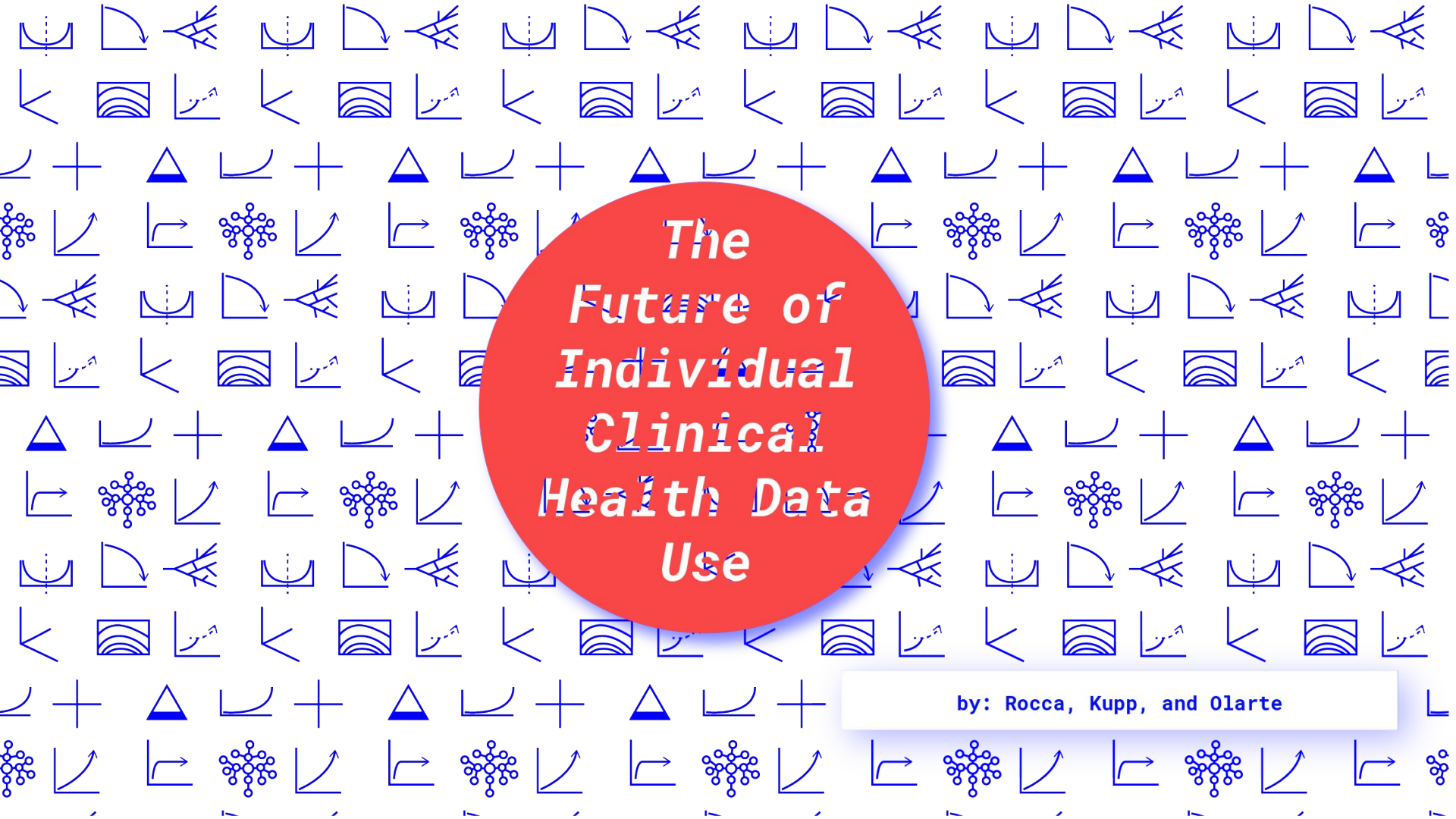

The Future of Individual Clinical Health Data Use
by: Rocca, Kupp, and Olarte

Table of contents

1. Objectives

Identify a future-informed business opportunity.

→ Report on future of healthcare data
→ Viable business plan
→ Go to market strategy
→ UI/UX prototype

2. Research question

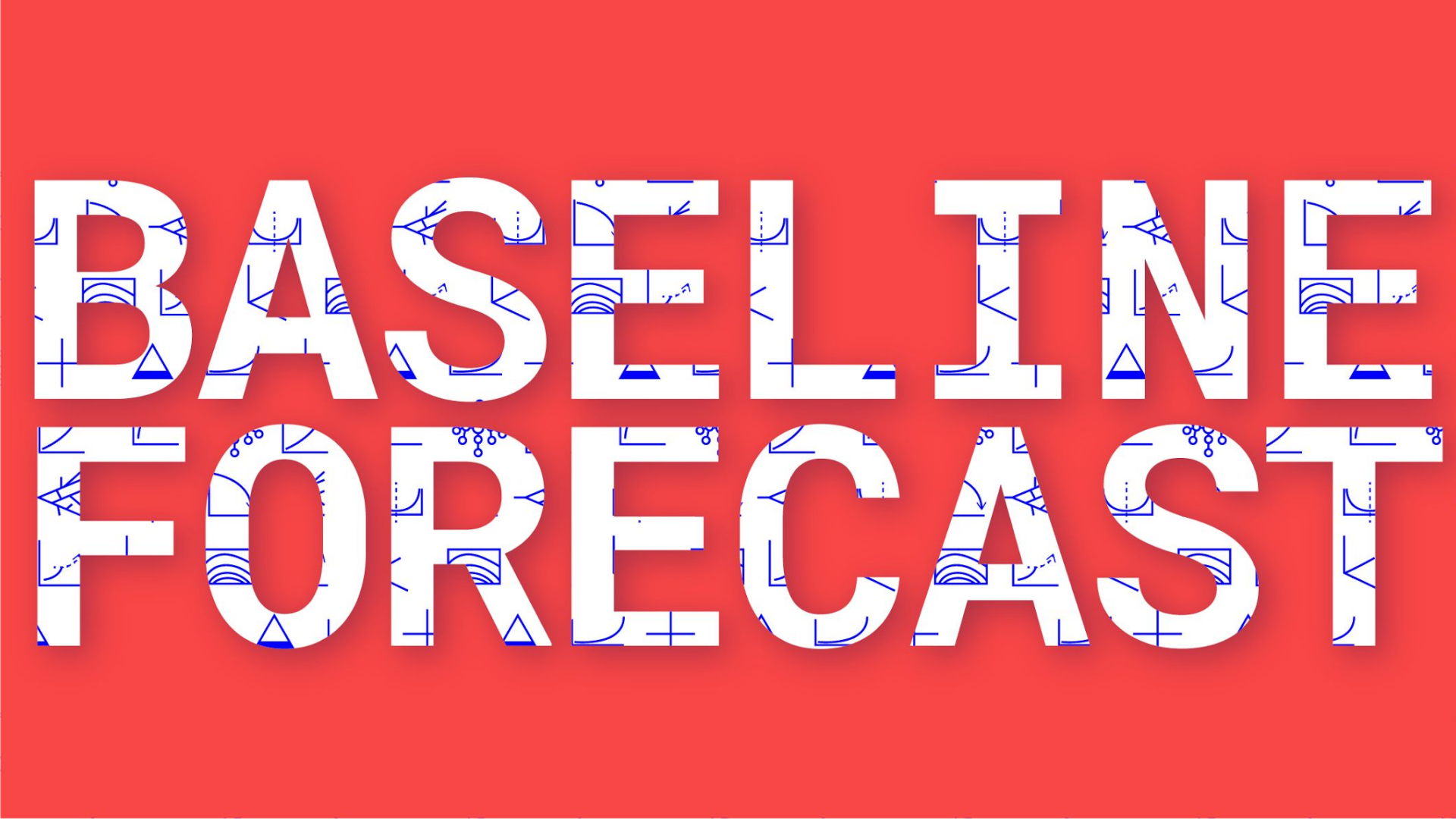
> How will the future of health data **redefine clinical practice business models** in the United States in 10 years?

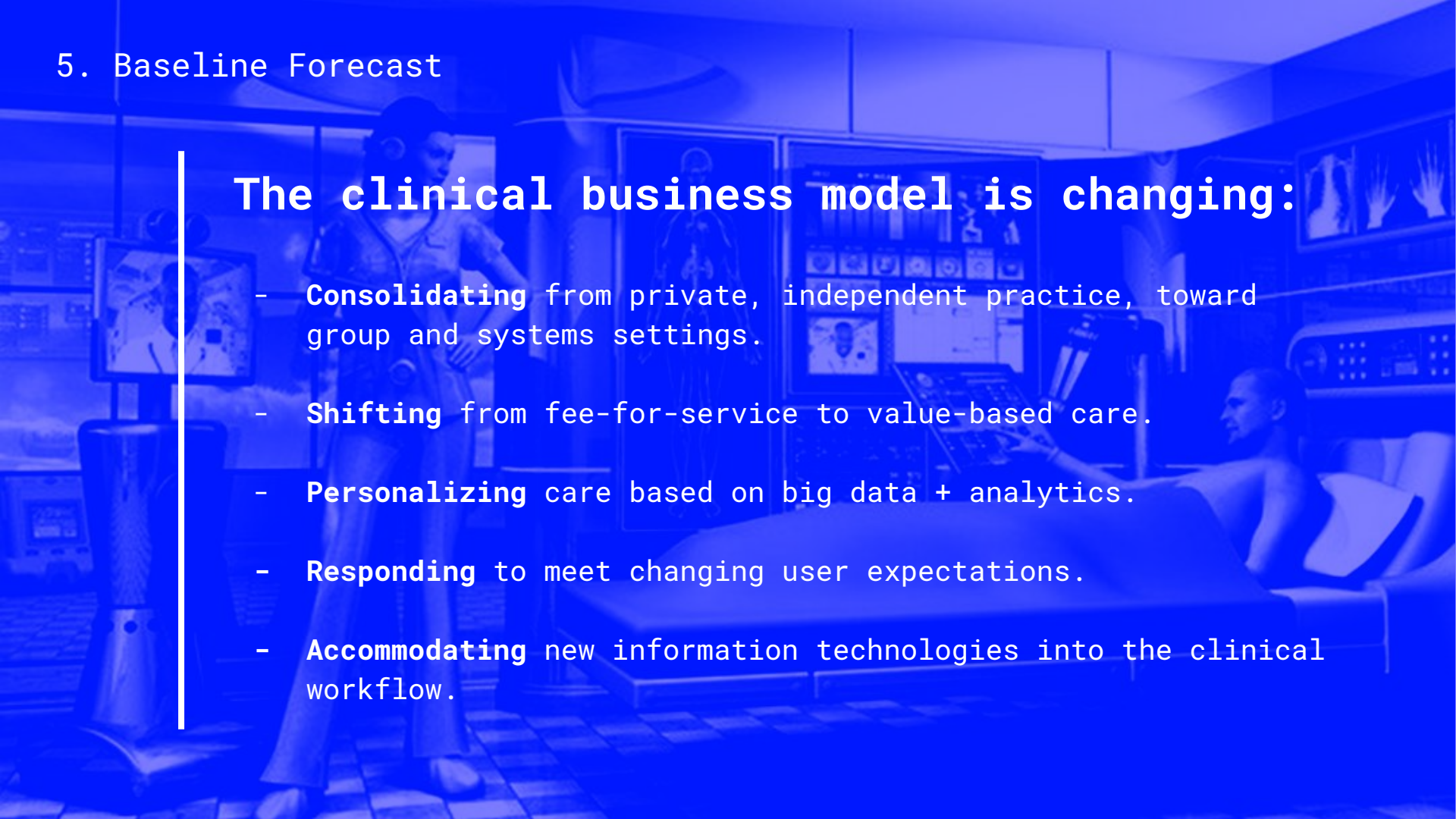
3. Working plan

WORKING PLAN		March					April				May
Activities	Deadlines	27-5	6-12	13-19	20-26	27-2	3-9	10-16	17-23	24-30	1-7
1. Project definition											
2. Research											
2.1 Stakeholders											
2.1.5 Insights workshop											
2.2 Scanning											
2.2.4 Insights workshop											
2.3 Validation											
3. Business Model											
4. Prototype											
4.1 Prototype 1.0											
4.2 Prototype 2.0											
4.1 Prototype 3.0 (high-difelity)											
5. Outreach (HC-BC conference)											
5.1 Landing page (draft)											
5.2 Landing page											
6. Printed Book											
6.4 Printed version											
7. Branding											
8. Booth											

4. Challenges

- Healthcare business model is changing
- Regulatory landscape is limiting
- Official Future favors ‘the big guys’
- We’re not technologists or clinicians


BASELINE
FORECAST



The clinical business model is changing:

- **Consolidating** from private, independent practice, toward group and systems settings.
- **Shifting** from fee-for-service to value-based care.
- **Personalizing** care based on big data + analytics.
- **Responding** to meet changing user expectations.
- **Accommodating** new information technologies into the clinical workflow.

6. Main driving forces

- Data: more!
- EHR: more!
- Regulation: more and more!

6.1 Increase in Health Data

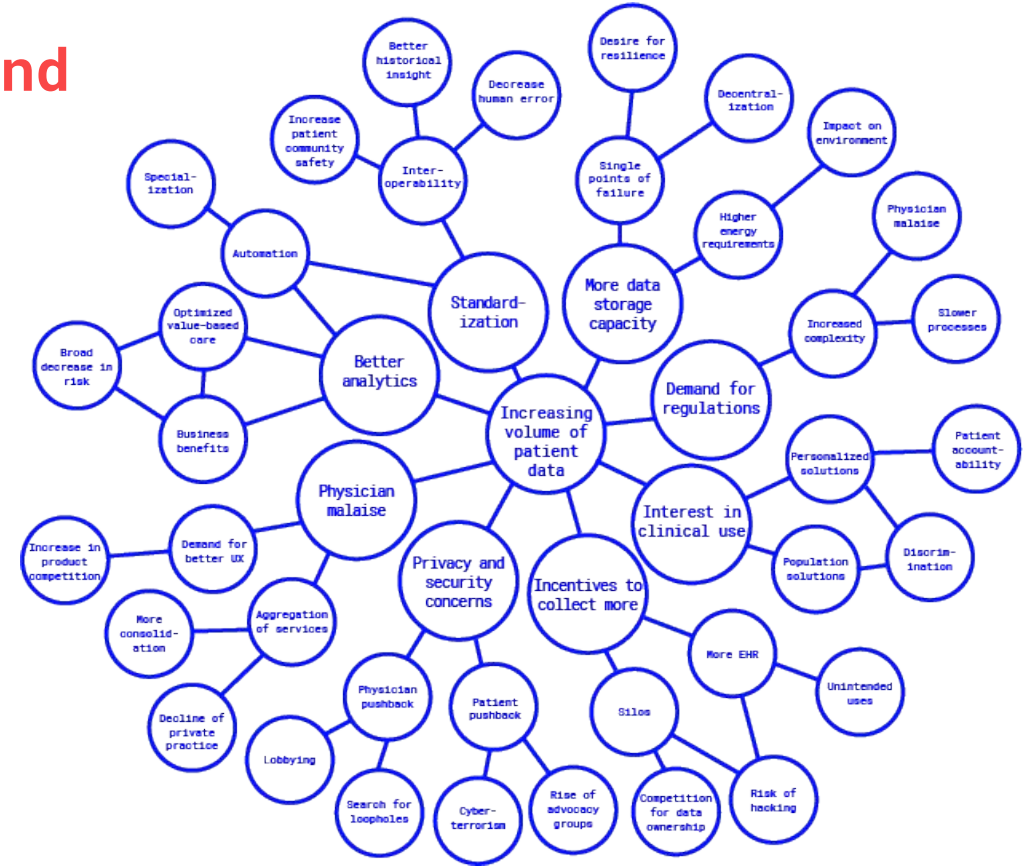
Volume of healthcare data

2013: 153 exabytes
2020: 2,314 exabytes

The global healthcare analytics market is expected to reach $8.7 Billion by 2020 from $5.8 Billion in 2015, at a CAGR of 26.5% during the forecast period.

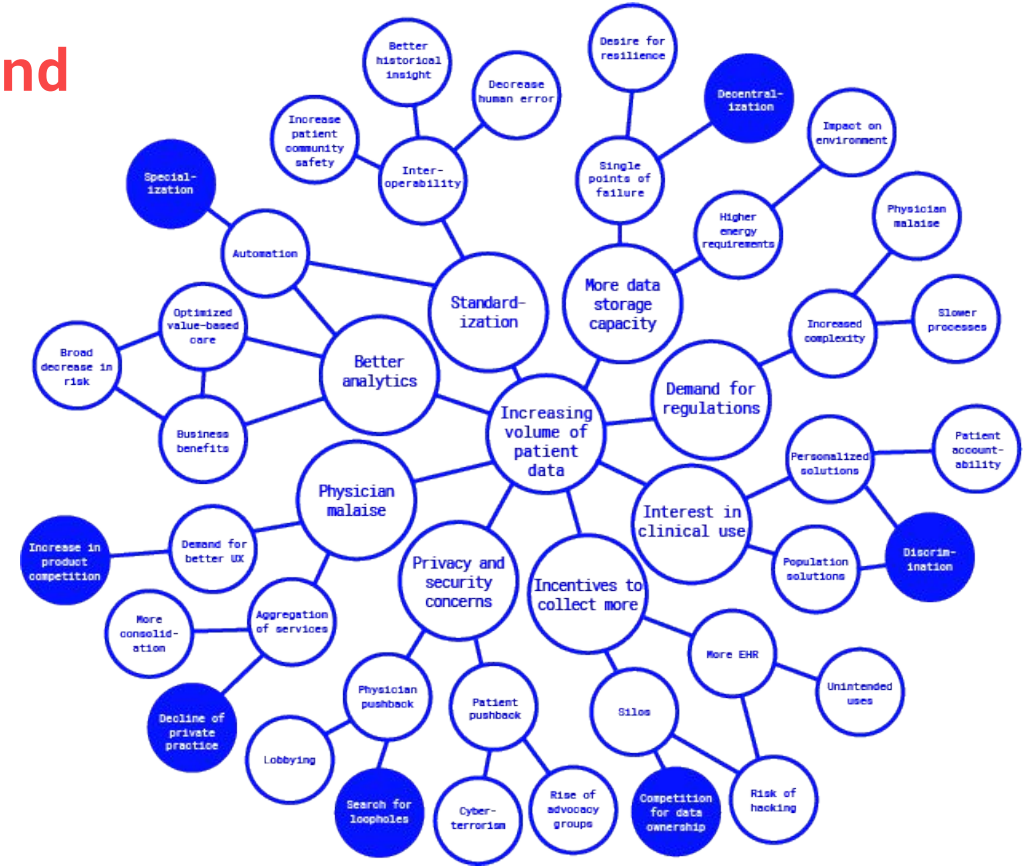
Available, secure, and useful data?

Assumption: The volume of data will continue to increase and will be readily accessible to the interested stakeholders. The influx of patient data combined with powerful new data analysis tools will drive down costs, improve patient outcomes, and offer new opportunities for profitability. Ubiquitous sensors, data storage, and (potentially) blockchain-enabled transactions and cybersecurity will facilitate the flow and processing of data.



Available, secure, and useful data?

Assumption: The volume of data will continue to increase and will be readily accessible to the interested stakeholders. The influx of patient data combined with powerful new data analysis tools will drive down costs, improve patient outcomes, and offer new opportunities for profitability. Ubiquitous sensors, data storage, and (potentially) blockchain-enabled transactions and cybersecurity will facilitate the flow and processing of data.



6.2 Increasing adoption of EHR

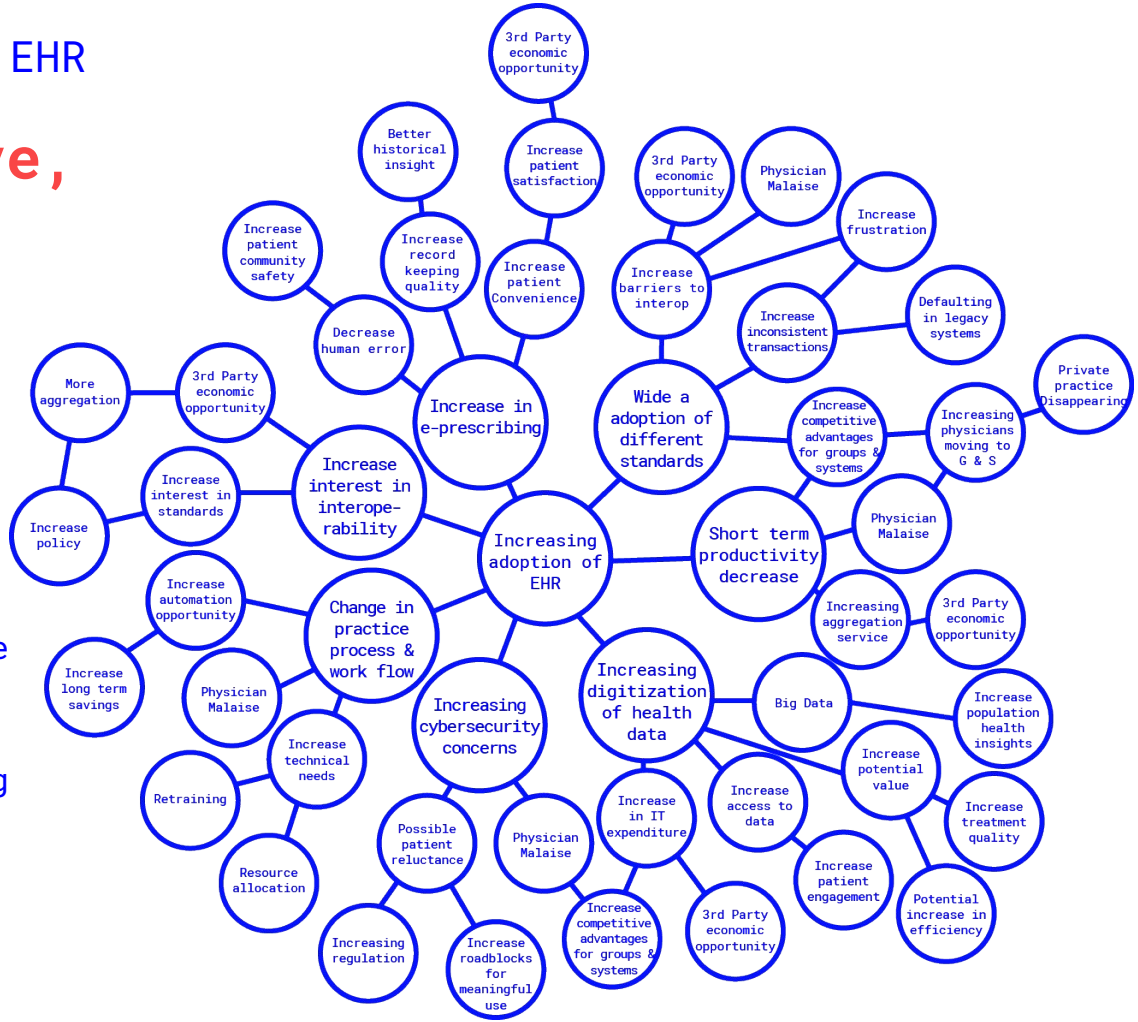
2012: 39.6%
2013: 48.1%
2014: 50.4%
2015: 62.8%
2016: 59%
2017: New regulations make more difficult for providers to get paid without an EHR — but some are still holding out.

"Only 34 percent of doctors surveyed by the American Medical Association said they were happy with their electronic systems."

6.2 Increasing adoption of EHR

Efficient, effective, personalized care?

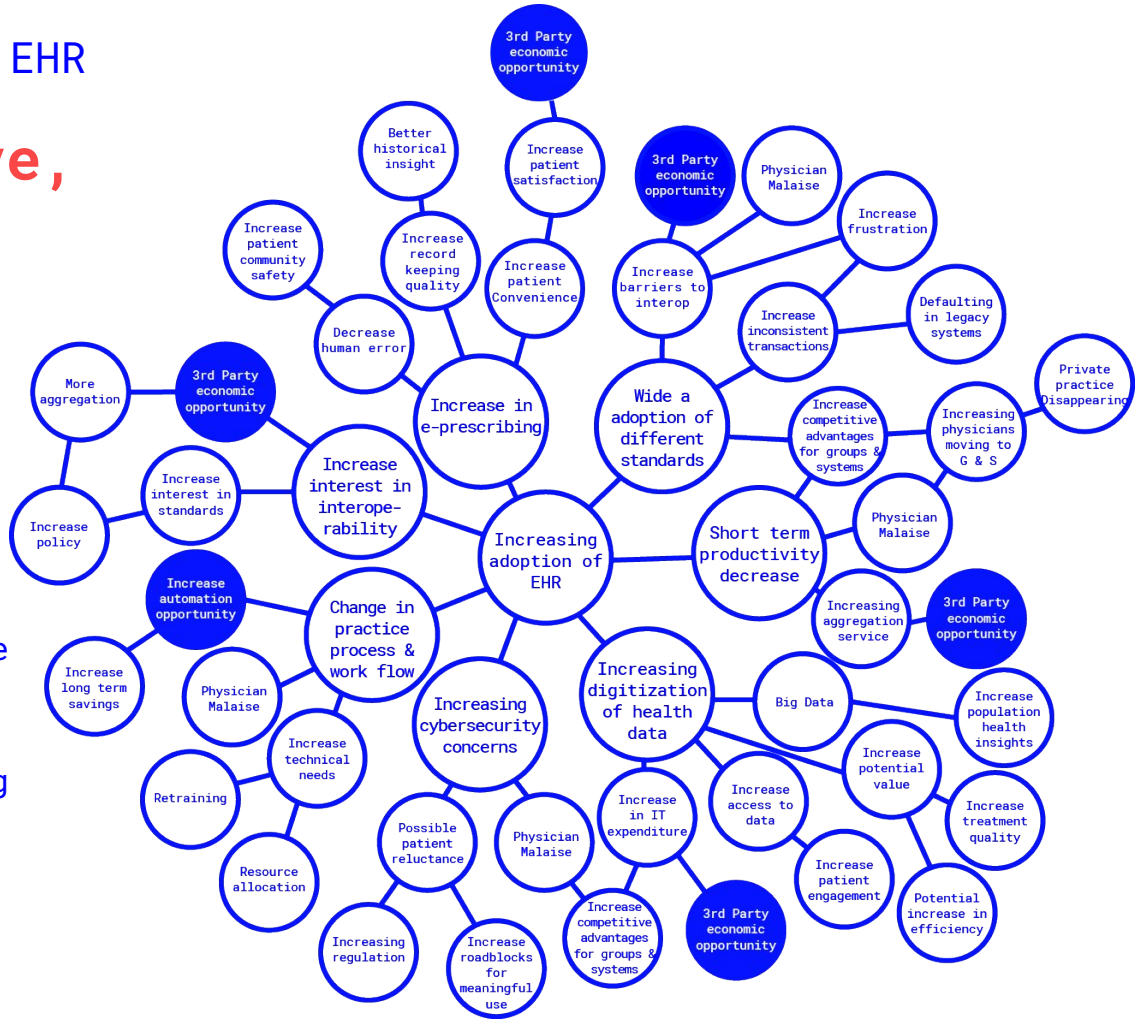
Assumption: The complete implementation of EHR (Electronic Health Records) will contribute to a more efficient health system and better health outcomes.
Identifiable data gathered by physicians will contribute to the creation of hyper-personalized care and the implementation of a value-based system. Large amounts of data will contribute to reducing the national expending on health care, making the system more sustainable.



6.2 Increasing adoption of EHR

Efficient, effective, personalized care?

Assumption: The complete implementation of EHR (Electronic Health Records) will contribute to a more efficient health system and better health outcomes.
Identifiable data gathered by physicians will contribute to the creation of hyper-personalized care and the implementation of a value-based system. Large amounts of data will contribute to reducing the national expending on health care, making the system more sustainable.



6.3 Regulation

A PhD in ‘Maze Navigation’

An overburdened, under-resourced public health care system, and profit-motivated private payers, are spearheading the push from fee-for-service to value-based care – allegedly, “quality vs. quantity” of treatments.

Years of increasing regulations and incentives around use of data, efficiency and quality of care, and more, are culminating in 2017’s MIPS & MACRA,which require more IT infrastructure, increase reporting requirements for providers, asking them to prove:

> Clinical Practice Improvement
> Quality of Care (?)
> Meaningful Use of Tech/Data
> Efficient Use of Health System Resources

6.3 Regulation

A PhD in ‘Maze Navigation’

An overburdened, under-resourced public health care system, and profit-motivated private payers, are spearheading the push from fee-for-service to value-based care – allegedly, “quality vs. quantity” of treatments.

Years of increasing regulations and incentives around use of data, efficiency and quality of care, and more, are culminating in 2017’s MIPS & MACRA,which require more IT infrastructure, increase reporting requirements for providers, asking them to prove:

> Clinical Practice Improvement
> Quality of Care (?)
> Meaningful Use of Tech/Data
> Efficient Use of Health System Resources

7. Trends

	Smart, Sensing, Connected Everything (IoT)		Fee-for-Service to “Value-Based Care”
	Digital native consumer expectations		Electronic Health Record (EHR) use
	Power Shift from Providers > Payers		Unhealthy American lifestyle
	Increasing lifespan		More people suffering from chronic diseases
	Increasing healthcare expenditures		Consolidation of services into groups & systems

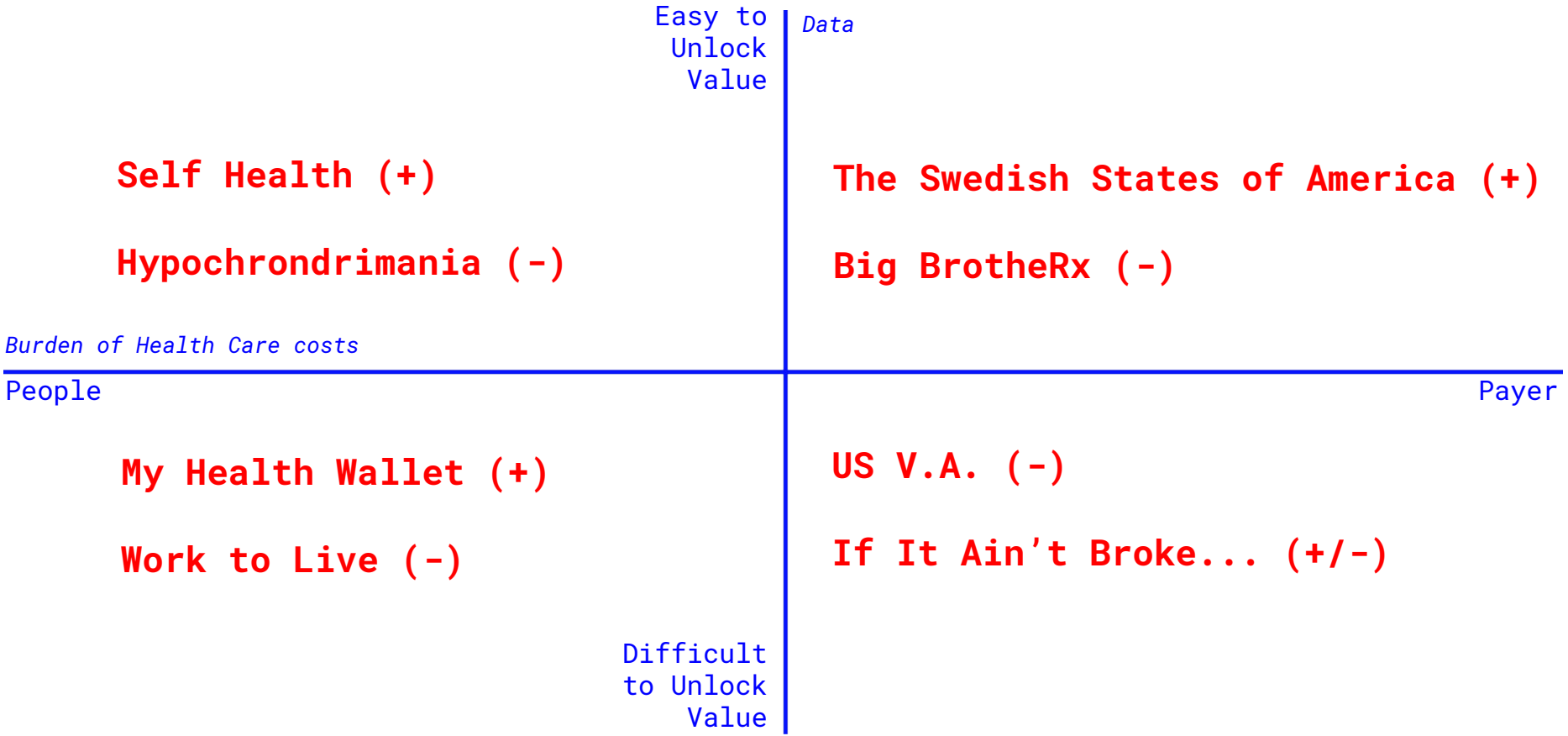
7. Trends

	Profit margins for providers are decreasing		Political (Public vs. Private Payers)
	‘Big Data’ as inherently valuable		‘Digital Health’ as a cure-all
	‘Big Data’ as a cure-all		Political Uncertainties: ACA?
	Major Discovery (i.e., curing cancer)		Major Outbreak (i.e., Zika)

8. Critical uncertainties

- Political climate
- Cybersecurity
- Attitudes toward privacy
- Barriers to interoperability
- Seachange in power structure
- Long-term viability of private practice.

9. Alternative futures



10. Opportunities

1. Universal Physician Identity
2. Universal Patient Identity
3. Ancillary services
4. Layers of communications
5. Health journeys
6. Balancing Accountability/”Value”
7. Patient Advocacy *into* the journey
8. Care Coordination Tool for Providers

11. Next steps

- Prototyping
- Validation
- Outreach

Thank you!

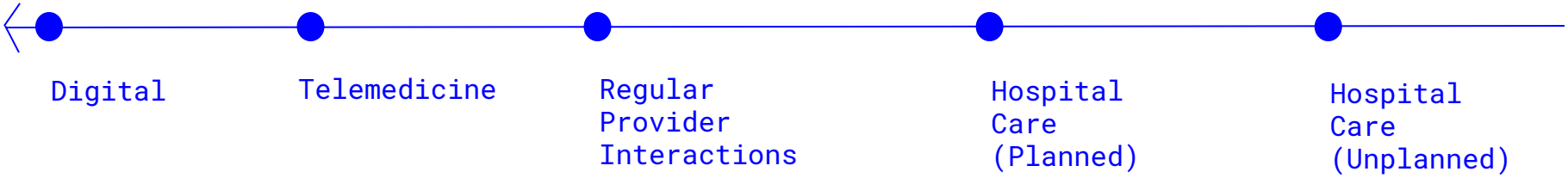
APPENDIX

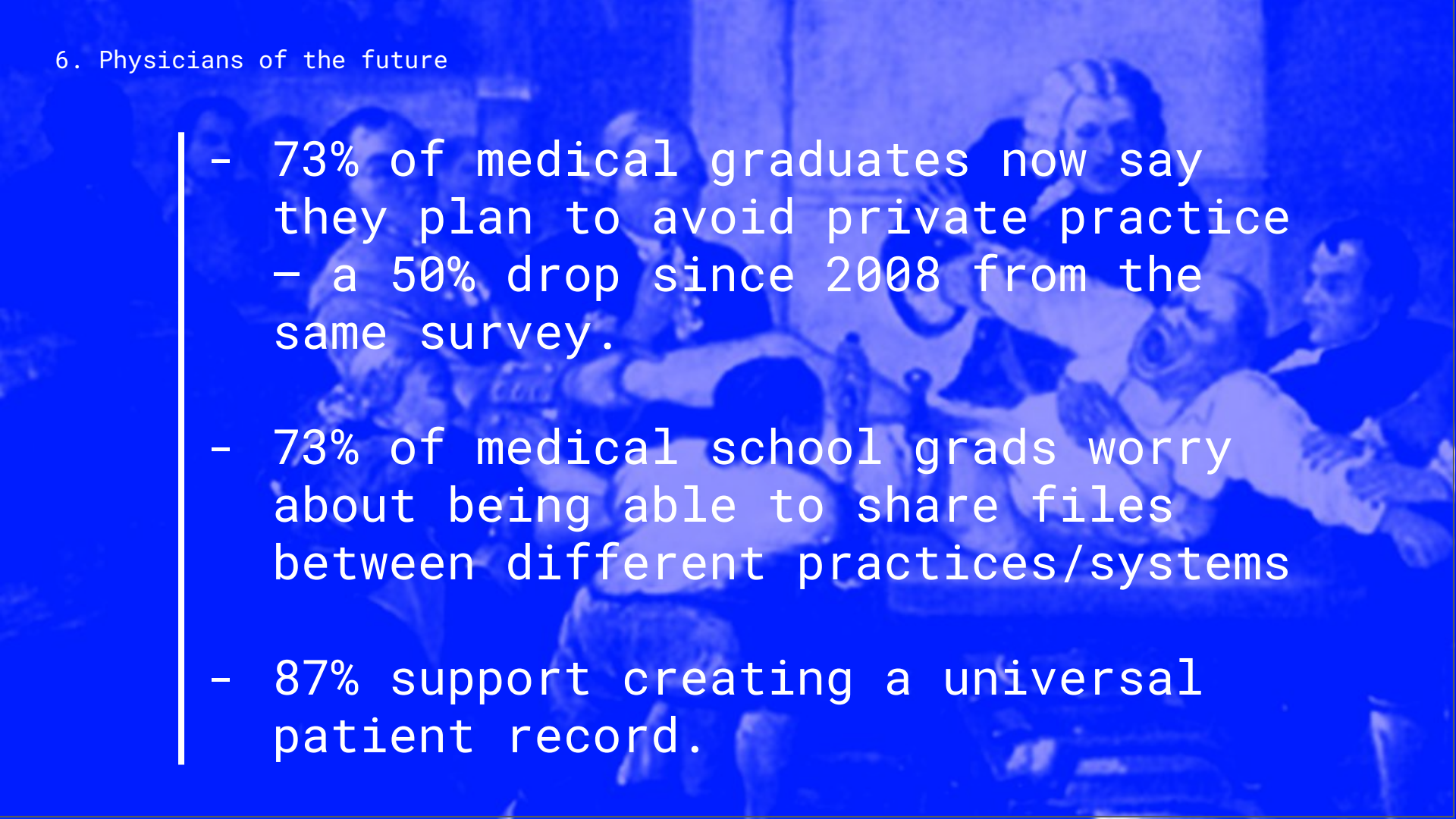
In Summary

DEMAND → Older, sicker Americans with changing expectations.

CONSOLIDATION → Independent practices are closing and moving toward bigger groups and systems.

TECHNOLOGY → Challenges and opportunities.


Digital
Telemedicine
Regular Provider Interactions
Hospital Care (Planned)
Hospital Care (Unplanned)



- 73% of medical graduates now say they plan to avoid private practice – a 50% drop since 2008 from the same survey.

- 73% of medical school grads worry about being able to share files between different practices/systems

- 87% support creating a universal patient record.

1. Increase in Regulation

- An overburdened, under-resourced public health care system, and profit-motivated private payers, are spearheading the push from fee-for-service to value-based care – “quality vs. quantity” of treatments. The record-keeping and new workflow/process changes.

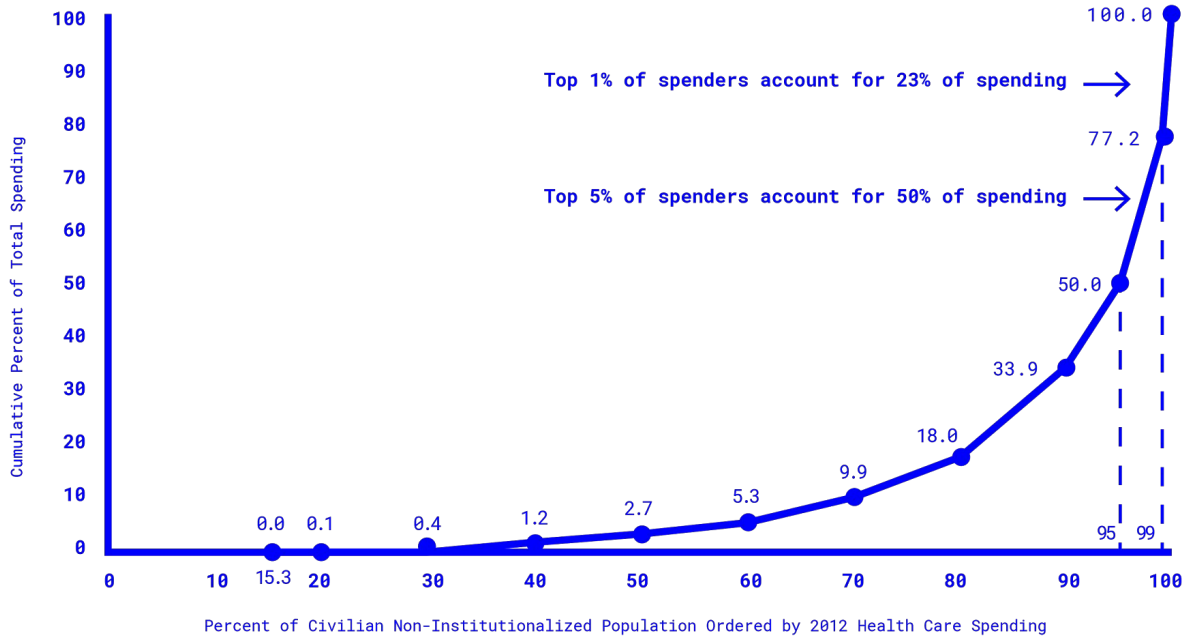
2. Increase in Data (Smart,Sensing,Enabled Everything)

- Health care follows a more universal trend - there’s not just more healthcare data, there’s more data of every kind. This will add to the data in the health system, and could provide useful comparison points, and enrich our understanding of clinical data in a more robust ‘personal data profile.’ Conversely, until we have meaningful tools to understand this data with, and a reimbursement model that allows for ‘data review’ time, it feels like more of a burden than a benefit to many stakeholders.

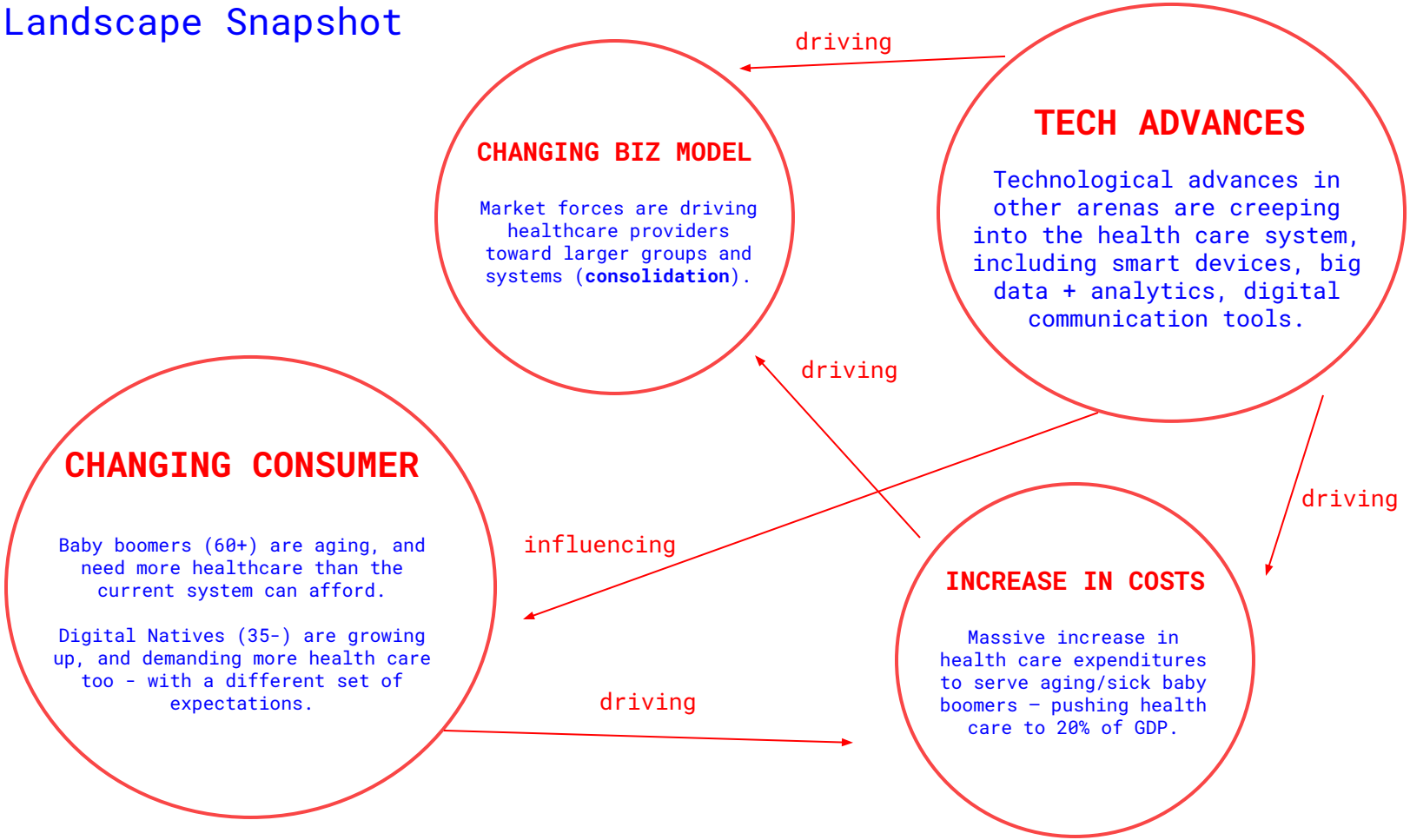
3. Increase in EHRs (Patient Record Digitization)

- While the EHR roll-out has been rough (and expensive) for health care orgs across the US, digital records of any kind are at least a little closer to being ‘big data’ than paper patient files – and we’re finally seeing signals that interoperability (the ability to share patient files between separate EHRs) is possible, if still a ways away.

5. Drivers


Top 1% of spenders account for 23% of spending
Top 5% of spenders account for 50% of spending
Cumulative Percent of Total Spending
Percent of Civilian Non-Institutionalized Population Ordered by 2012 Health Care Spending
0
10
20
30
40
50
60
70
80
90
100
0.0
0.1
0.4
1.2
2.7
5.3
9.9
18.0
33.9
50.0
77.2
100.0
15.3
95
99

Landscape Snapshot



The healthcare system is changing

- In WHERE healthcare is delivered: away from private, independent practice, toward group and systems settings.
- In HOW healthcare is reimbursed: from fee-for service to value-based care (quality of quantity).
- In WHAT healthcare is: toward personalized, data driven (quant>qual).
- In HOW data is collected, stored, shared, and used: there is more and more data with more and more uses.

APPENDIX: WHAT DO WE MEAN BY “THE FUTURE OF HEALTH DATA?

→ how and where it is collected
→ *what* data is collected
→ where it is stored
→ how it is secured
→ who owns it / accesses it
→ how it is used / who uses it
→ how it’s shared
→ the technologies that power all of this
→

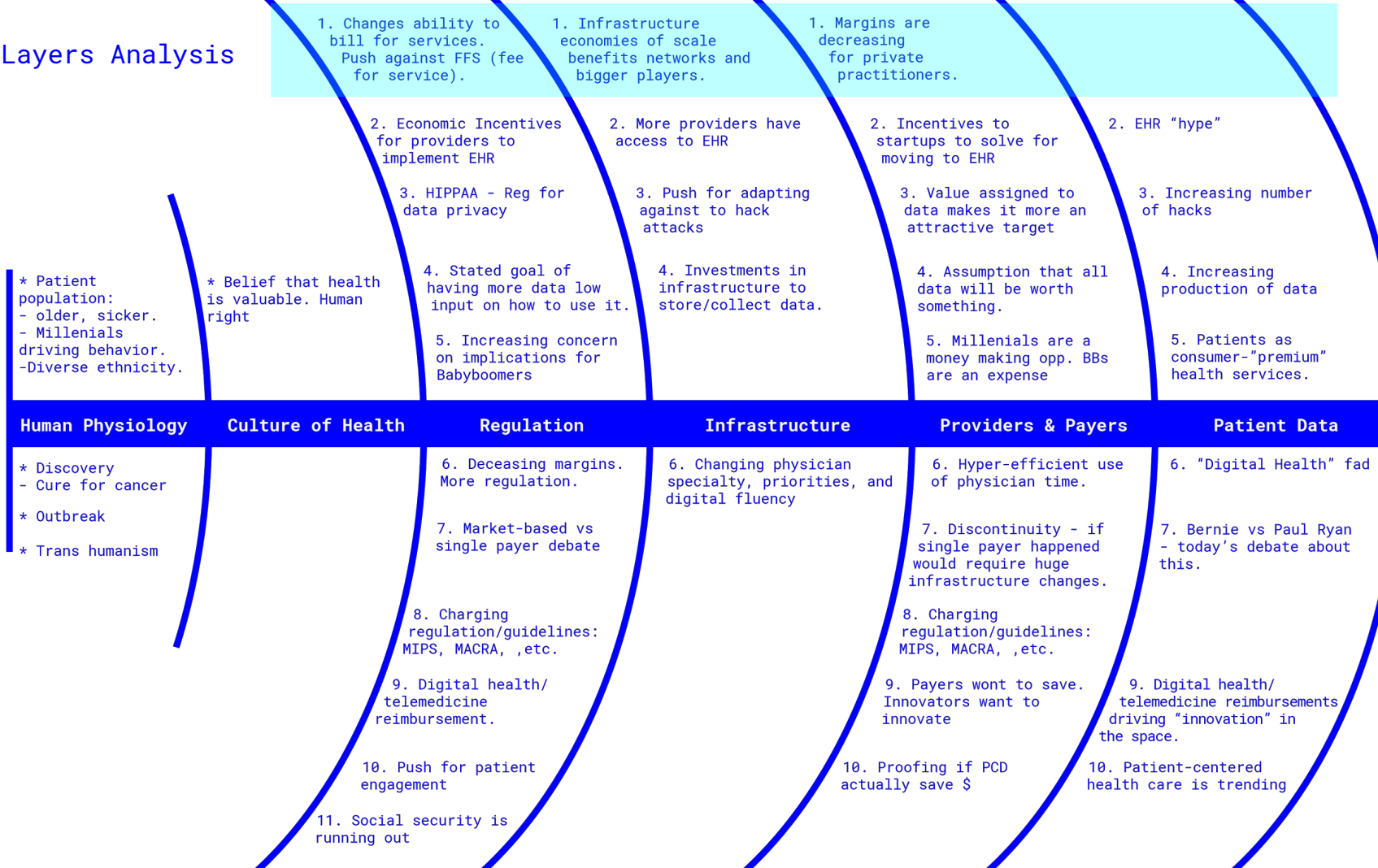
APPENDIX: EMR, EHR, OR PHR?

Electronic Medical Record (EMR): digital versions of the paper charts that traditionally lined doctor office walls.

Electronic Health Records (EHR): which are meant to include all the records of care a patient gets, from a variety of doctors or labs

Personal Health Records (PHR): essentially the same as EHRs but are managed by the patient, not the doctors.

3. Pace Layers Analysis



Consolidation: private practice > groups and systems

Human Physiology	Culture of Health	Regulation	Infrastructure	Providers & Payers	Patient Data
* Patient population: - older, sicker. - Millenials driving behavior. -Diverse ethnicity.	* Belief that health is valuable. Human right	1. Changes ability to bill for services. Push against FFS (fee for service). 2. Economic Incentives for providers to implement EHR 3. HIPPAA - Reg for data privacy 4. Stated goal of having more data low input on how to use it. 5. Increasing concern on implications for Babyboomers	1. Infrastructure economies of scale benefits networks and bigger players. 2. More providers have access to EHR 3. Push for adapting against to hack attacks 4. Investments in infrastructure to store/collect data.	1. Margins are decreasing for private practitioners. 2. Incentives to startups to solve for moving to EHR 3. Value assigned to data makes it more an attractive target 4. Assumption that all data will be worth something. 5. Millenials are a money making opp. BBs are an expense	2. EHR “hype” 3. Increasing number of hacks 4. Increasing production of data 5. Patients as consumer-”premium” health services.
* Discovery - Cure for cancer * Outbreak * Trans humanism		6. Deceasing margins. More regulation. 7. Market-based vs single payer debate 8. Charging regulation/guidelines: MIPS, MACRA, ,etc. 9. Digital health/ telemedicine reimbursement. 10. Push for patient engagement 11. Social security is running out	6. Changing physician specialty, priorities, and digital fluency	6. Hyper-efficient use of physician time. 7. Discontinuity - if single payer happened would require huge infrastructure changes. 8. Charging regulation/guidelines: MIPS, MACRA, ,etc. 9. Payers wont to save. Innovators want to innovate 10. Proofing if PCD actually save $	6. “Digital Health” fad 7. Bernie vs Paul Ryan - today’s debate about this. 9. Digital health/ telemedicine reimbursements driving “innovation” in the space. 10. Patient-centered health care is trending

3. Pace Layers Analysis