

A problem has been detected and windows has been shut down to prevent damage to your computer.

eHealth and D&I science: CTL-ALT-DEL

If this is the first time you've seen this Stop error screen, restart your computer, If this screen appears again, follow these steps:

Check to make sure any new hardware or software is properly installed. If this is a new installation, ask your hardware or software manufacturer for any windows updates you might need.

If problems continue, disable or remove any newly installed hardware or software. Disable BIOS memory options such as caching or shadowing. If you need to use Safe Mode to remove or disable components, restart your computer, press F8 to select Advanced Startup Options, and then select Safe Mode.

Technical information:

*** STOP: 0x000000D1 (0x0000000C,0x00000002,0x00000000,0xF86B5A89)

Gary G. Bennett Ph.D. Associate professor of psychology, global health & medicine, Director, Duke obesity prevention program

Beginning dump of physical memory

Physical memory dump complete.

Contact your system administrator or technical support group for further assistance.

This talk was presented at the NCI Implementation Science Forum on Thursday, October 18, 2012.

Slides depicting unpublished data, those with extensive animation (and all snarky jokes) have been removed.

The full set of slides are available upon request.

“**eHealth** is the use of emerging information and communication technology, especially the Internet, to improve or enable health and health care.”

asthma management

caregiving stress

breast cancer coping

chronic pain

heart failure

symptom monitoring

diabetes self management

problem drinking

falls prevention

headache pain

multiple risk behavior change

cardiac rehabilitation

HIV prevention

decision making

mental health

dietary change

organ donation

pediatric encopresis

prostate screening

smoking cessation

STD prevention

stress management

substance abuse

weight loss

tailored health education

symptom monitoring

self-monitoring

decision support tools

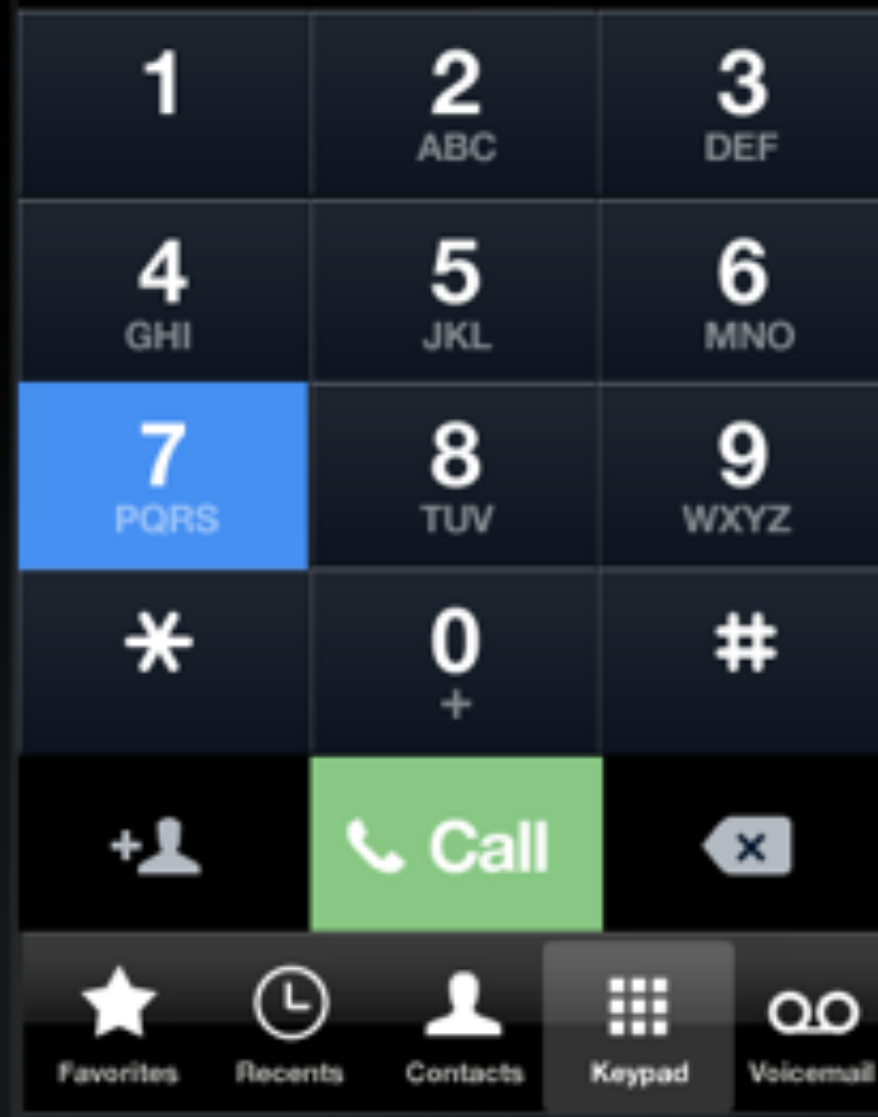
health system portals

mHealth communication

patient social networking

medication reminders

eHealth works



eHealth trials generally show:

- best outcomes with human support
- high attrition (study and non-use)
- decreased engagement over time

eHealth D&I science

Most want to...

- > disseminate content online
- > use eHealth to deliver an EBI
- > scale an eHealth intervention
- > am i missing anything?

eHealth d&i science: CTRL-ALT-DEL

>> 5 reasons why eHealth D&I issues are
unique

>> where are the eHealth D&I science
opportunities?

>> where can we be truly
disruptive?

A photograph of a modern conference room. In the foreground, a large, light-colored wooden conference table is visible, with a few black chairs around it. On the table, there are some small electronic devices and a microphone. The room has large glass windows on the left side, looking out onto a bright area. The ceiling is white with recessed lights. A semi-transparent blue banner is overlaid across the middle of the image, containing white text.

the eHealth market is crowded.

patientslikeme®

PatientsLikeMe is a **free online community** where thousands of patients with life-changing conditions share real-world experiences.

See how PatientsLikeMe can help you **take control of your health**:



Share your health profile

Answer simple questions to create a shared health profile. See how you're doing over time.



Find patients like you

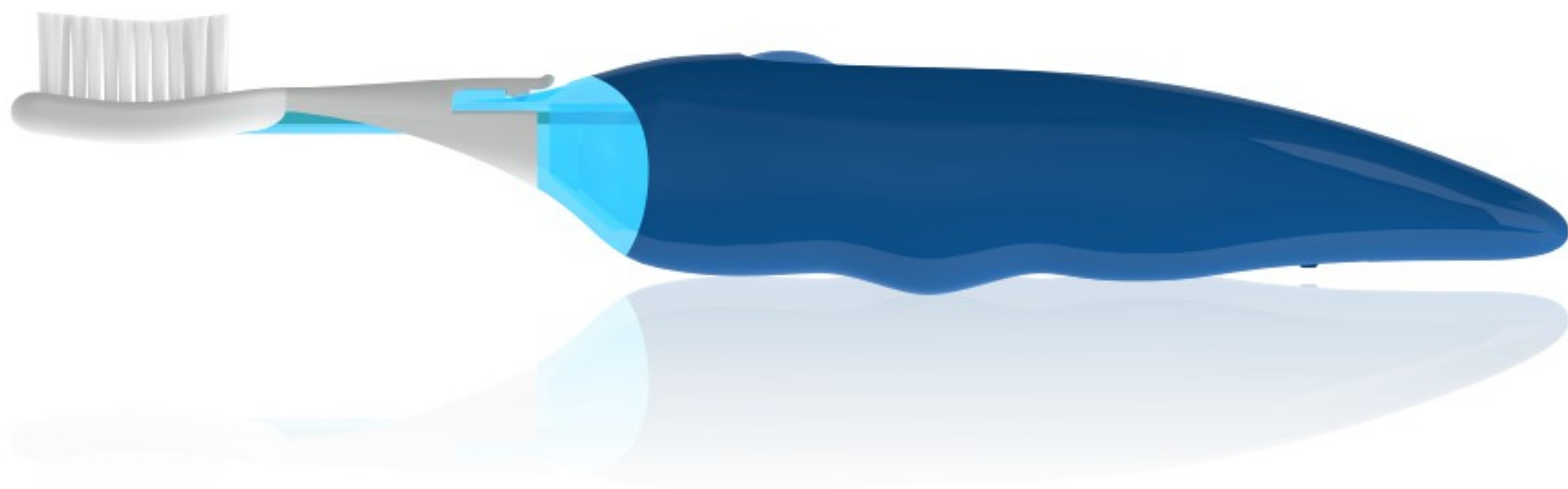
Search by gender, age, treatments, symptoms, and time since diagnosis to easily connect with patients like you.



Learn from others

Learn from the real-world treatment and symptoms reports, forum discussions, health profiles, one-on-one conversations, and more.







design

effectiveness

scale up



efficacy

sustainability

system
sustainability

~17 years



the industry “advantage”

design

effectiveness

scale up



efficacy

sustainability

system
sustainability

a lot less than 17 years

↑
whole

183,078,100

588,492

everything moves rapidly.

40%

<20





**500–700 iOS (iPhone, iPad)
weight loss apps**



- 204 weight loss apps,
13 evidence-based practices
- **NO** app had all 13 practices
- 10% of apps \geq 6 practices

Keep a food diary	43%
Assessing your weight	36%
Maintain calorie balance	34%
Keep a physical activity journal	27%
Portion control	25%
Read nutrition facts labels	22%
Regular physical activity	21%
Eating a diet rich in F&V	12%
Meal planning	9%
Drink water instead of soda or juice	7%
Loss of 1 to 2 lb/week	6%
Social support	3%



“...we are looking at how the NHS can use these apps for the benefit of patients, including how GPs could offer them for free.”

– *Andrew Lansley*
Secretary of Health, UK

it's not [just] the content.



Add a New Record

Systolic

Diastolic

Pulse

Get Pulse

Comments

Date

☒ Use Current Date

Add Record

02

FRI

03

SAT

04

SUN

05

MON

06

TUE

07

WED

08

THU

09

FRI

10

SAT



SYSTOLIC

DIASTOLIC

PULSE

Add Record



Create Page Sign In

Search what - business or categ in

Businesses grow faster online!

82% of consumers use online search engines to find local businesses. Get your business on the first pages of Google, Yahoo, Bing, and more. Guaranteed!

25.3%

88.9%



Create Page Sign In

Search what - business or categ in

Create a webpage for your business.


82% of consumers use online search engines to find local businesses. Get your business on the first pages of Google, Yahoo, Bing, and more. Guaranteed!

47.8%

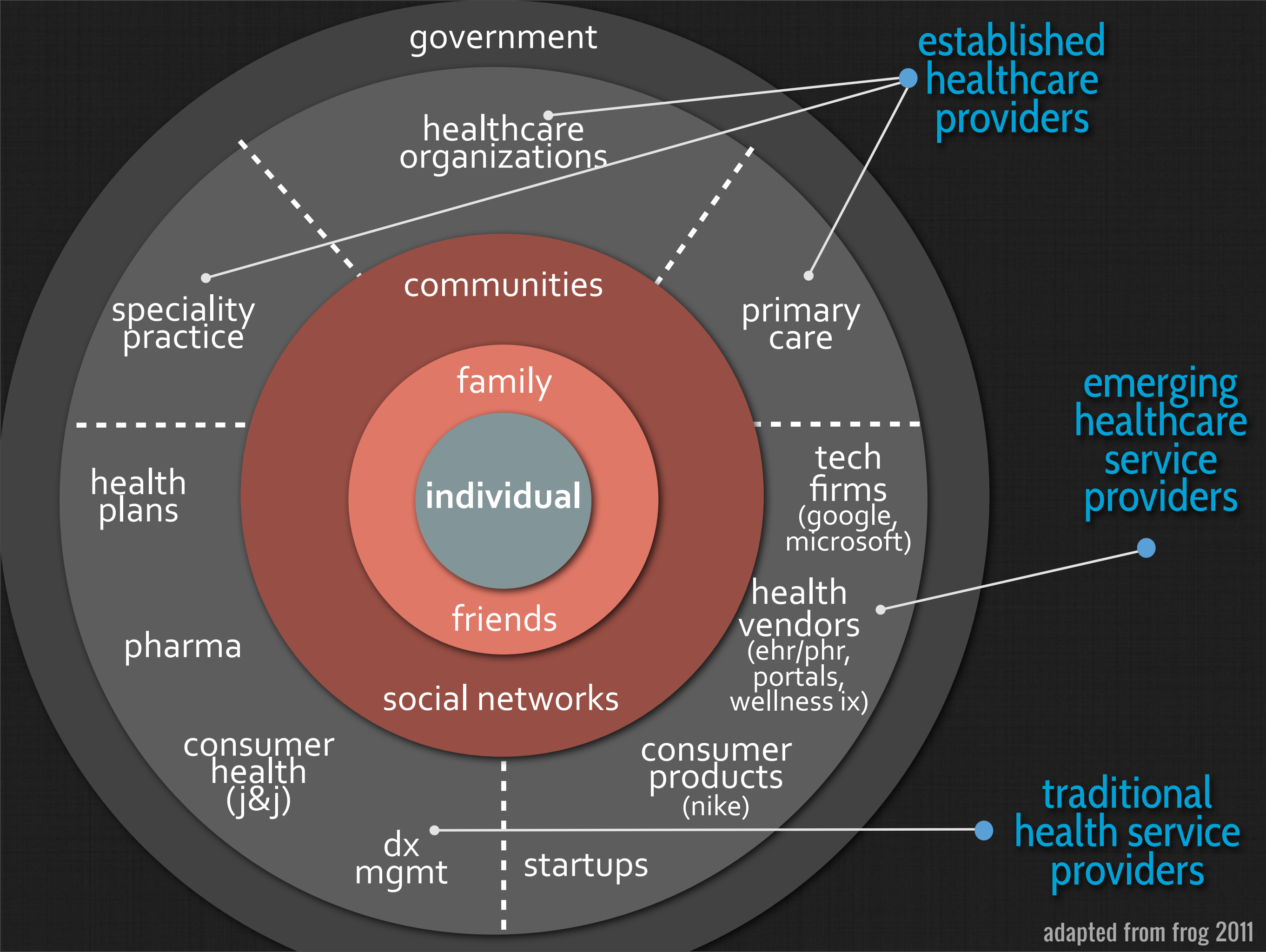


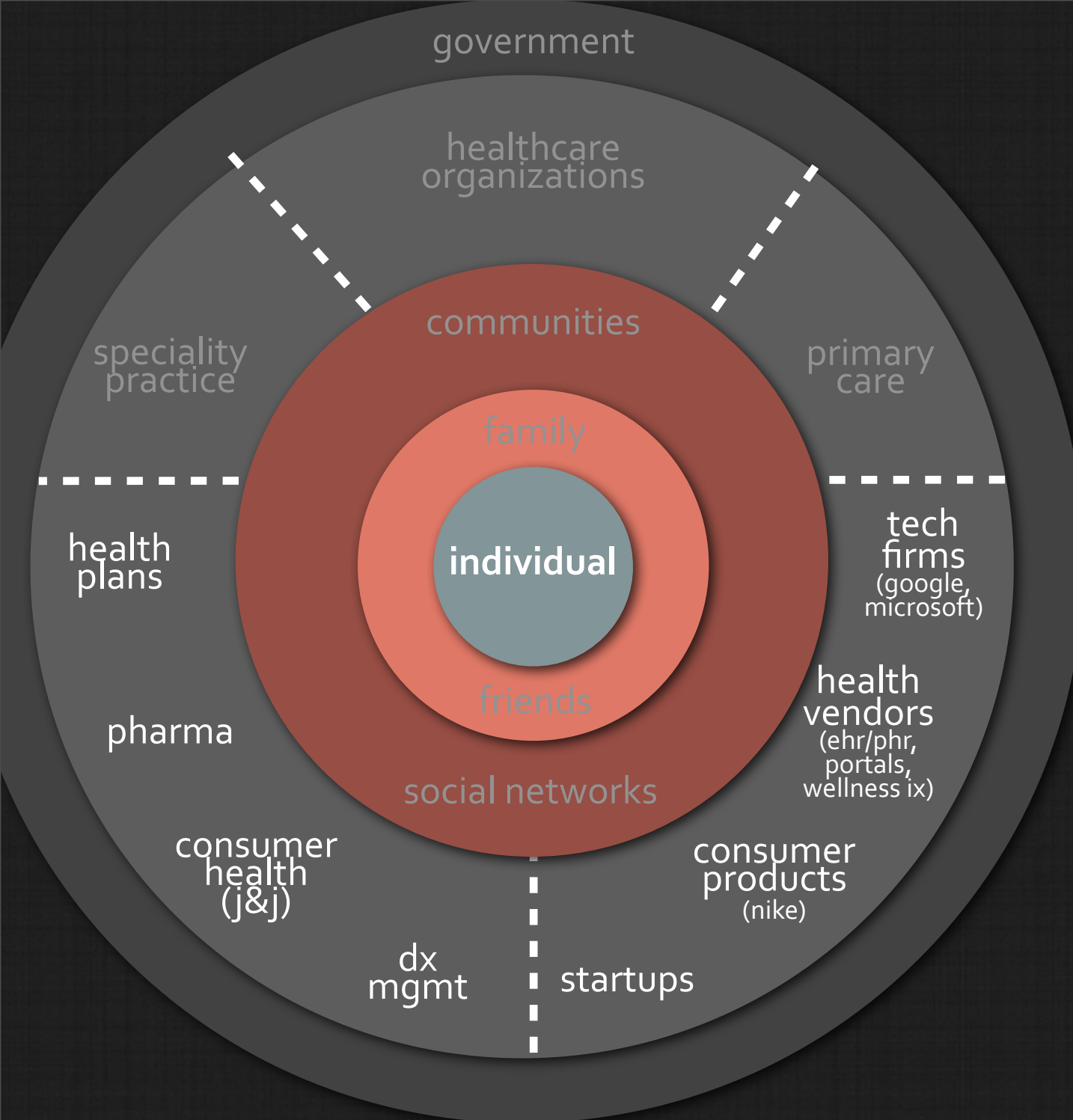


eHealth requires infrastructure.



eHealth adopters are numerous.
[and they're probably not who you think]





what are the **adoption** considerations?

how does eHealth **intervention structure** change in the setting?

what are the relevant **outcomes**?

do less **costly**, more **efficient** dissemination models exist?



how do we create new
or markets for evidence?

how do we get
evidence-based content
into non-academic
apps?

can we create
sustainable non-
commercial platforms
for eHealth
dissemination?

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disruptive?



to achieve high trials show:
reach reach

- it's not a "hit or miss" (40-80%) line"
- target specific populations

Particularly when ¹⁾ there is user human intervention
and ²⁾ participants are recruited online

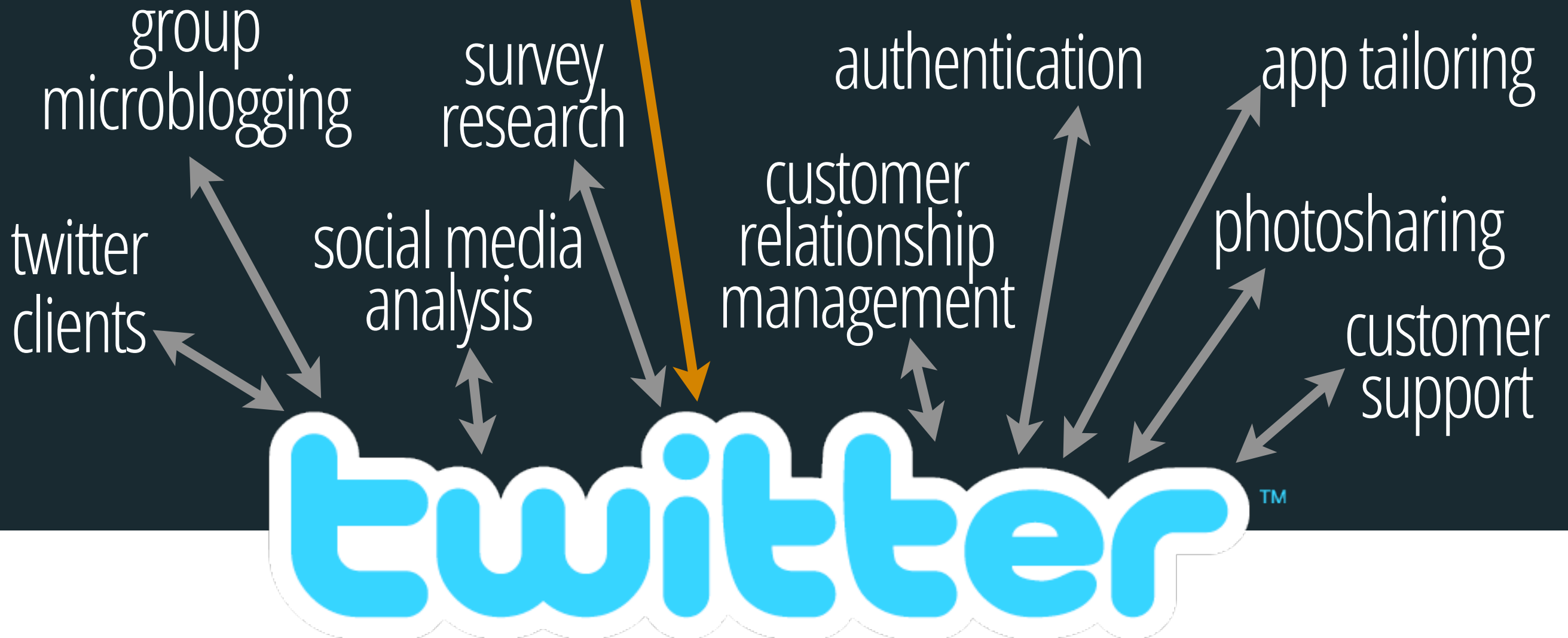
embracing **ecosystems**

“... online touchpoints where your users congregate.”



#plankaday

eHealth





sends 60 million
people each MONTH
to 3rd party apps

embracing **ecosystems**

- highly trafficked
- many developers
- built-in scalability
- low cost
- easy development
- captive users



the new
ecosystems

ehr/phr

patient
portals

hra

intranets

promoting **engagement**

- ▶ a leading adoption consideration
- ▶ reliable predictor of intervention outcomes
- ▶ sustained engagement is **challenging**
 - ▶ develop **continuously**
 - ▶ give them **choices**



Tracking

Skills training

Neighborhood

resources

Recipes

Action planning

Risk calculator

**Be Fit Be Well**

Friday, April 18

TrackingHealthy HabitsAction Plans

Main Menu

- Home
- Tracking
- Healthy Habits
- Your Neighborhood
- Strength Training
- Recipes
- Logout

Tasty and Delicious

From soups and stews to desserts and drinks, we've got healthy recipes for every taste. See them all here!



Your Raffle Points

17

[Click here for more!](#)

Search this site

search...

Login

Welcome, Erica

We hope you're enjoying Be Fit, Be Well!

Take a look at the boxes below. How are you doing so far? Are you getting close to your goals?

To enter your information, click on "Track this goal."

Sugary Drinks

We recommend that you avoid all sugary drinks.

Over the last 7 days, you had an average of 2 sugary drink(s) a day.

You're near your goal! Try to cut down on sugary drinks next week.

☒ YOU HAVE TRACKED THIS GOAL TODAY

[Track this goal](#) 

Walking

We recommend that you walk 10,000 steps every day. Your goal right now is 5,000 steps a day.

Over the last 7 days, you've walked an average of 5,709 steps(s) a day.

You're doing great! Keep up the good work.

☒ YOU HAVE TRACKED THIS GOAL TODAY

[Track this goal](#) 

Your Medicine

We recommend that you take your blood pressure medicine the right way every day.

It looks like you missed some days this week. Remember to enter your information on the site every day!

☐ YOU HAVE TRACKED THIS GOAL TODAY

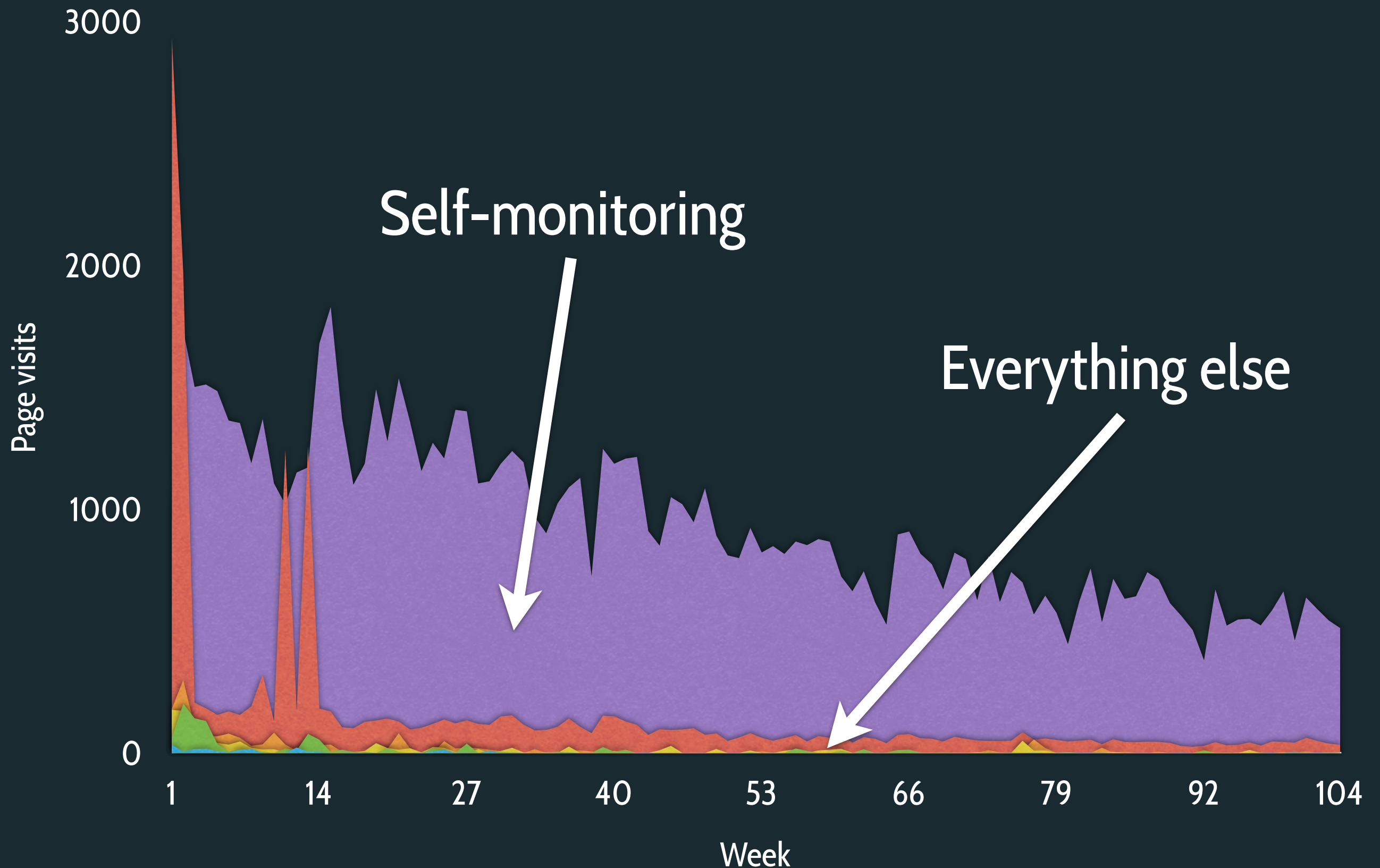
[Track this goal](#) 

Be Fit, Be Well is brought to you by the National Heart, Lung and Blood Institute, Washington University School of Medicine, Kaiser Permanente, and Dana-Farber Cancer Institute.

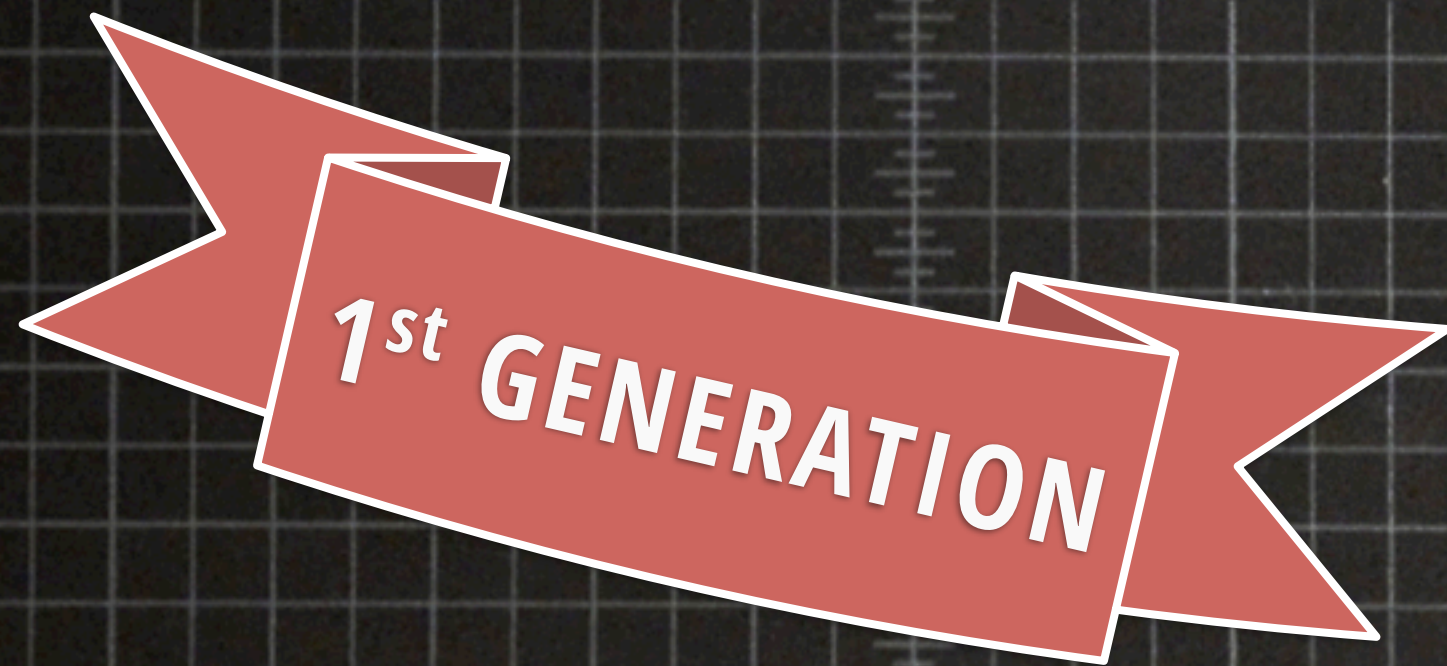
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Website page visits over 24-months



Email prompts
Tailored feedback
Goal setting
Dynamic content
Social support tools
Interactive elements
Quizzes
Games
Raffles



continuous development

responds to users:

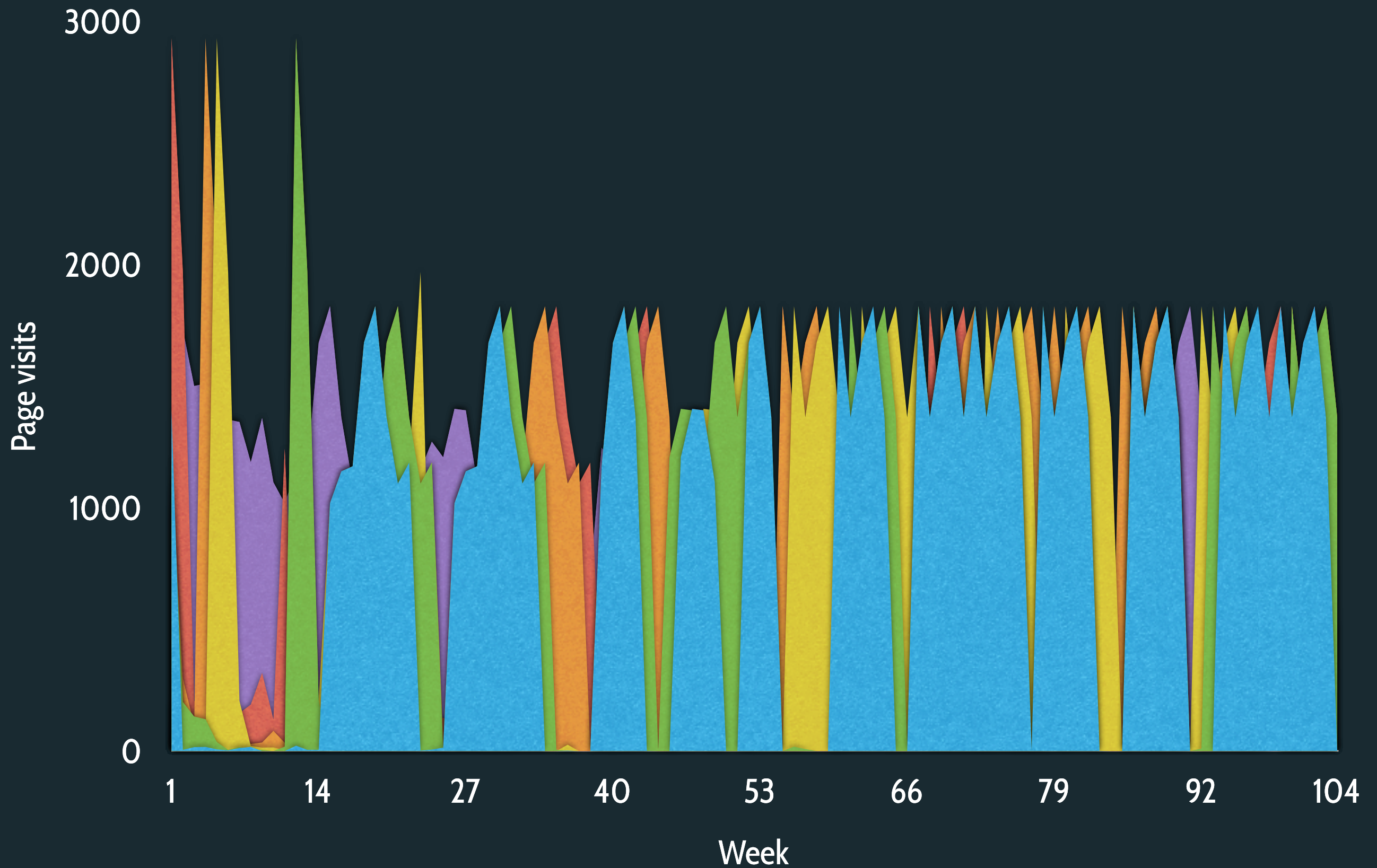
- expectations
- feedback
- behavior

promotes novelty effect

we have the designs,
but need to use them!

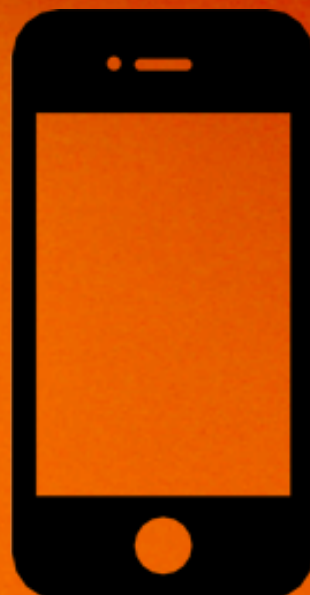


Website page visits over 24-months





or



or

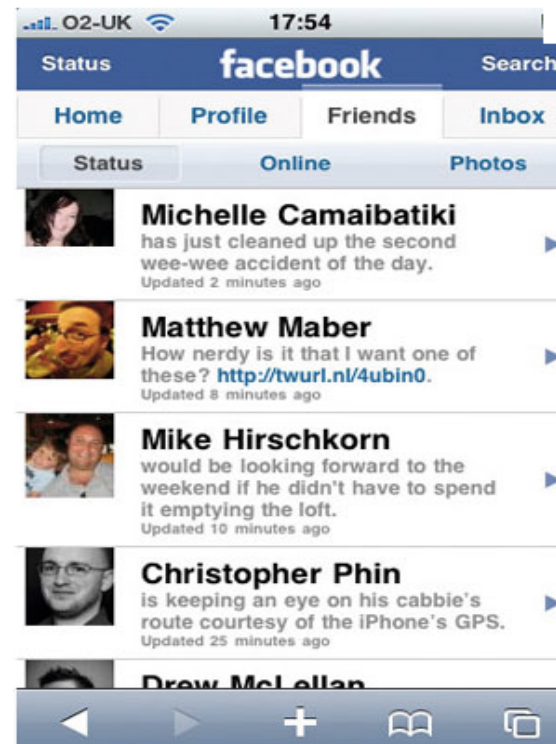


or





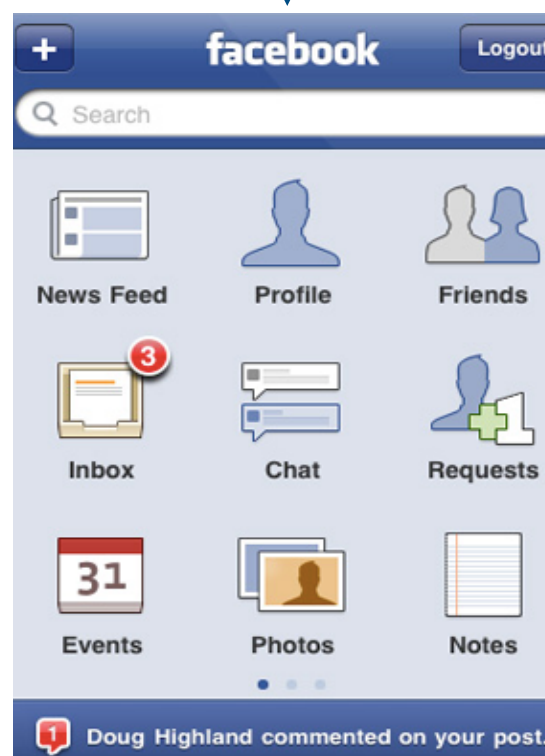
web



mobile web app



text messaging



mobile app



Bennett, Warner, Glasgow, et al.
Archives of Internal Medicine. 2012.

randomization
n=365

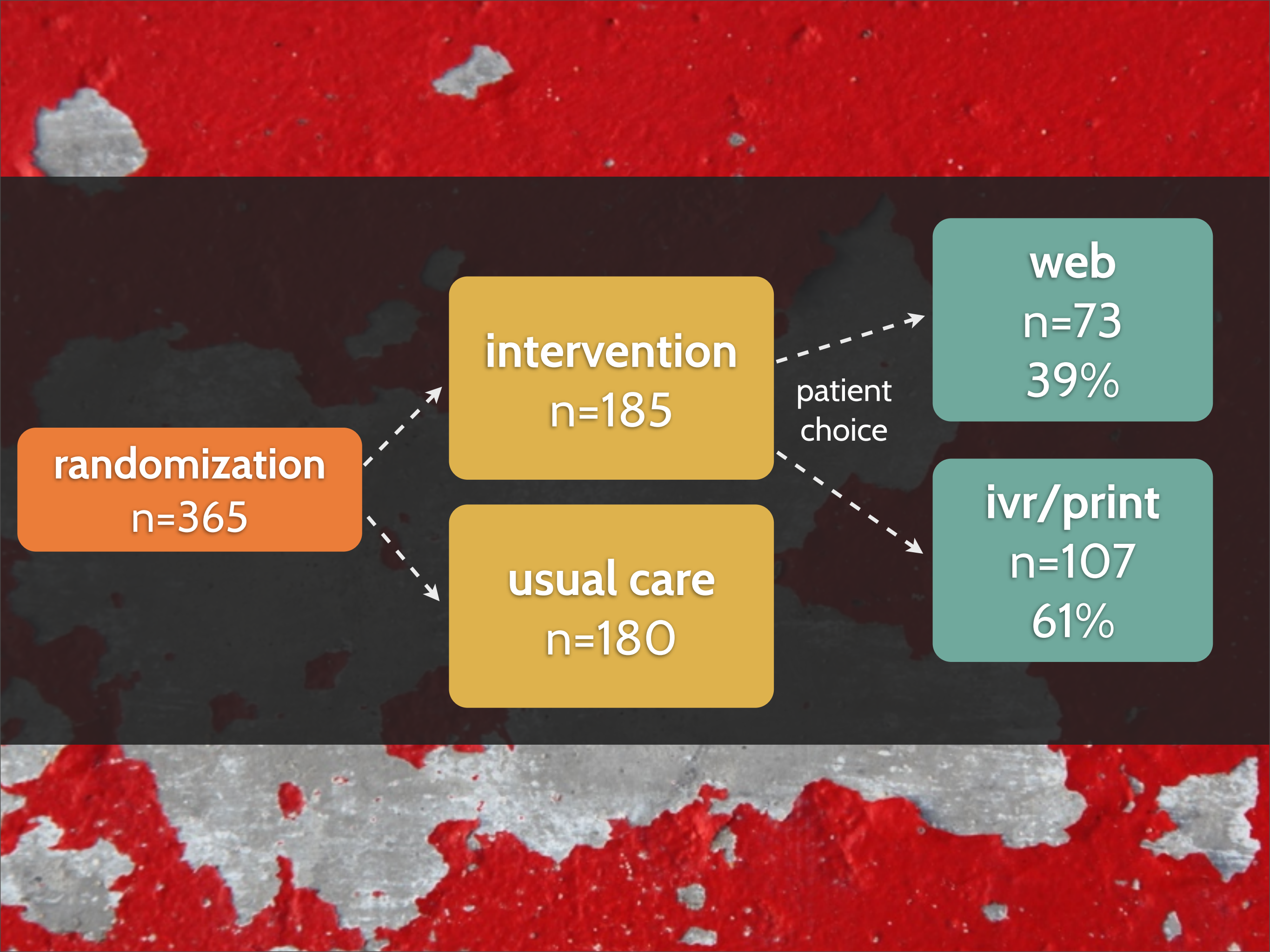
intervention
n=185

usual care
n=180

patient
choice

web
n=73
39%

ivr/print
n=107
61%



Who picked web?

- Higher education attainment
- Higher income
- Higher literacy
- Daily vs less regular internet use
- Regular Internet access at home and work
- Younger age



correlates of **web** engagement

Bachelor's degree vs. <12th grade RR=1.15 [1.03, 1.27]

>25k income vs. <25k RR=1.37 [1.14, 1.65]

High health literacy vs. low RR=1.11 [1.005, 1.23]

Daily internet use vs. none RR=1.26 [1.02, 1.56]

Work internet use vs. none RR=1.19 [1.03, 1.38]

Sugary Drinks
Instructions: Put a check (✓) if you had sugary drinks today.

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Instructions: Put a check (✓) if you had sugary drinks today.

EVERY DAY:

Follow the instructions for each healthy habit on your list.

BEFORE YOUR PHONE CALL:

1. Start with your first healthy habit. Count across and add up the number of check marks.
2. Write that number in the thick box on the end.
3. Do this for every healthy habit on your list. (If you are tracking Low-fat Dairy, count up the number of times you had low-fat dairy and write the number in the box.)

Action Plans

Week beginning _____

Your Distance D. _____

Blood Pressure Medicine

Instructions: Put a check (✓) if you took your blood pressure medicine the right way today.

Walking

Instructions: Put a check (✓) if you walked the right number of steps today.

10,000 or more steps

7,500 to 9,999 steps

5,000 to 7,499 steps

Day 1

Day 2

Day 3

Day 4

Day 5

Day 6

Day 7

Your Weekly Totals

Place sticker here for goal #3

bennettlab.org

Place sticker here for goal #4

Box A

Box B

Box C



correlates of **ivr** engagement

None

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disruptive?



“An innovation that is **disruptive allows a whole new population of consumers access to a product or service that was historically only accessible to consumers with a lot of money or a lot of skill.”**

--Clayton Christensen

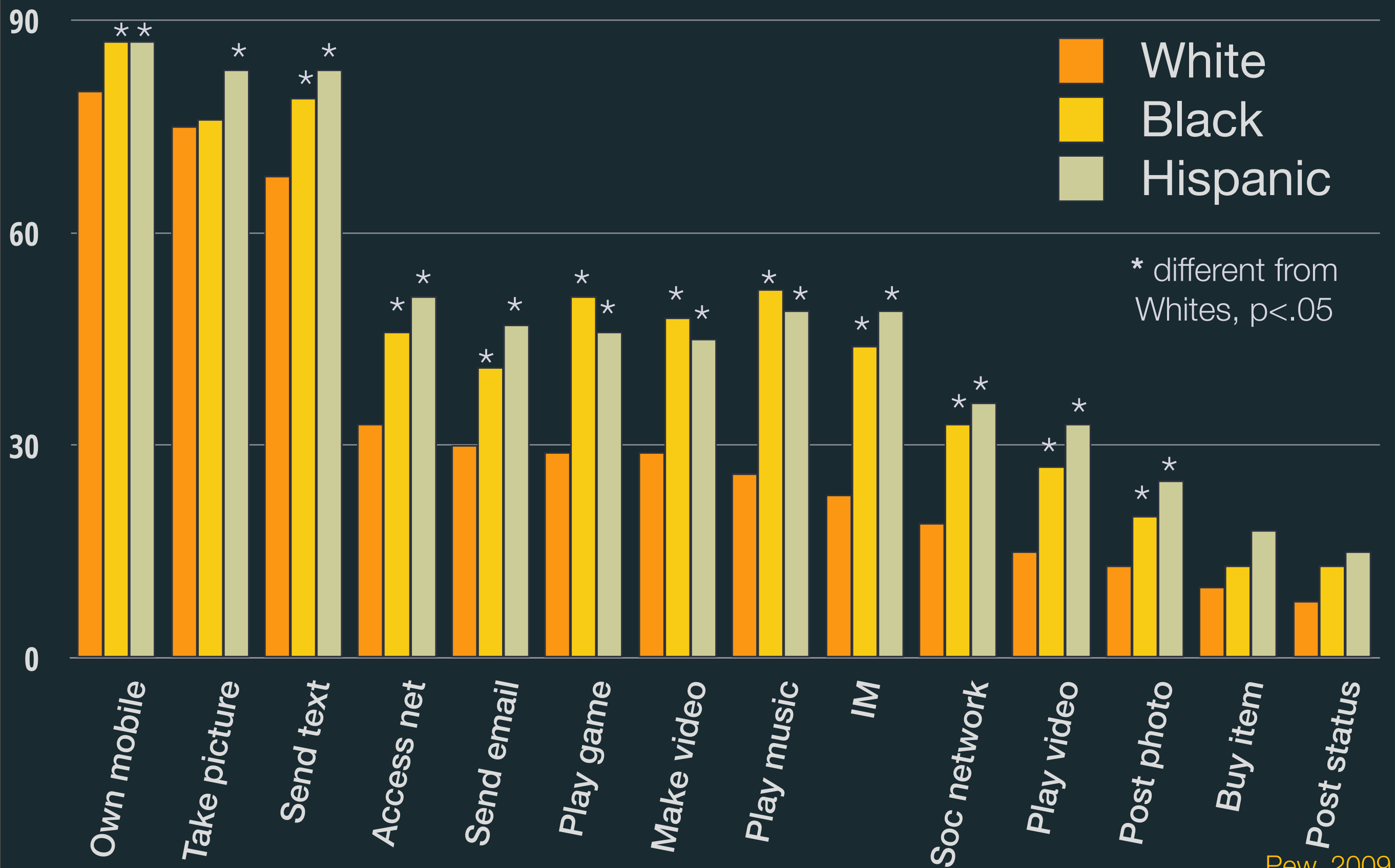
The [old] digital divide

“...bridging the digital divide is not just the morally right thing to do, it is the smart thing to do.”

-- Bill Clinton, 2000



Mobile data use by race, 2009







mHealth

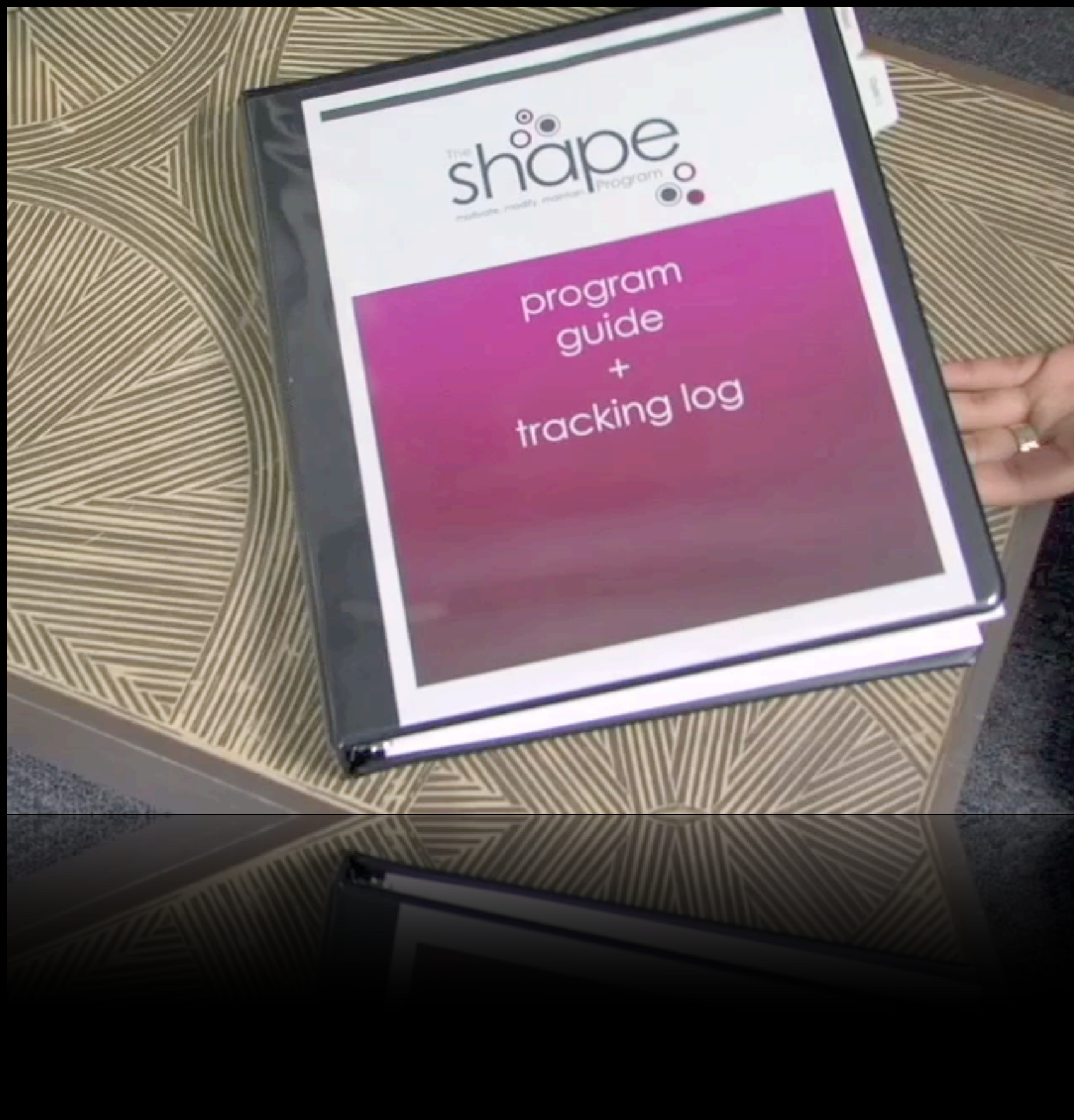
- ▶ ubiquitous, high reach
- ▶ mobile use is increasing dramatically
- ▶ low development and adoption costs
- ▶ device proximity is a huge asset

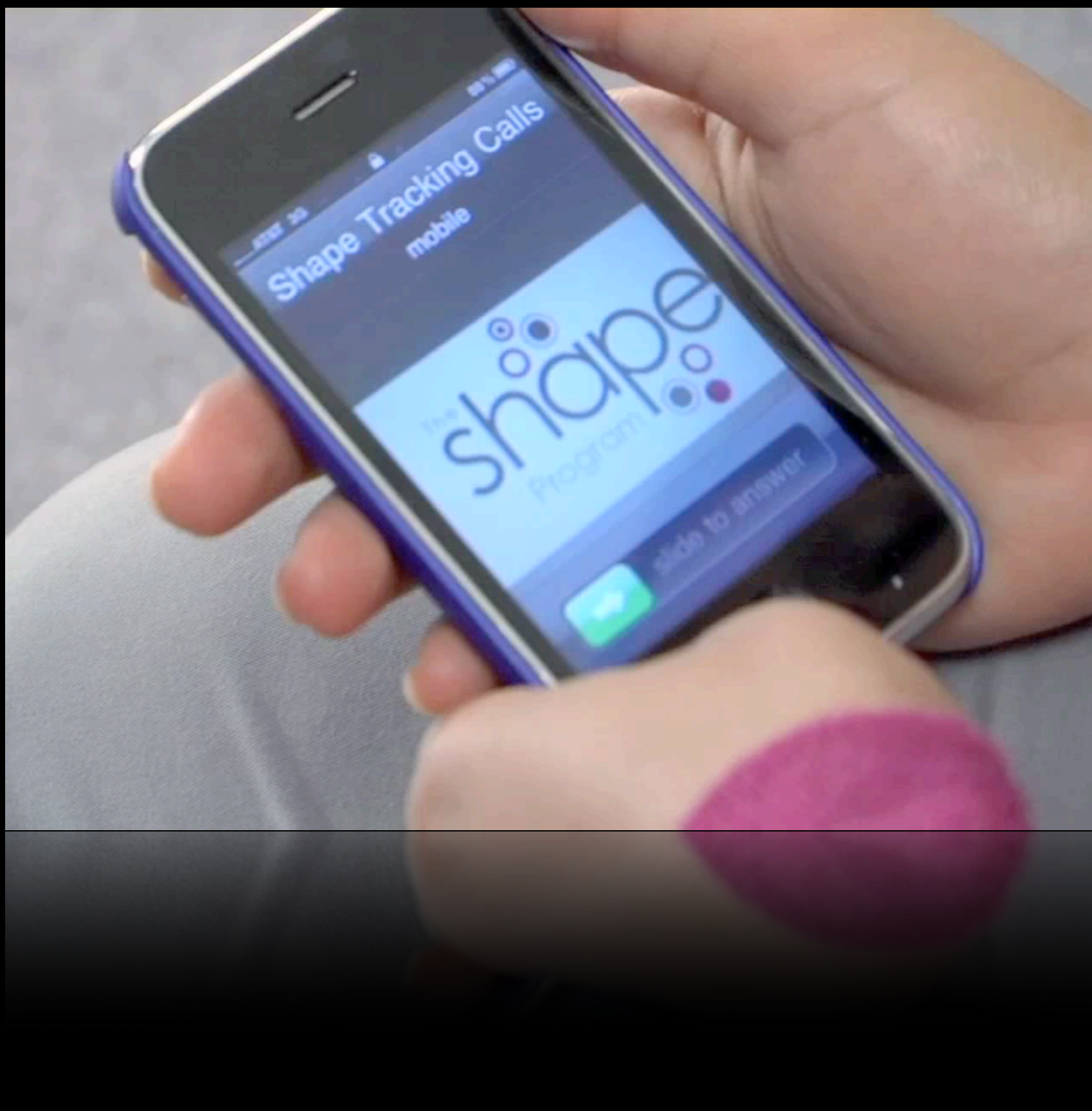
weekly iOTA self-
monitoring via
weekly IVR/text

tailored print
materials

12 coaching calls







costs 1/8 of BFBW

shape





Duke University and BennettLab help patients manage weight loss by automating participant workflow with Twilio

HIGHLIGHTS

- Quick development and integration of voice/SMS capabilities in weeks
- Outbound phone and SMS help participants with reminders and status updates
- Humanizing the automated system of calling participants

WEBSITE

www.bennettlab.org/

<http://www.shapeplan.com/>

"The low cost and unending flexibility of Twilio make it possible for programs like this to be leveraged from 200 participants to 20,000. This means that it could be easily and quickly implemented in communities all over the country."

- Dr. Gary Bennett
Duke University

Helping Americans lose weight remains one of the major challenges of the 21st century. Nationwide, over two-thirds of adults are overweight, and the rates are higher among socially disadvantaged populations. Recent figures show that obesity rates are higher among African American women (49%), compared to their non-Hispanic white counterparts (31%). To combat this epidemic, it will take more than fad diets and relying on individuals to change their lifestyles. It will take creative innovation and a population-relevant, holistic approach. This is what Dr. Gary

AUTOMATE WORKFLOWS

- Remove manual processes to create seamless and positive customer



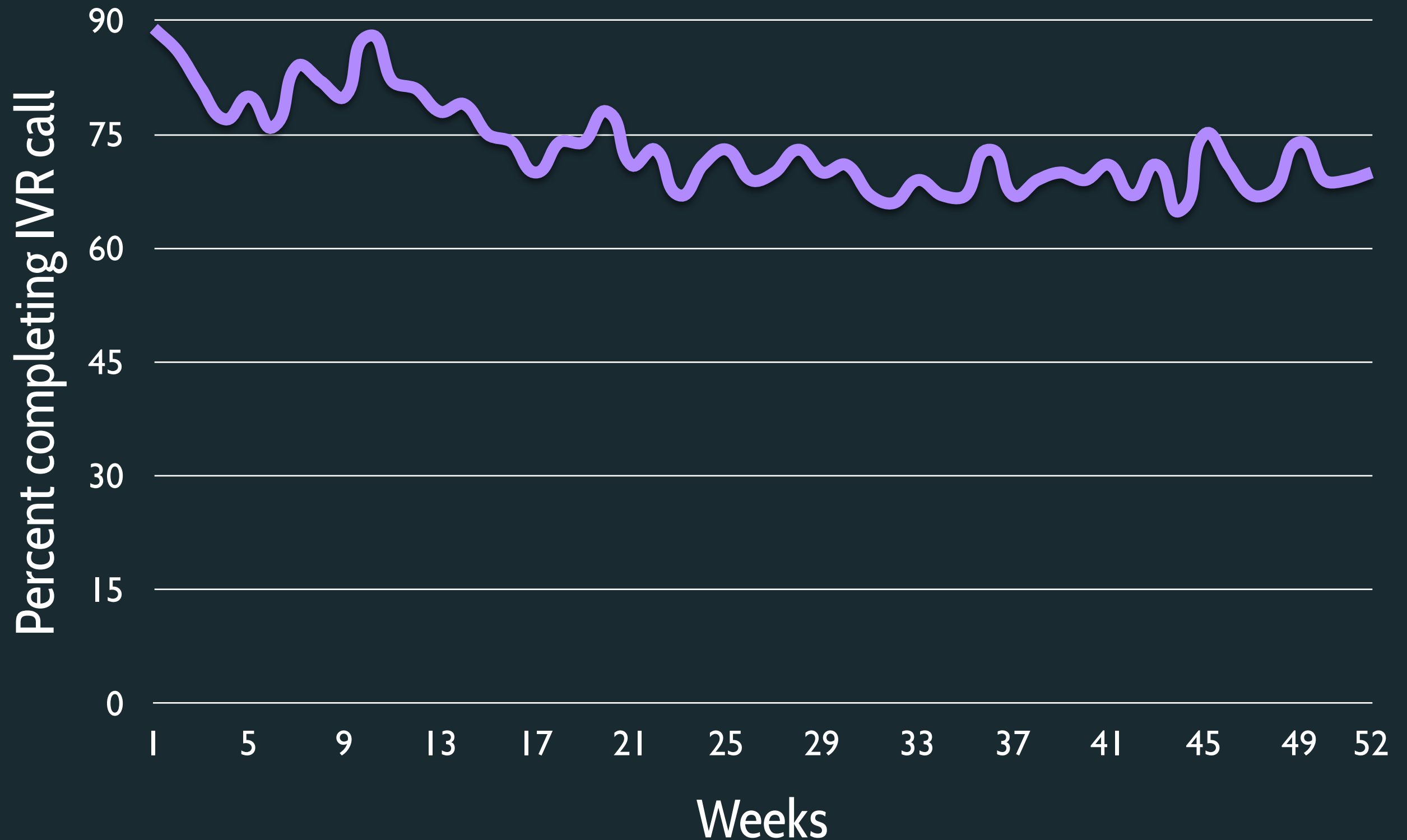
costs 1/8 of BFBW with
uncapped IVR scalability

minimal custom coding

high patient engagement



Shape IVR call completion by week

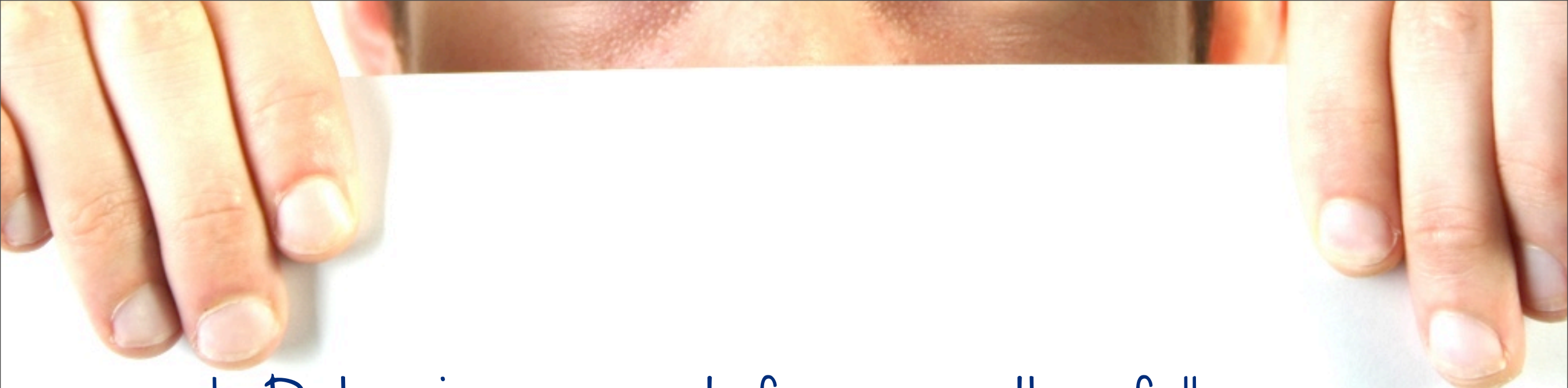




costs 1/8 of BFBW with
uncapped IVR scalability
minimal custom coding
high patient engagement
high patient/provider
satisfaction

shape





1. D&I science must focus on the full range of adopters in the eHealth market.

2. We need to narrow public-private gaps.

3. We can leverage modern design principles to enhance the reach and engagement of evidence based interventions.

4. mHealth might help improve disparities.

dukeobesity.org @drgarybennett

A close-up photograph of a person's hand holding a white rectangular card. The card has blue text written on it. The background is a plain, light color.

dukeobesity.org

@bennettbanter