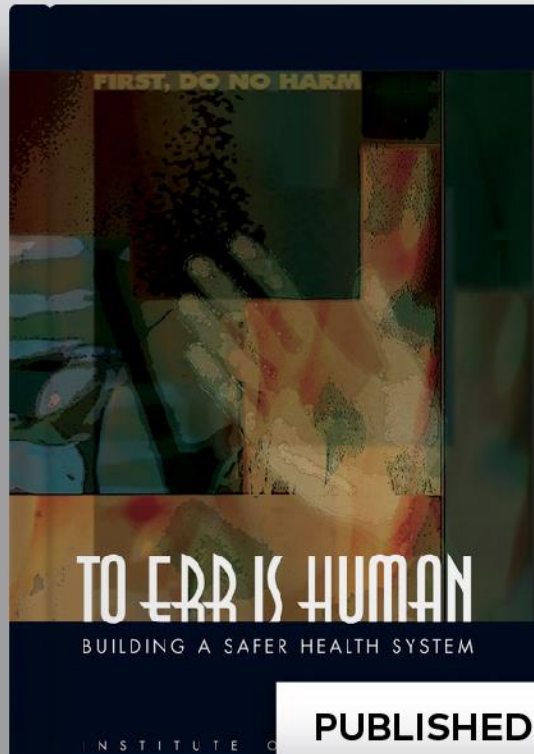


Network Medicine

Evolving Models: What Healthcare Organizations Must Do to Adapt, Survive, and Thrive

Todd Rothenhaus, MD
Chief Medical Officer, athenahealth

17 years after organized medicine admitted it had a problem, it's still has a problem

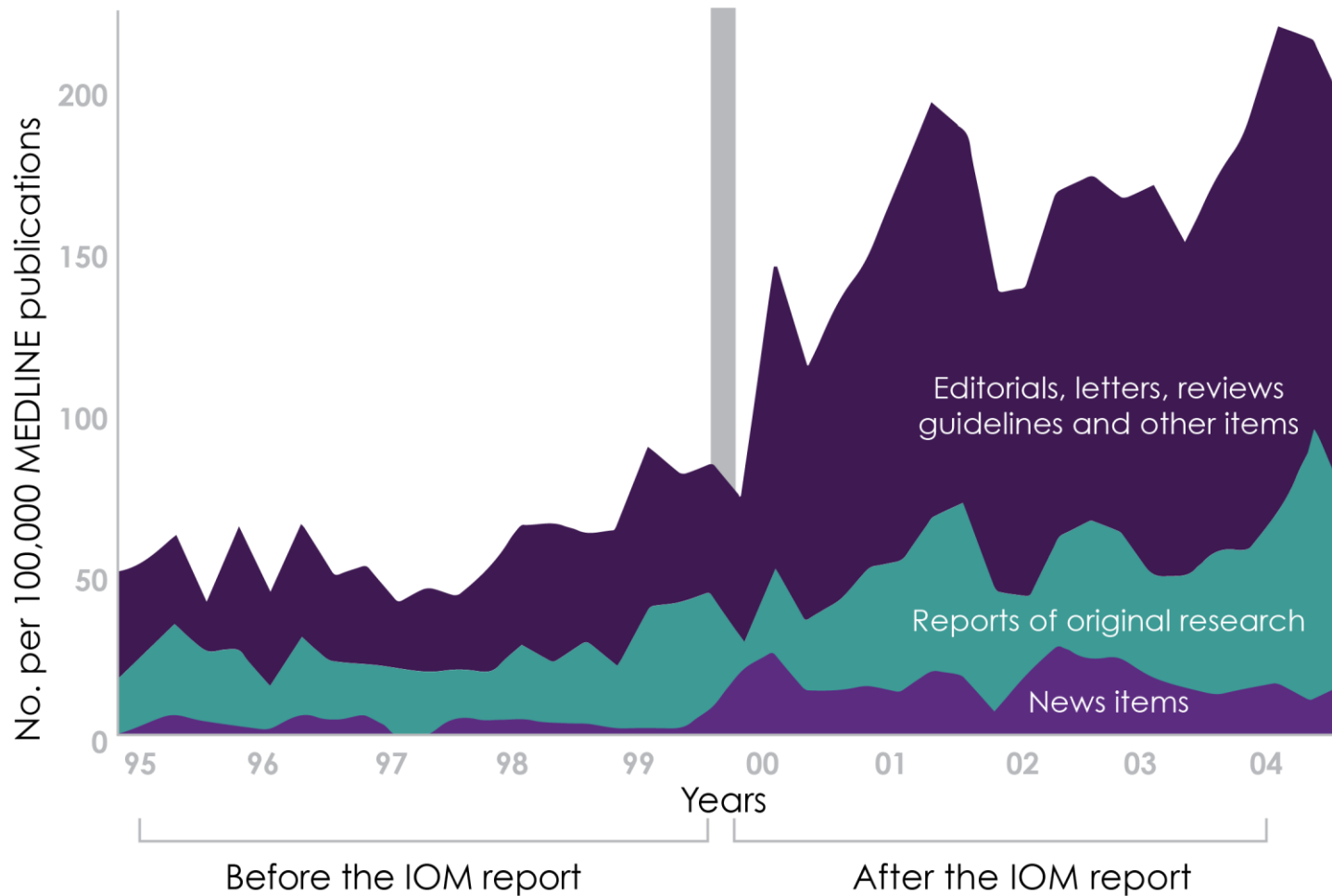


PUBLISHED 1999





PUBLISHED 2016

Investments in reducing harm & improving quality have been enormous





HPV vaccine: A breakthrough in prevention of cervical cancer

R. Sharma  

Senior Consultant, Department of
Gynaecology, New Delhi 110076, India

Once Again, Scientists Say Human Genome Is Complete

By NICHOLAS WADE

APRIL 1, 2013

Laparoscopy: The Controversial Beginnings of a Surgical Revolution

New Artificial Liver Shows Promise

By JAMIE COHEN • Oct. 17

ok

THE SATURDAY ESSAY The Future of Medicine Is in Your Smartphone

New tools are tilting health-care control

By ERIC J. TOPOL

Jan. 9, 2015 1:37 p.m. ET

Smart Bionic Limbs are Reengineering the Human

Forget prostheses that merely resemble a human limb. Scientists are building bionic limbs with machines that can sense their environment and predict a user's intentions. Smart robotics will enhance the powers of the human body.



By Erik Selge May 28, 2012

97



\$5 BILLION

to launch a new drug



 **Cialis**
(tadalafil)



Muscle Aches,
Pain, Stiffness,
Fibromyalgia?

KNOW YOUR SYMPTOMS;
IT MAY HELP YOUR DOCTOR HELP YOU

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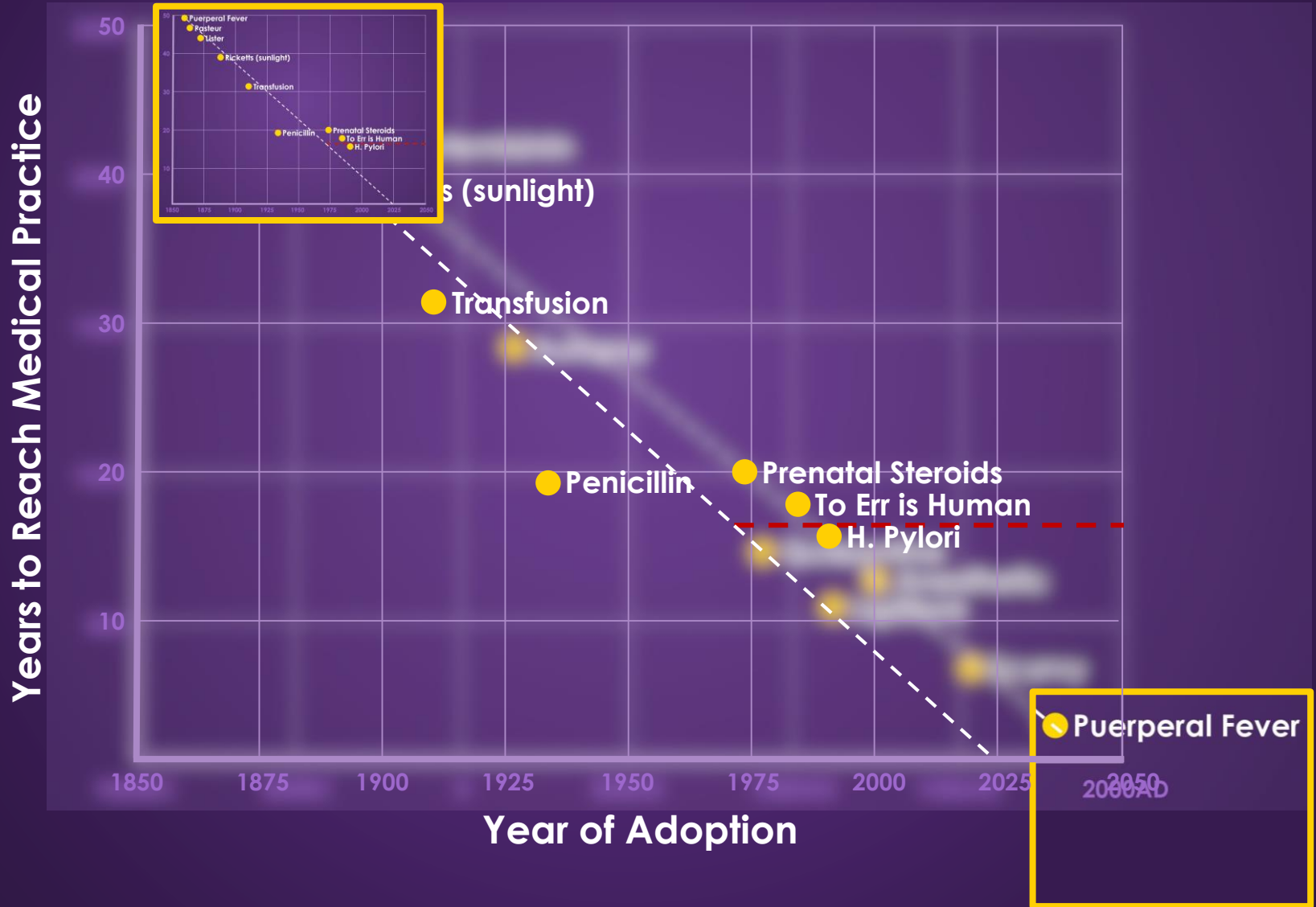
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ACOG
THE AMERICAN CONGRESS
OF OBSTETRICIANS
AND GYNECOLOGISTS

AAOS
AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS

The diffusion of medical innovations has
...but looks to be stuck at around 17 years
accelerated over the centuries



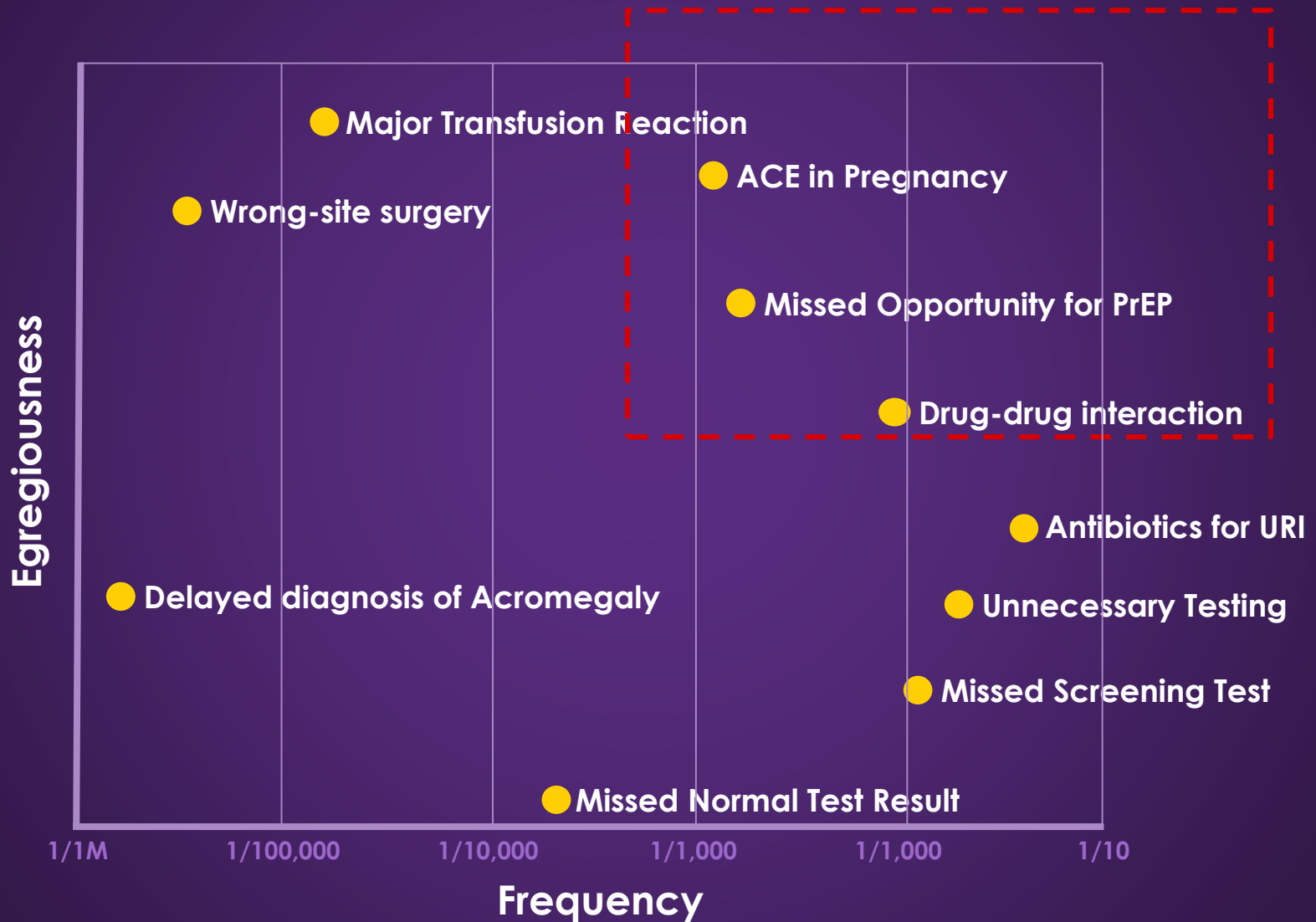
A man with a beard and a striped shirt is shown in profile, raising his right fist in a gesture of protest or solidarity. He is surrounded by a crowd of other people, many of whom are also raising their fists. In the background, several flags are visible, including the national flag of Tunisia, which features a white field with a red crescent and star. The scene is brightly lit, suggesting an outdoor setting during the day.

“Facebook is pretty much the **GPS for this revolution**. Without the street there’s no revolution, but add Facebook to the street and you get real potential.”

Foetus

Chief Technology Officer
Tazrik: Tunisian street resistance network

As we try to improve the health of the nation, **we don't know what we don't know.**





*What if healthcare
really had a
platform?*

We could...

- 1 **Connect providers** to drive clinical improvements and sharing of best practices
- 2 Leverage **network data** to focus interventions to stamp out bad medicine
- 3 Accelerate **dissemination and adoption** of new innovations to the point of care

We could...

1 **Connect providers** to drive clinical improvements and sharing of best practices

2 Leverage **network data** to focus interventions to stamp out bad medicine

3 Accelerate **dissemination and adoption** of new innovations to the point of care

“The common denominator of all platforms is that they facilitate interactions between **two distinct groups** that want to interact and need each other,”



Let's build a national physician game-layer to drive clinical improvement

Overview Productivity ▼ Revenue Cycle ▼ Patient Financial Responsibility ▼ Patient Engagement ▼ Clinicals ▼

View



View Partnership Metrics Report

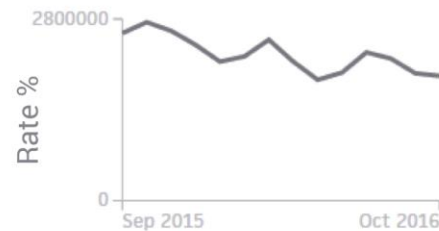
Filter

+ Select



AMERICAN COLLEGE of CARDIOLOGY

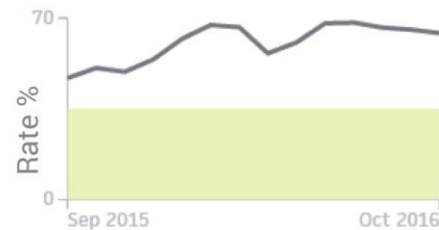
CLINICALS
TTR Coumadin



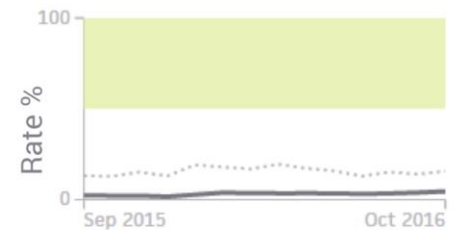
CLINICALS
Acute CHF Flare Rate



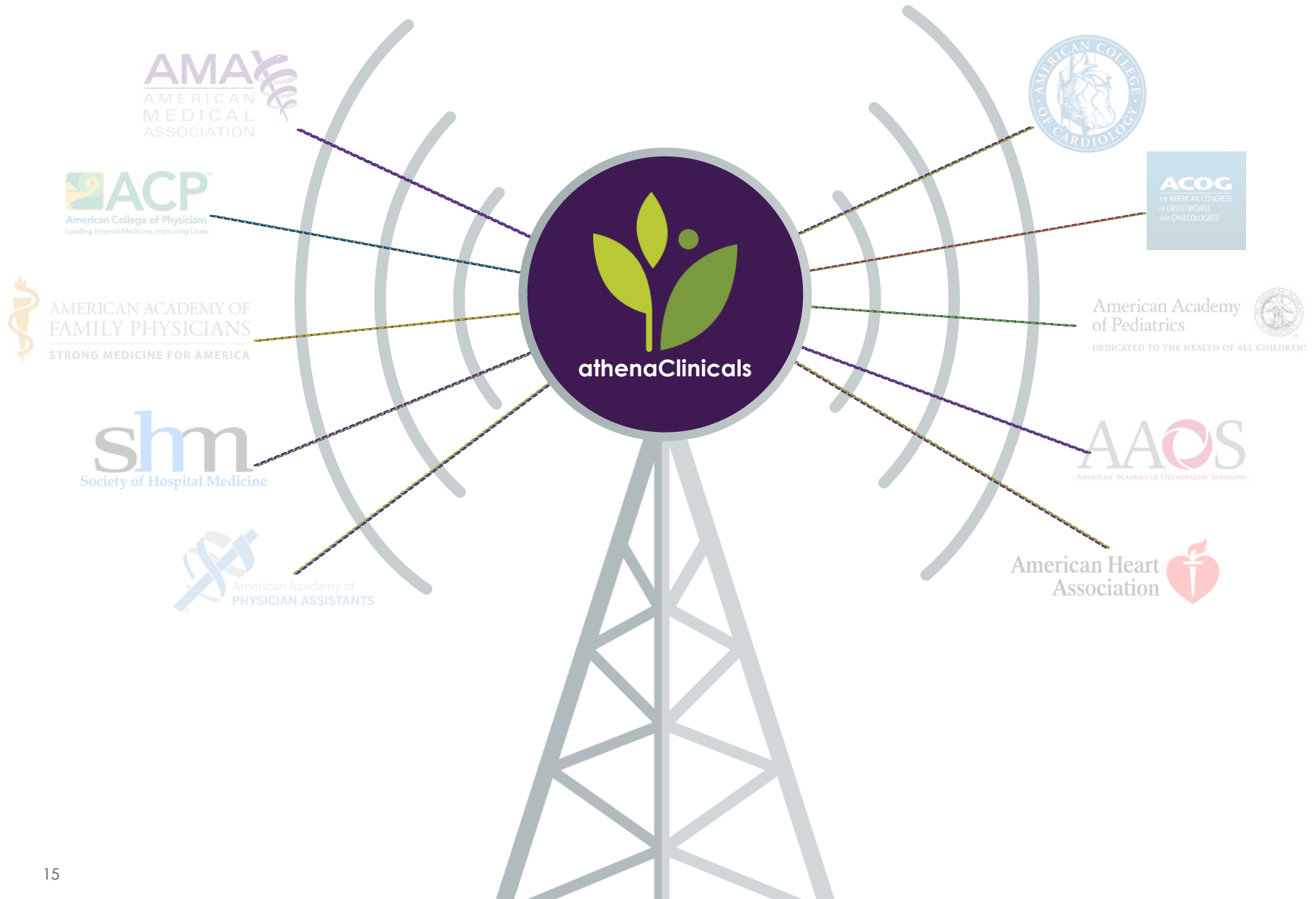
CLINICALS
Optimal Statin Use



CLINICALS
AMI Readmission Rate



Let's build a platform to reduce the cost of diffusing innovation



We could...

1

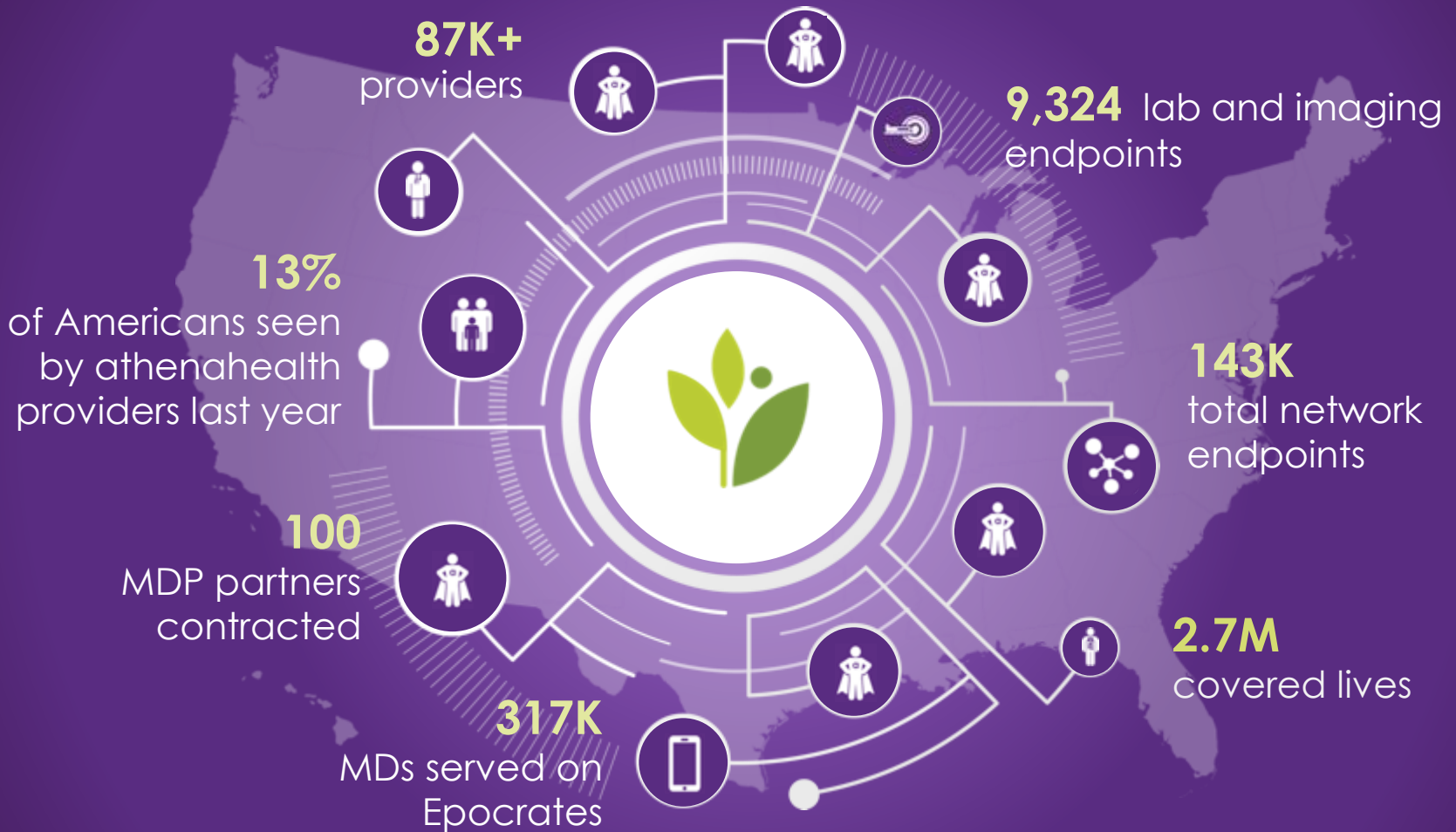
Connect providers to drive clinical improvements and sharing of best practices

2

Leverage **network data** to focus interventions to stamp out bad medicine

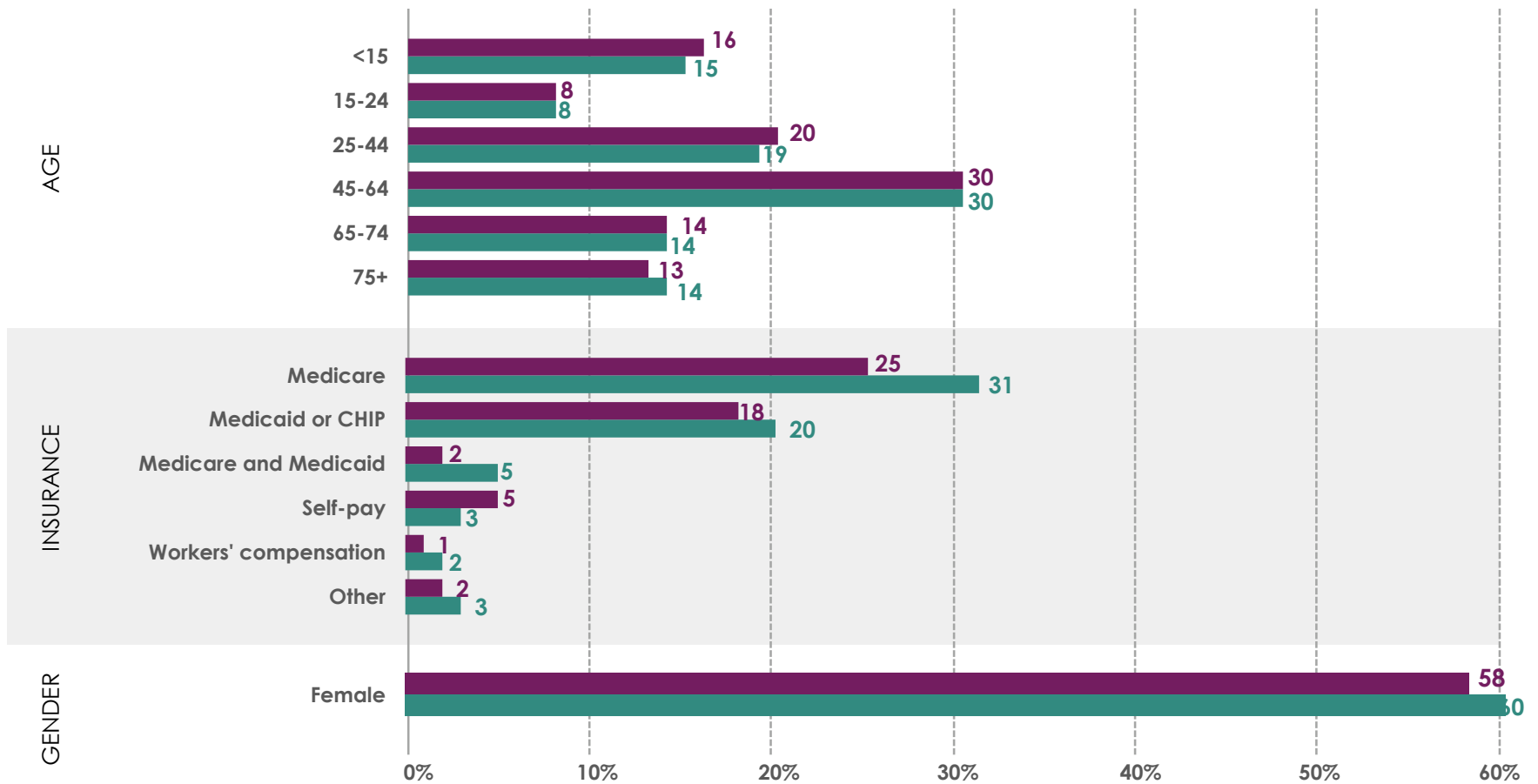
3

Accelerate **dissemination and adoption** of new innovations to the point of care



Patient Data Set Characteristics

athenahealth network vs CDC



Source: athenaResearch

1: 30 million visits to practices active on the athenahealth network before 2011

2. http://www.cdc.gov/nchs/data/ahcd/namcs_summary/2010_namcs_web_tables.pdf

Our network data allows us to surveil for
the most egregious errors

The NEW ENGLAND JOURNAL of MEDICINE

2006

ORIGINAL ARTICLE

2006

Major Congenital Malformations after First-Trimester Exposure to ACE Inhibitors

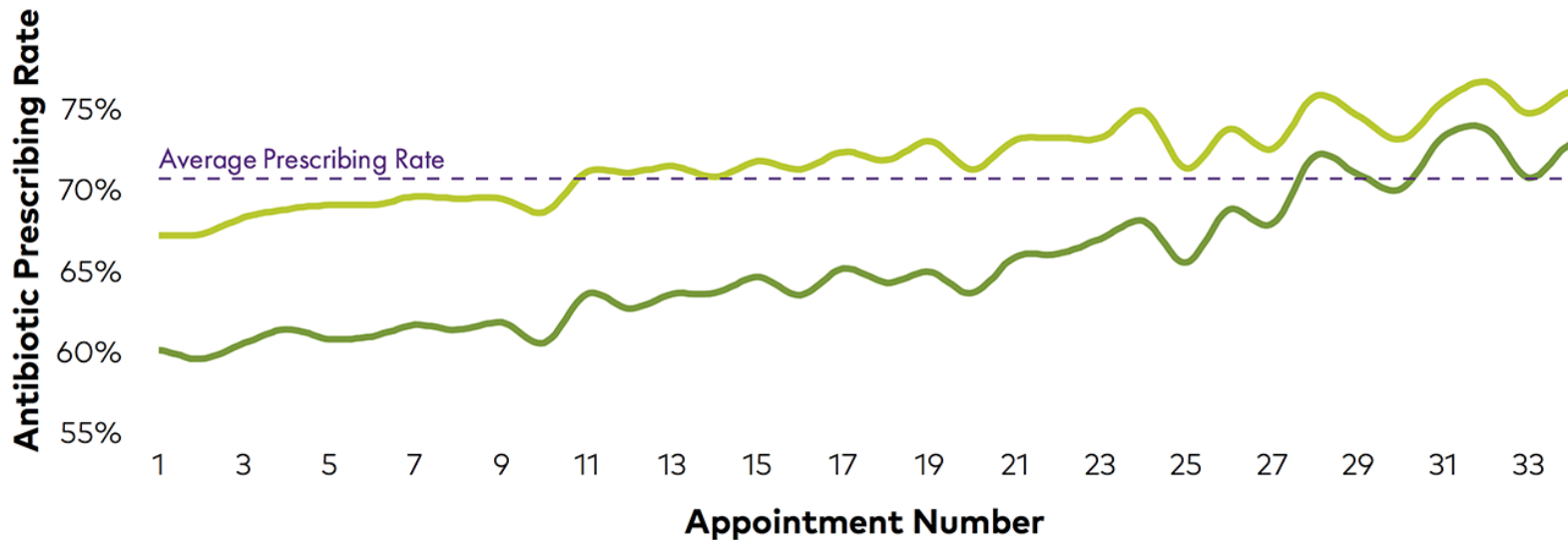
William O. Cooper, M.D., M.P.H., Sonia Hernandez-Diaz, M.D., Dr.P.H.,
Patrick G. Arbogast, Ph.D., Judith A. Dudley, B.S., Shannon Dyer, B.S.,
Patricia S. Gideon, R.N., Kathi Hall, B.S., and Wayne A. Ray, Ph.D.

- 10 year old study revealed the danger of ACE inhibitors to unborn children
- We found 62,468 women of child-bearing age across 2145 client sites
- Based on our data, ACOG published new guidance and partnered with us to campaign to providers

...and reveals patterns only we can uncover



Antibiotic prescriptions over the course of a day



- All Acute Respiratory Infection Appointments
- Acute Respiratory Infection Appointments Never Indicated for Antibiotics

We could...

1

Connect providers to drive clinical improvements and sharing of best practices

2

Leverage **network data** to focus interventions to stamp out bad medicine

3

Accelerate **dissemination and adoption** of new innovations to the point of care

PrEP/PEP

(PROPHYLAXIS)



PrEP & PEP INVOLVE TAKING HIV MEDICATIONS FOR PREVENTING TRANSMISSION OF THE VIRUS.

PrEP (PRE-EXPOSURE PROPHYLAXIS) IS TAKEN DAILY, WHILE **PEP** (POST-EXPOSURE PROPHYLAXIS) IS TAKEN WITHIN 72 HOURS AFTER EXPOSURE TO HIV, AND CONSISTS OF A MONTH OF TREATMENT. TALK TO A DOCTOR TO DETERMINE IF A PROPHYLAXIS IS RIGHT FOR YOU.

KNOW HIV.
THE STIGMA PROJECT

New recommendations on ART prophylaxis for patients with risk factors

Estimated **730,210 patients could benefit** (if PCPs asked the right questions)

10,103 we know could benefit from a conversation with their PCP

The Ebola Patient Was Sent Home Because of Bad Software

The Dallas hospital's debacle highlights the atrociousness of many electronic health records.

OCTOBER 3, 2014

NETWORK

50K+ providers in 2014 in need of guidance

KNOWLEDGE

At-risk patient Ebola symptoms, travel history, and risk for exposure.

WORK

Knowledge content added to EMR. And quick-reference list created.

300K physicians and 1M Epocrates users received necessary information.

Any opportunity can be tested, and anyone can
make an offer to take action

Delivered
2,000 flu shots
in 4 hours

UberHEALTH

FLU PREVENTION ON DEMAND





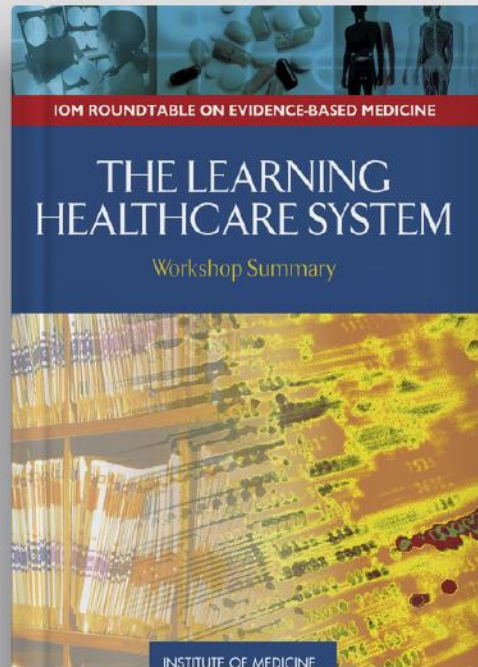
“To him who devotes his life to science, nothing can give more happiness than increasing the number of discoveries, but **his cup of joy is full when the results of his studies immediately find practical applications.**”

Louis Pasteur



348

The entire U.S. is struggling to create what we already have



The LHS Must Work Bi-Directionally: Afferent and Efferent Arms





**Healthcare's
platform is here.**