease, aging populations and health disparities increase … products require a greater proof of value.

Technology integration

Conversion to virtual personalized and preventive models … will require integration of new capabilities.

Required capital efficiency

Pressure moves from productivity and efficiency challenges to innovation with intelligent infrastructure … all uses of capital will require constant ROI assessment.

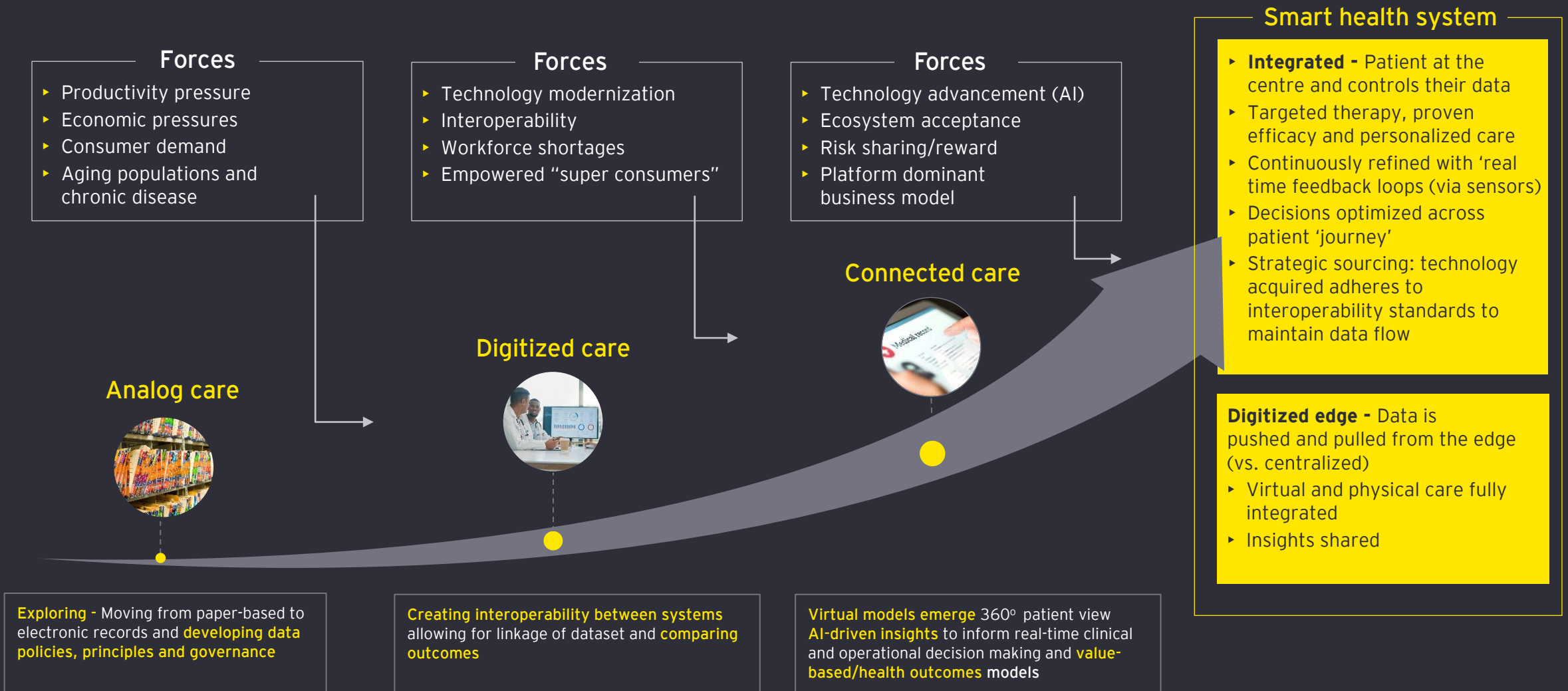## Customer engagement

Consumer demand for experience not just a service to receive care will reshape care delivery … will require change in business and clinical models.

Workforce shortages

18m predicted shortfall in global health care workforce by 2030 … will need a shift toward virtualization, automation and AI.

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A potential Intelligent Health Ecosystem of tomorrow will go beyond simply being "digitized" and "connected", becoming a truly "smart" system

Forces
- Productivity pressure
- Economic pressures
- Consumer demand
- Aging populations and chronic disease

Forces
- Technology modernization
- Interoperability
- Workforce shortages
- Empowered "super consumers"

Forces
- Technology advancement (AI)
- Ecosystem acceptance
- Risk sharing/reward
- Platform dominant business model

Connected care

Digitized care

Analog care

Smart health system

- **Integrated -** Patient at the centre and controls their data
- Targeted therapy, proven efficacy and personalized care
- Continuously refined with 'real time feedback loops (via sensors)
- Decisions optimized across patient 'journey'
- Strategic sourcing: technology acquired adheres to interoperability standards to maintain data flow

Digitized edge - Data is pushed and pulled from the edge (vs. centralized)
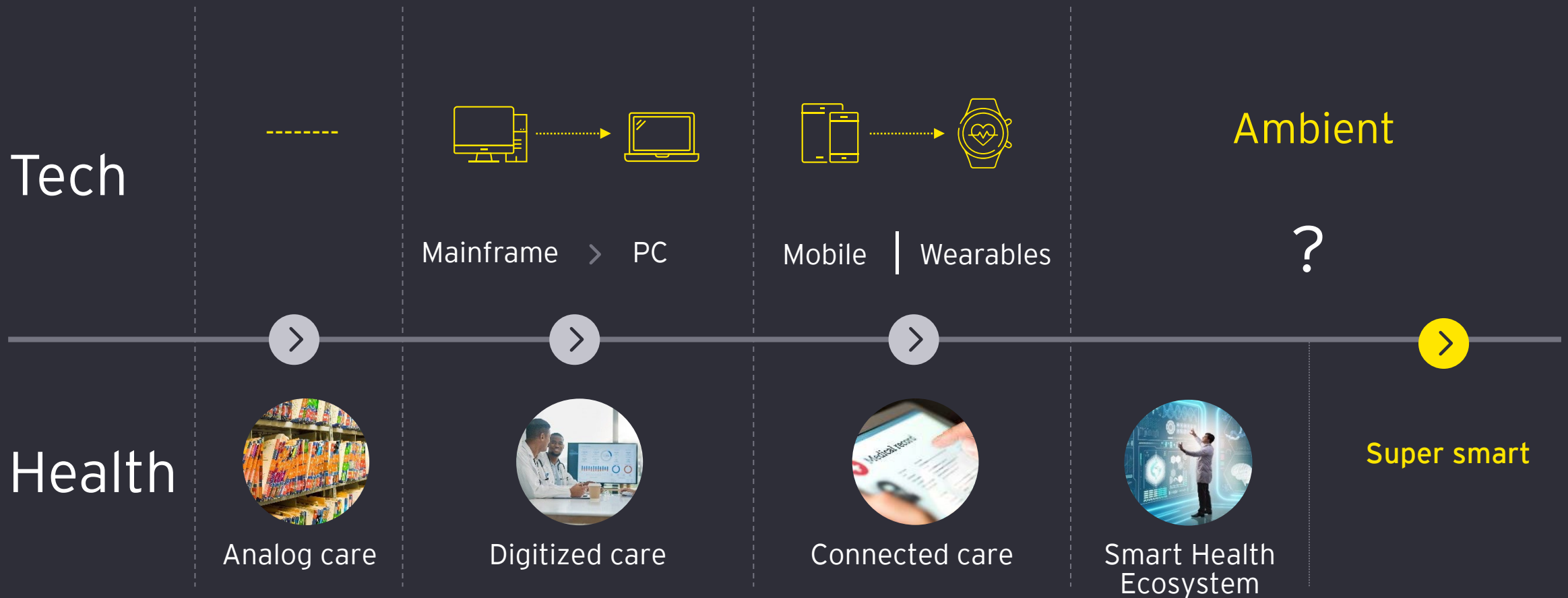- Virtual and physical care fully integrated
- Insights shared

Exploring - Moving from paper-based to electronic records and **developing data policies, principles and governance**

Creating interoperability between systems allowing for linkage of dataset and **comparing outcomes**

Virtual models emerge 360º patient view **AI-driven insights** to inform real-time clinical and operational decision making and **value-based/health outcomes** models

Sources: Frost & Sullivan, Healthcare IT News, Mordor Intelligence

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Such Smart Intelligent health systems will also depend on an inclusive operating model (ecosystem) where risk, reward, data models and insights are "shared"

Smart health system

Integrated - Patient at the centre and controls their own data

‣ Targeted therapy, proven efficacy and personalized care

‣ Continuously refined with 'real time feedback loops (via sensors)

‣ Decisions optimized across patient 'journey'

‣ Strategic sourcing: technology acquired adheres to interoperability standards to maintain data flow

Digitized edge - Data is pushed and pulled from the edge (vs. centralized)

‣ Virtual and physical care fully integrated

‣ Insights shared

The intelligent health ecosystem will:

‣ Drive innovation, collaboration and value sharing

‣ Deliver value for all stakeholders

‣ Be hyperconnected

‣ Have superfluid fast data flows and standards for interoperability

‣ Operate "human cognitive as well as computational AI

‣ Intelligently learn

Resulting benefits:

❯ Accelerated access to new innovation

❯ Personalized and patient-centric health experiences

❯ Enhanced outcomes achieved

❯ Value based care the 'norm' collectively recognized and differentially reimbursed

❯ Optimized (augmented) technology assisted decision-making
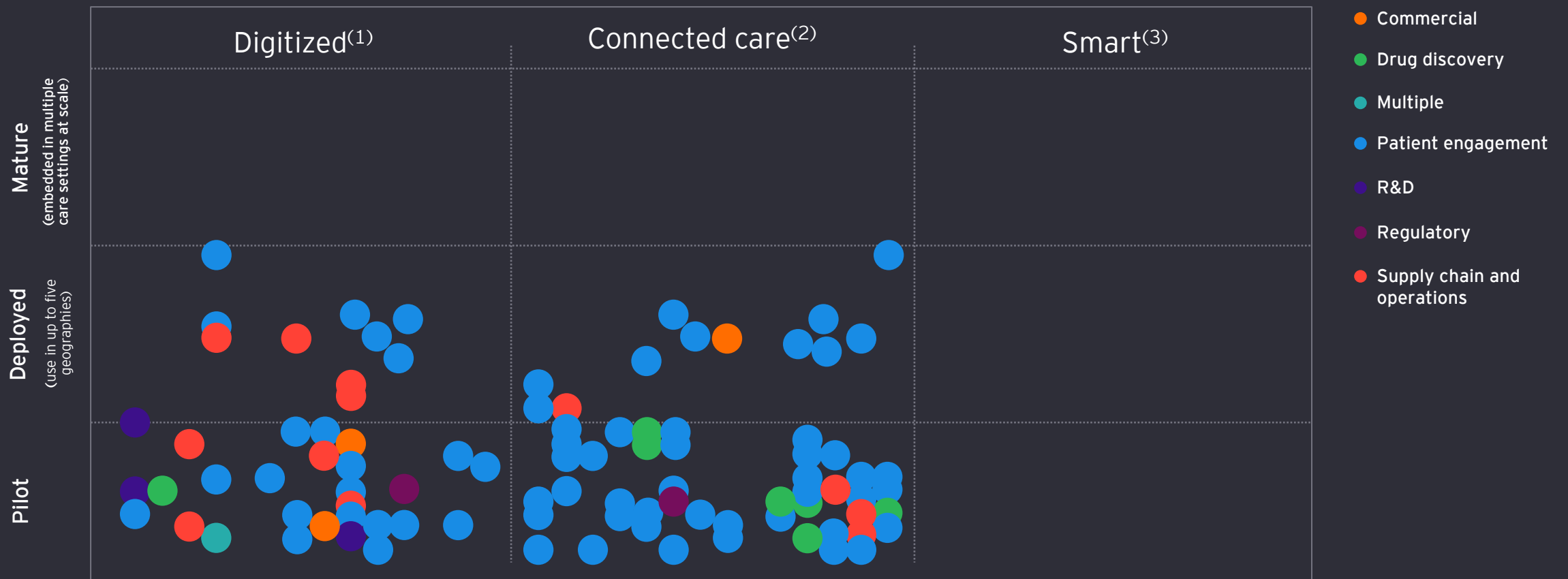
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In getting there, we are likely to **overestimate** the effect of a technology in the **short term ...** and **underestimate** its effect in the **long term**

Tech

?

Mainframe > PC

Mobile | Wearables

Ambient

?

Health

Analog care

Digitized care

Connected care

Smart Health Ecosystem

Super smart

EY

Innovations are emerging ... but not yet at the scale or interoperability to achieve real change

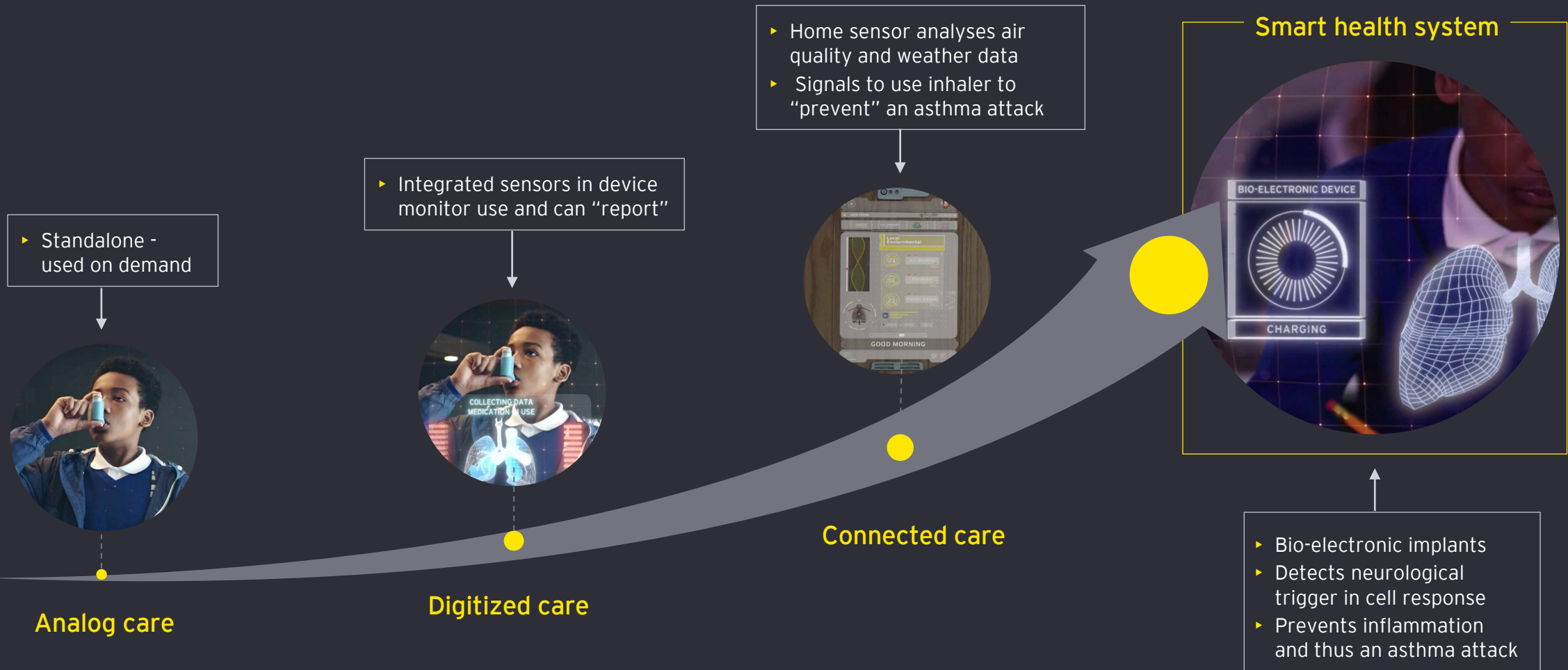EY Intelligent Health Ecosystem innovation dashboard @ December 2022

Digitized[1] **Connected care**[2] **Smart**[3]

Mature (embedded in multiple care settings at scale)

Deployed (use in up to five geographies)

Pilot

Legend:
- Commercial
- Drug discovery
- Multiple
- Patient engagement
- R&D
- Regulatory
- Supply chain and operations

(1) Digitization: mostly in traditional operating models and diagnostic in nature

(2) Integrated operation of discrete devices – emerging personalization and predictive in nature

(3) Intelligent intervention, highly personalized and interdependent on collaboration between organizations and prescriptive in nature
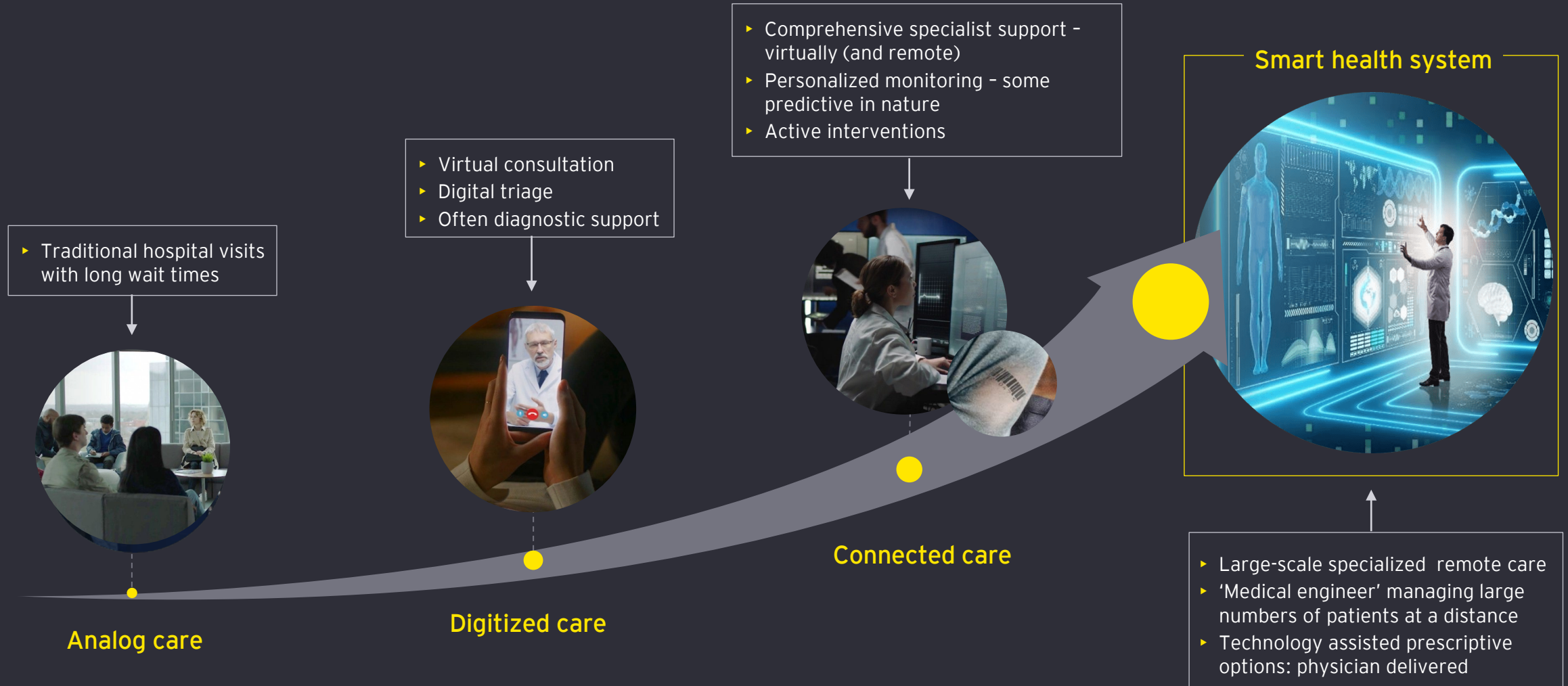
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In more detail ... example 1: Can we smartly prevent respiratory disease vs. treating symptoms?

‣ Standalone - used on demand

‣ Integrated sensors in device monitor use and can "report"

‣ Home sensor analyses air quality and weather data
‣ Signals to use inhaler to "prevent" an asthma attack

Smart health system

BIO-ELECTRONIC DEVICE

CHARGING

Connected care

Analog care

Digitized care

‣ Bio-electronic implants
‣ Detects neurological trigger in cell response
‣ Prevents inflammation and thus an asthma attack

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In more detail ... example 2: How can we provide post operative personalized care anytime, anywhere?

Smart health system

- ‣ Home coaching and personal assistant to assist progress

- ‣ Sensor embedded in implant
- ‣ Streams diagnostic data (one way to care team)

- ‣ Self-help guide
- ‣ Sporadic outpatient hospital visit

INBOX

Calibrating Digital Twin

PHYSIO SESSION

Connected care

Digitized care

Analog care

- ‣ Connected Digital twin driven rehab
- ‣ Personalized coaching
- ‣ Interactive prescriptive physical therapy based on patient performance
- ‣ Active monitoring of implant to prolong efficacy

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In more detail ... example 3: How can effective virtual care be scaled to increase access and affordability?

- Comprehensive specialist support – virtually (and remote)
- Personalized monitoring – some predictive in nature
- Active interventions

- Virtual consultation
- Digital triage
- Often diagnostic support

- Traditional hospital visits with long wait times

Smart health system

Connected care

Analog care

Digitized care

- Large-scale specialized remote care
- 'Medical engineer' managing large numbers of patients at a distance
- Technology assisted prescriptive options: physician delivered

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How can we better
steer the utilization
of health technology to
deliver smart health in
an intelligent
ecosystem?

The better the question. The better the answer.
The better the world works.

EY

A major hurdle is a misalignment in what stakeholders' value

As a patient

How can I be in control and get access to the right treatment quickly so I am healthy?

As a provider

How can I use data and evidence-based practices to diagnose faster and provide the most effective treatment?

As a payer

How can I keep our members well and provide the most cost-effective health solutions?

As a policy maker

How can I align incentives as well as manage risks to improve population health?

As a biopharma or med tech

How can I get approvals faster and be paid longer at a level to sustain innovation?

EY

And thus a misalignment in what is prioritized as a primary need

As a patient

How can I be in control and get access to the right treatment quickly so I am healthy?

Data ↓

I need to be sure the diagnosis is right, treatments will work for *me* and my quality of life will be improved.

As a provider

How can I use data and evidence-based practices to diagnose faster and provide the most effective treatment?

Data ↓

I need a comprehensive understanding of *my patients*, use trusted *algorithms* to assist in delivering **treatments**.

As a payer

How can I provide the most cost-effective health solutions?

Data ↓

I need to be able to *evidence value for money* using economic models and *pay only for treatments that work* for my clients.

As a policy maker

How can I align incentives as well as manage risks to improve population health?

Data ↓

I need *evidence of clinical safety* and measure how Health can be valued as an *population asset vs. a cost burden?*

As a biopharma or med tech

How can I get approvals faster and be paid longer at a level to sustain innovation?

Data ↓

I need to *identify patients for trials* faster, evidence efficacy, safety and value to *accelerate market access* for my innovations.

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Which drives different (expensive) investment priorities, often requiring access to other's data

As a patient

How can I be in control and get access to the right treatment quickly so I am healthy?

Data relevant and specific to me

I need to be sure the diagnosis is right, treatments will work for *me* and my quality of life will be improved.

As a provider

How can I use data and evidence-based practices to diagnose faster and provide the most treatment?

Population models inclusive of SDoH to validate decisions

I need a comprehensive understanding of *my patients*, use trusted *algorithms* to assist in delivering treatments.

As a payer

How can I provide the most cost-effective health solutions?

Highest financial return models to pay against

I need to be able to *evidence value for money* using economic models and *pay only for treatments that work for my clients.*

As a policy maker

How can I align incentives as well as manage risks to improve population health?

Safe and effective evidence to improve population health

I need *evidence of clinical safety* and measure how Health can be valued as an *population asset vs a cost burden?*
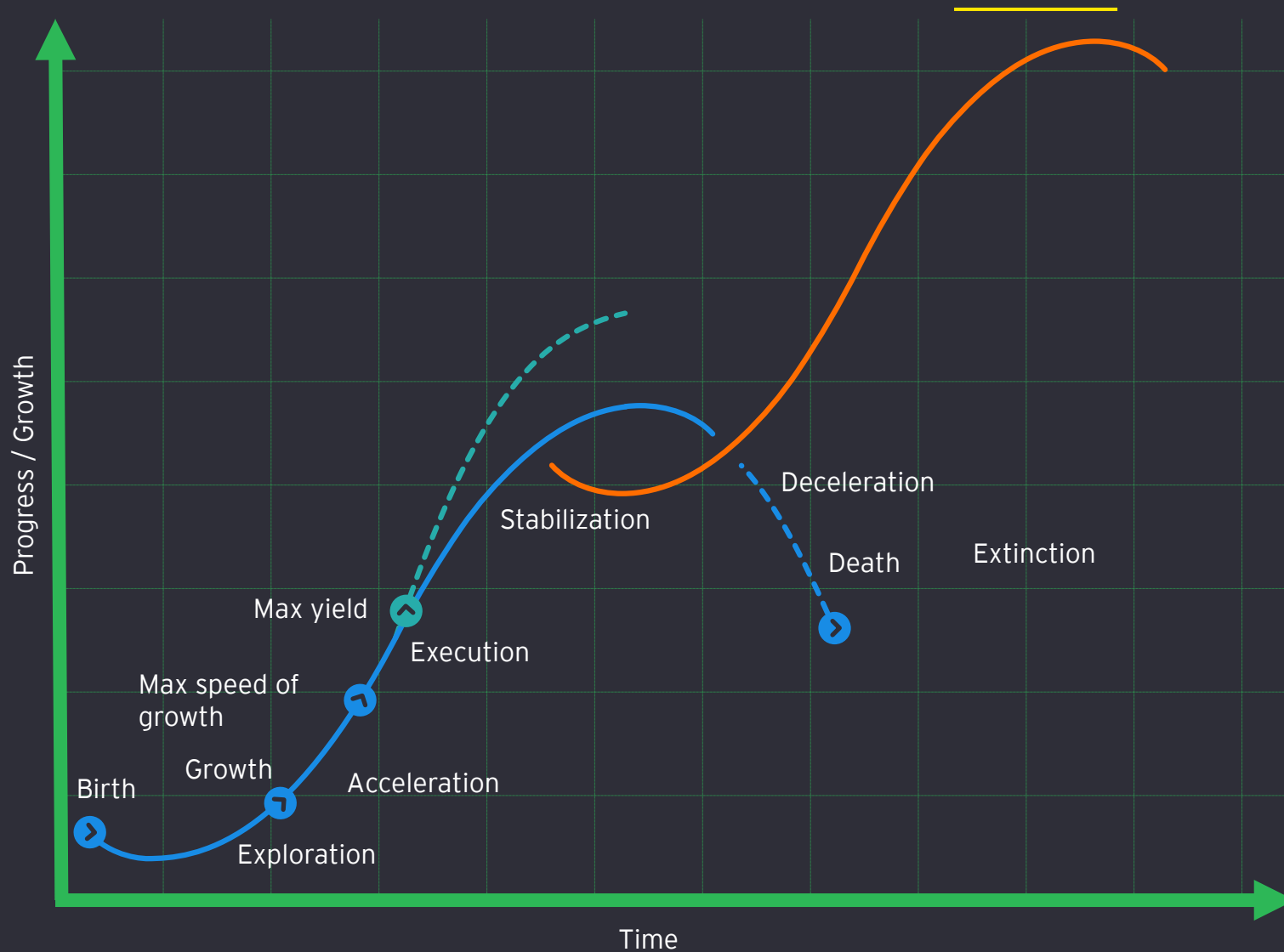
As a biopharma or med tech

How can I get approvals faster and be paid longer at a level to sustain innovation?

Patients identified and sustained optimal price points

I need to *identify patients for trials* faster, evidence efficacy, safety and value to *accelerate market access* for my innovations.

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Almost all business models (and life) follow a predictable pattern

Progress / Growth (vertical axis)

Time (horizontal axis)

Birth
Growth
Max speed of growth
Exploration
Acceleration
Max yield
Execution
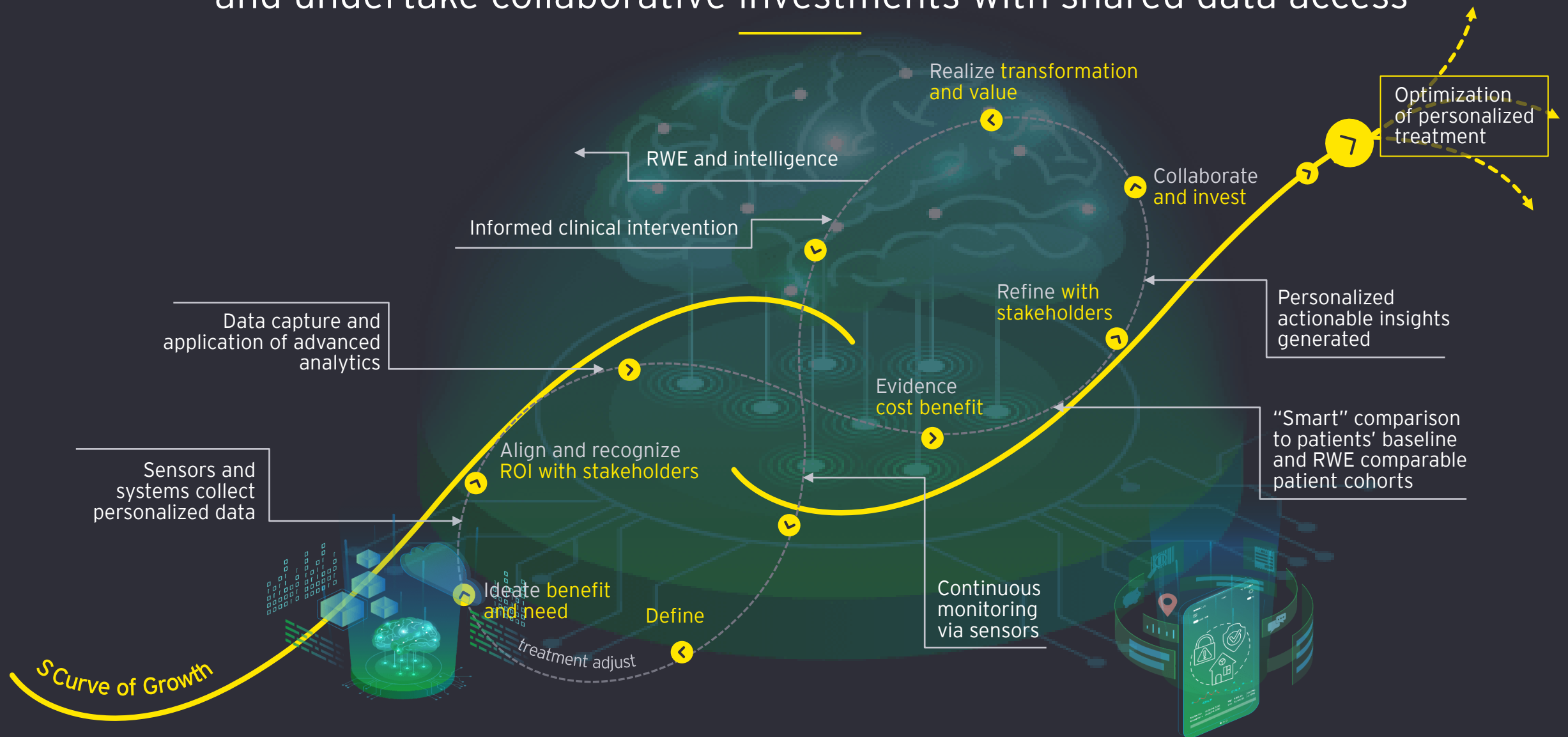Stabilization
Deceleration
Death
Extinction

How to be sustainable:

1. **Delay** extinction: optimize/digitize existing and stretch the curve

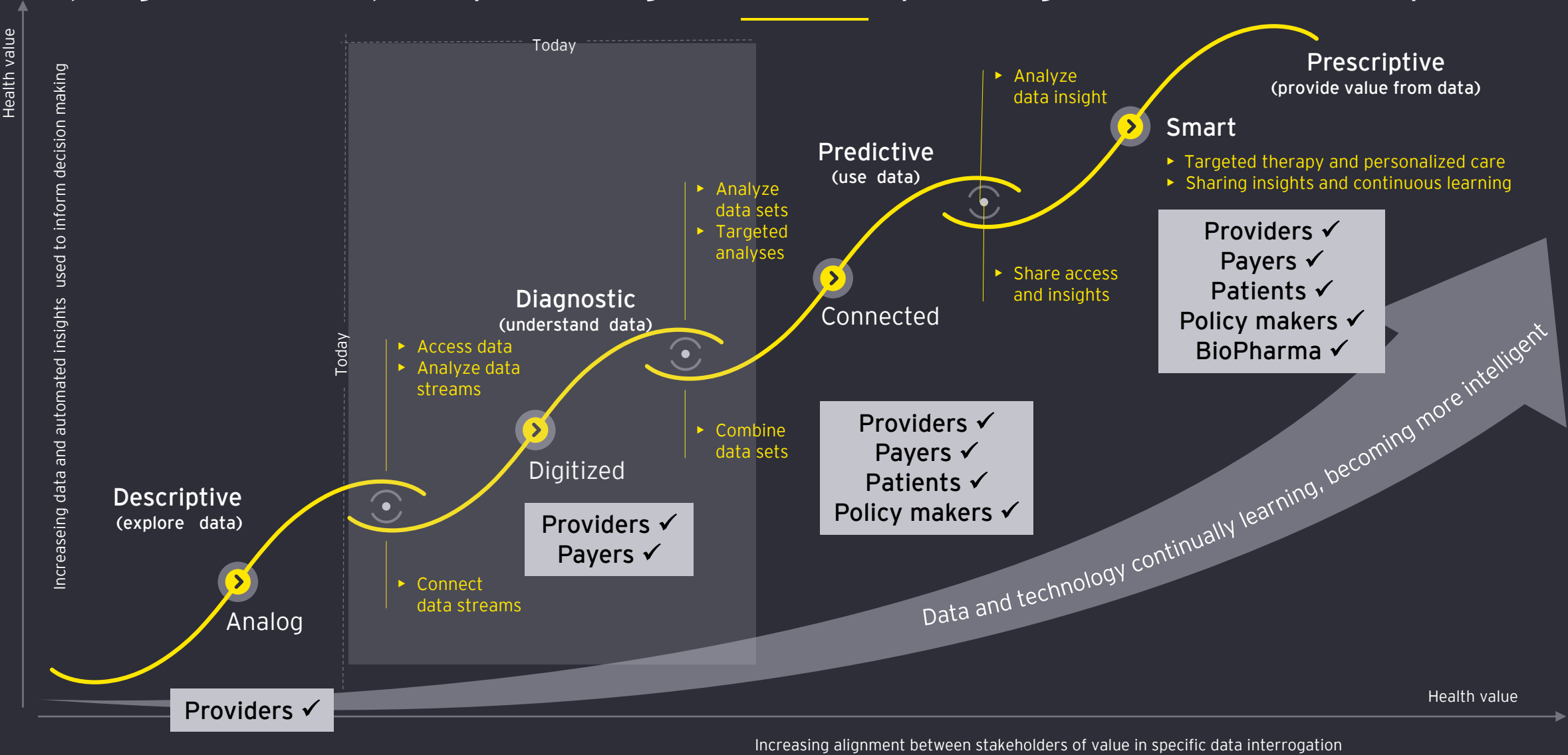2. **Avoid** extinction: unlock innovation transform operations and jump the curve

Stretch   Jump

Technology gives more opportunity to jump the curve

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Be confident to "jump the curve": bridge the misalignment on "value" and undertake collaborative investments with shared data access

Realize transformation and value

Optimization of personalized treatment

RWE and intelligence

Collaborate and invest

Informed clinical intervention

Refine with stakeholders

Data capture and application of advanced analytics

Personalized actionable insights generated

Evidence cost benefit

Sensors and systems collect personalized data

Align and recognize ROI with stakeholders

"Smart" comparison to patients' baseline and RWE comparable patient cohorts

Ideate benefit and need

Define

Continuous monitoring via sensors

treatment adjust

S Curve of Growth

EY

And with increased alignment on value and thus value-based care we will progress more quickly from digitized to truly intelligent smart health systems

Health value

Increasing data and automated insights used to inform decision making

Today

Descriptive
(explore data)

Analog

Providers ✓

Today

▶ Access data
▶ Analyze data streams

▶ Connect data streams

Diagnostic
(understand data)

Digitized

Providers ✓
Payers ✓

▶ Analyze data sets
▶ Targeted analyses

▶ Combine data sets

Predictive
(use data)

Connected

Providers ✓
Payers ✓
Patients ✓
Policy makers ✓

▶ Analyze data insight

▶ Share access and insights

Prescriptive
(provide value from data)

Smart

▶ Targeted therapy and personalized care
▶ Sharing insights and continuous learning

Providers ✓
Payers ✓
Patients ✓
Policy makers ✓
BioPharma ✓

Data and technology continually learning, becoming more intelligent

Health value

Increasing alignment between stakeholders of value in specific data interrogation

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Having "an experience" and not just "use of" is becoming commonplace. In other industries, user experience market leaders have defined characteristics

Winning characteristics	Amazon	AirBnB	Netflix	Uber
Convenience	Easy ordering, cost-competitive, rapid delivery	Single interface for all activities	Easy selection/can view on any device	Simple mobile booking and payment
Seamless trading exchange	Wide range of suppliers in network	Network of available properties for rent	Single point to access content from different media producers	Anytime, anywhere access
Predictive and personalized	Recommendations based on user history	Search algorithm based on user profile	Recommendations based on past viewing	Recommendations to improve travel time
High consumer choice	Buying options (used vs. new)	Wide range of accommodations	Vast and expanding content library	Tiered options based on cost and service
Transparency	Responsive, accountable customer service	Customized interactions between parties	Flat-rate subscription model	Real-time tracking of mobility options

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How is the experience of the consumer changing in health?

Insights from the EY 2023 consumer value-based care global survey: The majority of consumers ...

1 Prioritize access
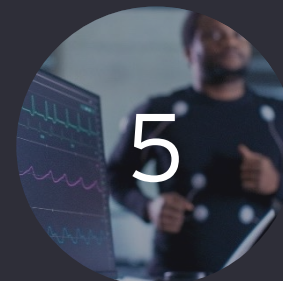to care as most valuable

2 Expect to use wearables
and mobile apps and be
treated 'hospital in home'

3 Believe the health industry
to be very tech-driven: more
precision medicine and AI
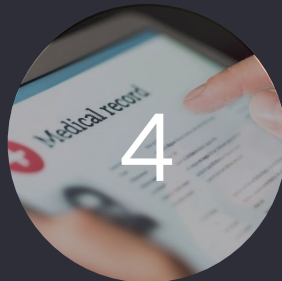
4 Are willing to share health data
if it is used for research / help
with improved effectiveness

5 Are willing share other kinds
of data with their clinician
(diet, lifestyle, genetic,
report outcomes)

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Unlocking the power of data, aligning on value and collaborating on investments to deliver an intelligent health experience is the key to any sustainable strategy

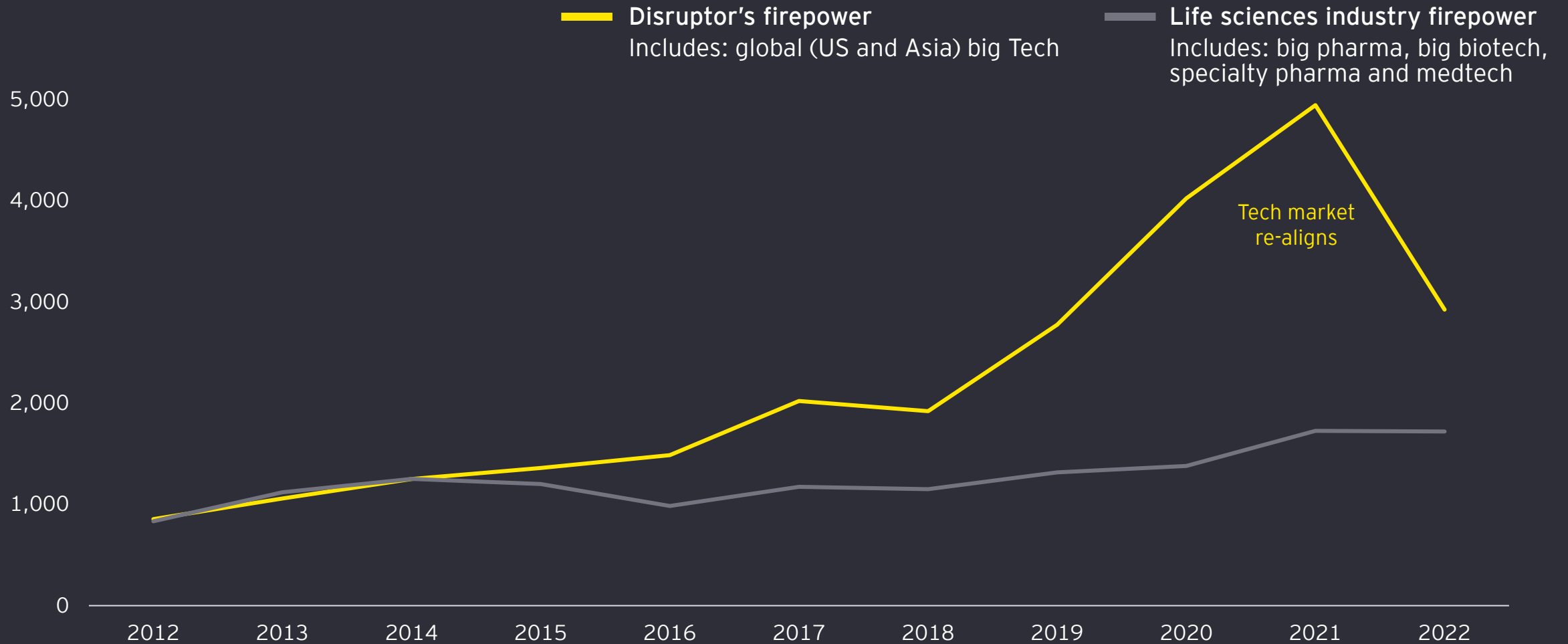$$FV = i(HEx)$$

Future Value

intelligent Health Experience

Leading Experience characteristics

🟥 Convenient 🟧 Seamless exchange 🟩 Predictive and personalized 🟦 Wide choice 🟪 Transparent

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In summary ...

Align on Value
Clinical / non-clinical measures

Collaborate
On investments and share returns

User experience
Is an integral part of value

Insights
Must be personalized

Fast feedback
To flex treatment options

Demonstrated Health outcomes
Are differentially reimbursed

Clinical decision support models
May be flexed (with more precise data) to expediate access

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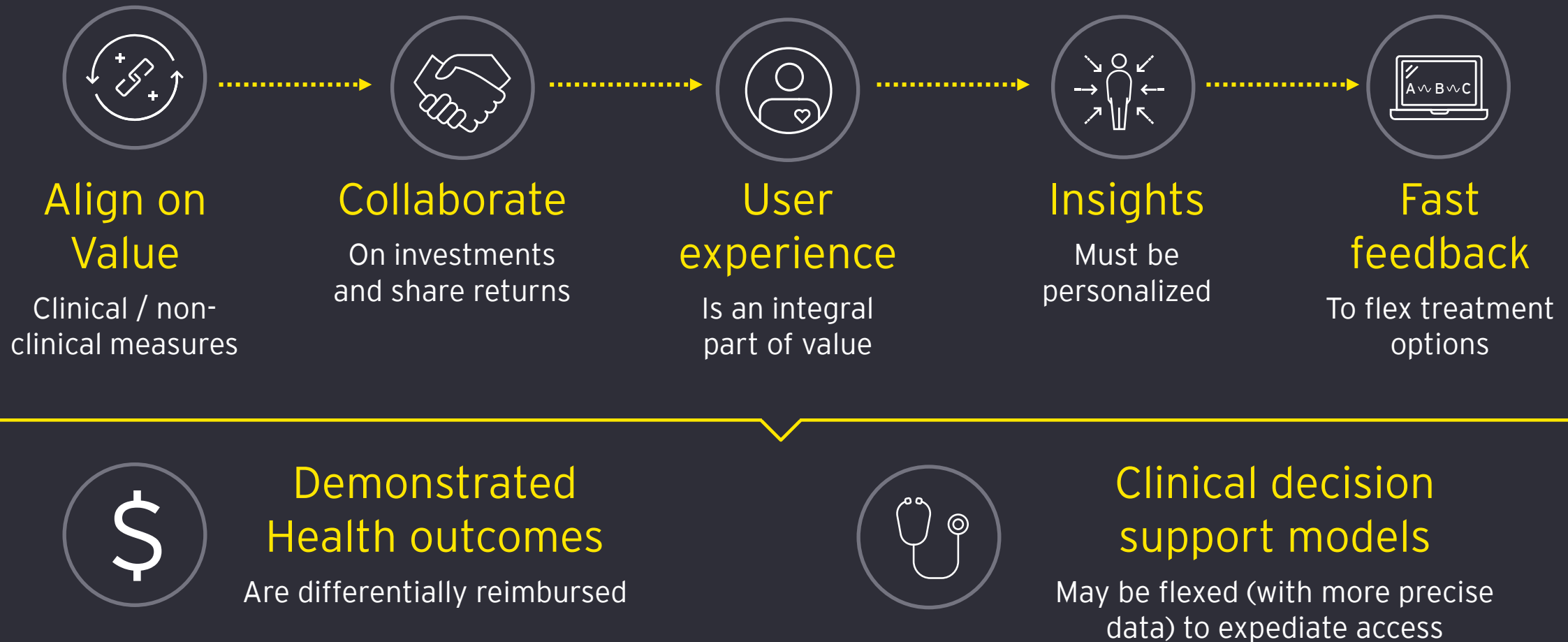
Tech disruptors have the firepower to help ... mutual value and trust must be on the table

━━ Disruptor's firepower
Includes: global (US and Asia) big Tech

━━ Life sciences industry firepower
Includes: big pharma, big biotech, specialty pharma and medtech

Tech market re-aligns

Sources: EY, Capital IQ. Firepower analysis calculated through 31 Dec 2022

EY

And even ChatGPT agrees … !

Q

What is value-based (health) care?

It is a shift away from the traditional fee-for-service model, which has been criticized for driving up costs and encouraging unnecessary procedures.

"

Value-based healthcare (VBHC) is a healthcare delivery model that emphasizes the value of healthcare services over the volume of services provided. In this model, healthcare providers are incentivized to improve patient outcomes while reducing costs, rather than being paid for the number of procedures or tests performed.

Value-based healthcare takes a holistic approach to patient care, with a focus on improving the patient's overall health outcomes, including their quality of life. The model requires healthcare providers to work together across different specialties and care settings, using evidence-based practices and data analytics to inform clinical decision-making.

The value-based healthcare model aims to improve patient outcomes by:

1. Focusing on prevention and early intervention to avoid costly hospitalizations and treatments.

2. Providing coordinated and integrated care to avoid duplication of services.

3. Encouraging patient engagement and education to empower patients to manage their own health.

4. Measuring and reporting outcomes to improve accountability and transparency.

The goal of value-based healthcare is to improve the quality and affordability of healthcare services, while enhancing patient experience and outcomes.

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