



Why Maternal Digital Health is Needed in Rural America

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UAMS[®]

| Institute for Digital
Health & Innovation

Disclaimers

- AngelEye™
- AirToco™



Why Maternal Digital Health is Needed in Rural America



- The participants will understand why designing and implementing a digital health platform is important.
- The participants will understand how multidisciplinary providers, linked through technology, will form a new patient centered
 - system of care
 - The participants will learn why it impossible to continue to delivery care under the traditional model

Are Hospitals Becoming Obsolete?

NY Times Op Ed (2018)

By [Ezekiel J. Emanuel](#)



Consider this: What year saw the maximum number of hospitalizations in the United States?

The answer is 1981 (171 admissions per 1,000 Americans).

There is now a lower rate of hospitalizations than in 1946.

Number of hospitals has declined to 5,534 in 2018 (6,933 in 2017)

Battle of Giants



Breaking Healthcare



Online Deliveries

Of course no one will ever deliver a baby online?





Star Wars: Episode III – Revenge of the Sith (6th movie made)

Award-Winning Work

Universe of Star Wars timeline

- 19 Years before Episode IV , First Star Wars Movie
- Three years after the onset of the Clone Wars, the noble Jedi Knights...
- Birth of Luke and Leia Skywalker

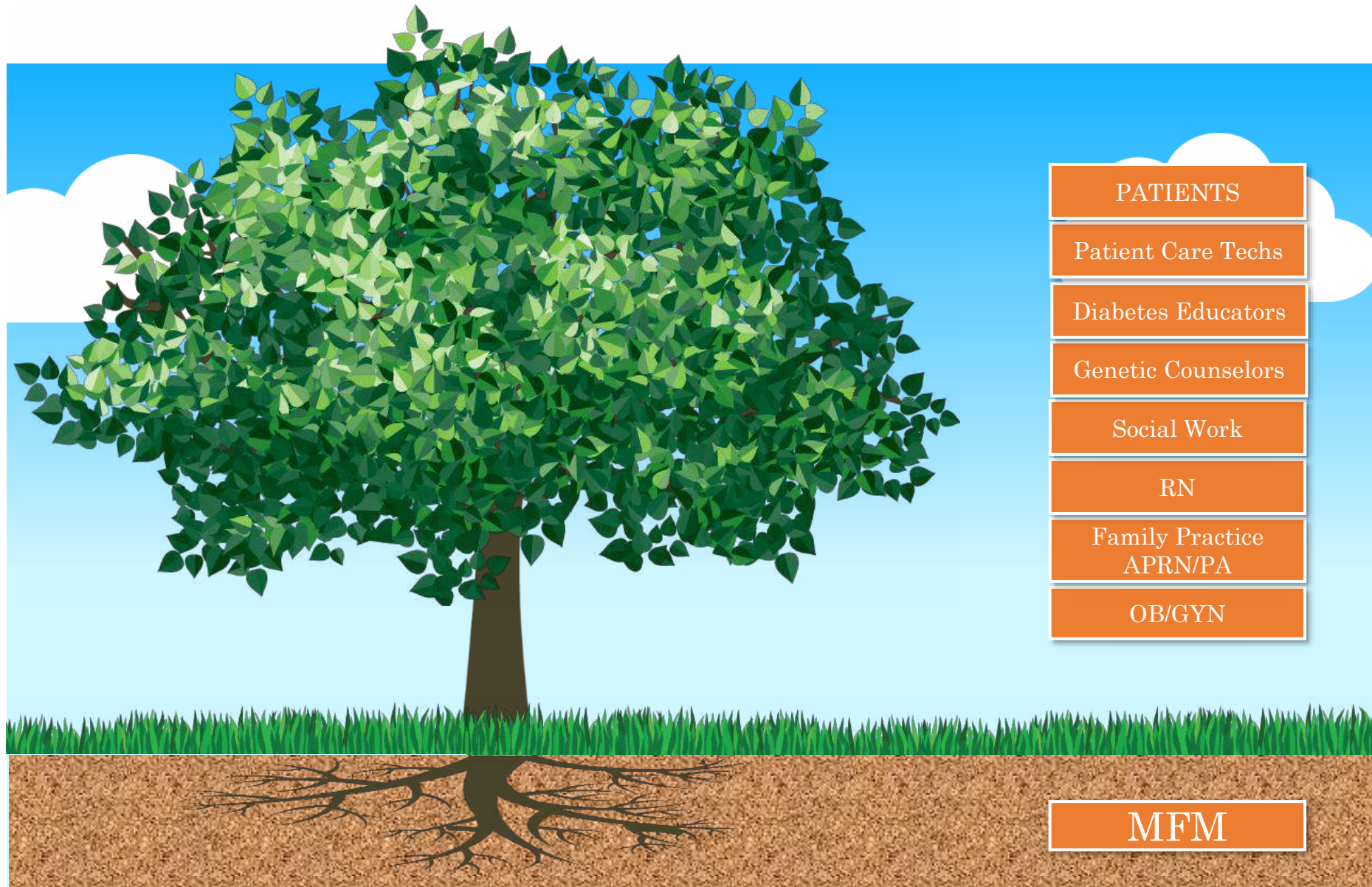
Wikipedia

- Director: George Lucas
- Release date: May 15, 2005
- Box office: \$848.8 million
- Budget: 113,000,000 United States dollar
- Rating: PG-13

Jennifer's Story

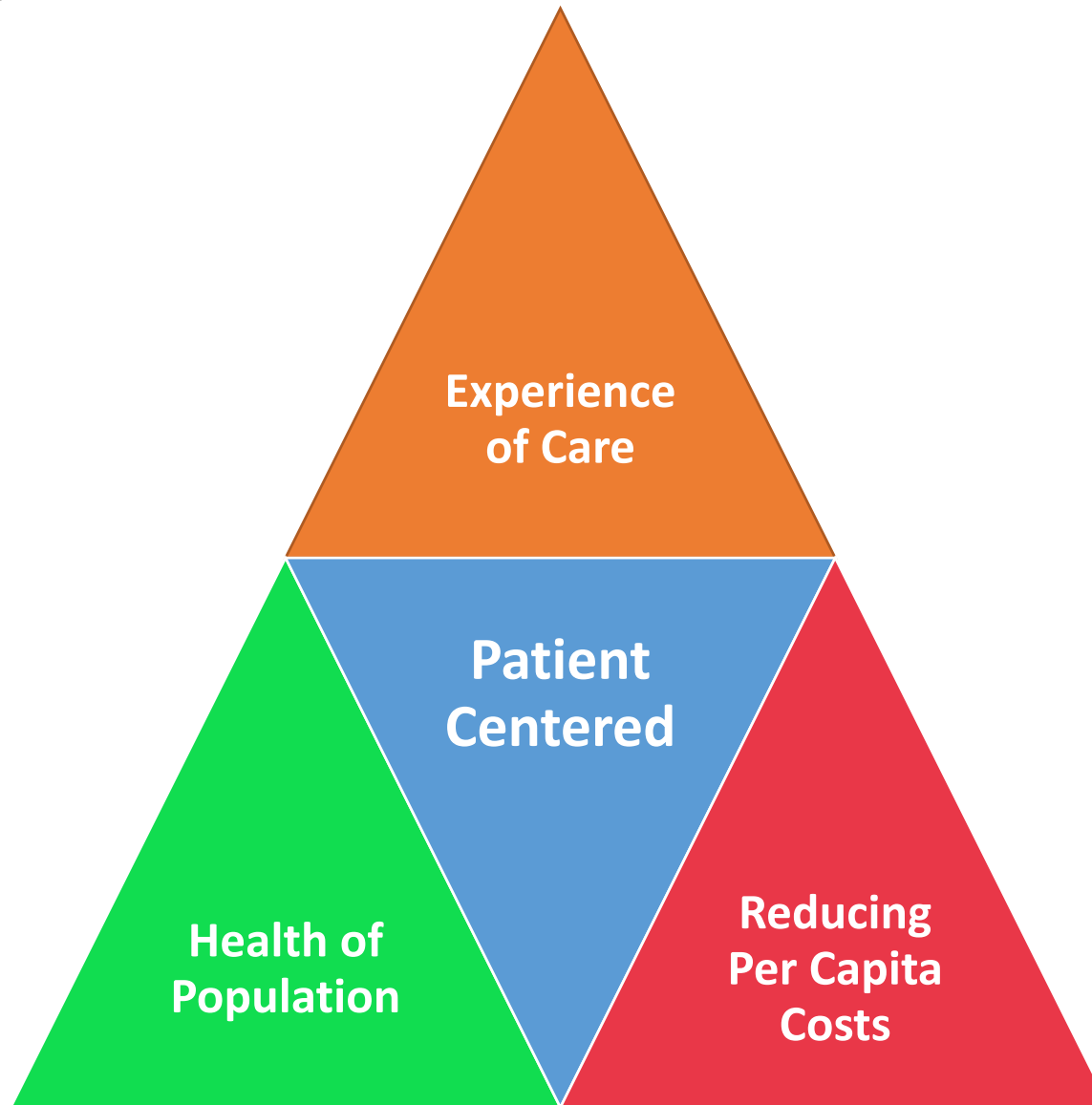


Obstetrical Knowledge Tree: MFM





Triple Aim

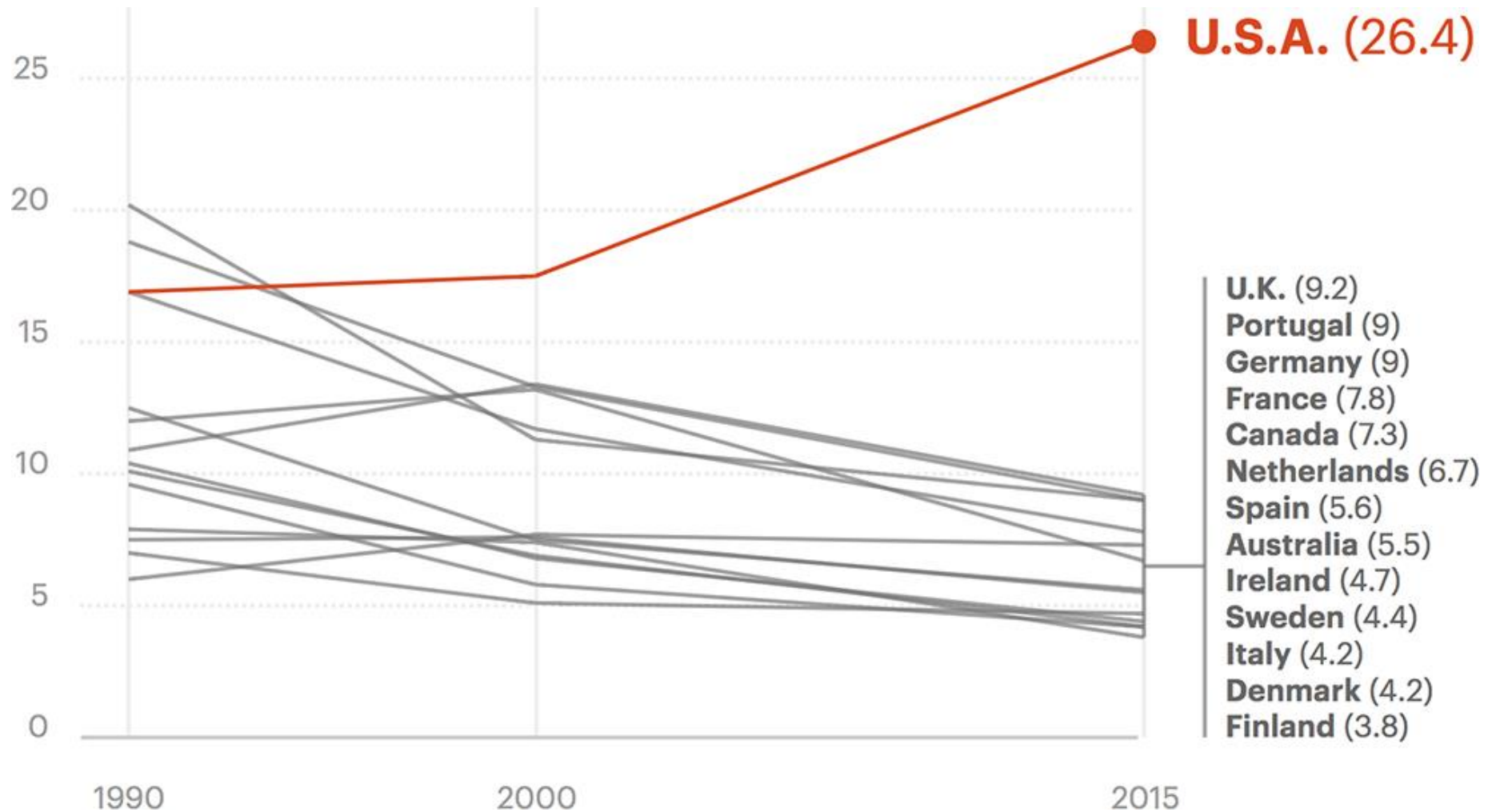


**Donald Berwick at
Institute for Healthcare
Improvement**

Across the Healthcare Spectrum



MATERNAL MORTALITY



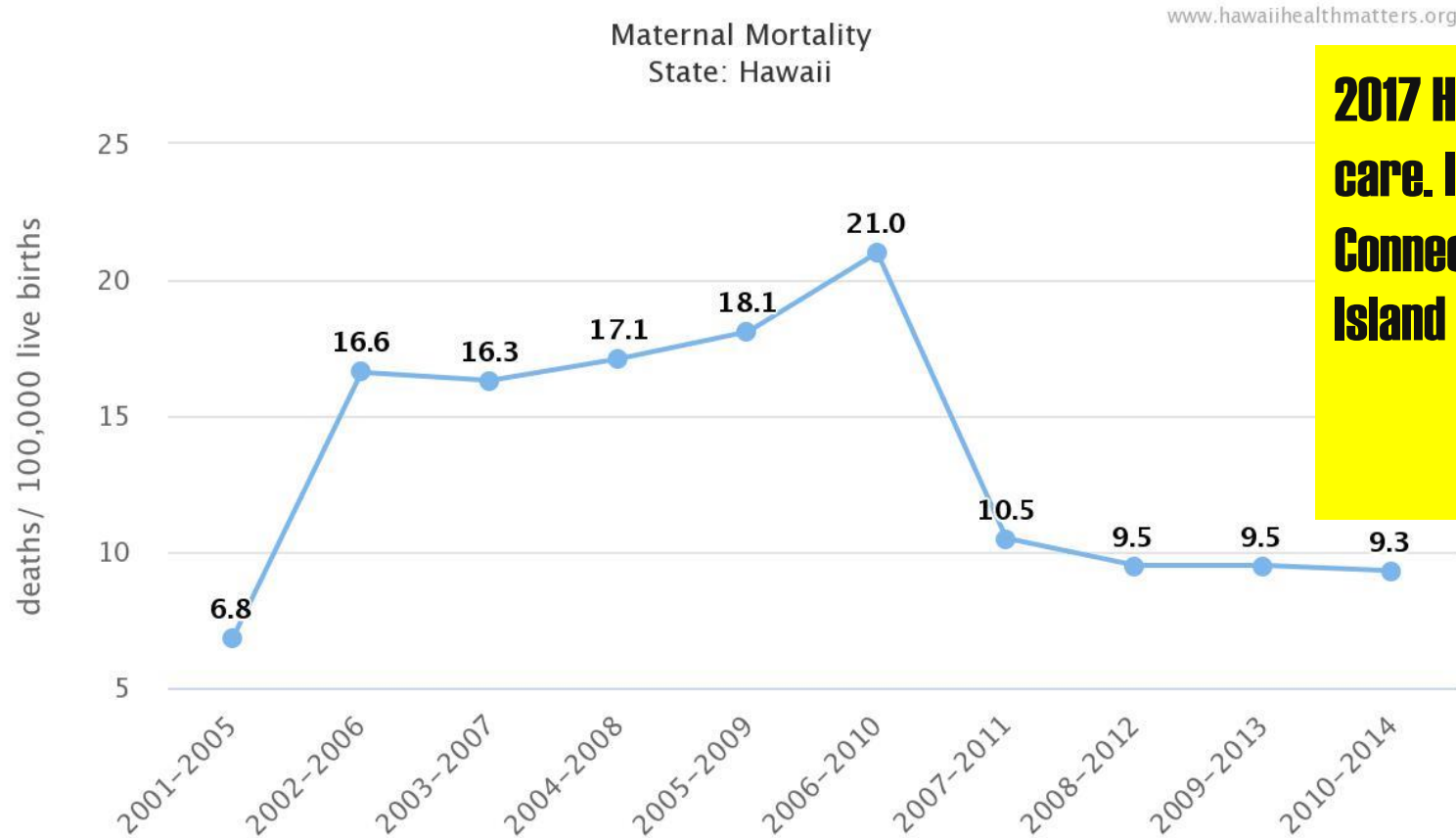
Mothers Should not Die!



Worst and Best State Comparisons

State	Total	Non-Hispanic Hispanic	Non-Hispanic White	Non-Hispanic Black	Native American	Asian
Massachusetts	5.6 (3.9–6.3)	6.9	3.9 (2.1–5.6)	17.0 (7.4–26.7)	0	4.9
Mississippi	24.4 (19.6–25.8)	33.7	16.0 (10.6–21.4)	34.2 (25.8–42.7)	0	0
Arkansas	28.9 (23.6–30.4)	19.5	24.1 (18.2–30.0)	51.8 (35.5–68.0)	0	25
Dist of Col	38.8 (25.9–41.0)	7.4	0	0	70.6 (46.9–94.4)	0

Maternal Mortality Hawaii 2001-2014



2017 Hawaii is the top state for health care. It's followed by Massachusetts, Connecticut, Washington and Rhode Island to round out the top five.

Source: Hawaii State Department of Health, Vital Statistics (2010-2014)

Maternal Mortality: United States

For women in the United States, each year:

50,000

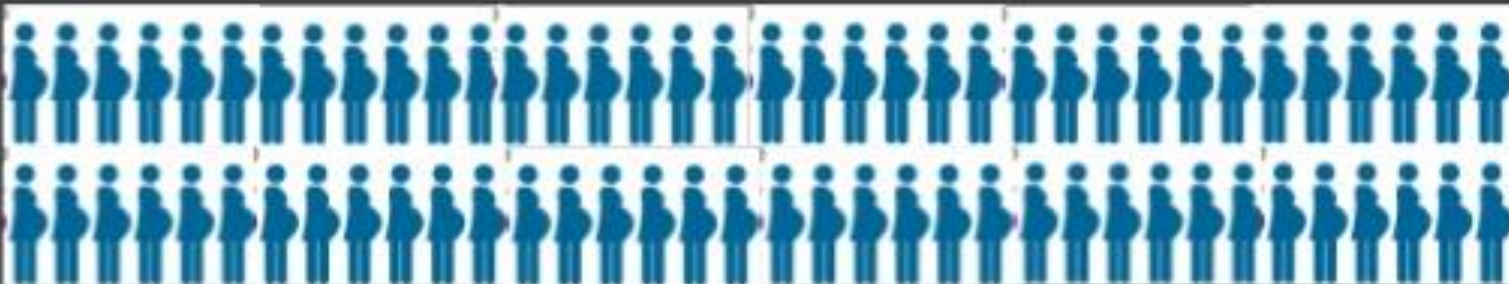
suffer severe morbidities
due to pregnancy-
related complications

650
die

due to
pregnancy-
related
complications



This means that for every 1 woman who dies due to a pregnancy-related condition, another 76 women experience a severe co-morbidity.



70%
in
20 years

Rural Maternity Services in Jeopardy

- Half a million rural women give birth in US hospitals each year
- Majority rely on local maternity services
- 10% of rural counties lost these services last 10 years
- Doubling of Infant mortality rate where counties have lost OB services

NRHA Policy Paper: Access to Rural Maternity Care Britta Anderson, Ph.D., Adam Gingery, M.B.A., Maeve McClellan, M.P.H., Robin Rose, R.N., David Schmitz, M.D., Pat Schou, M.P.H.

Powell, J., Skinner, C., Lavender, D., Avery, D., & Leeper, J. (2018). Obstetric Care by Family Physicians and Infant Mortality in Rural Alabama. *The Journal of the American Board of Family Medicine*, 31(4), 542-549.

Kozhimannil KB, Hung P, Henning-Smith C, Casey MM, Prasad S. Association Between Loss of HospitalBased Obstetric Services and Birth Outcomes in Rural Counties in the United States. *JAMA*. 2018;319(12):1239–1247. doi:10.1001/jama.2018.1830

Regional Organization of Perinatal Services

- Distance from a tertiary care perinatal facility
- Inadequate prenatal care
- Lack of coordination
- Long transport distances ,
in labor



Increases the likelihood of very low birthweight infants delivering in smaller hospitals!

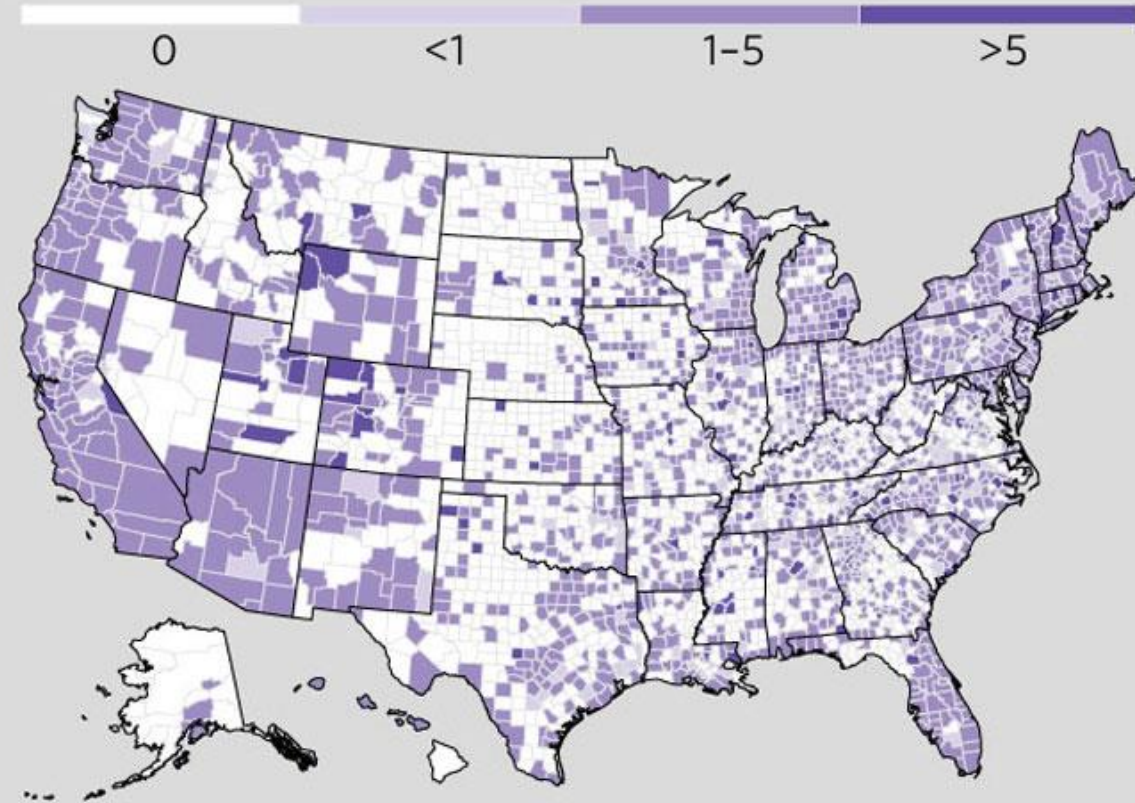
Rural Maternity Services in Jeopardy

- 7.2% of rural hospitals had closed their obstetrics units between 2010 and 2014.
- Hospitals Discontinuing Ob are:
 - smaller in size
 - privately owned
 - communities with fewer obstetricians and family physicians
 - families have lower income and have fewer resources to overcome barriers to care
- intrapartum care “only” increased when patients traveled average of 29 miles

Maternity Deserts

Obstetrician/gynecologists are scarce in rural areas and small towns.

Number of OB/GYNs per 10,000 women aged 15+



Sources: Census Bureau; Physician data derived from American Medical Association Masterfile, March 2017



Barriers to Providing Rural OB Services

- low Medicaid reimbursement and the high cost of malpractice insurance
- 2010, Medicaid funded 51% rural and 39% urban births
- Medicaid (51% of rural women compared to 39% of urban).
- Medicaid's reimbursement for childbirth is about half that of private insurers.
- Malpractice premiums to cost as much as \$85,000 to \$200,000



Workforce Shortages

- Quality of Care and Birth Outcomes
- Workforce Shortages
 - family practice physicians (declining number of physicians)
 - Malpractice lawsuits
 - Inability to keep up
 - Associated with low volume hospitals
 - Obstetricians
 - Certified nurse midwives
 - General surgeons

The unpredictable nature of obstetrical care results in a demanding lifestyle on providers !

Distance to Obstetrical Hospitals

- Has been increasing with rural hospital closures
- Studies have linked drives of greater than 45 minutes to adverse outcomes
- Temporary housing locations are expensive (burden on poor)
- Distance deliveries associated with family stress
- May be associated with a reduction in prenatal care (can't travel)



Workforce Costs (OB Hospitals)

- large stream of overhead costs associated with the OB's practice
- Incentive-based compensation is not typically a consideration in contracts (buy providers.)
- Must have more than one provider to cover call and to assist in C-sections
- Anesthesia support is also required
- market competitive for wages, guarantees that approach or even exceed median compensation (usually must be higher)

Fixed workforce cost may make it difficult or impossible to break even!

Compensation for Providers

- Compensation for obstetrician-gynecologists physicians has grown 10%,
- Must have more than one provider
- CAH to provide 24/7 (Increased by \$92,000/5 years)



Inductions and C-sections

- 2002 and 2010, the rates of non-indicated labor inductions in the United States rose faster in rural areas
- In Canada patients undergoing travel were 1.3 times more likely to undergo induction
- Women concerned about getting to the hospital in time for delivery from an isolated rural area may elect for intervention



Kozhimannil, K. (2014). Rural-urban differences in childbirth care, 2002-2010, and implications for the future. *Medical care*, 52(1), 4.

Kornelsen, J., Moola, S., & Grzybowski, S. (2009). Does distance matter? Increased induction rates for rural women who have to travel for intrapartum care. *Journal of Obstetrics and Gynaecology Canada*, 31(1), 21-27

Fee for Service World

“Today” doctors and hospitals are making the most money they will ever make, in a fee for service world, **payments will only go down!**



Telemedicine Reimbursement

- Parity provisions for reimbursement of telemedicine-provided physician services
 - Patients stay local
 - Rural community retains revenue
 - Reimbursement by
 - Private health insurance carriers
 - Medicare
 - Medicaid



Institute for Digital Health and Innovation 2019

Academic Education

- AAMC training competencies: AAMC committee to develop student digital health competencies.
- Will apply competencies to training at UAMS
- UAMS COM
 - Senior elective
 - Honors Program development
 - Early training (first 2 years exposure)
- School of Nursing
- School of Pharmacy

Clinical Training

- Clinical Training: UAMS faculty and Nursing service (ICE) (should be embedded in new hires)
- Online education modules have been developed
- Imbedding Education in training (students and residents)
- State wide education of providers

IPE

Digital Health

- Maximizes healthcare resources
- Provides increased opportunities to engage clinicians
- Patients self-manage their care
- Uses technology available to consumers to deliver patient care outside of the hospital or doctor's office

Links: patients + doctors + hospitals = System of Care

Care is delivered anywhere, anytime, and by anyone!

Health Care Experts

- There is broad consensus that fee-for-service (FFS) reimbursement distorts care provision away from the social optimum and incentivizes encourages *overtreatment*.

McGuire, T. (2011). Physician Agency and Payment for Primary Medical Care. The Oxford Handbook of Health Economics.

Identified Waste

Problem	Savings
Variation in the intensity of medical and surgical services	\$600 Billion
Misuse of drugs and treatments	\$52.2 Billion
ED overuse	\$55 Billion
Underuse controller med's	\$2.5 Billion
Generic antihypertensives	\$3 Billion
Antibiotic overuse	1.1 Billion

At least 30% waste in healthcare!



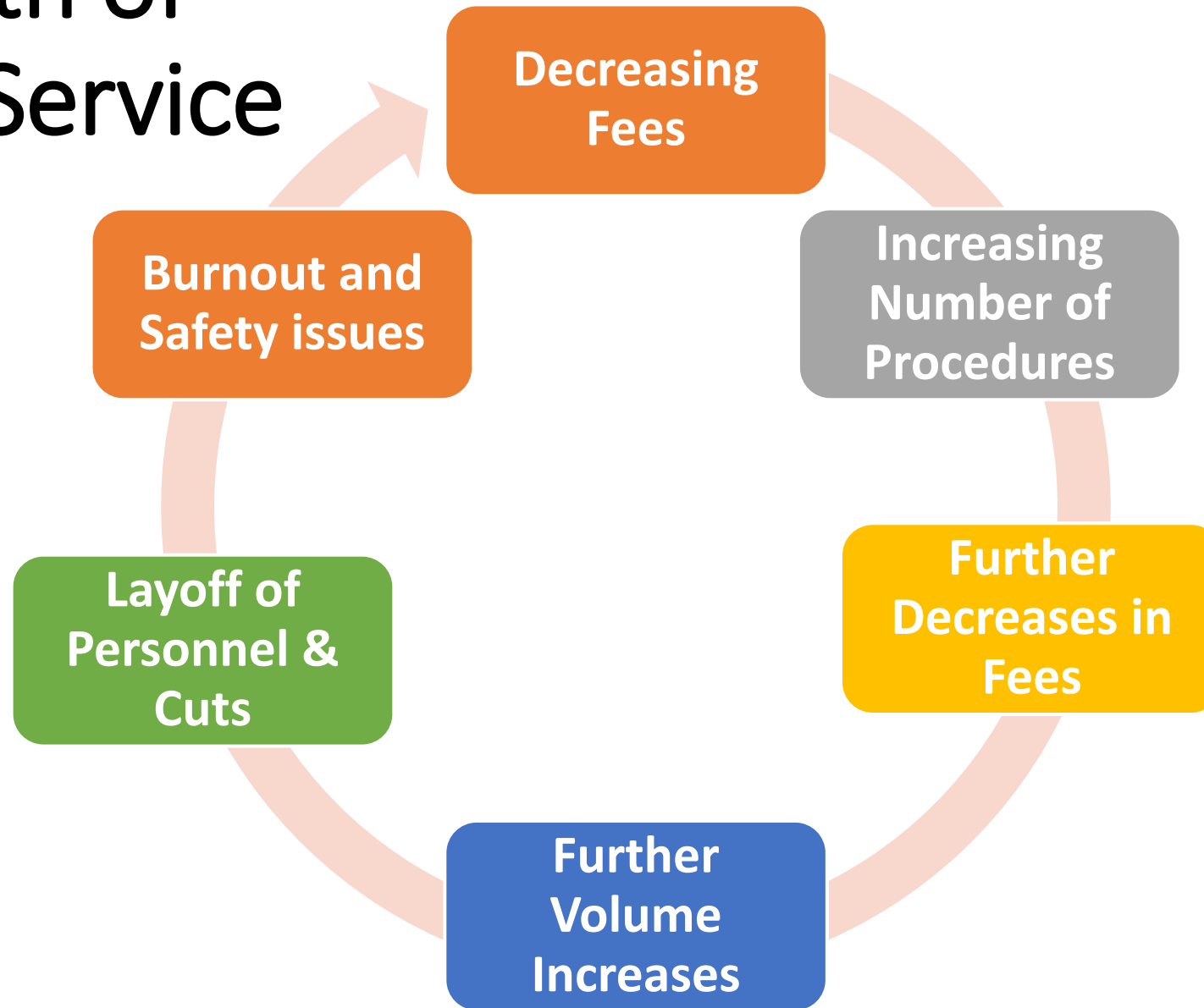
THE NETWORK FOR
EXCELLENCE IN
HEALTH INNOVATION

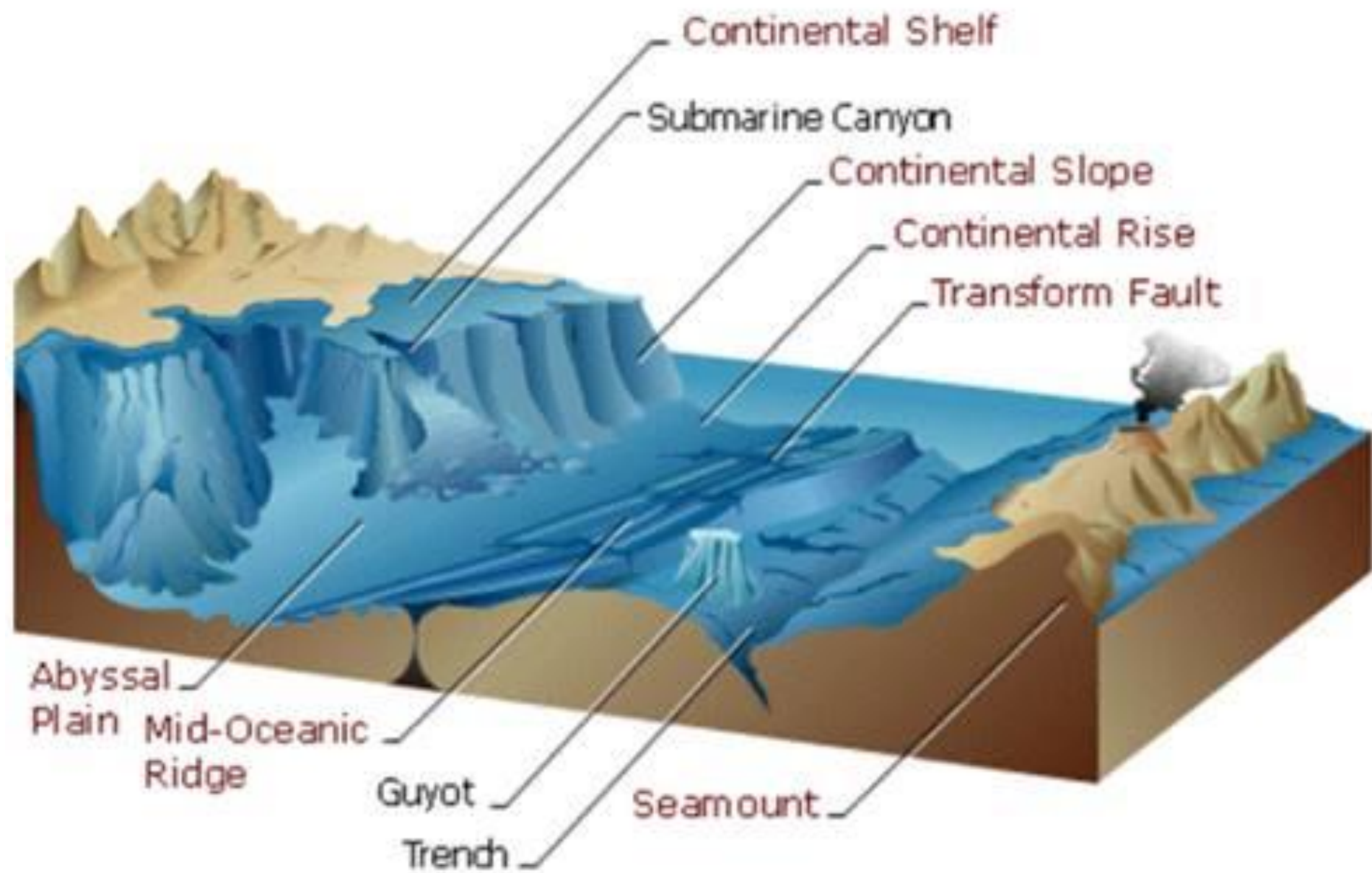
Fee for Service

Reduction in
payment may
encourage
increase in
volume!



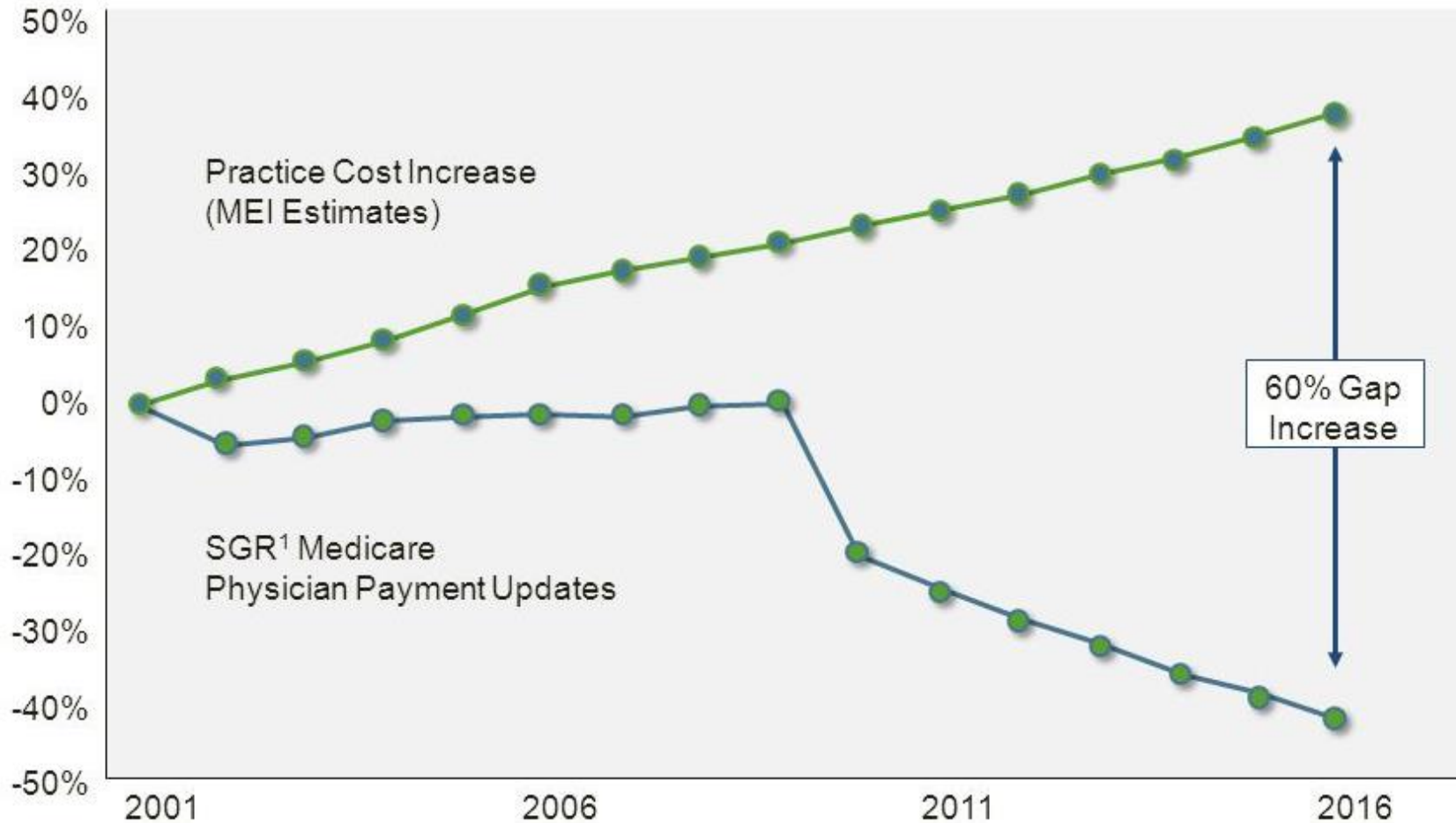
The Death of Fee For Service





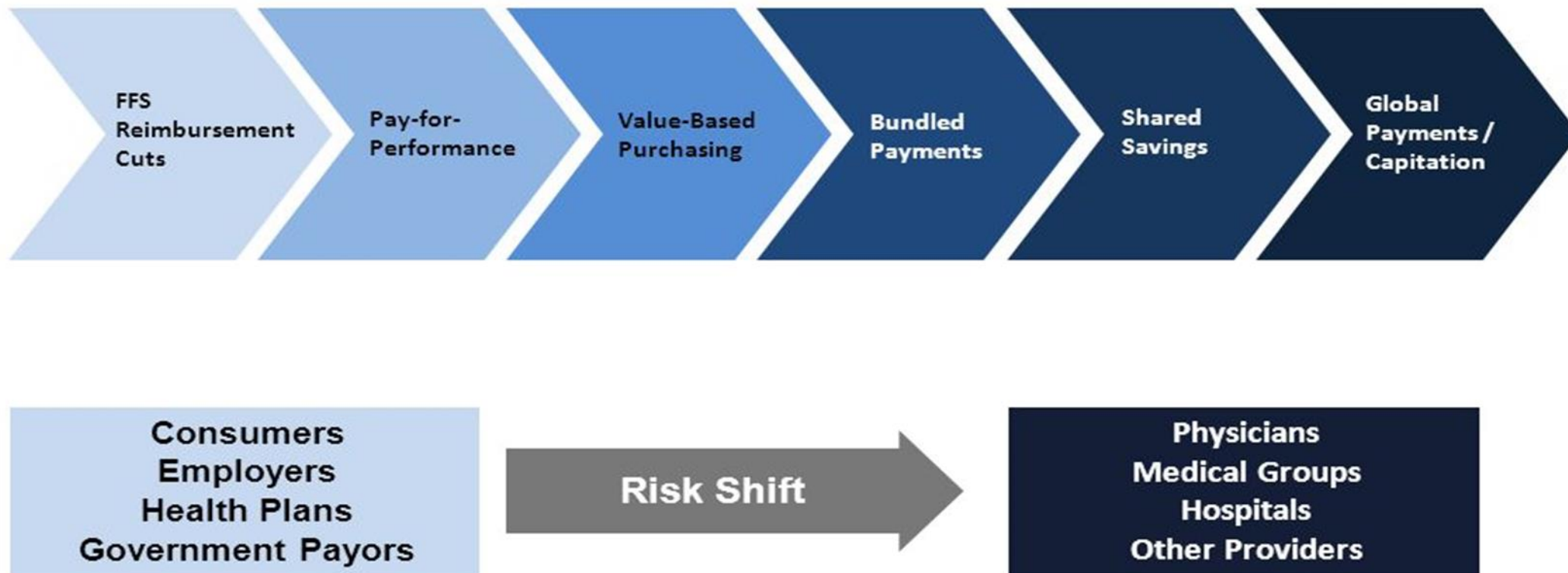
Physician “Real Income” Declining

Gap Increase Between Practice Cost Increase, Payment Updates



Source: Health Leaders 2011

Shifting Risk



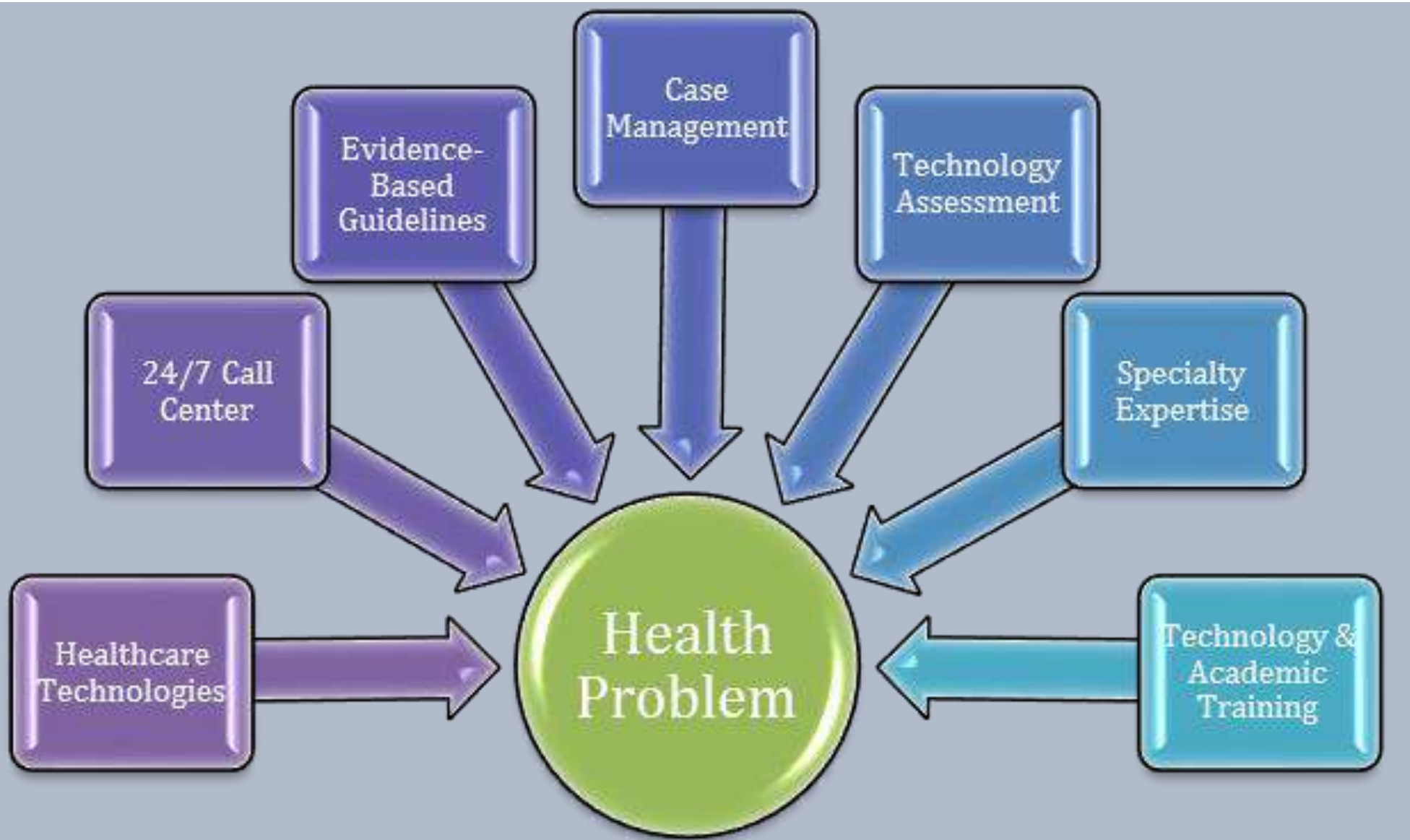
Shifting Risk

Systems Engineering

*Systems Engineering integrates all the disciplines and specialty groups into a **team effort** forming a structured development process that proceeds from concept to production to operation.*

*Systems Engineering considers both the business and the technical **needs of all customers** with the goal of providing a **quality product** that meets the user needs.*

ANGELS Approach to New Programs







Systems Approach (Multidisciplinary)

- **MDs**
- **Physician Assistants**
- **Pharmacists**
- **APNs**
- **Nurses**
- **Paramedics**
- **Nursing Assistants**
- **Lay Healthcare Workers**

Medicare Spending v. Quality of Care



Arkansas Solution

Insanity is doing the same thing over and over again and expecting different results.

-Albert Einstein

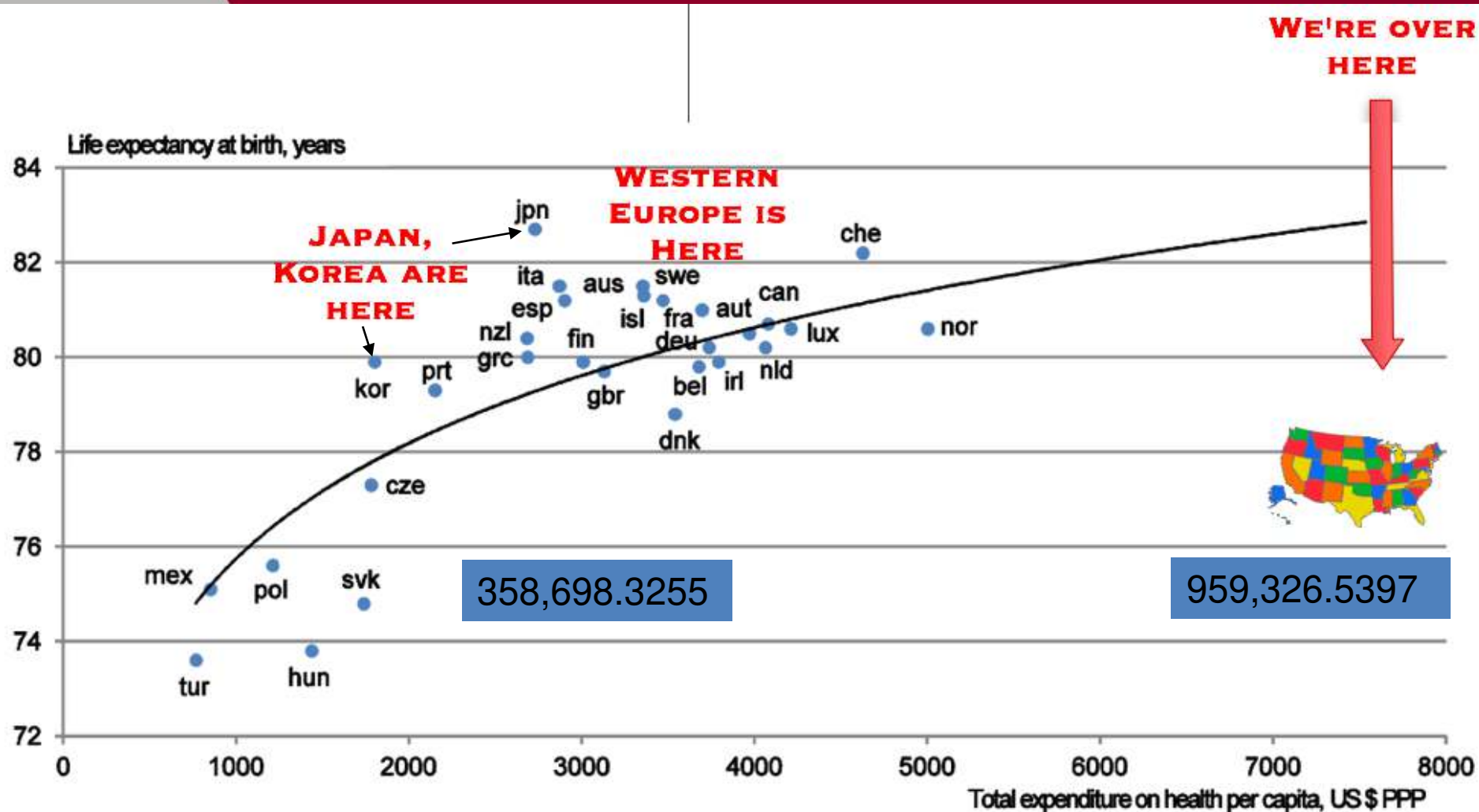
Health Care Disparity

Where you live should
not determine whether
you live or die!

ANGELS 2003
16 Years!



Life Expectancy vs Spending



Digital Health

Traditional Tele-health consults
Remote care
Apps and Cell Phones
Individual and Population based care
management

Payment Reform Will Force the Market Forward!

Digital Health

Maximize healthcare resources
Provide increased opportunities to
engage clinicians
Patients self-manage their care
management

Delivers patient care outside of the hospital or doctor's office.

Digital Health

- Maximize healthcare resources
- Provide increased opportunities to engage clinicians
- Patients self-manage their care
- Uses technology available to consumers to deliver patient care outside of the hospital or doctor's office.

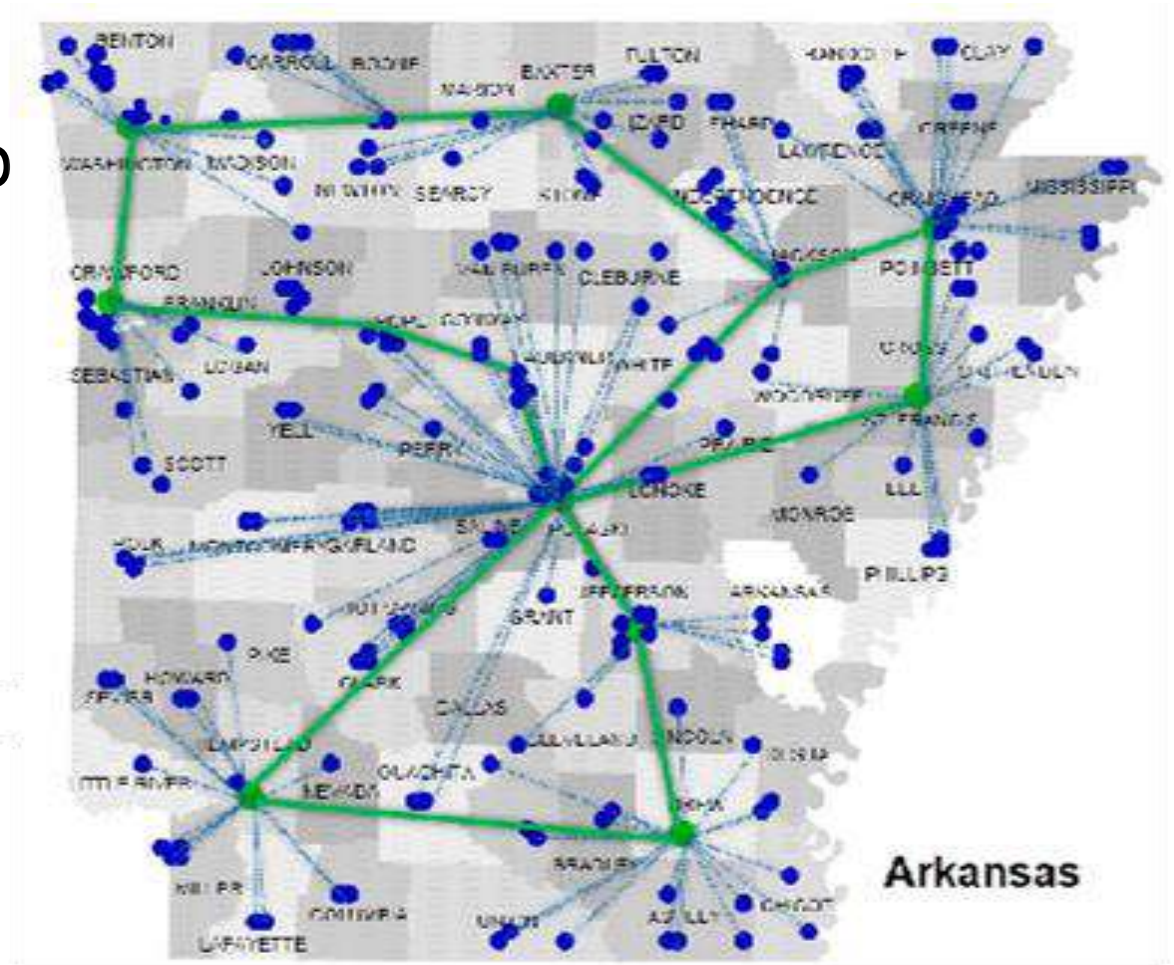
Links: patients + doctors + hospitals = System of Care

Care is delivered anywhere, anytime, and by anyone!

Our Vision

Eliminate health care disparities in Arkansas and abroad through digital health and healthcare innovations which embrace technology that improves the access to and the quality of clinical care, education, and research.

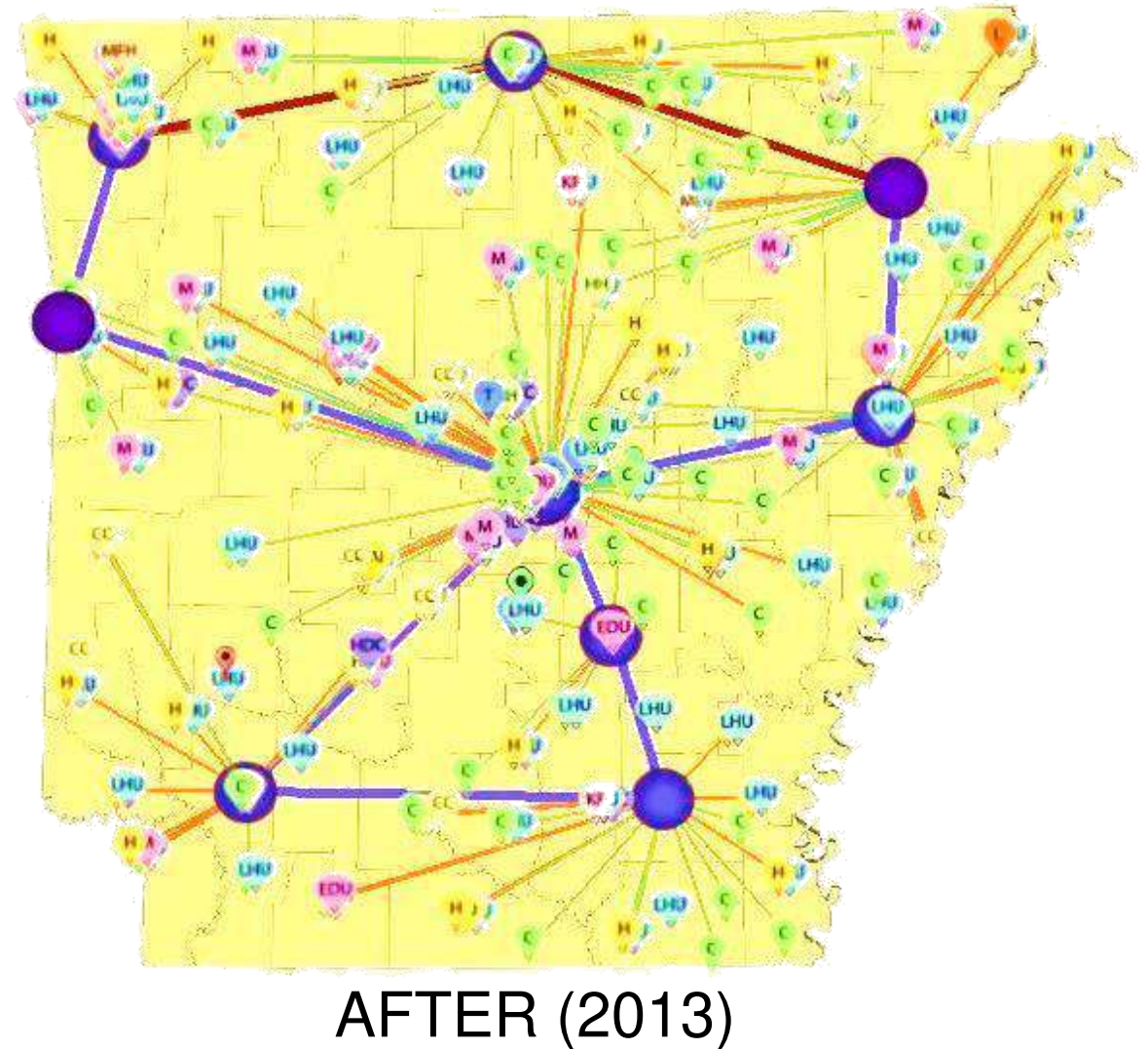
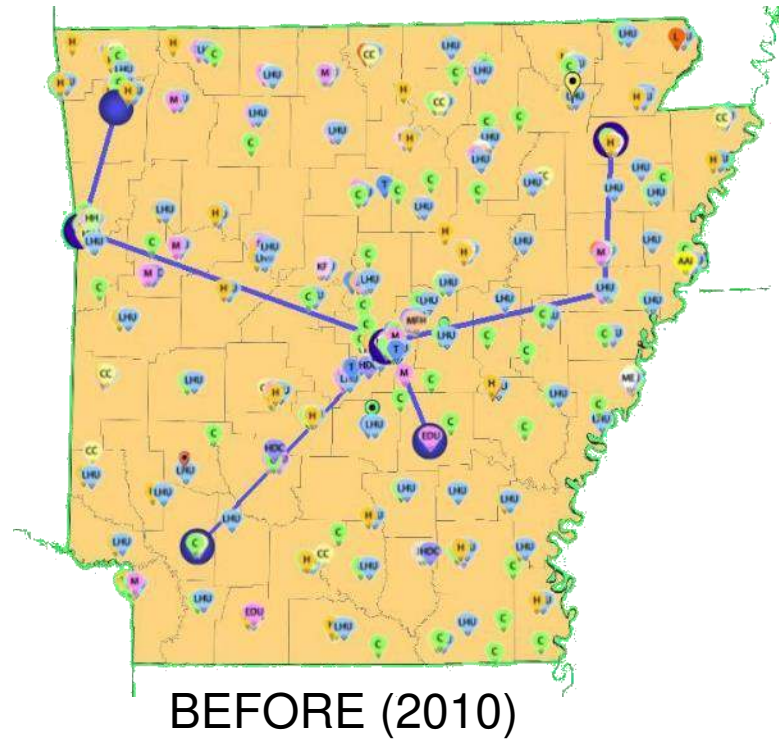
Our state's only academic medical center has access to thousands of miles of fiber optic cable through its broadband network, **UAMS e-Link** and partnership with the Arkansas Research and Education Optical Network (AREON) and fiber optic networks.



\$102 Million Tel-Health Stimulus (2010)



Arkansas' Connectivity Before & After BTOP



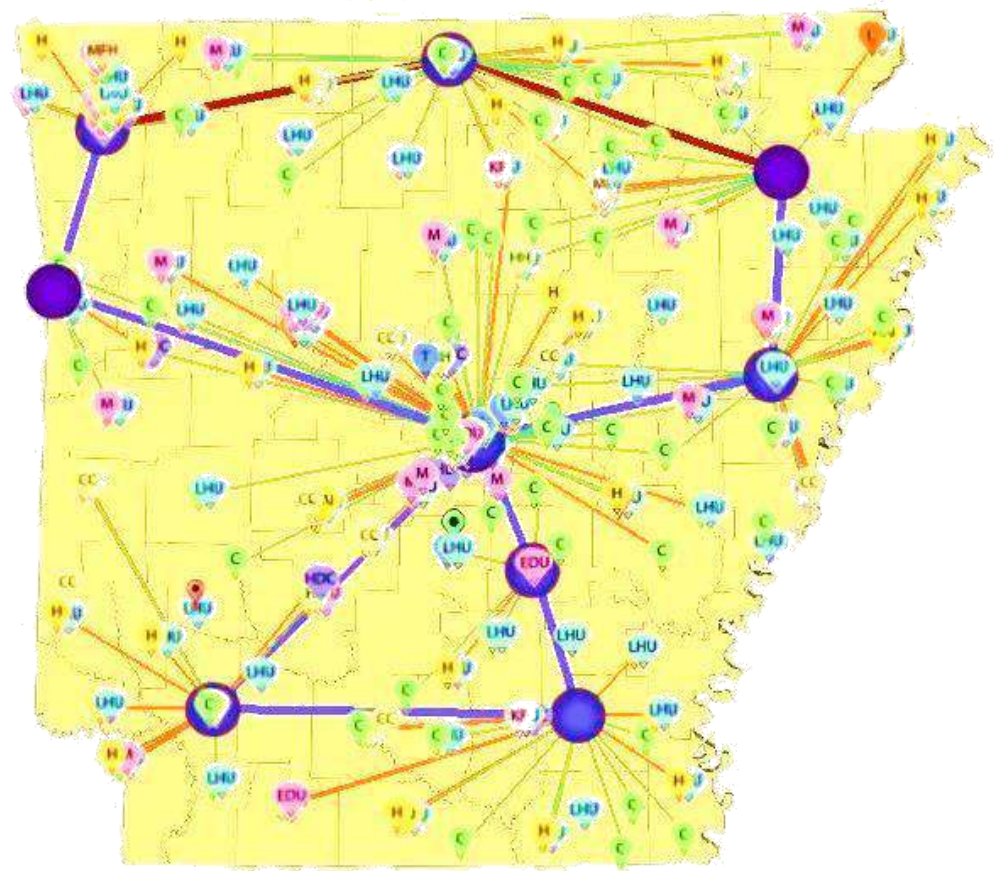
Arkansas' Connectivity Through e-Link

Video access to 1,000+ health care providers on a dedicated, high-speed, HIPAA-compliant network

Cost savings related to data circuit rates and network-related equipment for delivery of telemedicine services

24/7 Telehealth support for UAMS-provided equipment and software around the state

Cell phone based meeting software allows collaboration anytime, anywhere, using a camera-equipped device





Institute for Digital Health & Innovation

The Benefit of an Institute for Digital Health & Innovation



Research
(Clinical, Value,
Efficiency &
Quality)



**Care Model
Design &
Pathways**



**Workforce
Retooling**
Education



**Population
Segmentation**



**Balance of
Human
Touch &
Technology**



**The New
Care Team**
(Patients, Doctors,
Remote Workers &
Machines)

What is the Value
Proposition of a
Digitally Enabled
System of Care?



Access



Quality



Efficiency

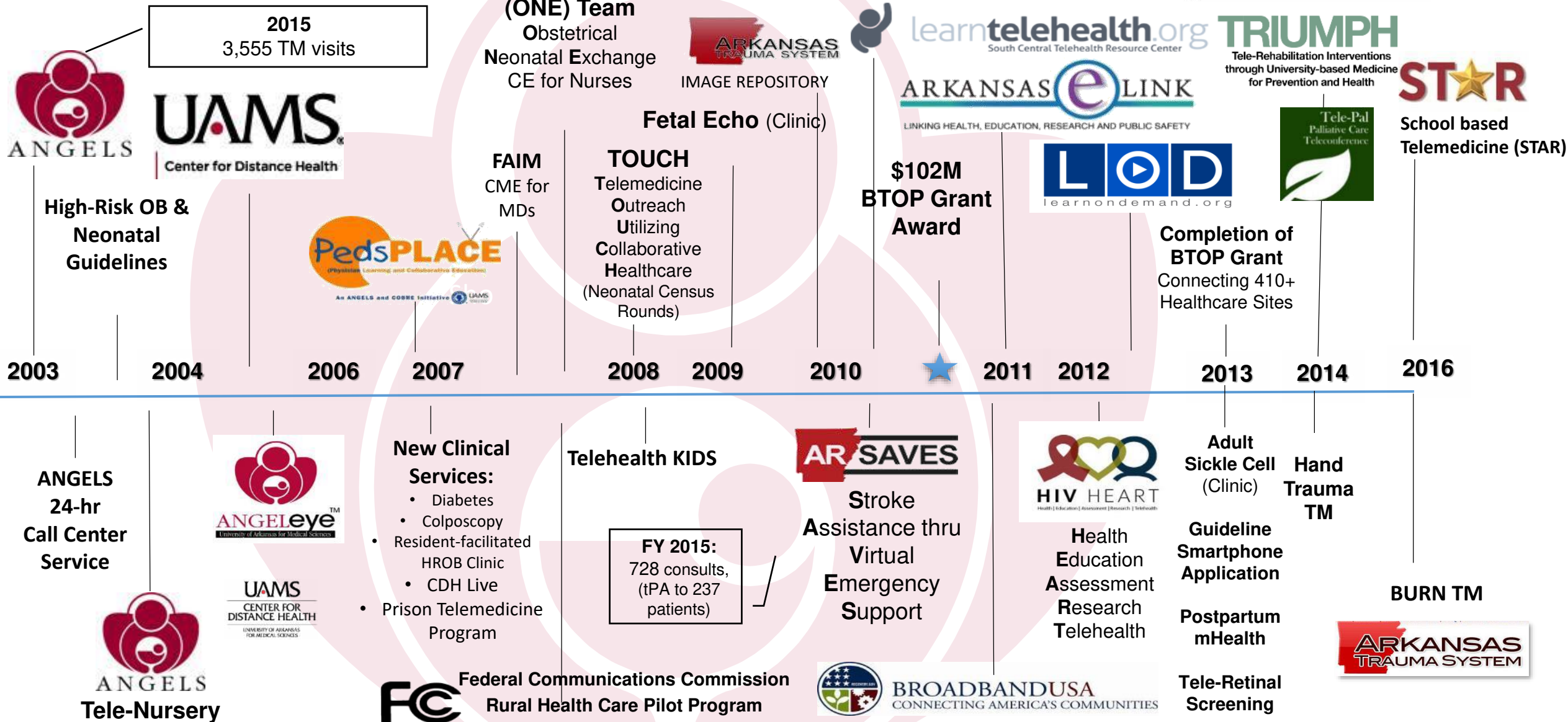


Experience

How it Works



Evolution of UAMS Telehealth Programs (2003-2016)



Center of Arkansas



Evolution of ANGELS Into IDHI Arkansas

- In 2002, DHS approached UAMS with High-Risk OB support concept.
- This innovative program was able to leverage federal dollars to increase access to care.
- UAMS provides state match portion, resulting in the requirement of no state funds.

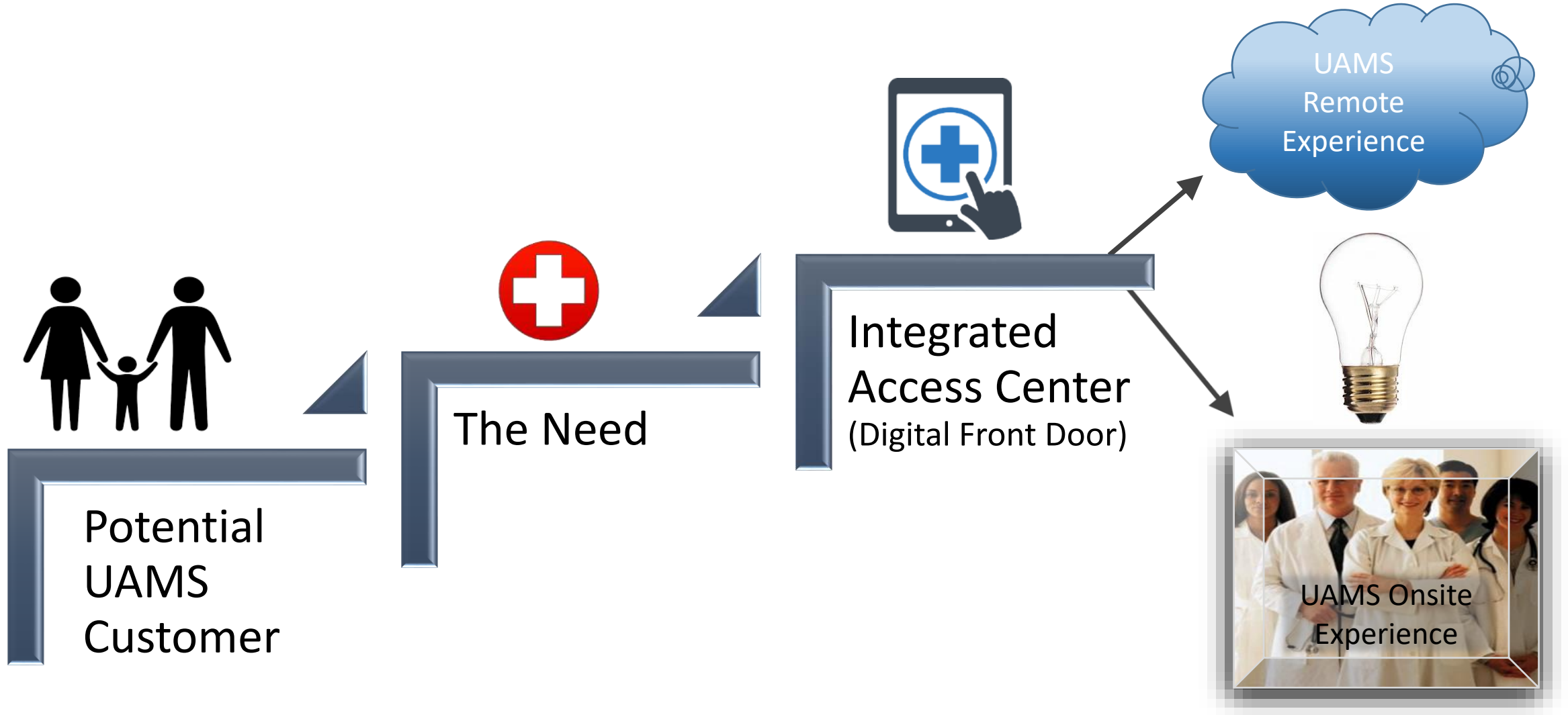


Access

- Change how, where, & when people get healthcare
- Redesign care models using both physical and virtual space
- Extend reach & impact of clinical care without new facilities
- Cover gaps in healthcare coverage



The Front Door to a Digital-Enabled System of Care





Arkansas Health Distribution Center

- A unified platform & experience that connects supply with demand
- Shared resources
- New sites of care
- Enhanced relationships
- Increased engagement
- Improved coordination & continuity of care

Digital Health



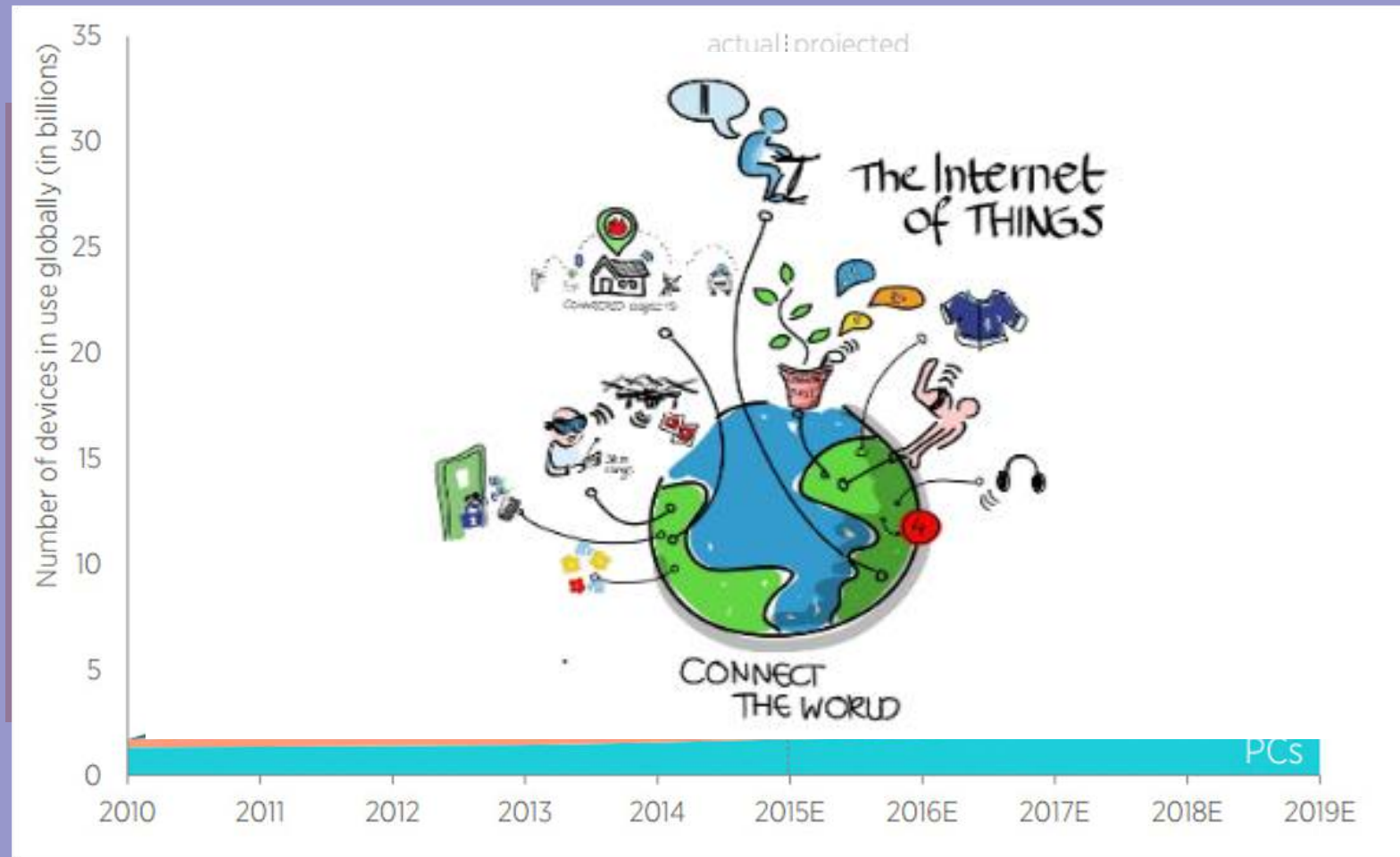
Increase production

Cut production costs

Improve safety

Internet of Things: Bandwidth

Figure 2. The Internet of Everything: Devices in Use Globally



Source: John Greenough, "The Internet of Everything 2015," *Business Insider Intelligence*. Produced by Adam Thierer and Andrea Castillo, Mercatus Center at George Mason University, 2015.

Connected Health

Traditional Tele-health consults

Remote care

Apps and Cell Phones

Individual and Population based care management

Hospitals Providers and Patients

Payment Reform Will Force the Market Forward!

Connected Health

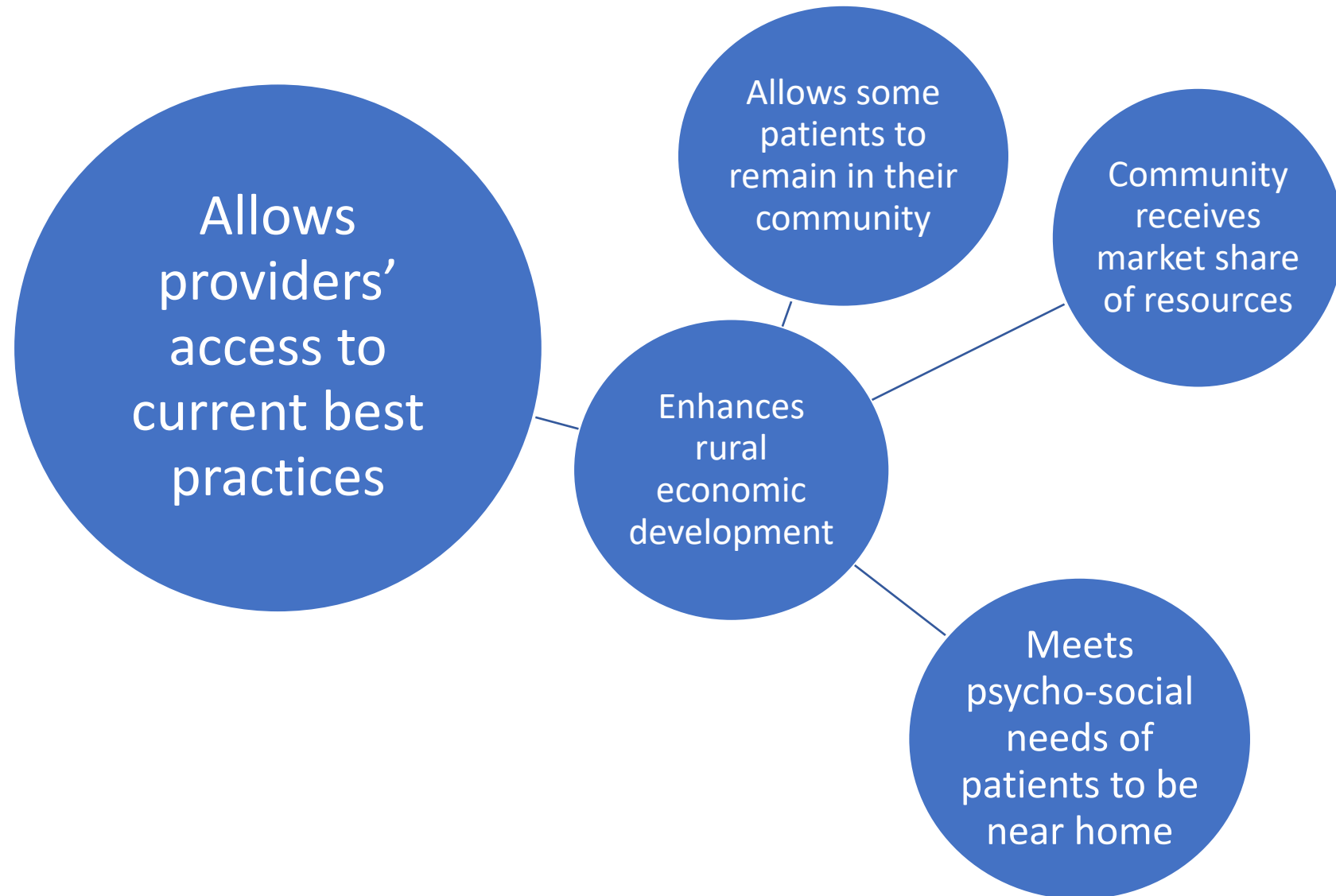
Maximize healthcare resources

Provide increased opportunities to engage clinicians

Patients self-manage their care (blood glucose)

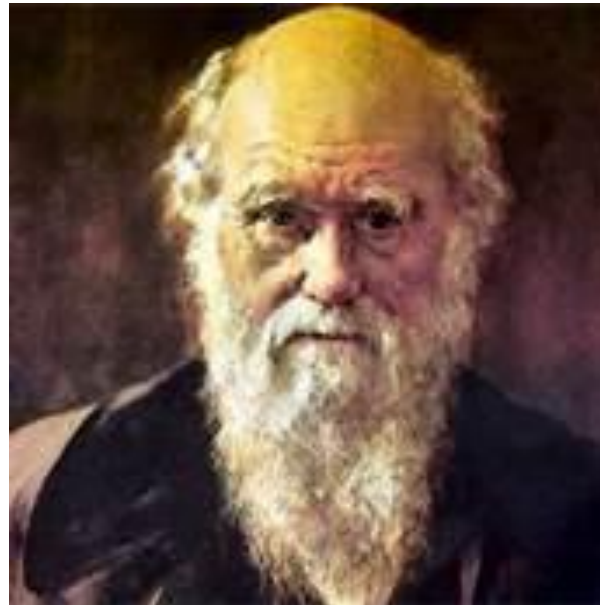
Uses technology available to consumers to deliver patient care outside of the hospital or doctor's office.

Subspecialty Health Care Access



Evolution

“It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change.”



Charles Darwin

UAMS-Where Telemedicine Lives!



For additional information:

<http://www.arkansaselink.com>

<http://learntelehealth.org>

Angels in Action

