

Group Health Research Institute

Data Visualization Tool



Karmin Mauritz and Hannah Sherwood
iSchool Founding Board Meeting, 3 May 2013



Hannah Sherwood, User Experience Designer

- 2nd year MSIM student
- Focus on information architecture & interaction design
- Special interest in mobile technologies
- Internship experience with Microsoft Research & Costco



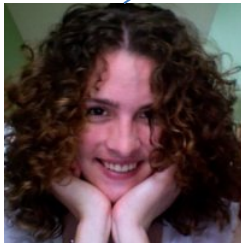
Karmin Mauritz, User Experience Designer

- 2nd year MSIM student
- Focus on information architecture & interaction design
- Previously a software engineer at National Instruments
- Internships with Seattle UX/IA consulting agencies, Term Management and RampGroup





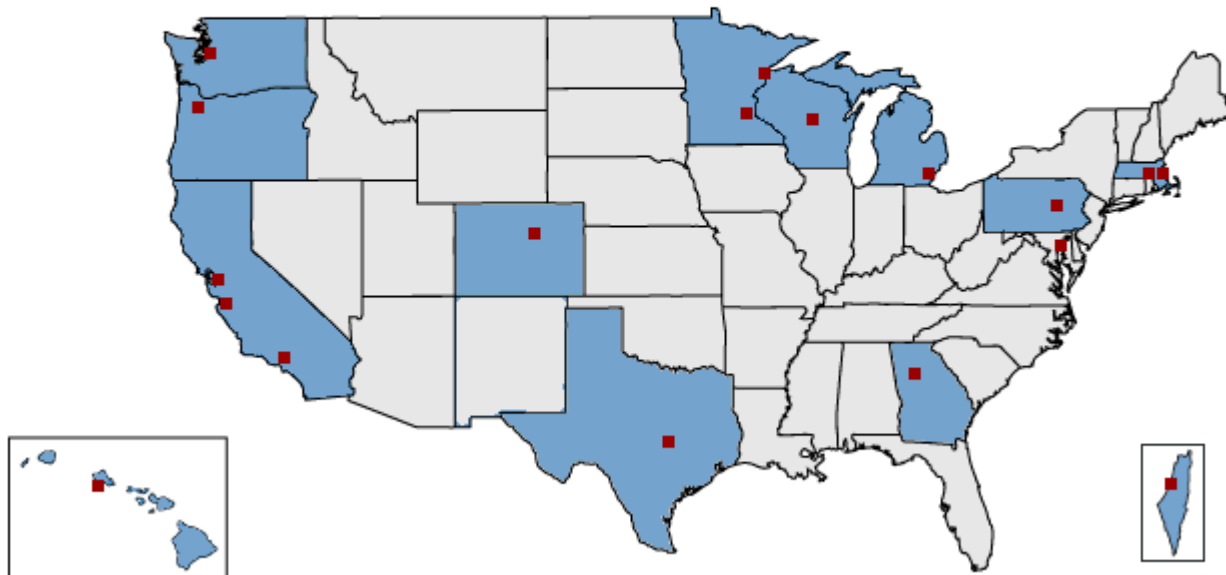
HMO Research Network / Mental Health Research Network



Designing an Interactive Data
Visualization Tool for Mental Health Data

HMO Research Network / Mental Health Research Network

HMO Research Network Members





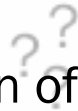
project goals



Bridge a technical divide



Encourage data-driven decision making



Promote exploration of information and self-service

Provide translational research

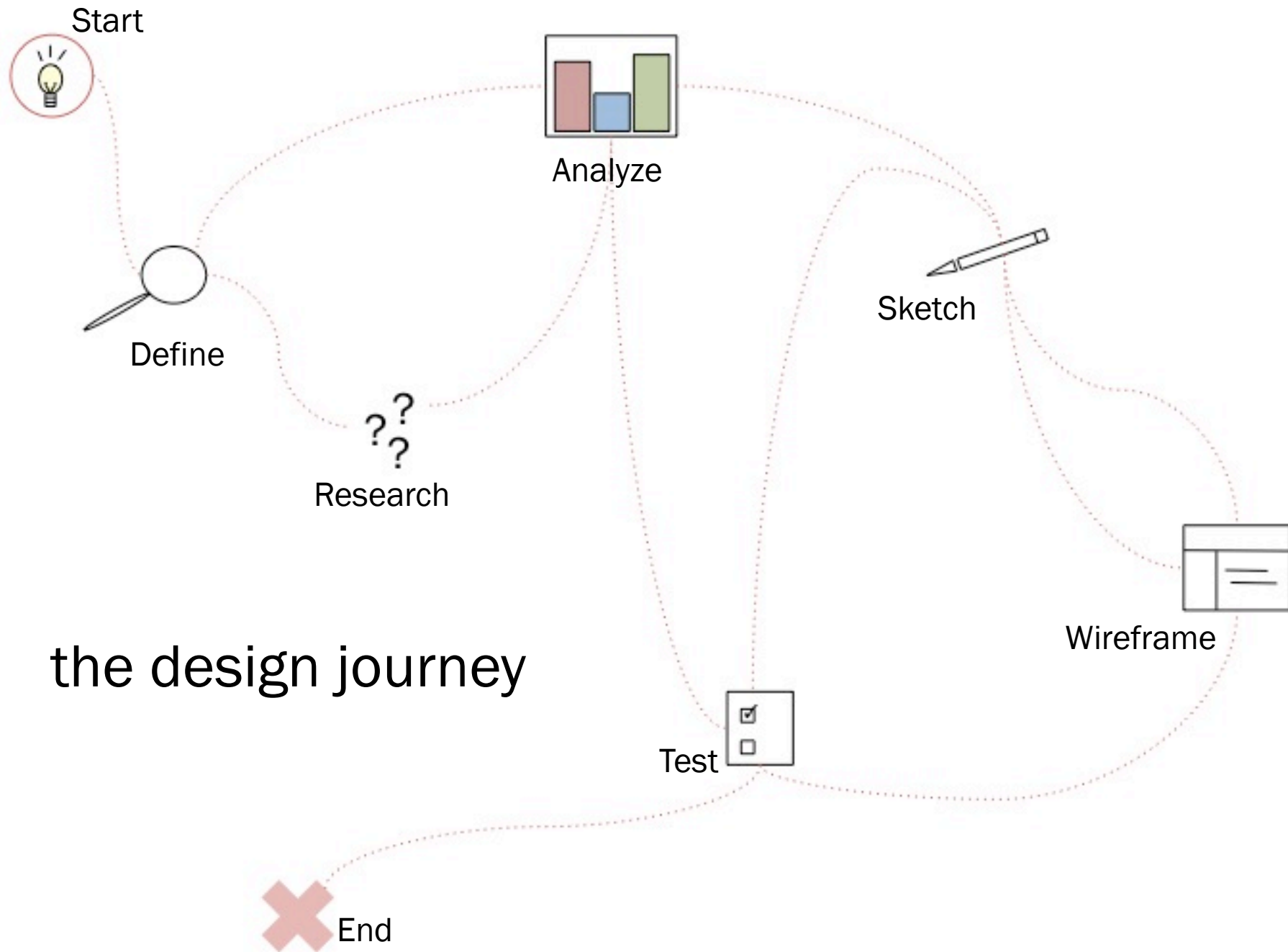


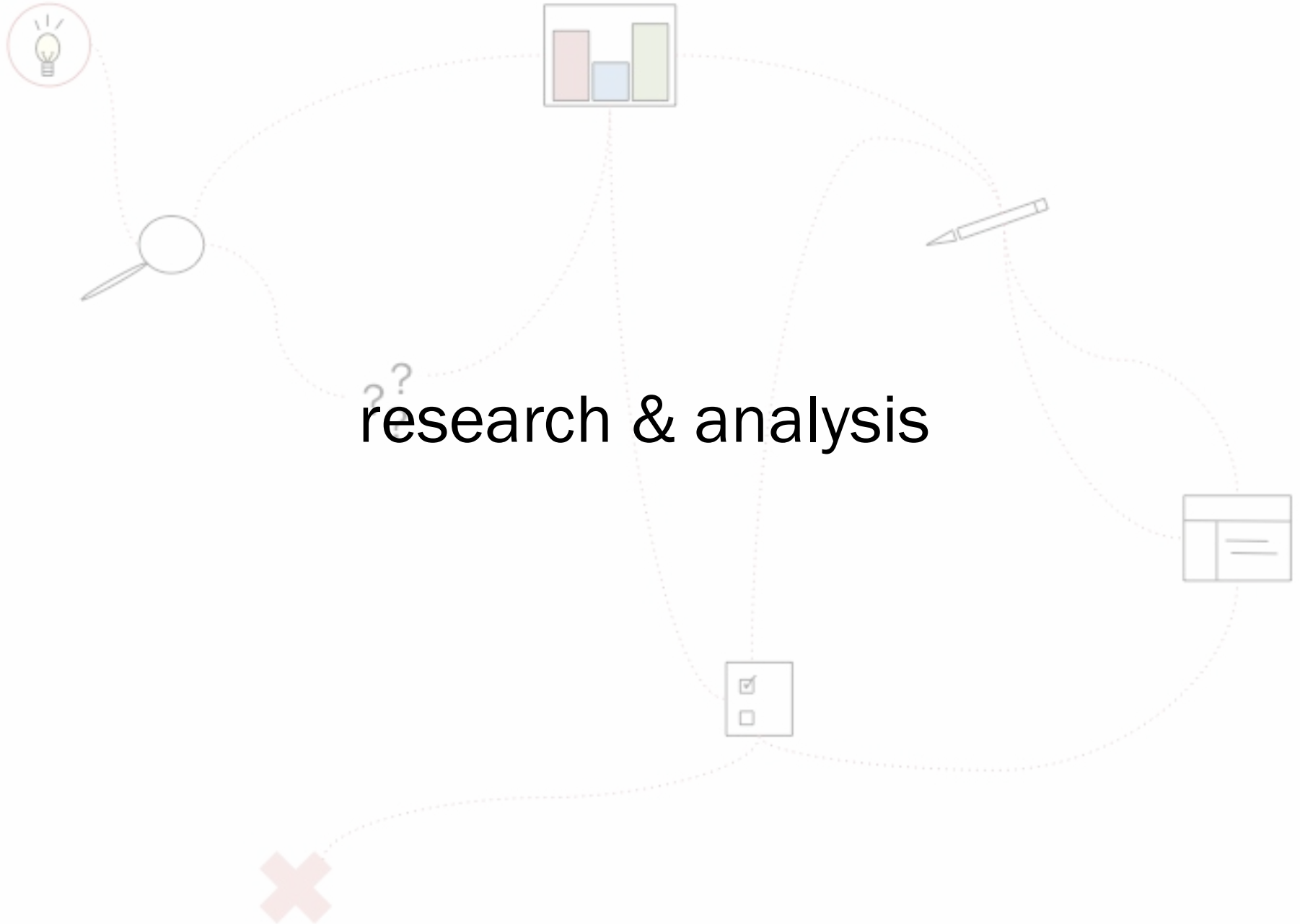
stretch goal

Make extensible to other health data











user personas; sample questions

Researchers:

“Are we prescribing more stimulants to children than other HMO’s? Are these prescriptions increasing or decreasing over time?”

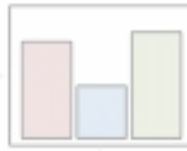
“Are there enough patients to warrant a research study that have been diagnosed with both Depression and Anxiety who are also currently taking anti-depressants?”

Clinicians:

“How do trends for my clinic compare to the regional and/or the national averages (benchmarks) for diagnoses of ADD in male children?”

NIMH:

“Are people taking narcotics medication more likely to attempt suicide?”



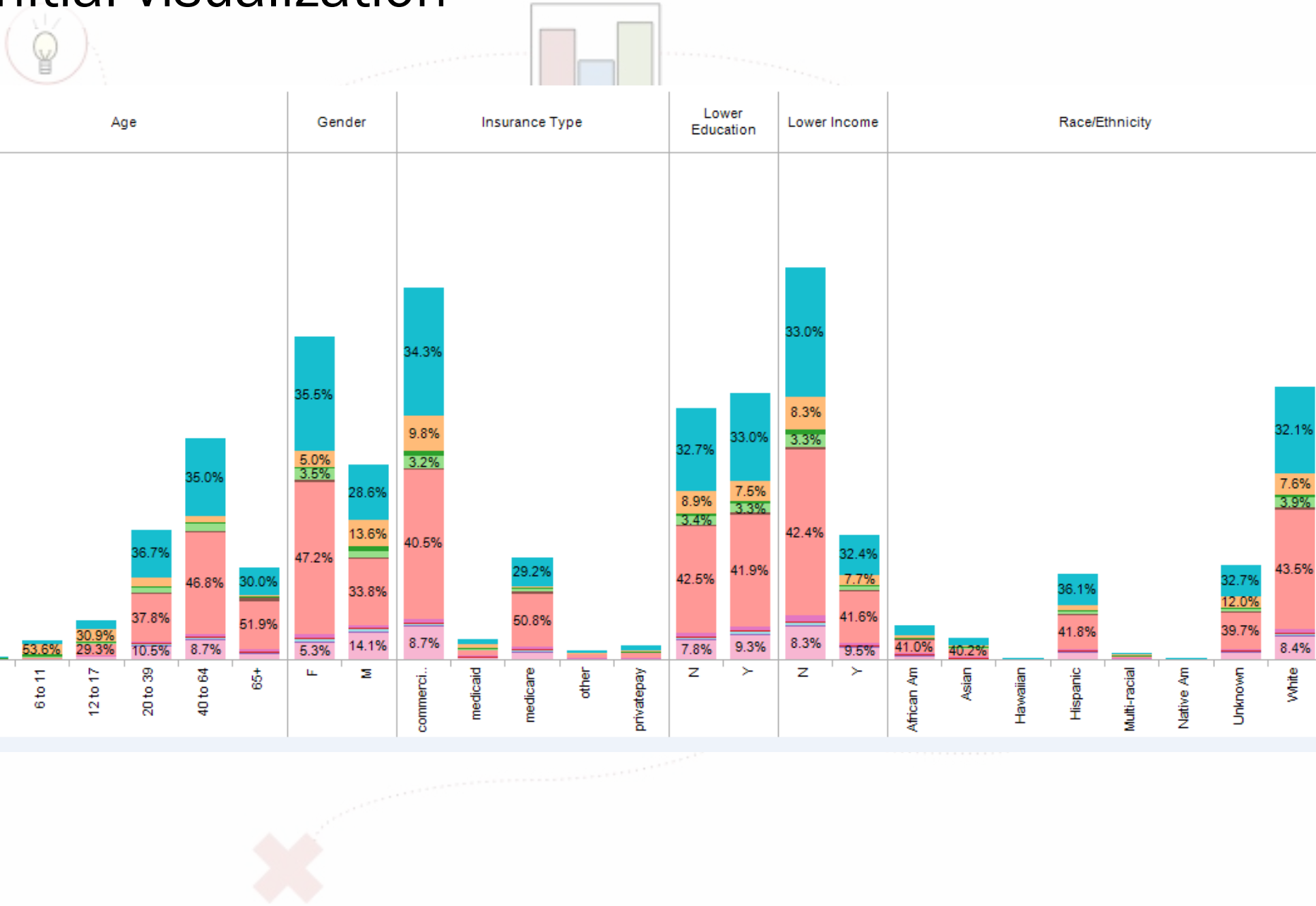
“the analysis of most (probably all) data sets should begin with an initial attempt to understand the general characteristics of the data by graphing them”

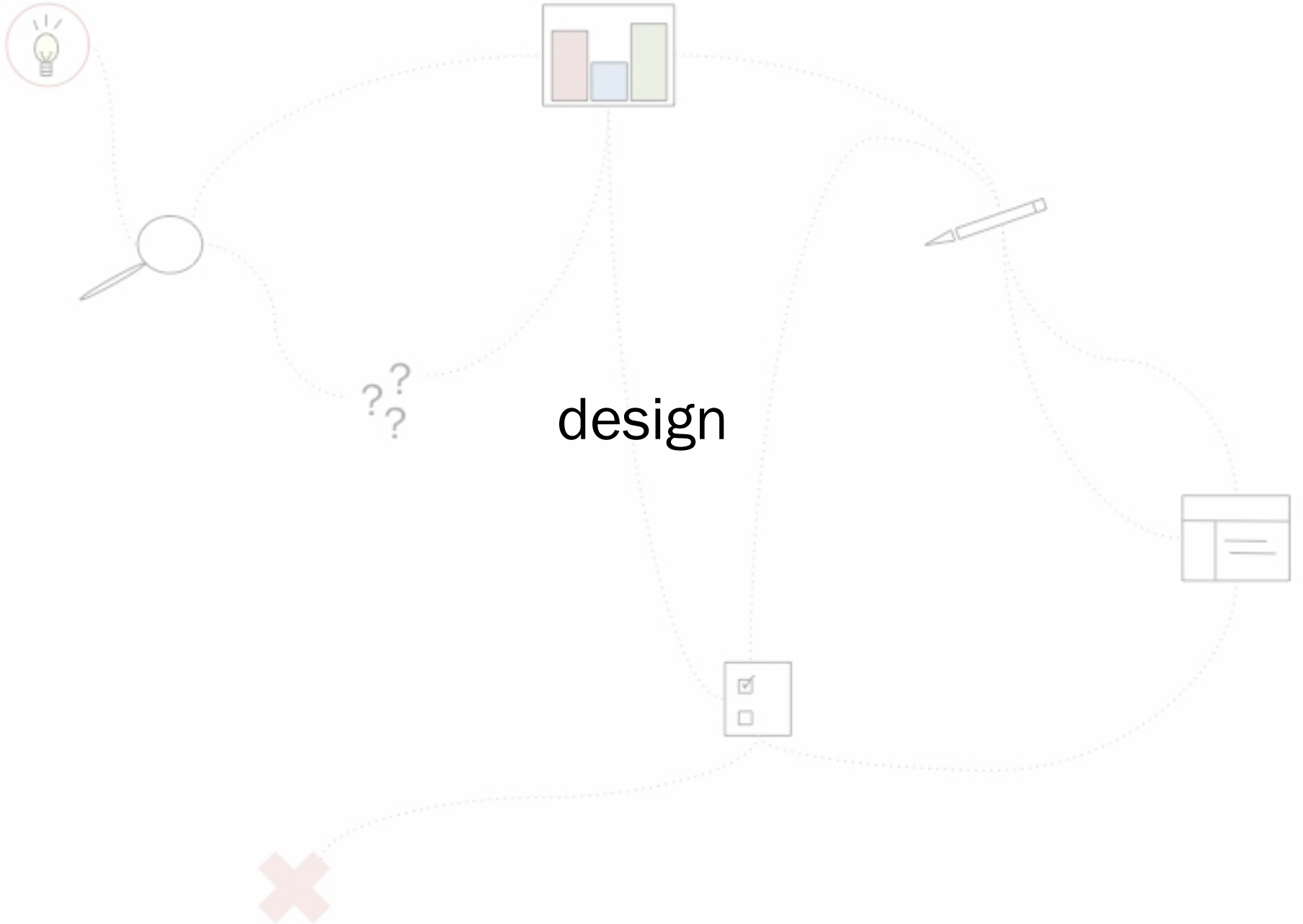
Everitt & Hothorn

Handbook of Statistical Analyses using R



initial visualization







user requirements



design challenges

How do we display “rate” in a clear, meaningful way?

How do we show statistical significance, especially for users who may not have a strong understanding of the term?

Make sure that...

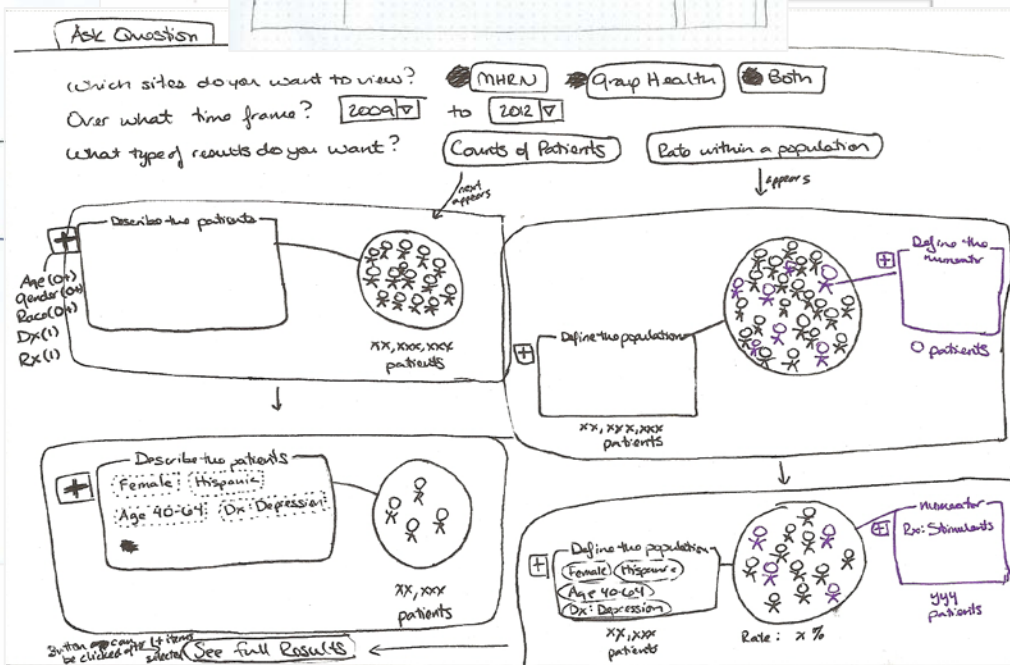
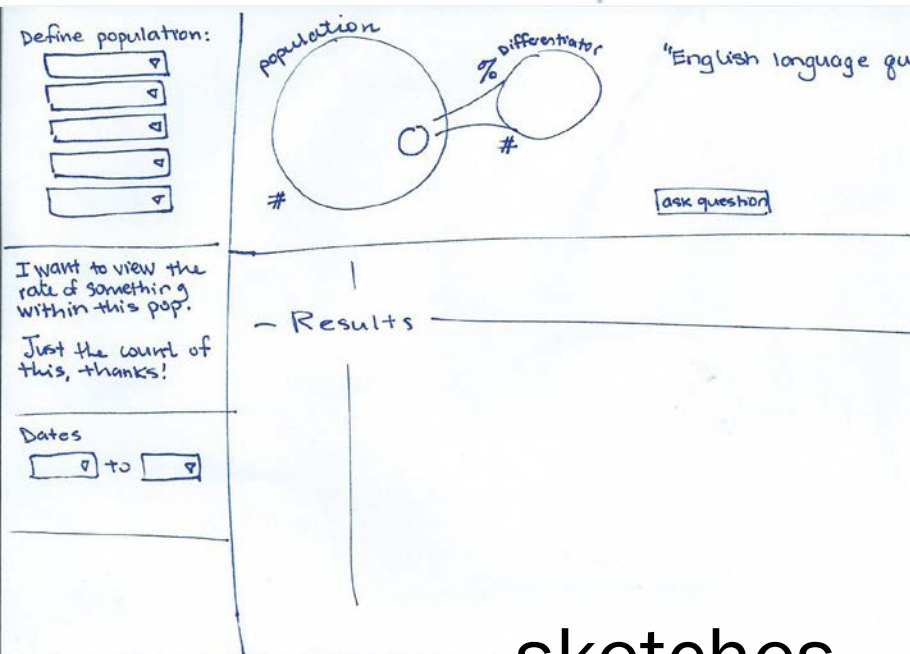
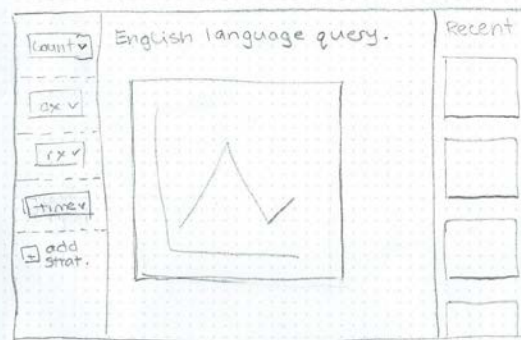
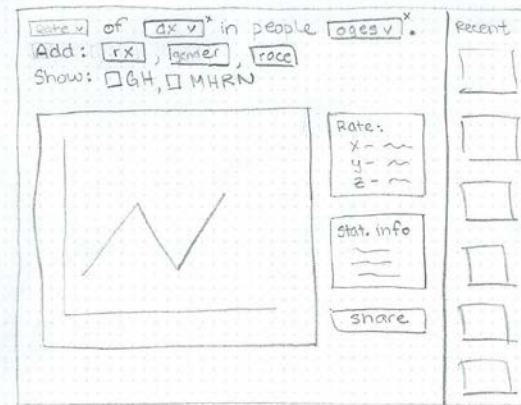
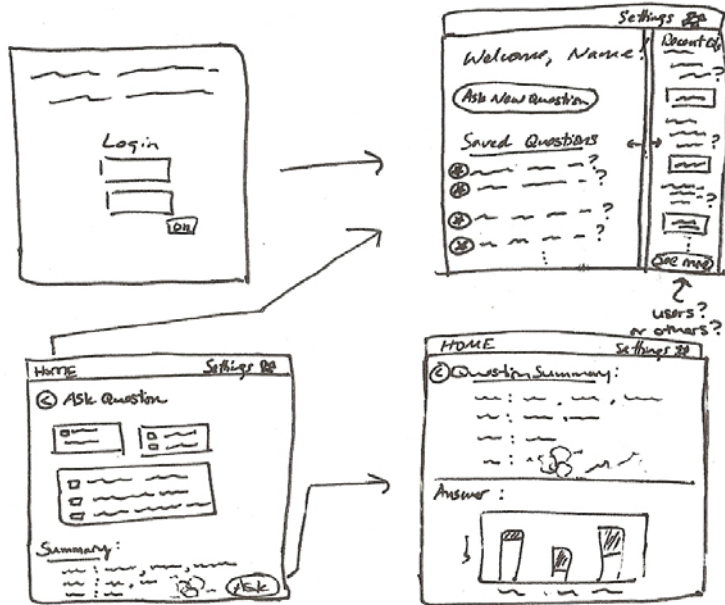
- the user understands the question she’s asking

- the data is sufficiently de-identified to prevent privacy concerns

Sites are reluctant to share data and don’t want to “look bad”

Who are our users? Most of our user base does not yet exist; they aren’t aware that the data even exists!





sketches

wireframes

Ask Question
Browse Questions

See what questions other people are asking!

Recently Asked Questions

How many caucasian male patients between the ages of 0 - 5, 6 - 11, 12 - 17, and 18 - 19 in 2010 were diagnosed with Attention Deficit Disorder?

How many patients have been diagnosed with both Depressive Disorder and Anxiety Disorder?

How many and what percentage of female hispanic patients between 2009 and 2011 were diagnosed with Possible Self-Inflicted Injury or Self-Inflicted Injury and were taking Stimulants (any)?

How many and what percentage of patients diagnosed with Attention Deficit Disorder are in psychotherapy?

See More...

Question type: "view how rates or counts of diagnoses and treatments have changed over time"
Change

You asked: How has the *rate of anti-depressants* as a treatment changed between 2011 and 2012 in female patients between the ages of 0 and 18 and diagnosed with *depressive disorder*?

Graph

Table

Statistical information

What is your population?

race

all

gender

female

age

0 - 18

diagnosis

depressive disorder

treatment

all

What is the time period?

From

01/11

To

12/11

I want to...

view the rate of something within this population

treatment

anti-depressants

race

all

view just the count of the defined population

Population:

Rate of:

taking anti-depressants

Your question is:

What percentage of female patients ages 0 to 18 who have been diagnosed with depressive disorder are taking anti-depressants?

Ask question

female, ages 0-18, with depressive disorder

Ask Question
Browse Questions

Ask Question > Patient Rate / Count Question

Selection Criteria

Question Summary

Demographics

Gender

Female

Age

Any

Race / Ethnicity

Hispanic

Diagnosis

Patient Diagnosis

Multiple Selected

☒ Any Selected
☐ All Selected

Treatment

Treatment

Stimulants (any)

Date Range

2009

to

2011

Data Type

☒ Count of Patients
☒ Percentage of Patients

within total enrolled population

Location

☒ Mental Health Research Network (MHRN)
☒ Group Health Cooperative (GHC)

Your question is:

How many, and what percentage, of hispanic, female, patients between 2009 and 2011 were diagnosed with Possible Self-Inflicted Injury, or Self-Inflicted Injury, and were taking Stimulants (any) ?

Results

☐ Show Breakdown by Age
☐ Show Breakdown by Diagnosis
☒ Show Annual
☐ Breakdown

Table View

Location	Year	Count of Patients	Percentage
MHRN	2009	2,222	2.2%
MHRN	2010	2,222	2.2%
MHRN	2011	2,222	2.2%
GHC	2009	33	3.3%
GHC	2010	33	3.3%
GHC	2011	33	3.3%

Statistics

Location	Year	Mean Annual Count	Std Dev of Count	Mean Percentage
MHRN	Overall	2,222	22	2.2%
GHC	Overall	33	3	3.3%

Share Link to Results

Print View

Download Table

prototype demo

Mental Health Research [My Settings](#)

[My Dashboard](#) | [Ask Question](#) | [Browse Questions](#)

Which site(s) do you want to view?

Over what time frame?
2009 to 2012 [Ask Another Question](#)

What types of results are you interested in?

Who is in your population?
age: 0 - 18
dx: Attention Deficit Disorder

xx,xxx patients at MHRN
y,yyy patients at Group Health

+

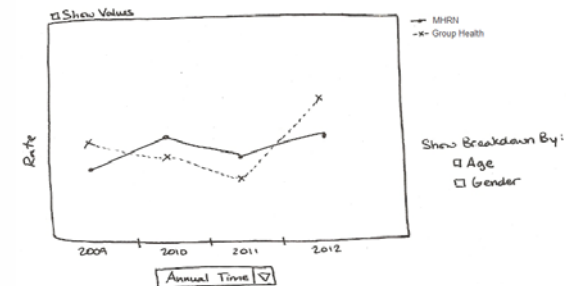
What do you want the rate of?
rx: Stimulants (any)

xx,xxx patients at MHRN
y,yyy patients at Group Health

x.x% at MHRN
y.y% at Group Health

Detailed Results

“How has the rate of stimulants use amongst children diagnosed with Attention Deficit Disorder changed from 2009 to 2012?”



“How does Group Health compare to the entire Research Network?”



next steps



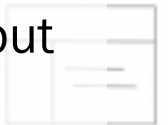
Usability testing on current prototype → UI refinements
At least one more round; more if time permits

Contacting Tableau for purchase and implementation information



“Sell” our dashboards / the benefits of Tableau to Group Health

We may not see the tool fully implemented before we graduate, but
we would like it to be on its way there





contact us

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questions?

