Building Your Data Toolbox

Gregory Basham, Director of Care Coordination
Kirk Broome, PhD, Sr. Director of Transformation
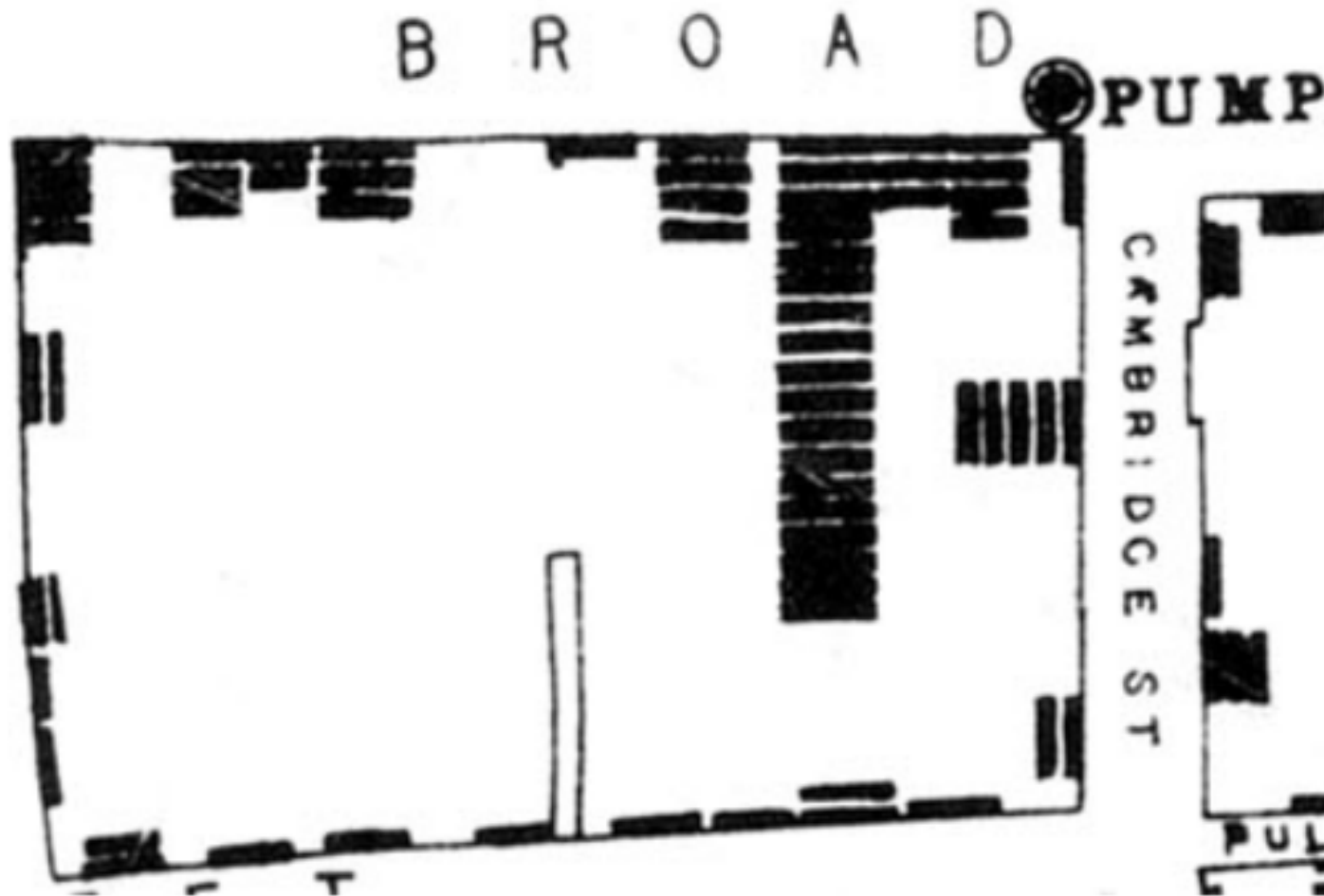**Julia E. Brown, BSN, RN**, Nurse Informaticist
Camille Patterson, PhD, Director of Research
Linda K. Perna, PhD, Sr. Evaluation Specialist

A Brief History
of Data-Driven Care

John Snow's Cholera Map, 1854

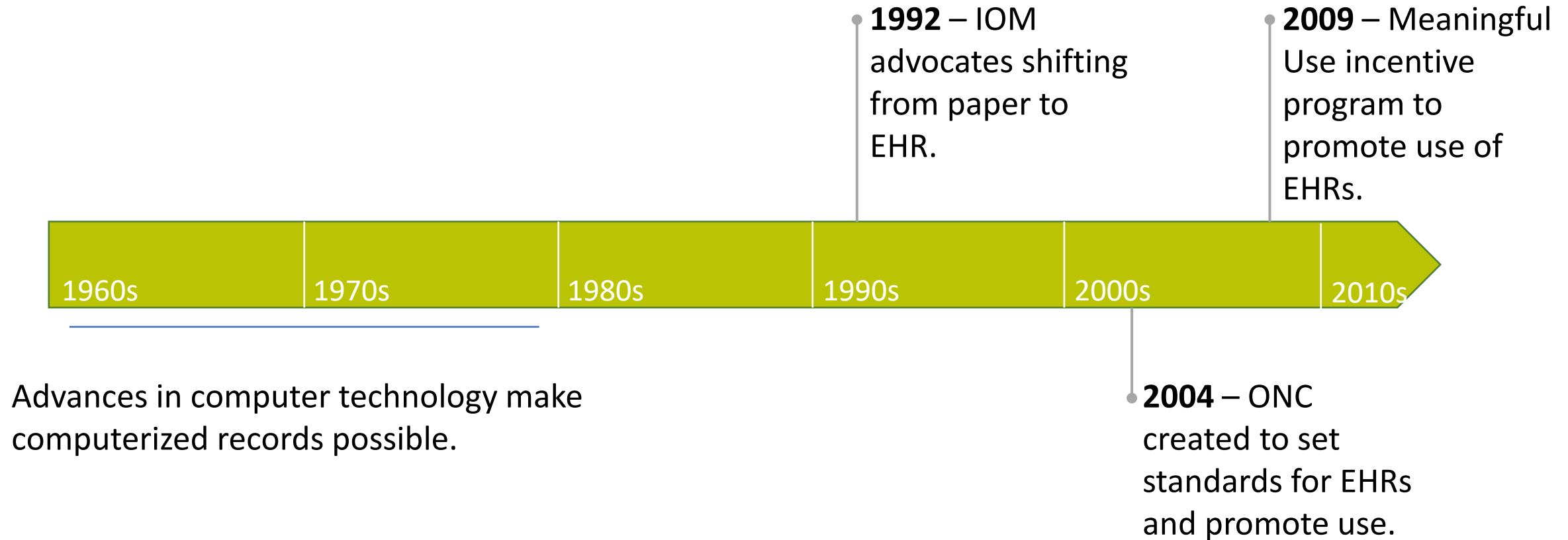# Medical Record of the 1900s (or 2000s?)

How do you use it?

"It is hard to do anything with a traditional medical record besides write in it."

- Powsner & Tufte (1994)

mhmrtarrant
WE CHANGE LIVES

Computerized records

Early timeline of electronic health records

1992 – IOM advocates shifting from paper to EHR.

2009 – Meaningful Use incentive program to promote use of EHRs.

1960s	1970s	1980s	1990s	2000s	2010s

Advances in computer technology make computerized records possible.

2004 – ONC created to set standards for EHRs and promote use.

Evans (2016), *IMIA Yearbook of Medical Informatics*

How do you use it?

"Medical records will soon be computerized, making them more legible but hardly more comprehensible. Data are just as easily lost in pages of printout as in tangles of handwriting."

- Powsner & Tufte (1994)

mhmrtarrant
WE CHANGE LIVES

How do you use it?

"Medical records will soon be computerized, making them more legible but hardly more comprehensible. ==Data are just as easily lost in pages of printout as in tangles of handwriting=="."
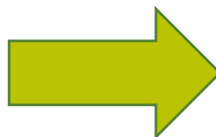
- Powsner & Tufte (1994)

mhmrtarrant
WE CHANGE LIVES

Data Sharing

- Continuity of Care Documents (CCDs)

- Querying data

- Connecting to other provider EHRs

  - Getting the "right" people in the room
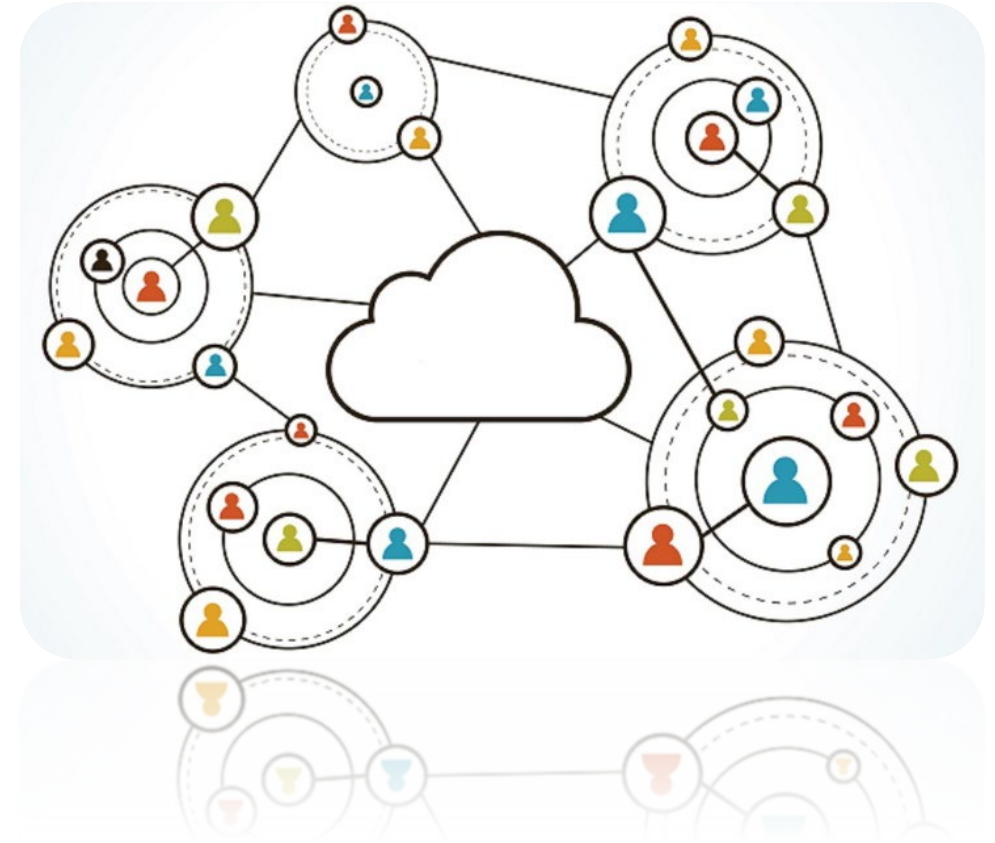
A "record" or a "tool"?

Achieve data-driven goals

Improve patient care

Increase satisfaction

Reduce cost, raise revenue

Accreditation, certification

Monitoring, compliance

mhmrtarrant
WE CHANGE LIVES

8 Key Steps

Key steps

1. What are you measuring?

2. What do you *need* versus what would be *nice to have*?

3. What already exists? Start with what you have!

4. When does it fit in the patient flow?

5. What is the "change process"?

6. Design to answer the question

7. Was there benefit?

8. Share what you learn!

1. What are you trying to measure?

- Patient satisfaction
- Staff satisfaction
- Patient outcomes

- Population needs
- Accessibility
- Training needs

mhmrtarrant
WE CHANGE LIVES

2. What do you *need* versus what would be *nice* to have?

3. What already exists?

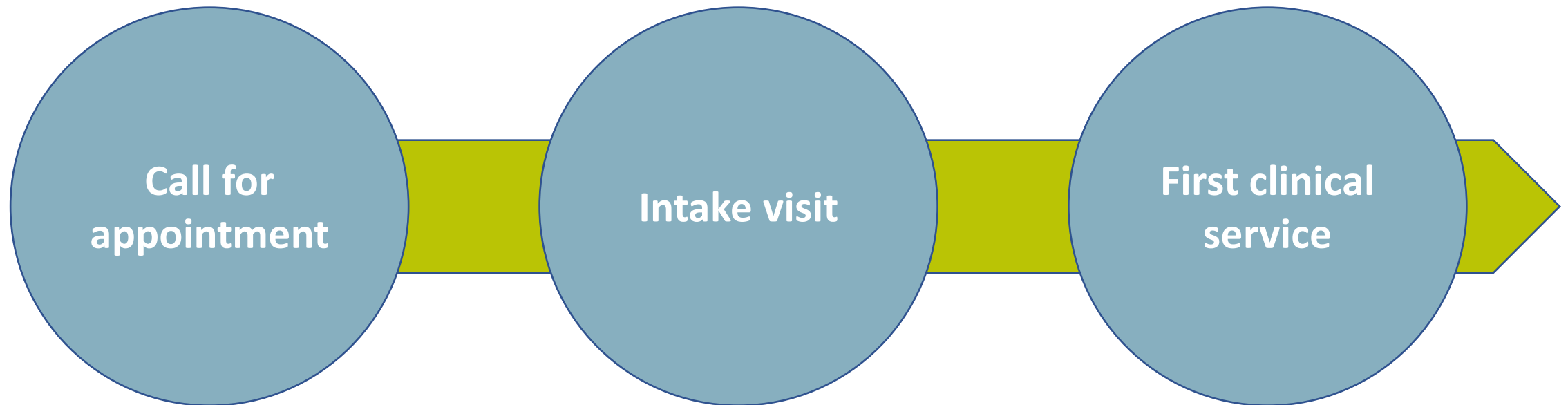**Reuse what you are collecting for other reasons**

- PHQ-9

- AUDIT C

- CSSRS

- NOMs

- Length of stay

- Days to first service

- Service utilization

- No shows

- Care plan goals

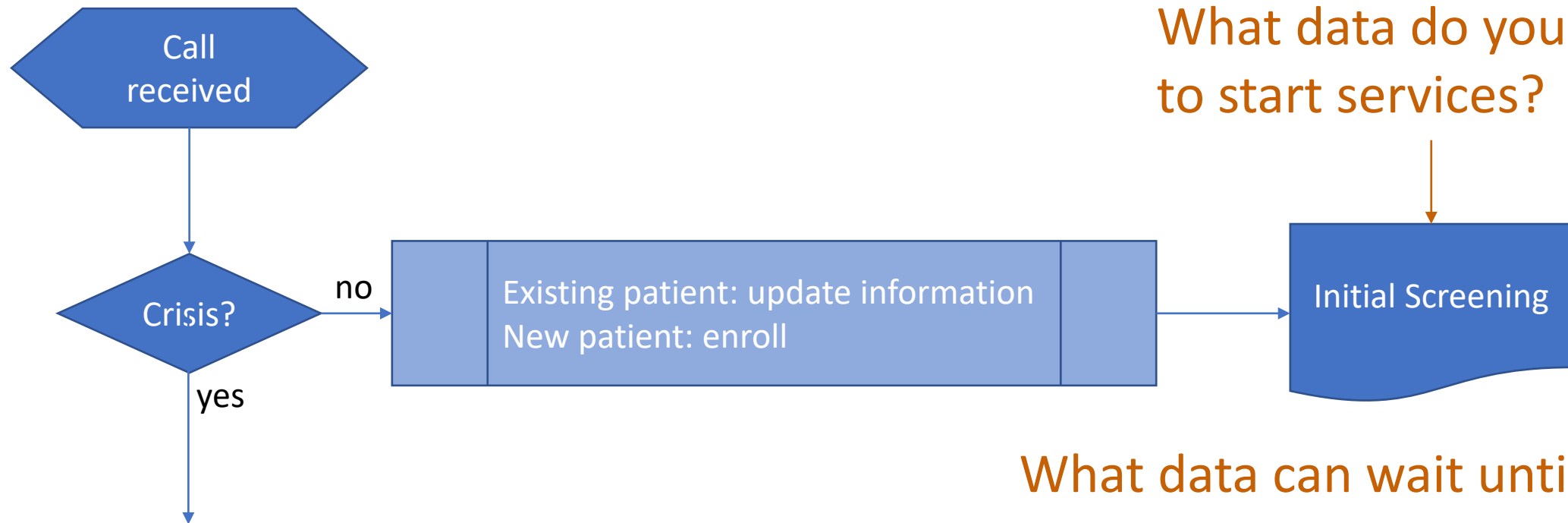# 4. When does it fit in the patient flow?

Pick a process and follow it – what are the steps?

Example: admission process

4. When does it fit in the patient flow?

What must be measured when?

Call received

Crisis?

no → Existing patient: update information
New patient: enroll → Initial Screening

yes

What data do you need to start services?

What data can wait until later?

mhmr tarrant
WE CHANGE LIVES

5. What is the "change process"?

When and how often do you need to measure?

vs.

weeks · weeks

Singer & Willett (2003); Howard et al (1996), *American Psychologist*
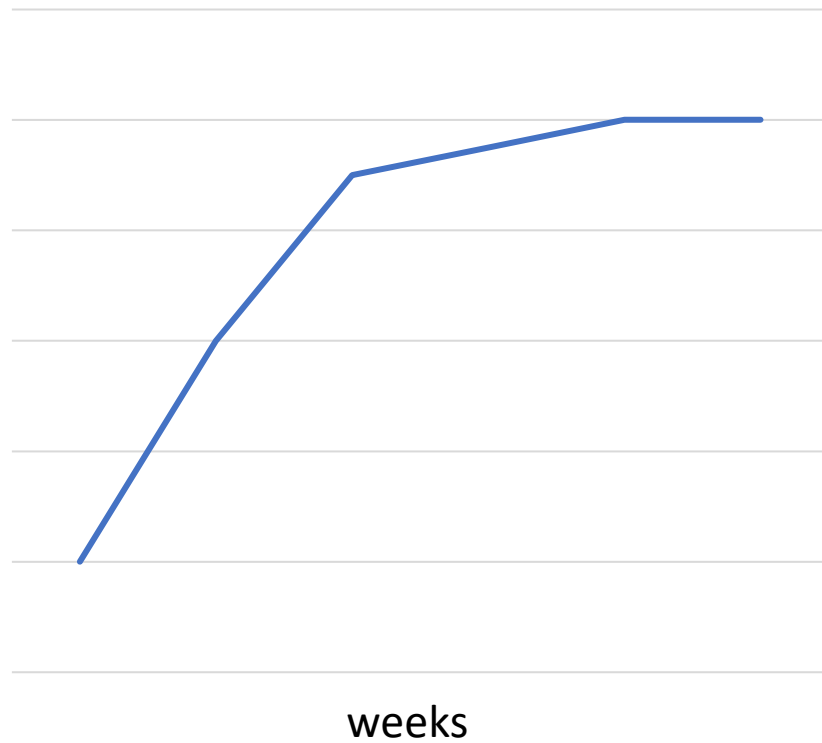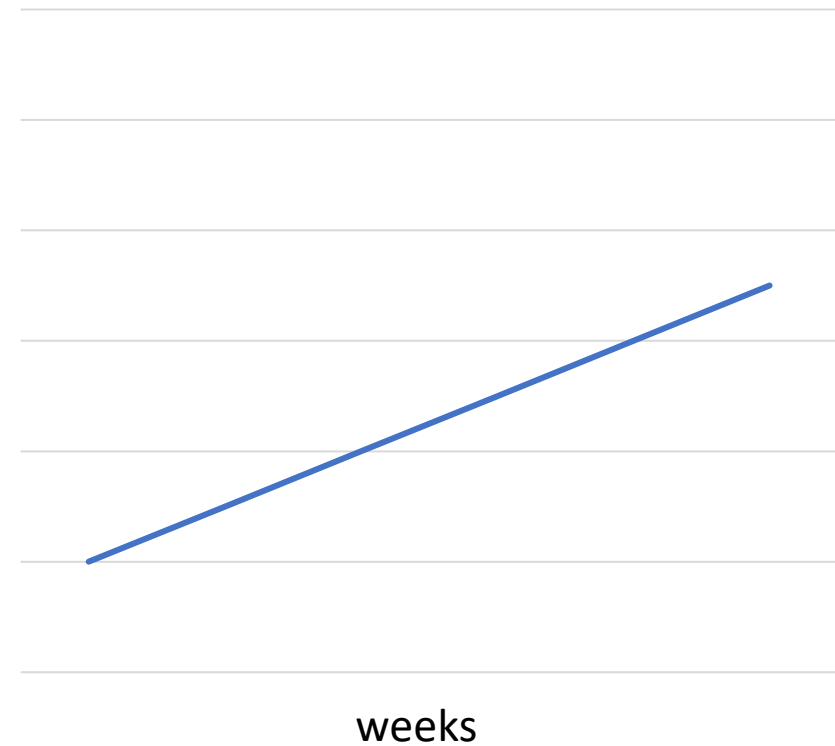
6. Design to answer the question

Reports

Dashboards

CarePathways

7. Was there benefit?

PDSA

Check in with programs

Analyze data for trends
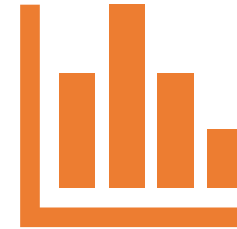
mhmrtarrant
WE CHANGE LIVES

8. Share what you learned!

Lunch and Learns

In-services

Communication emails

Community Outreach

mhmrtarrant
WE CHANGE LIVES

Design Basics

Know your audience

Who will use
the data?

What should they do with it
or understand about it?

What story is
the data telling?

mhmrtarrant
WE CHANGE LIVES
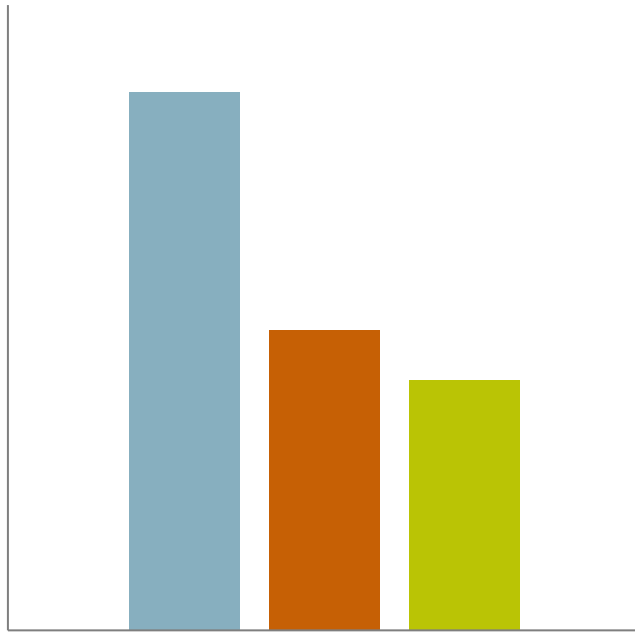
Know your tools

Charts are good for:

- Showing patterns or relationships
- Comparing sets of values
- Summarizing large datasets

Tables are good for:

- Showing precise values
- Looking up individual values
- Comparing individual values, but not sets
- Showing smaller datasets

mhmrtarrant
WE CHANGE LIVES

Workhorse charts

Bar charts
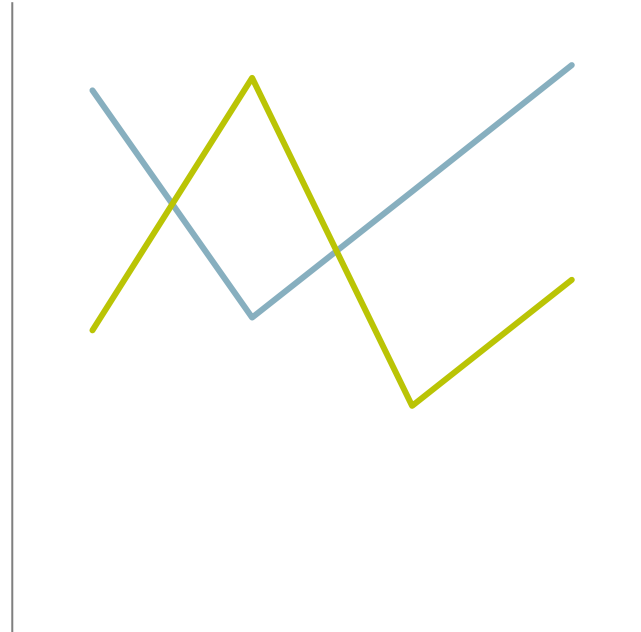
Line charts
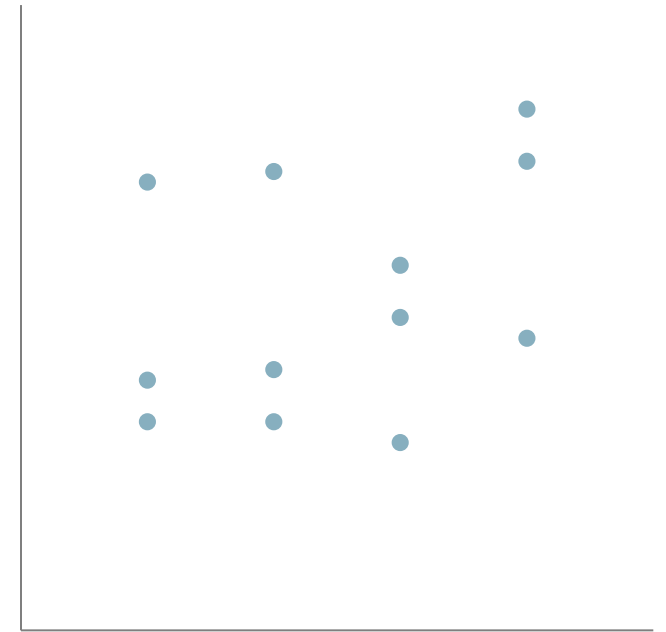
Dot & scatterplots

Beware the flashy chart

Will viewers see the meaning,
or a pretty picture?

European asylum seeker application decisions
Main origin and destination countries

Total asylum decisions
2012 316,625
2014 388,620

2014

| Origin | Destination | Total decisions* | Decisions by origin |
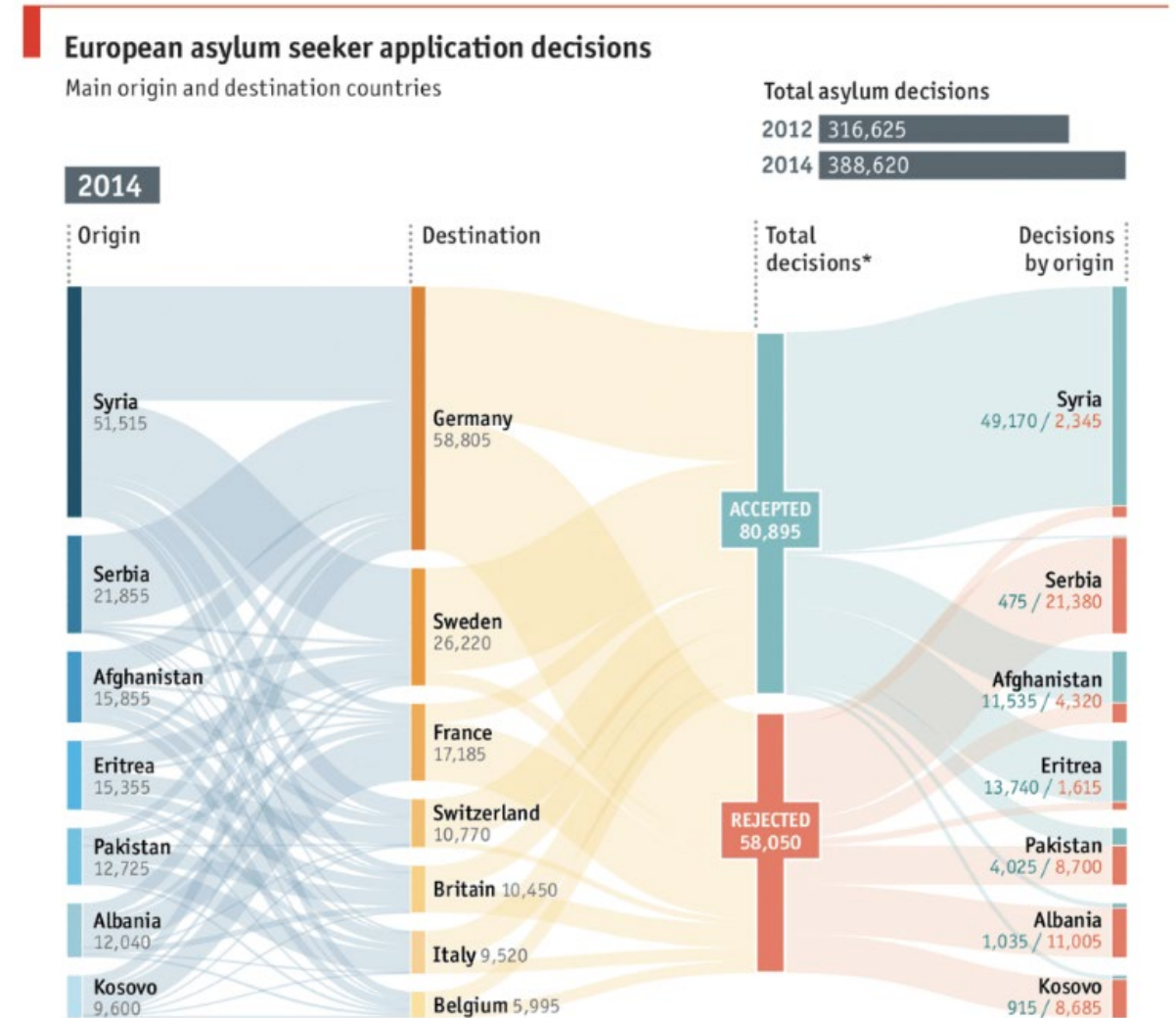
Seeking safety, European asylum application flows: acceptances and rejections – The Economist

Highlight and organize to tell the story
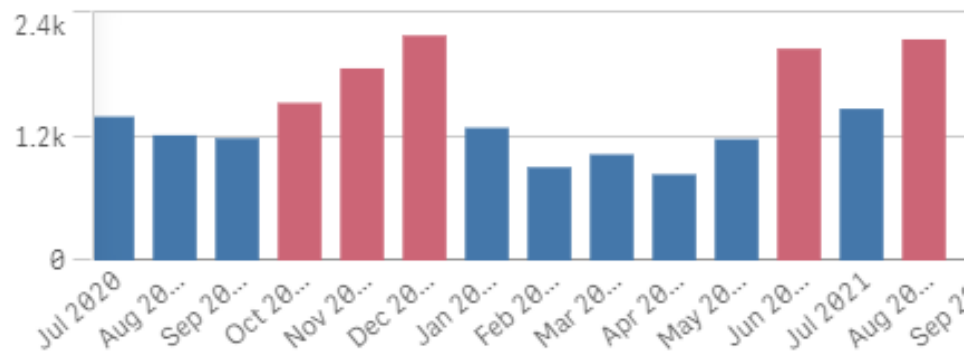
Highlighting draws attention to important datapoints.
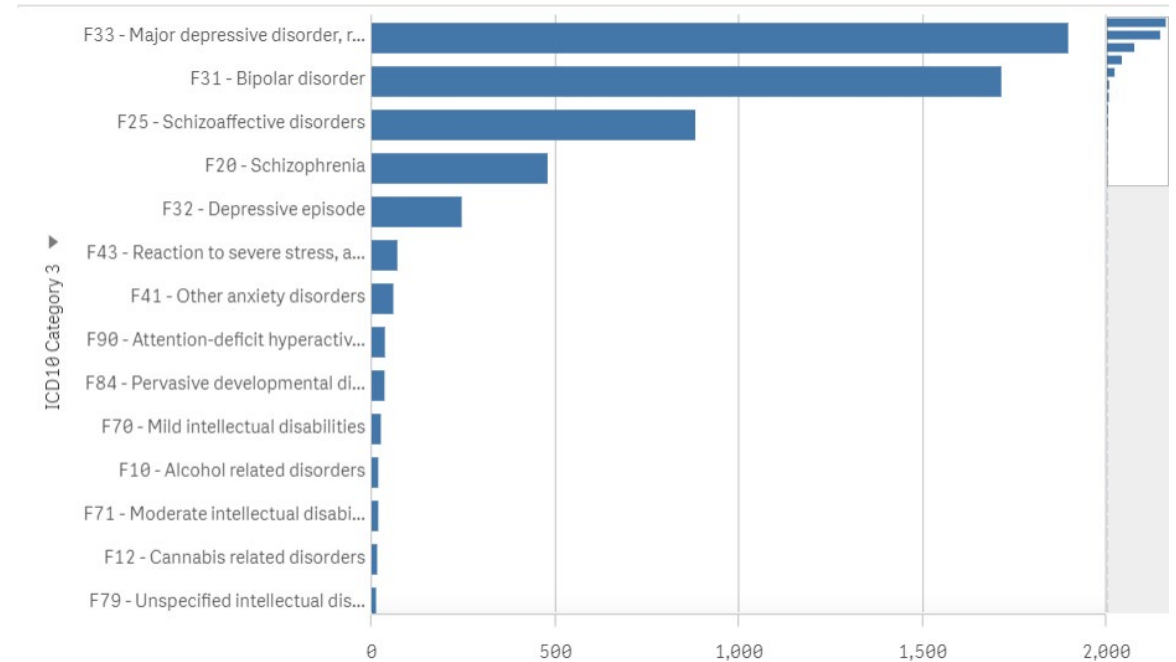
Sorting and grouping draws attention to key patterns.

"Above all else, show the data."

- Edward Tufte (2001)

mhmrtarrant
WE CHANGE LIVES

Examples

Using Qualitative Data to Fill Gaps in Quantitative Data

What are you trying to measure?

- Patient satisfaction
- Staff satisfaction
- Patient outcomes

- Population needs
- Accessibility
- Training needs

Types of Qualitative Data

FOCUS GROUPS   SURVEYS   CHART REVIEW   CASE STUDIES
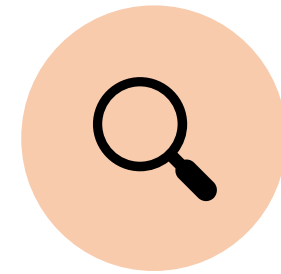
Getting the most out of the resources you have

Resources for Focus Groups

- Size – ideal 8-12 per group

Virtual

- Facilitators
- Note-takers/Transcribers
- Recording software
- Meeting software

In-Person

- Facilitators
- Note-takers/Transcribers
- Recording equipment
- Transportation expenses
- Meeting Space
- Food/incentives

Resources for Qualitative Surveys

- Can combine with quantitative tools or use hybrid methods to save resources
- Structured or semi-structured interviews
- Methods include calls, face to face, email, web link, video chat
- Staff to conduct interviews or distribute surveys
- Staff to review responses
- Online survey software

Resources for Chart Review

Types of Data Available

- Physician/nursing/caseworker notes
- Ambulatory and emergency room reports
- Referrals and consultations
- Admission/discharge documentation
- Laboratory, testing, and diagnostic information
- Medications and treatment plans

Benefits and Considerations

- Effective method to examine large amounts of data
- Well-suited for mixed methods and longitudinal designs
- Useful in fidelity assessments
- Can be used to answer questions beyond patient outcomes
- Incomplete/missing data
- Variance in data quality
- *Must* have a clear plan

Resources for Case Studies

Purpose and Uses

- In-depth study of an individual, group, or event

- Tells a story from the participant perspective

- Explores and describes the "how" and "why"

- Data types include interviews, documents, archived records, direct observation, participant observation, artifacts

Benefits and Considerations

- Insight into participants' treatment experiences

- Can increase understanding of poorly understood issues

- Provides new perspectives for further research

- Allows study of rare occurrences

- Emphasis on cultural, community, and individual norms, values, beliefs, attitudes, motivations

- Inherent subjectivity

- Best suited for few participants

Where does it fit in the patient flow?

- What population? Current patients? Community? Staff? All of the above?
- What you wish to measure will help you decide if you need patients who are new to answer questions or those who have been there longer.
- Decide if you should or can use a random sample, an existing group, or use another type of participant selection.
- How often should you collect data?
- Who should collect data? Anonymity can be important.

Designing the tool

- Use established tools when available
- Consult with Subject Matter Experts:
  - Clinical team
  - Evaluation
  - Medical
  - People with lived experience
  - Community partners
- Consult existing literature
- Pilot test when possible

Priority needs discovered by qualitative data

- Hiring LCDCs to ensure appropriate staffing to handle co-occurring SUD conditions and support CCBHC requirements

- Hiring bilingual staff to support Spanish-language services

- Adding extending evening and/or weekend hours

- Providing additional staff training, on topics such as eating disorders, trauma, working with LGBTQ youth

- Creating new groups and classes, such as grief support, LGBTQ, life skills, budget and money management, and nutrition

- Establish "transition support" for youth turning 18 and moving to the adult clinics

- Improving waiting area atmosphere, such as by making water and snacks more accessible, and offering waiting area activities

- Exploring alternative transportation options for patients

mhmrtarrant
WE CHANGE LIVES

Care Coordination

Data in Care Coordination

- There is no hard and fast rule to how care coordination works. It starts with data. Whether that's internal or external sources.

The Linchpin of CCBHC is Care Coordination

- Data drives creative care coordination
- Care coordination organizes and plans care among different services, providers, across various organizations and is clearly documented.
- Risk stratification to determine level of care coordination
- Data sharing among all providers to achieve safe and effective care.
- Utilize data to link programs where collaboration might be supportive
- Data health equity and address health disparities

CCDs

- Continuity of Care Documents
  - Summary of patient information from visits including upcoming visits, problems, allergies, medications, encounters, family history, goals, immunizations, implants, vital signs, plan of treatment, procedures, results, social history, etc.
- Obtaining CCDs electronically for the ability to reconcile key data elements:
  - Diagnoses
  - Allergies
  - Medications

Risk Stratification

- It helps us to direct, improve, and change the way we care for our patients.
  - By quantifying the patients' physical, behavioral, and social needs, we can see positive or negative trends and adjust care accordingly.
- Identify patients needing enhanced care coordination based on their risk level score.
- Includes elements of medical health, SUDs, and IDD diagnoses as well as various social determinants of health such as access to food, level of understanding of diagnoses, hospitalization and incarceration risk, and access to reliable/consistent shelter.
- Automated tool using data compiled in the system from internal and external sources.

Risk Stratification and Care Management

Using Predictive Modeling to Assign Individuals Within the Care Management Disc

LEVEL 3

3% - High risk with multiple chronic illnesses
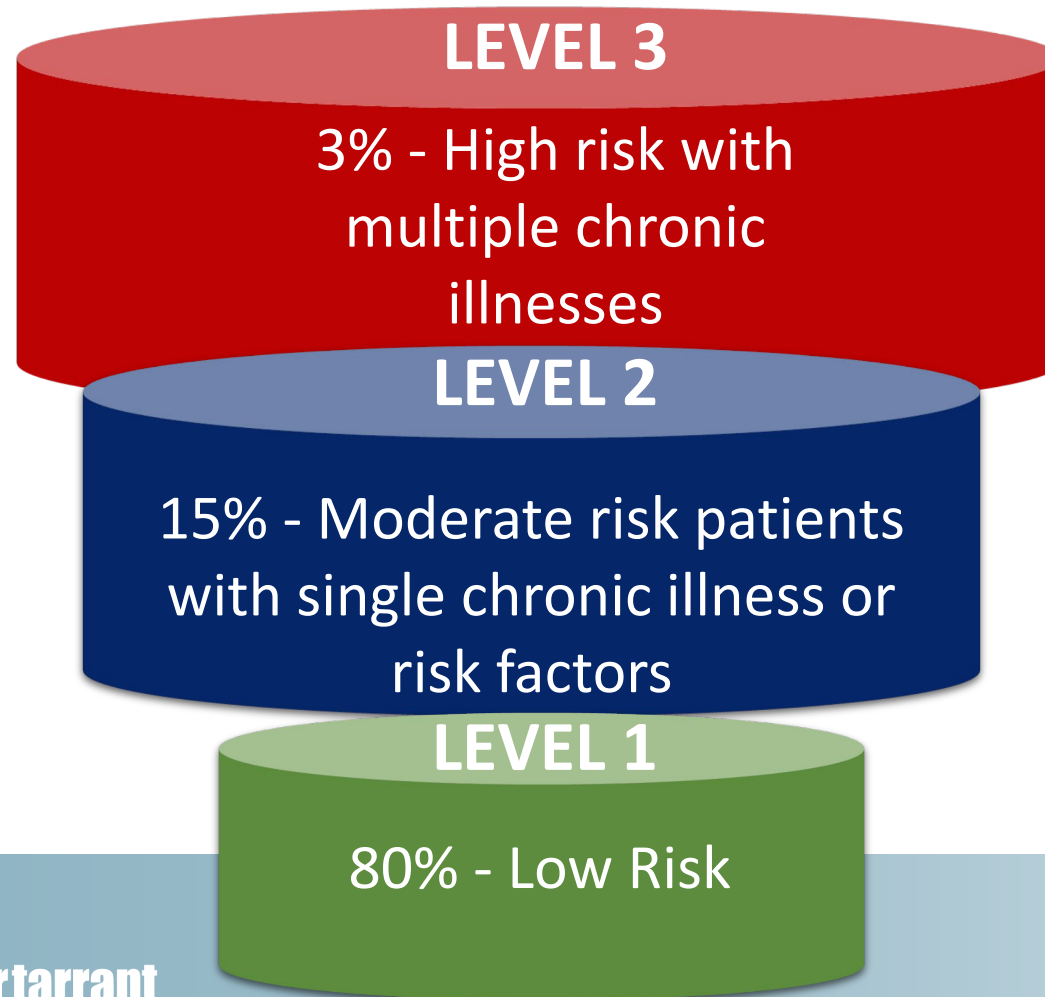
Intensive Care Management:
Example:
Schizophrenia, Bipolar, or MDD +
1 or more chronic diseases +
Hospitalization or missed clinic appointments

LEVEL 2

15% - Moderate risk patients with single chronic illness or risk factors

Health Coaching & Lifestyle Management: Example:
Schizophrenia, Bipolar, or MDD +
1 chronic disease + social determinants health risks

LEVEL 1

80% - Low Risk

Health Education and Promotion

mhmrtarrant
WE CHANGE LIVES

LOGGED IN AS
Julia E. Brown

🔍 What can I help you find?

Advanced Client Search

Recent Clients

My Forms ▸

My Favorites ▸

Recent Forms ▸

Control Panel
⏻ 🔒 ▬ 📅 🖼

Recent Clients | Site

MICKEY MOUSE (002362567)

👤 MICKEY MOUSE (1 F... ▾

▲ MICKEY MOUSE (002362567)

MICKEY MOUSE (002362567)	Ep: -	Emergency Contact: -	⚠ Allergies (0) ✎
Preferred Name: -	Admission Date: -	Phone: -	
Location: -	DX P: -	Relationship: -	
Phone #: 407-555-1111	M, 94, 11/18/28		
Communication Pref.: -	Ht: -, Wt: -, BMI: -		

RISK STRATIFICATION TOOL

[Submit] [Backup] [Discard] [Send To Do] [Add to Favorites]

Care Coordination Risk Stratification Tool
Diagnosis
Health Literacy
Social Determinants
Hospitalization/Incarceration Risk
Nutrition
Draft/Final

Family Friend Contacts

▾

Date *
[   ] 📅 [T] [Y] ▲▼

Program where patient is receiving services *
[Select   ✕ ▾]

▾ Diagnosis

Has the patient been diagnosed with any of the following?

Schizophrenia

		Score 1a
○ Yes	○ No	[ ]

Depression and/or Anxiety?

		Score 1b
○ Yes	○ No	[ ]

Bipolar disorder?

		Score 1c
○ Yes	○ No	[ ]

Substance Abuse Diagnosis

Opioid

		Score 2a
○ Yes	○ No	[ ]

Stimulant

		Score 2b
○ Yes	○ No	[ ]

AVPM | MHMR | JULIAD
BUILD: 2023.04.00.01

Referral Management

- Using the internal referral system to coordinate and communicate care needs across the agency and disciplines.

- Taking the guess work out of what resources are available in house.

- Including status updates and comments to make communication more transparent and ensure all documentation on that coordination of care stays within the patient's permanent record.

- This system has caused an increase in referrals and care provided to patients!

Referral Management Dashboard

MyAvatar NX Dashboards

- To view pertinent information in one "screenshot" to determine next steps in care

MICKEY MOUSE (002342461)	Ep: -	Emergency Contact: -	🟨 1. Mickey will become aggressive in t...	⚠ Allergies (0)
Preferred Name: -	Admission Date: -	Phone: -		
Location: -	DX P: -	Relationship: -		
Phone #: 817-888-3262	M, 94, 11/18/28			
Communication Pref.: -	Ht: -, Wt: -, BMI: -			

STATUS OF INTERNAL REFERRALS LAST 24 HOURS

Search: [_____]

Patient Name ↑↓	PATID ↑↓	Referral Date ↑↓	Status ↑↓	Referral Initiator ↑↓	Referral Description ↑↓	Referral Status ↑↓	Comments ↑↓
Patient Name	PATID	Referral Date	Status	Referral Initiator	Referral Descriptic	Referral Status	Comments
MOUSE,MICKEY	2342461	2023-04-28	Closed	Julia E. Brown	Nursing Referral	Waitlist	Called patient and LVM. Will continue chart review for more information and try to call patient again tomorrow.

STATUS OF INTERNAL REFERRALS BY PATID

Patient Name	PATID	Referral Date	Status	Referral Initiator	Referral Description	Referral Status	Comments
MOUSE,MICKEY	2342461	2023-04-28	Closed	Julia E. Brown	Nursing Referral	Waitlist	Called patient and LVM. Will continue chart review for more information and try to call patient again tomorrow.
MOUSE,MICKEY	2342461	2023-01-30	Closed	Julia E. Brown	Medical Legal Partnership Referral	Waitlist	LVM and waiting for more information
MOUSE,MICKEY	2342461	2022-10-04	Open	Julia E. Denny	Housing Referral		
MOUSE,MICKEY	2342461	2022-10-27	Open	Julia E. Denny	Adult Transportation Referral		
MOUSE,MICKEY	2342461	2023-02-16	Open	Julia E. Brown	Adult Transportation Referral		

STATUS OF INTERNAL REFERRALS BY STAFF ID

Patient Name	PATID	Referral Date	Status	Referral Initiator	Referral Description	Referral Status	Comments
MOUSE,MICKEY	2342461	2023-04-28	Closed	Julia E. Brown	Nursing Referral	Waitlist	Called patient and LVM. Will continue chart review for more information and try to call patient again tomorrow.

mhmrtarrant
WE CHANGE LIVES

INTERNAL REFERRAL WAITLIST BY PATIENT

Patient Name	PATID	Date Added	Referral Date	Referral Form	Waitlist Status	Referral Initiator	Reason for Closure	Reason for Removal	Priority	Waitlist Comments
MOUSE,MICKEY	2342461	2023-04-28	2023-04-28	Nursing Referral	Closed (Send To Do Item)	Julia E. Brown	Scheduled with program/services	No Entry	No Entry	Patient returned call and scheduled to visit with the nurse in 1 week.
MOUSE,MICKEY	2342461	2023-01-30	2023-01-30	Medical Legal Partnership Referral	Closed (Send To Do Item)	Julia E. Brown	Completed Advanced Directive	No Entry	No Entry	Scheduled and completed

INTERNAL REFERRAL WAITLIST BY STAFF

Patient Name	PATID	Date Added	Referral Date	Referral Form	Waitlist Status	Referral Initiator	Reason for Closure	Reason for Removal	Priority	Waitlist Comments
MOUSE,MICKEY	2342461	2023-04-28	2023-04-28	Nursing Referral	Closed (Send To Do Item)	Julia E. Brown	Scheduled with program/services	No Entry	No Entry	Patient returned call and scheduled to visit with the nurse in 1 week.

Referral Forms

Form Description	Episode	Date	Time	Data Entry By	Workflow Status
ALL	ALL	ALL	A...	ALL	ALL
Nursing Referral	1 (MHMR Tarrant (Episode))	04/28/2023	05:50 PM	JULIA BROWN RN	Final
ABH Access to Care Referral	1 (MHMR Tarrant (Episode))	04/20/2023	01:56 PM	JULIA BROWN RN	Final
ECS Therapy Orders Request	1 (MHMR Tarrant (Episode))	03/20/2023	12:48 PM	GRETCHEN COOPER PT	--
Adult Transportation Referral	1 (MHMR Tarrant (Episode))	03/17/2023	01:33 PM	JULIE NOLAN QMHP-CS-BA	Final
CSCT Referral	1 (MHMR Tarrant (Episode))	02/28/2023	11:52 AM	CHEYENNE RHODES RN	Draft
Adult Transportation Referral	1 (MHMR Tarrant (Episode))	02/16/2023	01:49 PM	JULIA BROWN RN	Final
Medical Legal Partnership	1 (MHMR		02:57		

Nursing Referral

Nursing Referral
Referral Information: Team: Nu (REFERRALNURSING) Type: Nu (27)

Referral Date: 04/28/2023

Program where patient is receiving services: Arlington Adult Clinic

Nursing Referral: Pillbox, Injection, Wellness Visit

Is this an urgent request? (help needed within 1 week): No

Draft/Final: Final

Open   New Record   Clear Filters

Open Record   Close All   Print

Patient Info Dashboard

CLIENT EPISODES

Episode Number	Program	Admit Practitioner	Attending Practitioner	Admit Date	Discharge Date	Primary Diagnosis	
3	Billy Gregory Detox	No Entry	YAHAGI,KEISHA	04/27/2023	Open Episode	Missing Diagnosis	
2	EC Intervention (Episode)	No Entry		01/03/2023	Open Episode	Missing Diagnosis	
1	MHMR Tarrant (Episode)	No Entry		09/01/2022	Open Episode	Major depressive disorder, recurrent, moderate	

CLIENT DIAGNOSES

Ep#	Diagnosis Date	Diagnosis Type	Status	Rank	Diagnosis	Diagnosis Code
1	2022-09-01	Admission	Active	Primary	Major depressive disorder, recurrent, moderate	F33.1

PROGRAM ADMISSION AND DISCHARGE TRACKING

Admission Date	Admitted Program	Discharge Date
2023-04-27	Arlington Adult Clinic	

FAMILY AND FRIEND CONTACT

Name	Relationship	Other	Role	Phone#1	Phone#2	Expiration
Donald Duck	Cousin			817-894-0695		

CLIENT CASELOAD

STAFFID	STAFF NAME	USERID	Credentials
	Haley Lindley	haleyl	
414643	Stephen Cregar	stephenc	Nurse Practitioner, Qualified Mental Health Professional CSSP
101094	Gretchen L. Cooper	t101094	Physical Therapist

FINANCIAL ELIGIBILITY

Order	Guarantor	Episode	Program	Verify	START	END	Policy
1	Non-Billable(101)	3	Billy Gregory Detox	Yes	2023-04-27		No Policy
1	Non-Billable(101)	2	EC Intervention (Episode)	Yes	2023-01-03		No Policy
1	Non-Billable(101)	1	MHMR Tarrant (Episode)	Yes	2022-09-01		No Policy

CLIENT APPOINTMENTS

Date	Start Time	End Time	Episode	Program	Service Code	Description	Staff Name	Site	Location	Status

Future Appointments (0)

Today (0)

Past Appointments

CLINICAL SERVICES HISTORY

ServiceDate	Submitted Date	Submitted Time	Practitioner	Co-Practitioner	Program	Service	Start Time	End Time	Dur	Loc	Recipient	EncType	Appt Type	PN DX 1 Code	PN DX 1 Description	Note Name	Status
04/27/2023	2023-04-27	03:41 PM	BROWN,JULIA	N/A	4637R	Medication Training & Support Individual	02:30 PM	02:45 PM	15	Home	Consumer	Face-to-Face	Scheduled/Kept	F33.1	Major depressive disorder, rec	PN G&I	Final
02/22/2023	2023-02-22	02:16 PM	COOPER,GRETCHEN	N/A	3151	Therapeutic Activities	01:00 PM	01:30 PM		Other	Consumer and Family/LAR Only	Face-to-Face	Scheduled/Kept			ECS PN	Draft
01/05/2023	2023-01-06	02:28 PM	COOPER,GRETCHEN	N/A	3155	Specialized Skills Training Individual	01:00 PM	01:00 PM	0	Other	Consumer and Family/LAR Only	Video	Consumer Cancel/No-show			ECS PN	Draft
	2022-10-17	01:57 PM	CREGAR,STEPHEN	N/A		Unknown				Unknow	Unknown	Unknown	Unknown			Independent SUD Group Progress Note	Unknown
	2022-10-19	09:35 AM	KOENIG,STEPHANIE	N/A		Unknown				Unknow	Unknown	Unknown	Unknown			Independent SUD Group Progress Note	Unknown
	2022-11-30	01:08 PM	CREGAR,STEPHEN	N/A		Unknown				Unknow	Unknown	Unknown	Unknown			Independent SUD Group Progress	Unknown

KPI Dashboards

- Key Performance Indicators
  - Keeping People:
    - Informed
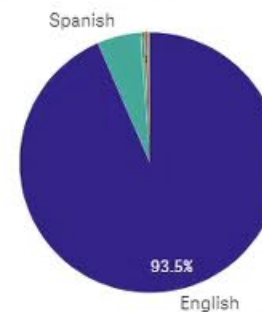   - Involved
    - Interested
    - Inspired

CarePathways KPI Dashboards 2.0

Hello Kirk Broome!   Transfer Selections   Help   Log Out

MHMR of Tarrant County (362) KPI Dashboards

Analyze
Sheet

Narrate
Storytelling

Languages

Selections

Languages

Patient counts and percentages by language group

Language Group 🔍 Primary Language 🔍	Values	
	Client Count	Percent of Patients
⊕ English	118,342	93.5%
⊕ Spanish	6,830	5.4%
⊕ Other Language	389	0.3%
⊕ Other Indo-European Language	320	0.3%
⊕ Other Communication	260	0.2%
⊕ Asian or Pacific Island Language	215	0.2%
⊕ Unknown	194	0.2%
⊕ American Sign Language	70	0.1%

Exclude No Entry

Exclude English & No Entry

Primary Language, all ages

Spanish

93.5%

English

Primary Language, age 5-17

Spanish
10.5%

87.6%

English
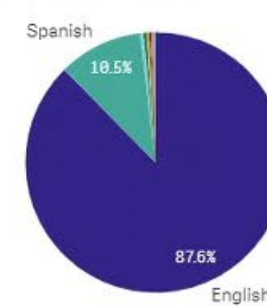
Primary Language, age 18-64
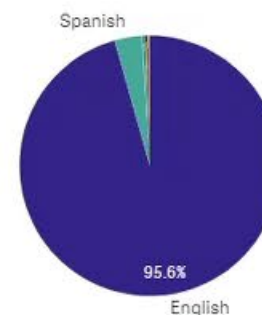
Spanish

95.6%

English

Primary Language, age 65+
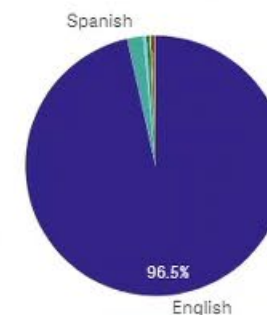
Spanish

96.5%

English

General

Admission

Service

Client

Diagnosis

Financial

Appointments

Medication

Calendar

Fiscal Calendar

Date Sort

Service Date ▼

Service Date
2020-07-01 to 2023-05-17

mhmrtarrant
WE CHANGE LIVES

MHMR of Tarrant County (362) KPI Dashboards   Analyze Sheet   Narrate Storytelling   Zero Suicide Pathway 🖥 ▾   <   >   ✎ Edit sheet

No selections applied   Selections

Zero Suicide Pathway

Patients on Pathway

153

Average Days Enrolled

187.1

Patients by Age Group

99.3%

Suicidal Thoughts, last screening

Yes 42.1%   55.9% No

Select Enrollment D...

📅 Select date range ▾

Patients Discharged

45

Reason for disenrollment

Administrative
Outcomes Met
54.3% Individual Choice
23.9%
Other

General

Admission

Service

Client

Diagnosis

Financial

Appointments

Medication

Calendar

Fiscal Calendar

Date Sort

Service Date ▾
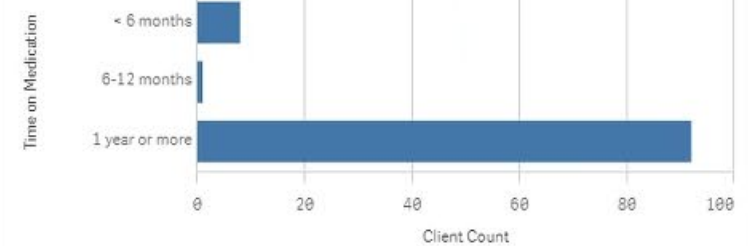
Service Date
2020-07-01 to 2023-05-17

CSSRS Scores by Week on Pathway

Weeks After Pathway Enrollment

Patients currently on pathway

PATID 🔍	Enrollment Date	Days on Pathway	CSSRS Score	Suicidal Thoughts, last screening 🔍
Totals		**187**	**4.2152**	
410	2022-12-12	157		No
2870	2022-08-30	261		No
10370	2022-11-04	195		No
20552	2022-11-10	189		Yes
28484	2022-11-29	170		No
30166	2022-10-18	212		No
31864	2022-08-22	269		No
924296	2023-01-23	115		Yes
983316	2023-03-23	56		Yes

mhmrtarrant
WE CHANGE LIVES

What's Next?

Updating Your Toolbox

EVERCHANGING PROCESS

ADAPTING TO NEW TECHNOLOGY
AND REGULATIONS

mhmrtarrant
WE CHANGE LIVES

Resources

Suggested Reading

- Scott Berinato, *Good charts: The HBR guide to making better, more persuasive data visualizations*

- Nancy Duarte, *Slideology*

- Stephen Few, *Show me the numbers*

- Stephen Few, *Now I see it*

- Anything by Edward Tufte, but especially:
  - *The visual display of quantitative data*
  - *Beautiful evidence*

Questions?

mhmrtarrant
WE CHANGE LIVES

For more information on any of our services, visit:

www.MHMRtarrant.org

Facebook.com/MHMRtarrant

ICARE Call Center
call or text

24
7

local	(817)335-3022
toll free	(800)866-2465
tty	(817)569-4488