Reducing DUP in a U.S. community: The Mindmap study (NIH: R01MH103831)

Specific Aims:

- Primary: To determine whether an early detection strategy (ED 'Mindmap') vs. usual detection can reduce DUP in a U.S. community setting;
- 2. **Secondary:** To determine whether DUP reduction can augment outcomes of an existing CSC (**STEP**).





NIMH: Division of Services and Intervention Research

FUNDING & DISCLOSURES

Vinod H. Srihari, M.D. Director, STEP Program www.step.yale.edu



This presentation is based on work funded by a grant (NIH: R01MH103831)



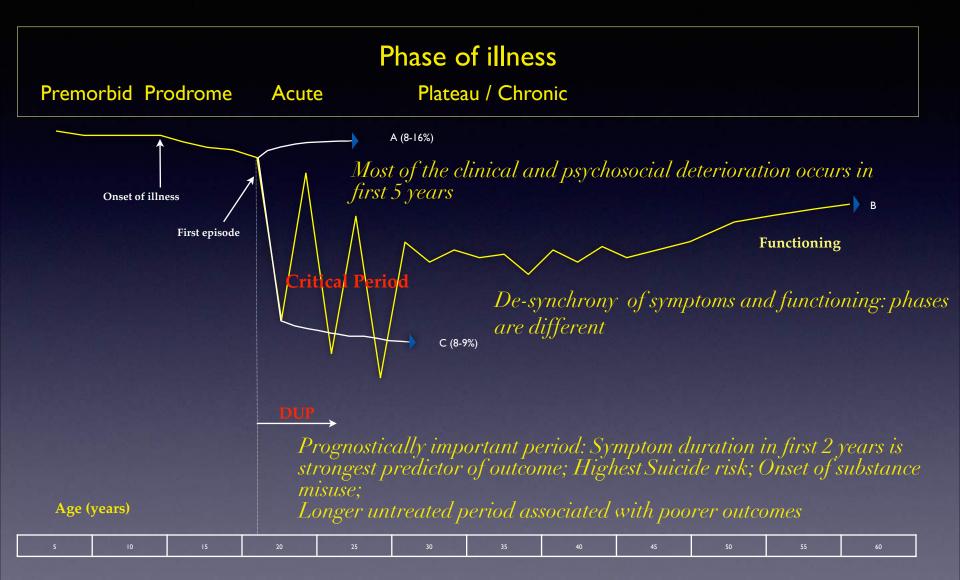
NIMH: Division of Services and Intervention Research

Dr. Srihari has served on consultations for other first-episode services.

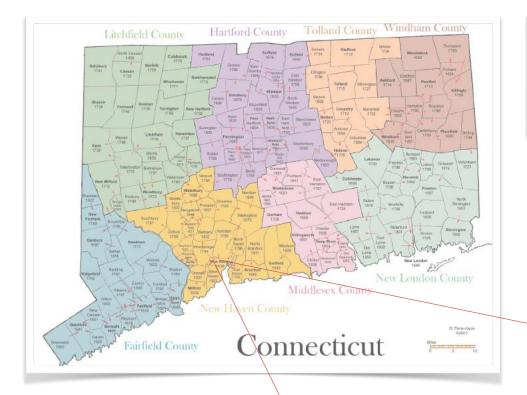
Dr. Srihari has also participated in Scientific Advisory Boards for Takeda and Janssen Pharmaceuticals.

Dr. Srihari is a co-founder of STEP-Forward, LLC that provides technical assistance to agencies to build or connect early intervention services to learning health networks.

Schizophrenia(s): The Rationale for Early Intervention



from Srihari et al. Psych Clin of N America, 2012



The Program for Specialized Treatment Early in Psychosis (STEP) est. 2006

2006-13: Pragmatic RCT of Specialty team based FES ('CSC')

2014 -: State and SAMHSA supports transition to **Population Health** oriented FES

2015-19: Early Detection campaign

2019 -: PH oriented EIS (ED + FES); Learning Health Networks

Based in public-academic partnership

CMHC: DMHAS-Yale

•STEP Clinic Eligibility (2014-):

-16-35yo

- -<3yrs since psychosis onset
- resident of 10 contiguous towns
- No insurance based exclusions
- Primary non-affective psychotic disorders

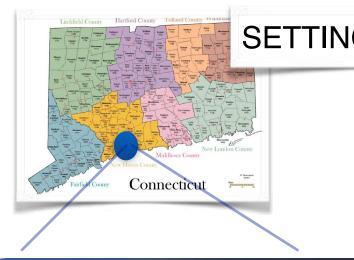




I. Design of Early Detection campaign

II. Campaign implementation

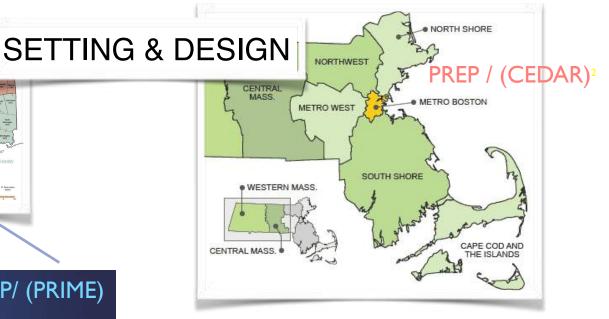
III. Results



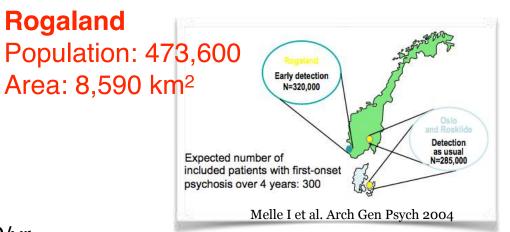


10 Towns

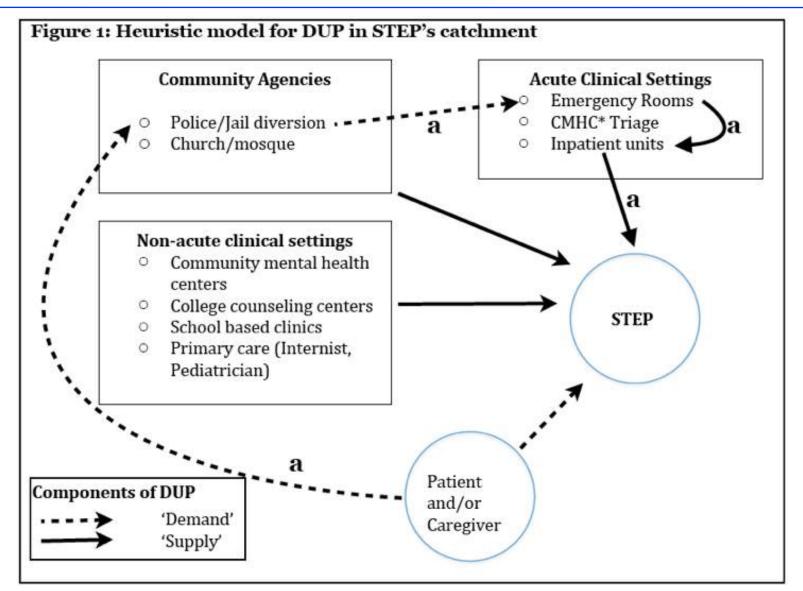
Population: 408,874 Area: 506 km² Estimated incident cases (<3yrs): 120/yr



Metropolitan Boston Population: 646,000 Area: 232.1 km²



Building an ED strategy: Targeting **Supply** and **Demand**



Goldberg-Huxley model of the pathway to psychiatric care: Levels & Filters Huxley P. Nordic J of Psychiatry 1996;50(S37):47-53.

Mindmap: Principles of the campaign

1. **Population Health:** address Demand/Supply sources of delay within a **defined geopolitical region**

2. **Complex intervention**: Entry into care is **iterative/interactive** with focus on call to action (vs. awareness or stigma)

3. **Social-Ecological Strategy**: responsive to needs and referral behavior of multiple, regionally salient targets

4. Social Marketing for persuasion

Srihari et. al, BMC Psychiatry 2014





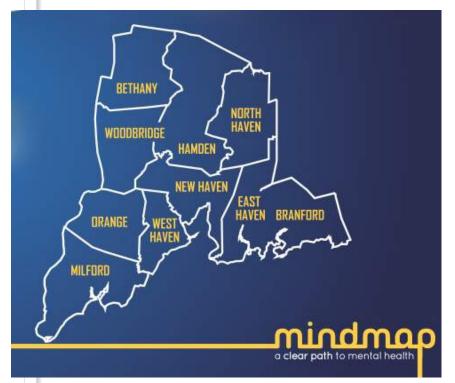
II. Mindmap

What did we do?

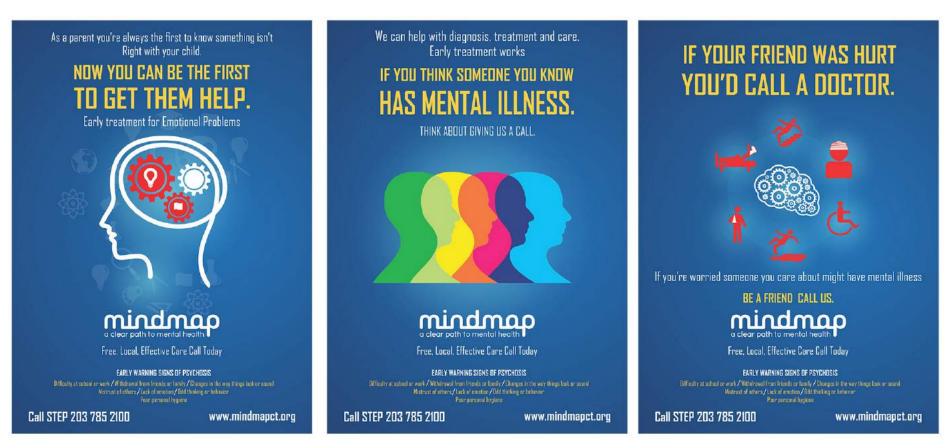


Mindmap: 3 interleaved components

- Public Education Campaign (targets Demand > Supply)
- 2. Professional Outreach & Detailing (targets Supply)
- Wait time reduction 'Rapid Access to STEP' (targets Supply)

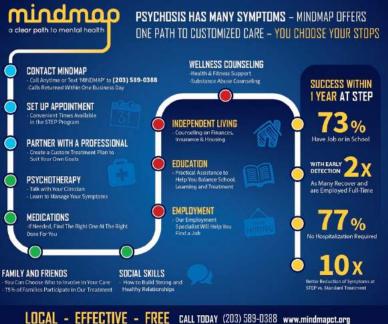


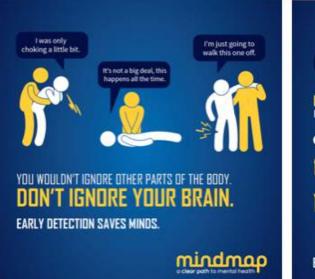
Messaging



- Target distinct groups
- Facilitate 'sharing' or organic amplification
- Clear 'call to action' (i.e. referral number)









PEOPLE WITH PSYCHOSIS **ARE 14 X MORE LIKELY** TO BE THE VICTIM OF VIOLENCE THAN TO COMMIT IT.

PSYCHOSIS IS NOT PSYCHO

mindmap

EARLY DETECTION SAVES MINDS.

ONLINE ECOSYSTEM

WEBSITE (OWNED) **SOCIAL MEDIA (EARNED)**

PAID SOCIAL (BOUGHT)



FACE BOOK TARGETING



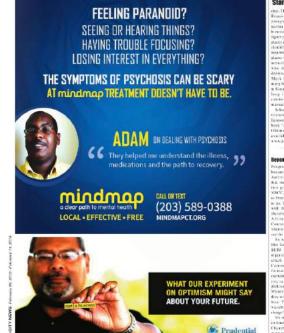
- Can target a defined population (geographic, demographic)
- Can measure and monetize impact



Innovative treatment for young people with psychosis at no cost for two years

By Jocelyn Maminta Medical/Health Reporter Published: January 4, 2016, 6:49 pm 💟 🕝 🚯 🖗





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Integrating mass & social media: multiple channels with clear call to action

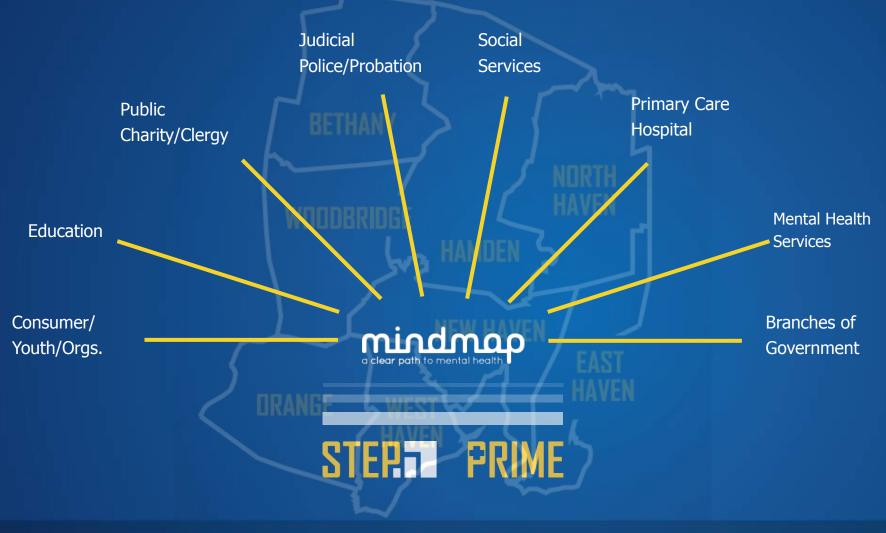
Postcards

Postcards were sent to every household in 2017 and 2018 with revised graphics

LOCATION	~ POSTCARDS SENT
New Haven	16,930
New Haven	16,795
New Haven	23,650
North Haven	9,732
Hamden	10,668
Milford	23,135
West Haven	21,744
East Haven	12,533
Branford, Orange, Woodbridge, Bethany	24,839
	160,026



2. Professional Outreach & Detailing (POD) (Supply > Demand)





Outreach and Detailing (Interleaved with public education)











Events



2 Special Events

These events included the MindMap Campaign Kick-off and the MindMap One Year Anniversary Party/Art Show.



11 Workshops

A gathering of community stakeholders and mental health professionals to build awareness of psychosis, early treatment, and the MindMap campaign.



15 Community Events

MindMap had a presence 13 events in the community such as Mental Health Month Run and Fresh Check Days.

Giveaway Items

Items were created to serve clinical practitioners and referrers. The giveaway items included bags, mugs, stress relievers (blue "squeeze" brains), candy, privacy door hangers, water bottles, brochures, tear off notepads, booklets, pens, magnets, tissue boxes, and cold packs.

Giveaway items created brand awareness.





3. Rapid Access to STEP (RAS)

Sticky handoffs, performance improvement tactics

- Quick screening & triage
- Separate RAS & FES teams
- 'Relationship management' with all POD groups
- Screening within 1 working day and admission within 1 week
- 'Pre-referral' support for parents/ caregivers/friends & others
- Continuous audit of delay from screening to enrollment as part of PDSA cycles

PSYCHOSIS EARLY DETECTION SAVES MINDS

WHO DO WE TREAT?



PRIME

Recent onset of psychosis (<3 years) Ages 16 - 35 Restricted to the following towns: At risk for psychosis Ages 12 - 35 No geographic restrictions



If in doubt about eligibility, **just call us.** LOCAL - EFFECTIVE - FREE

> www.mindmapct.org (203) 589-0388

The STEP-ED trial: other design elements

Eligibility

- -16-35yo
- -Within 3 yrs of psychosis onset
- -Primary non-affective psychotic disorders
- -Living in 10 towns (New Haven site) or usual catchment (Boston site)

Measures

- SIPS (Psychosis onset)
- Pathways to Care Interview
- DSM Diagnosis (SCID)
- -Neuro/Social Cognition -Social & Vocational Fx -QOL
- -Symptoms (PANSS) -Resource utilization (SURF)

Study protocol: Srihari et al. BMC Psychiatry, 2014



IF YOU THINK SOMEONE YOU KNOW HAS A MENTAL ILLNESS Get them help.

www.mindmaoct.org

We can help with diagnosis, treatment and care, EARLY TREATMENT WORKS,



III. Results

1. Campaign metrics

2. DUP

3. Pathways to Care

ONLINE ECOSYSTEM

WEBSITE (OWNED)

SOCIAL MEDIA (EARNED)

PAID SOCIAL (BOUGHT)

CALL TO ACTION

Like us on Facebook. Follow, share, tweet, retweet contribute to all social media platforms



You

Tube

Ĭn

QUIZ mindmapct.org

facebook.com/mindmapct youtube.com/mindmapct instagram.com/mindmapct

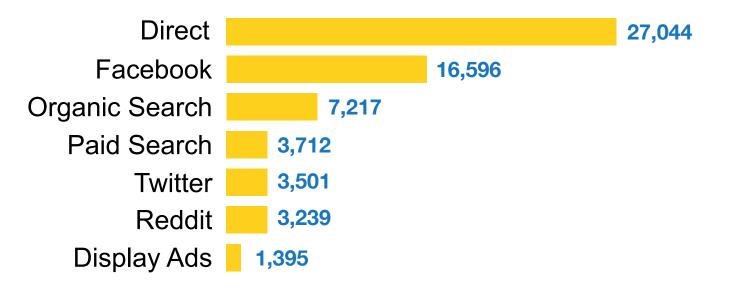
linkedin.com/mindmapct twitter.com/mindmapct pinterest.com/mindmapct



a clear path to mental health

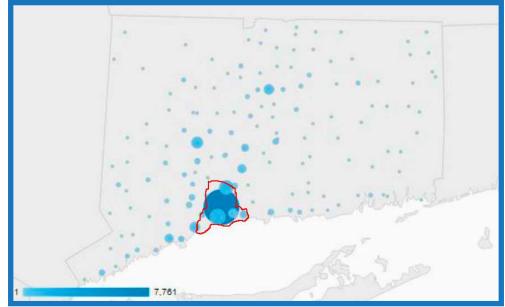
Website Visits

The MindMap website garnered **48,988 visitors**, and many visited the site multiple times. The following map show where these visitors came from.



Website Visits

The MindMap website garnered **48,988 visitors**, and many visited the site multiple times. The following map show where these visitors came from.



www.mindmapct.org

Paid Campaigns

We took advantage of the **detailed geo fenced targeting** that social media advertising provides in order to reach our target audience through the platforms they already use.



Facebook

The dominant platform targeting peers, clients and caregivers by their interests, geography and behavior.

Delivers content in a passive way, i.e. when users are not specifically searching or discussing the topic of psychosis.

4,900,000 Impressions **11,000** Engagements

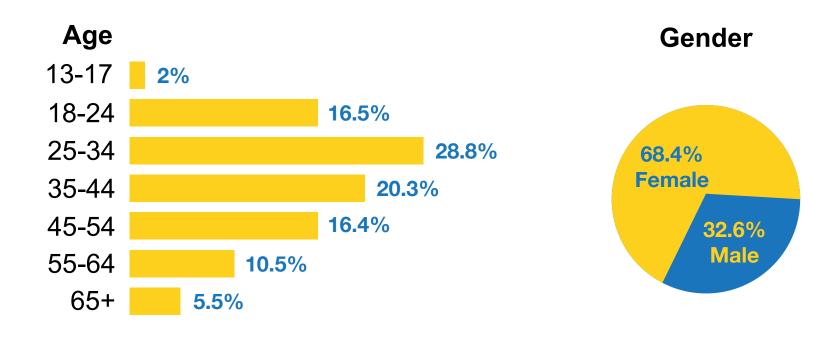
16,596 Visitors to website

0.22%

Avg. Engagement Rate 0.17%

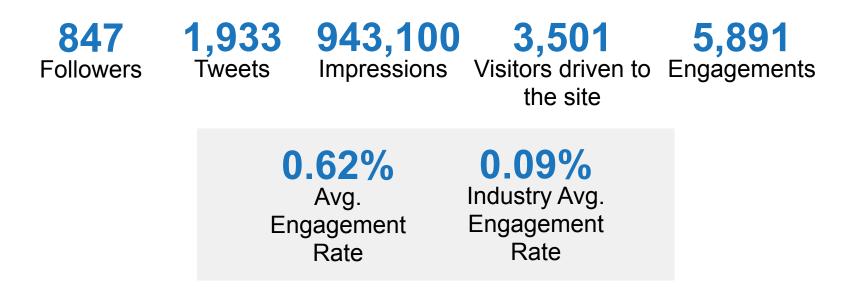
Industry Avg. Engagement Rate

Facebook Demographics



Twitter

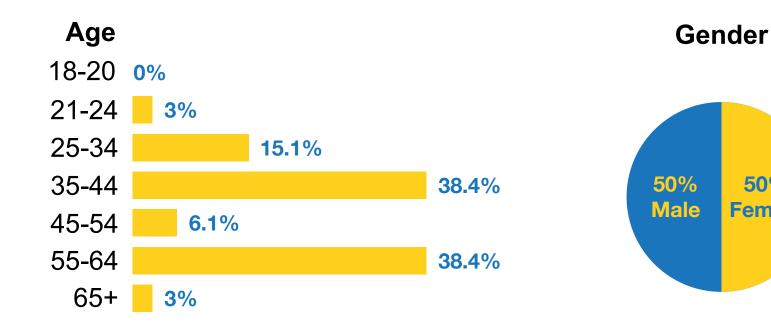
Key platform to target potential peers and media around interests using hashtags. Useful platform for awareness and advocacy.



Twitter Demographics

50%

Female



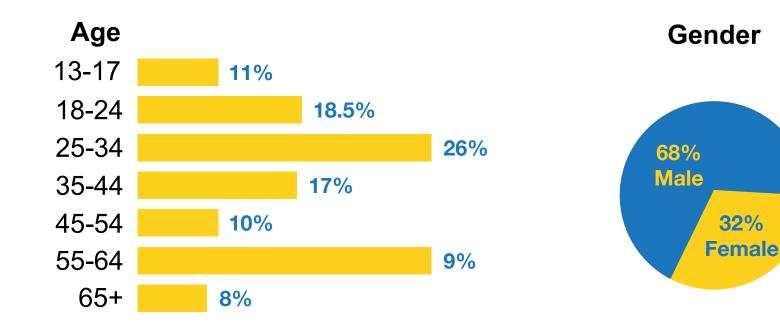
YouTube

The key video platform to target potential clients around their interests, geography, and behavior. We continued to see strong performance on Youtube, though watch time vs. Views on our 15 second promo spot suggests market saturation.

YouTube is the no.1 search engine for ages 16-35.

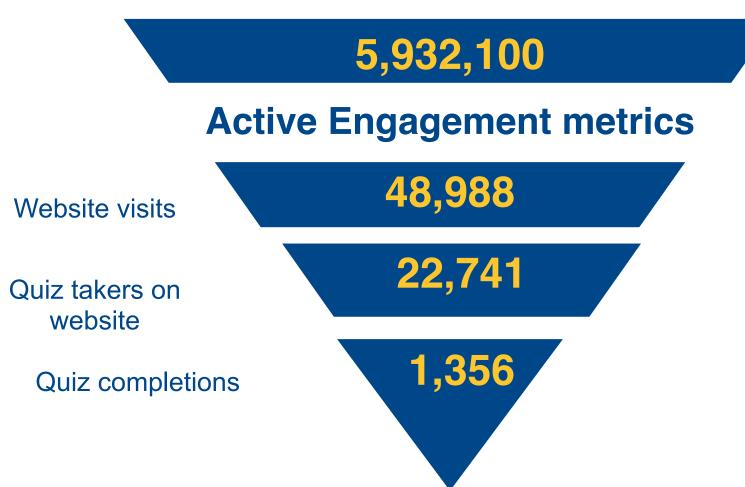
210,000 Minutes watched 477,000 Views Subscribers Cost per view

Youtube Demographics



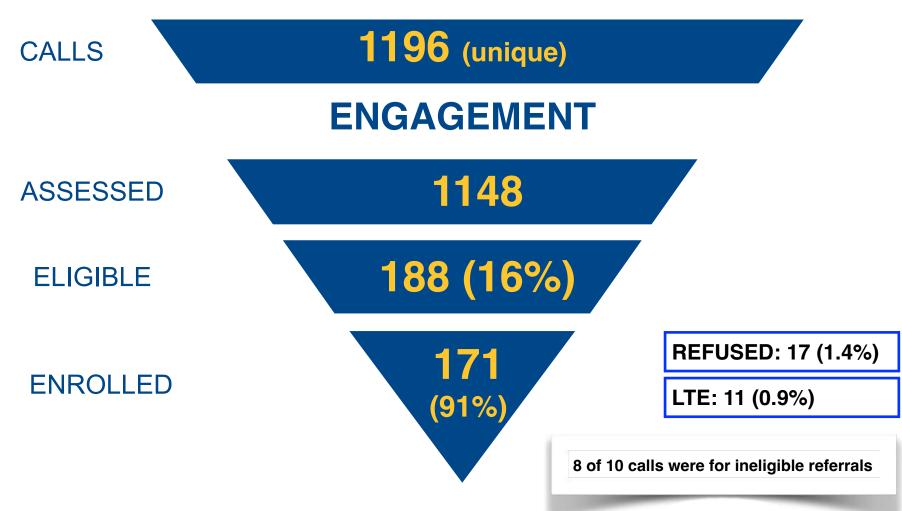
'VIRTUAL' SCOREBOARD (2015-19)

Passive Impressions

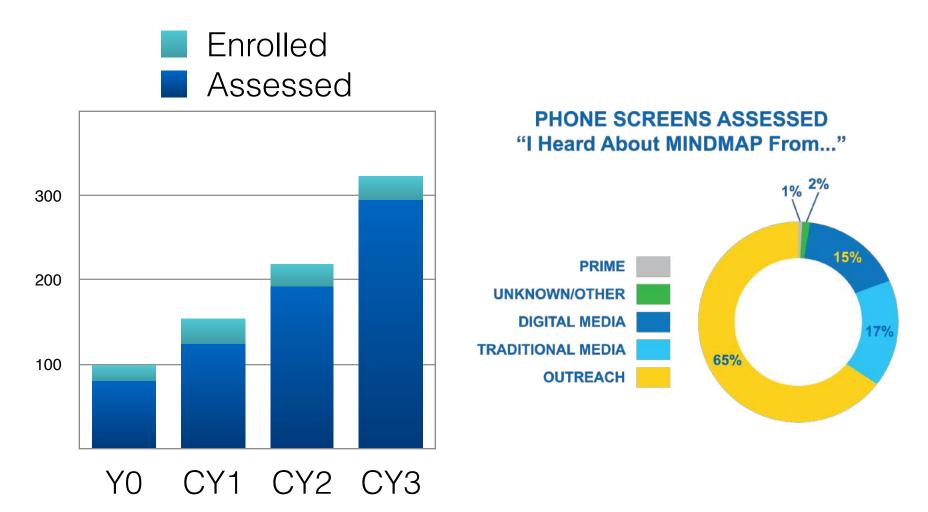


'REAL' SCOREBOARD 2015-19

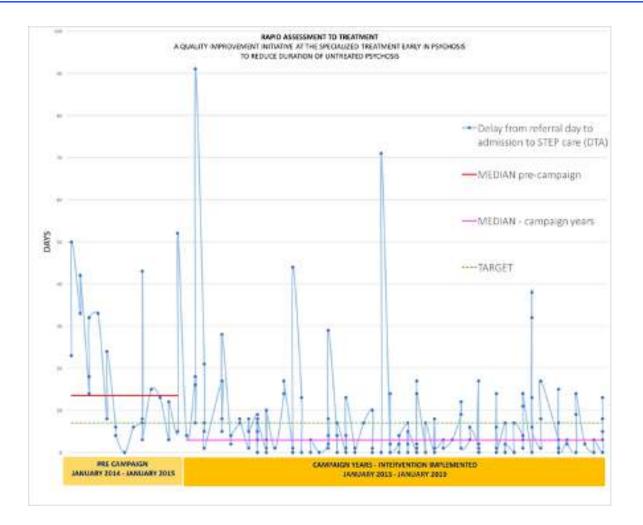
HELP-SEEKING



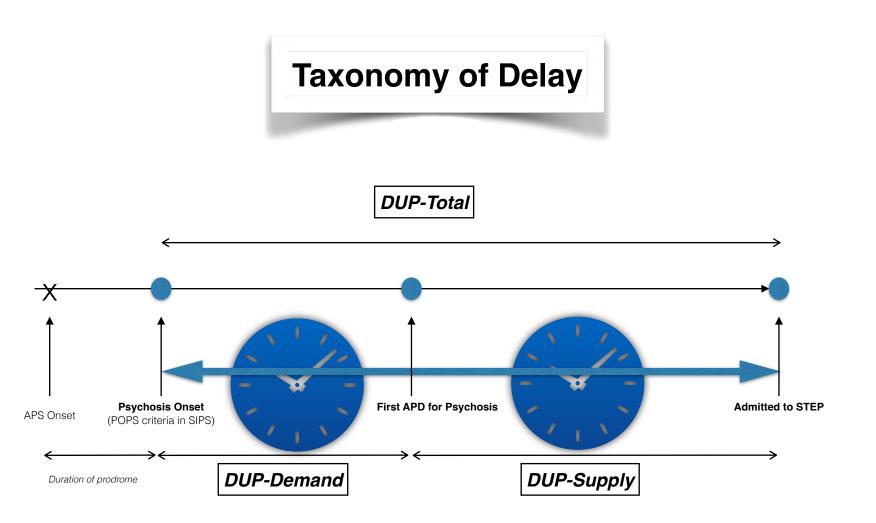
PATIENT FLOW



Rapid Access to STEP (RAS) : Using QI to reduce wait times



Reducing delay from referral to admission at a U.S. first episode psychosis service. A Quality-Improvement initiative Ferrara et al., Psychiatric Services, 2022.



Total <u>Baseline</u> DUP in days (median, range) 324.5 (224.5, 526.5) at PREP and 311.5 (59.0, 492.5) at STEP

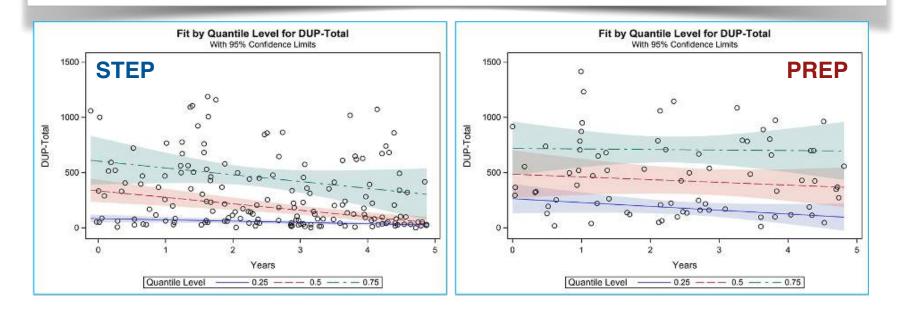
Table 2.

DUP (days) for patients enrolled in FES (STEP & PREP) before (2014–2015) and during (2015–2019) early detection campaign (Mindmap)

		STEP		PREP	
		2014–2015 (pre-Mindmap) N = 24	2015-2019 (Mindmap) N = 147	2014–2015 <i>N</i> = 12	2015–2019 <i>N</i> = 63
DUP-Demand	Mean (SD)	173.5 (177.2)	145.3 (234.0)	204.1 (211.4)	186.4 (236.7)
	Median (Q1,Q3)	98.5 (19.5, 329.0)	48.0 (14.0, 183.0)	127.0 (46.5, 317.5)	81.0 (17.0, 291.0)
	Range	0-700	0–1153	1-701	1-938
DUP-Supply	Mean (SD)	153.0 (218.7)	138.7 (242.2)	180.8 (175.5)	297.8 (312.6)
	Median (Q1, Q3)	29.5 (13.5, 246.0)	20.0 (9.0, 133.0)	152.0 (39.0, 234.5)	149.0 (65.0, 458.0)
	Range	0-726	0-1106	0-521	0-1290
DUP-Total	Mean (SD)	326.5 (303.4)	284.1 (301.6)	384.9 (255.4)	484.2 (346.6)
	Median (Q1, Q3)	311.5 (59.0, 492.5)	149.0 (50.0, 457.0)	324.5 (224.5, 526.5)	430.0 (162.0,709.0)
	Range	8-1060	2-1189†	19-917	13-1416†

Srihari et al., Schiz Bulletin Open 2022

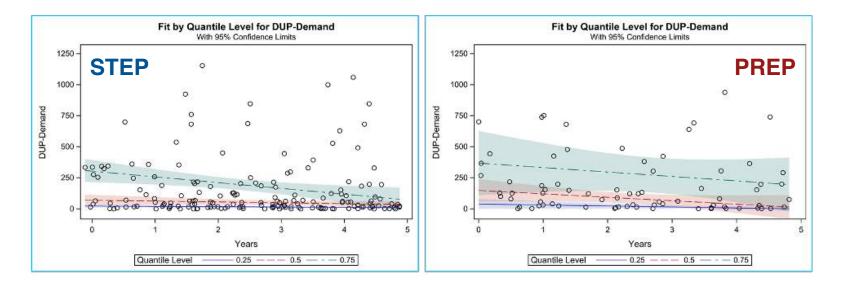
Mindmap led to persistent and meaningful reductions in **DUP-Total**



Slope of changes (95% CI) 25% percentile: -11.5 (-20.4, -2.7) days/year, p=0.01 50% percentile: -58.5 (-85.2, -31.7) days/year, p < 0.0001 75% percentile: -61.6(-147.0, 23.8) days/year, p=0.16 Slope of changes (95% CI) 25% percentile: -34.6 (-82.6, 13.3) days/year, p=0.15 50% percentile: -24.7 (-92.7, 43.3) days/year, p=0.47 75% percentile: -4.8 (-99.7, 90.2) days/year, p=0.92

- For every year of Mindmap, time to enrollment in FES was reduced by 11.5 days (Q1) and 58.5 days (Q2) at STEP but remained unchanged at PREP
- 2. DUP-Total (median) fell from 312 to 149 days at STEP (vs 325 to 430 days at PREP).

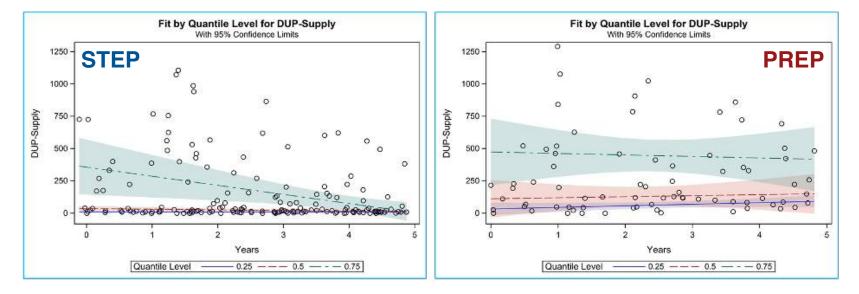
Reductions in DUP-Demand at STEP (New Haven)



Slope of changes (95% CI) 25% percentile: -2.5 (-6.8, 1.8) days/year, p=0.25 50% percentile: -6.9 (-19.5, 5.6) days/year, p=0.28 75% percentile: -46.3 (-79.3, -13.3) days/year, p=0.006 Slope of changes (95% Cl) 25% percentile: -7.9 (-18.7, 2.8) days/year, p=0.14 50% percentile: -27.8 (-63.3, 7.9) days/year, p=0.12 75% percentile: -35.8(-116.9, 45.2) days/year, p=0.38

For every year of Mindmap, time to first antipsychotic Rx was reduced by 46 days at New Haven (for <u>longest</u> DUPs)

Reductions in DUP-Supply at STEP (New Haven)



Slope of changes (95% CI) 25% percentile: -0.6 (-2.0, 0.8) days/year, p=0.39 50% percentile: -5.2 (-9.9, -0.4) days/year, p=0.03 75% percentile: -70.3(-121.6, -19.1) days/year, p=0.008 Slope of changes (95% CI) 25% percentile: 12.3 (-4.3, 28.8) days/year, p=0.15 50% percentile: 7.9 (-46.7, 62.5) days/year, p=0.77 75% percentile: -11.7 (-105.2, 81.9) days/year, p=0.80

For every year of Mindmap, time from first antipsychotic Rx to STEP was reduced by 70 days at New Haven (for longest DUPs)

Psychosis Onset to FES: SHORTENED BY HOW MUCH?

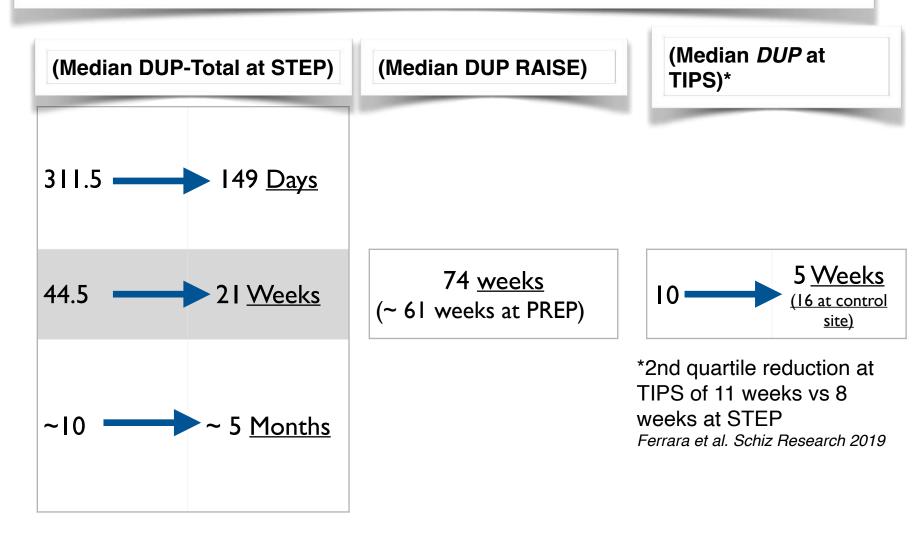
(Median DUP-Total at STEP)





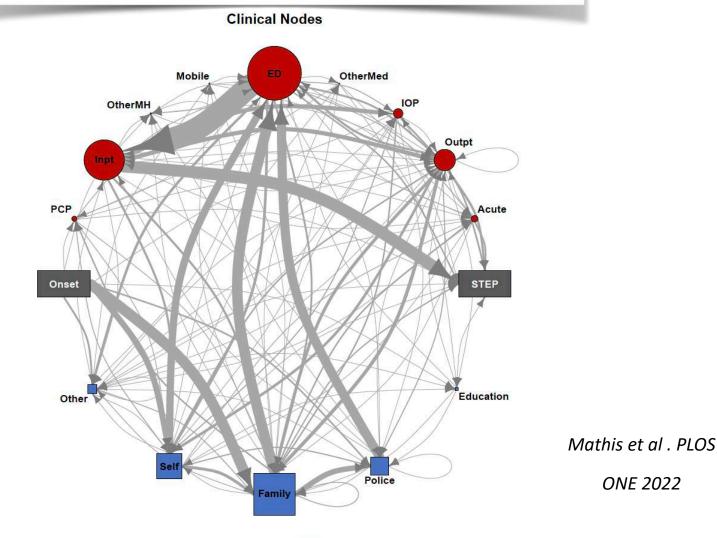
Srihari et al., **Reducing the Duration of Untreated Psychosis (DUP) in a US Community: A Quasi-Experimental Trial.** Schizophrenia Bulletin Open, Volume 3, Issue 1, January 2022

Psychosis Onset to FES: SHORTENED BY HOW MUCH?



Srihari et al., Reducing the Duration of Untreated Psychosis (DUP) in a US Community: A Quasi-Experimental Trial. Schizophrenia Bulletin Open, Volume 3, Issue 1, January 2022

Understanding regional pathways to care



Community Nodes

Single largest source of delay was between psychosis onset and first help-seeking attempt

Ferrara et al.,

Social Psychiatry and Psychiatric Epidemiology (2021) 56:1359–1369

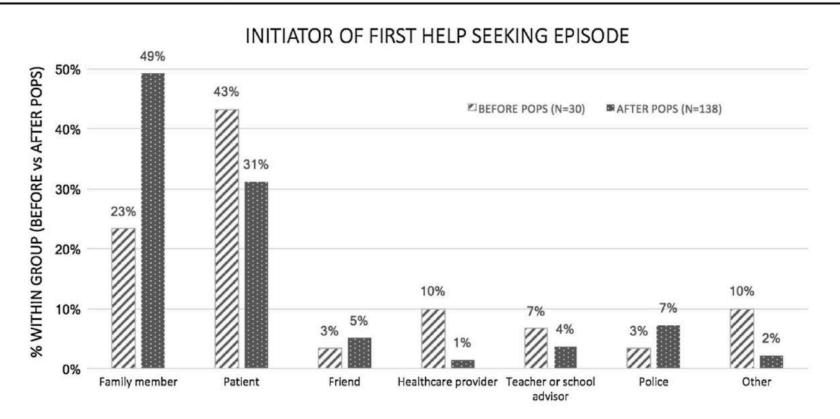
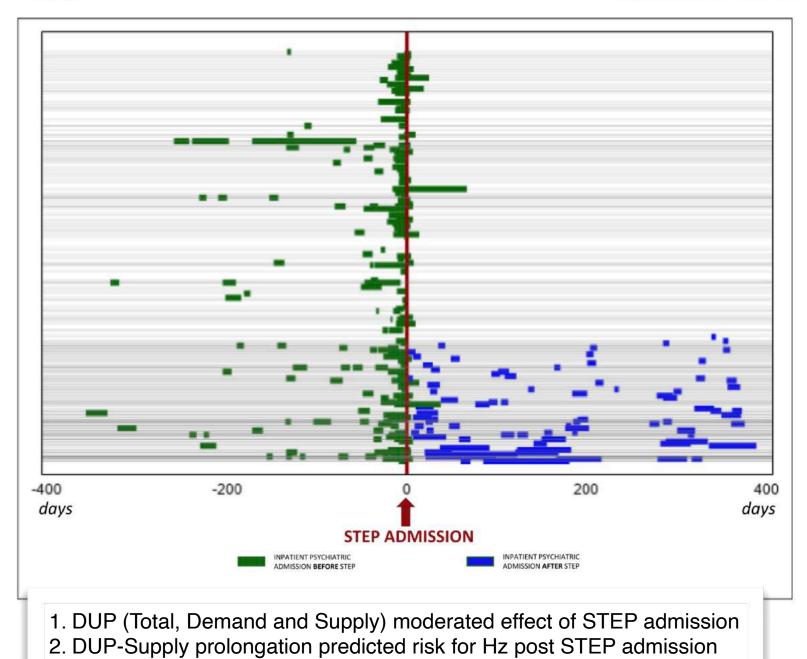


Fig. 2 Initiators of the first help-seeking attempt during prodromal (pre-POPS) vs psychotic (post-POPS) phase







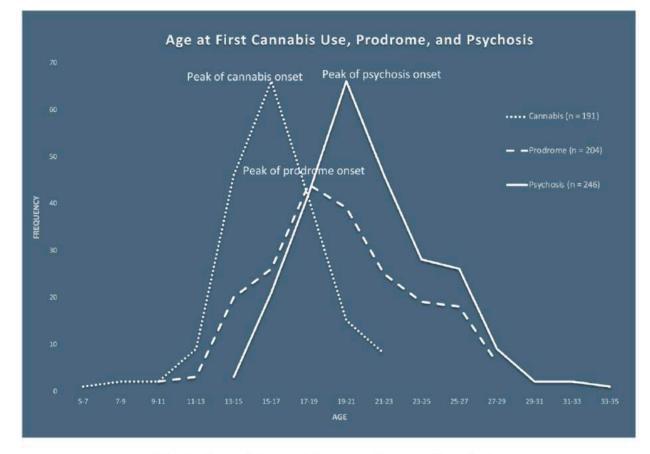


Fig. 1. Age at first cannabis use, prodrome, and psychosis.

- 1. High prevalence of Cannabis Use (78%) and Disordered Use (47%)
- 2. Most use began before prodrome (94%)
- 3. Earlier use associate with earlier APS and FEP, worse premorbid fx and worse use at admission

SUMMARY

- 1. Mindmap was able to *progressively* reduce *community* DUP by a meaningful amount (50% reduction in Total DUP)
- 2. Mindmap is *feasible* to integrate with FES or CSC
- 3. Wait times can be reduced by teams using standard *quality improvement* methods
- 4. Pathways to care are *regionally idiosyncratic* & *dynamic*
- 5. Demand and Supply Side sources of delay vary across sites and can each be targeted



PSYCHOSIS DOESN'T MEAN You're going crazy But it does mean you need help.

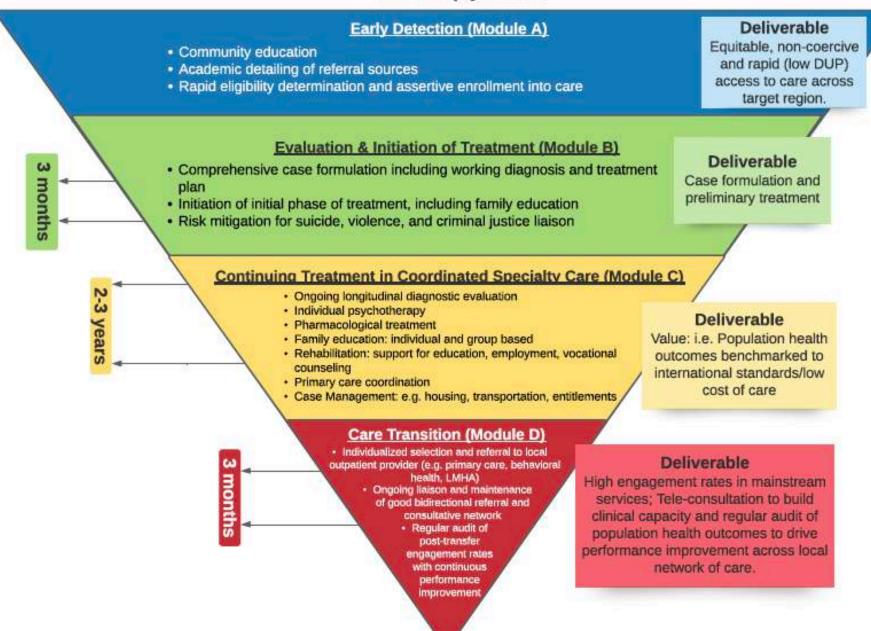
LESSONS

- 1. <u>The costs of usual detection</u>. ED campaign led to 3X referrals to STEP with 'sticky' front door; referrals fell over usual detection at PREP
- 2. <u>Use of SIPS to measure DUP</u>: (i) reliable psychosis onset; (ii) dating of CHR state (iii) delineation of pathways during vs after prodrome
- 3. ED efforts need to be **long** (multi-year), **wide** (target supply and demand side) and **complex** (not merely complicated) or responsive to feedback from regional referral sources
- 4. Interventional approach: ED effort clarified local pathways to care and important nodes (not the other way around)
- 5. <u>Sustainability?</u> As with TIPS ED effects decayed to baseline after a year, but if continued would likely progressively reduce DUP



Early Intervention Service Care Pathway

www.step.yale.edu

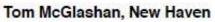


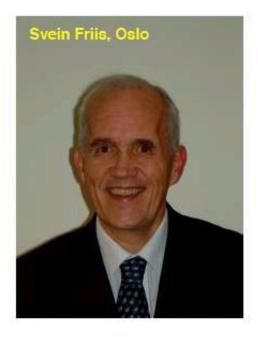
ACKNOWLEDGMENTS













PSYCHOSIS EARLY DETECTION SAVES MINDS

WHO DO WE TREAT?



Recent onset of psychosis (<3 years) Ages 16 - 35 Restricted to the following towns:

PRIME

At risk for psychosis Ages 12 - 35 No geographic restrictions



If in doubt about eligibility, **just call us.** LOCAL - EFFECTIVE - FREE



www.mindmapct.org (203) 589-0388





Barbara Walsh, PhD PRIME & STEP Assessments Philip Markovich STEP Outreach Coordinator



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CMHC / Yale

