



Better data, better outcomes: Depression

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Agenda



What are you currently missing?



Depression Experience Surveys

- Overview of surveys
 - Insights & use cases
-



The Evidation Platform

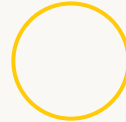


Questions

Most real-world data is episodic and fragmented, revealing only a small fraction of individuals' health experiences



A physician recommends that a patient starts taking an antidepressant



At a follow up visit, they report they stopped taking the medication due to side effects

Real-world data collected directly from individuals, provides context, and illuminates a more complete picture of health



A physician recommends that a patient starts taking an antidepressant



Changes in sleep



Managing stress



Lifestyle changes



Other treatments



At a follow up visit, they report they stopped taking the medication due to side effects

Evidation uses a layered approach to create novel real-world datasets

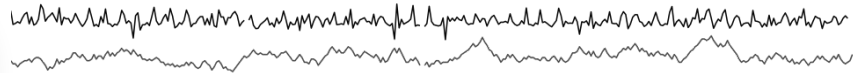
Evidation data is collected directly from individuals, through active and passive means, to create a more complete and nuanced picture of health.



Layer 1: Expert-designed in-depth surveys.



Layer 2: Repeated historical measures of experience, behaviors, and outcomes.



Layer 3: Dense objective measures of behavior and physiological functioning from consumer devices.

Quarterly **symptom and medication use** surveys paired with annual **SDoH** surveys and periodic PROs (e.g. **PHQ-8**)

Opportunity each day to report on **mood, sleep quality**, and **stress** with one click on the Evidation app

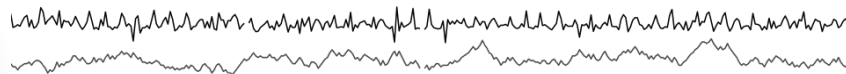
Daily summaries of **activity, sleep**, and **heart rate** from wearable devices - Fitbit, Apple Watch, Oura, and others



Layer 1: Expert-designed in-depth surveys.



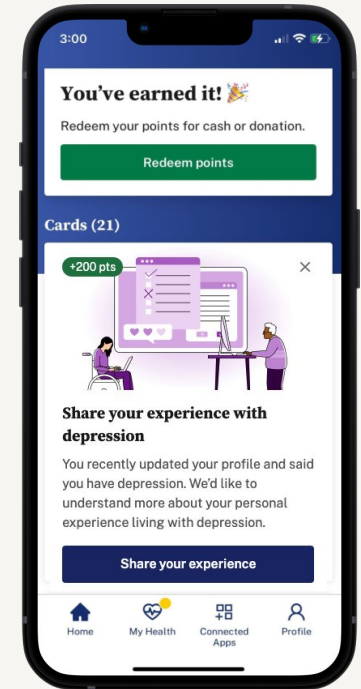
Layer 2: Repeated historical measures of experience, behaviors, and outcomes.



Layer 3: Dense objective measures of behavior and physiological functioning from consumer devices.

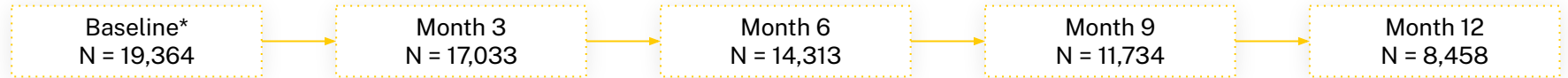
Depression Experience Surveys Overview

- **Objective:** Better understand depression symptoms in the real world, experiences with prescription medications, and quality of life
- **Setting:** Open to any member of the Evidation Community — the largest, most diverse virtual research cohort in the U.S. with nearly 5 million people
- **Scale:** 50,000+ Evidation Members enrolled in the survey so far
- **Timing:** Data collection is ongoing - the dataset will continue to grow. Findings presented are from March 2023 through February 2024
- **Privacy and trust:** Participants explicitly opted in to share their survey responses along with retrospective data collected from digital devices



We engage with individuals over time to understand their experiences with depression in the real world

Longitudinal data collection through an ongoing relationship with individuals can be used to **characterize** subgroups, **monitor** changes, and **quantify** impact of changes on relevant outcomes



*March 2023 cohort



105,615 total surveys

covering OTC medication use/alternative therapies, lifestyle changes, and symptom frequency and severity in the past 3 months

- ▶ Reports of **26,853** in-person HCP visits and **22,115** telehealth HCP visits
- ▶ **14,060** prescription treatment changes
- ▶ **28,000+** have activity data connected to the platform

Who has participated in the program?

- **50,000+** participants to date*
- **80%** Non-Hispanic White
- **85%** Female, **13%** Male, **2%** Non-binary
- **22%** Over 45 years old



Clinical Characteristics

Rx medication use at enrollment

- **63%** On Rx medication
- **39%** Taking SSRIs

Usual physician seen for depression

- **57%** general practitioner
- **9%** no usual physician

Age of diagnosis

- **24 years** was the average
- **33%** diagnosed when they were 18 or younger

PHQ-8 Scores

- **39%** experiencing major depression
- **36%** with 6 or more PHQ-8 reports

* Data has been filtered and cleaned to represent participants with demographic data and reflect trustworthy responses

Exploring real-world experience with depression symptoms

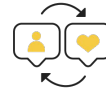
Understanding fatigue in depression

Background



- Fatigue is one of the most prevalent symptoms of major depressive disorder
- Experiencing fatigue may be related to a depressive episode, but can also be triggered by other factors, such as a side effect to depression treatment
- Fatigue may also remain even after a depressive episode¹

Why is this important?



- Left unaddressed, residual fatigue may exacerbate poor health outcomes and be a risk factor for relapse¹
- The experience of fatigue may be further influenced by social and contextual factors as well as comorbid conditions
- It is important to understand *who* experiences fatigue, *in what context*, and to explore *new ways to measure* it

How can direct to patient data help?



- Allows us to gather diverse patient perspectives on fatigue, how it impacts quality of life, and brainstorm potential interventions to address symptoms
- Provides longitudinal views on symptoms which can identify and characterize individuals who experience worsening fatigue as soon as possible
- Generates data needed to explore the association between fatigue and data from wearable devices

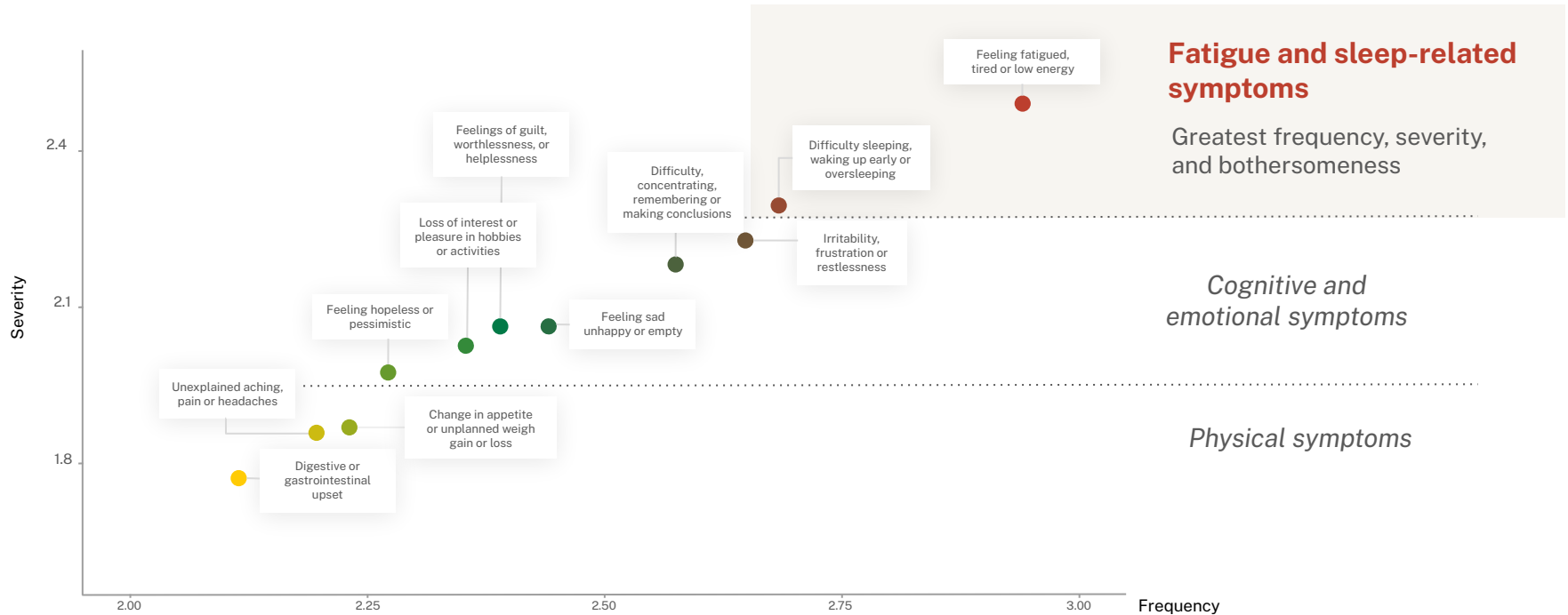
¹ Targum SD, Fava M. Fatigue as a residual symptom of depression. *Innov Clin Neurosci*. 2011;8(10):40-43.

Fatigue and sleep-related symptoms remain a significant unmet need

Frequency, Severity and Bothersomeness of Depression Symptoms

(N=40,317)

Bothersomeness ● 2.2 ● 2.4 ● 2.6 ● 2.8

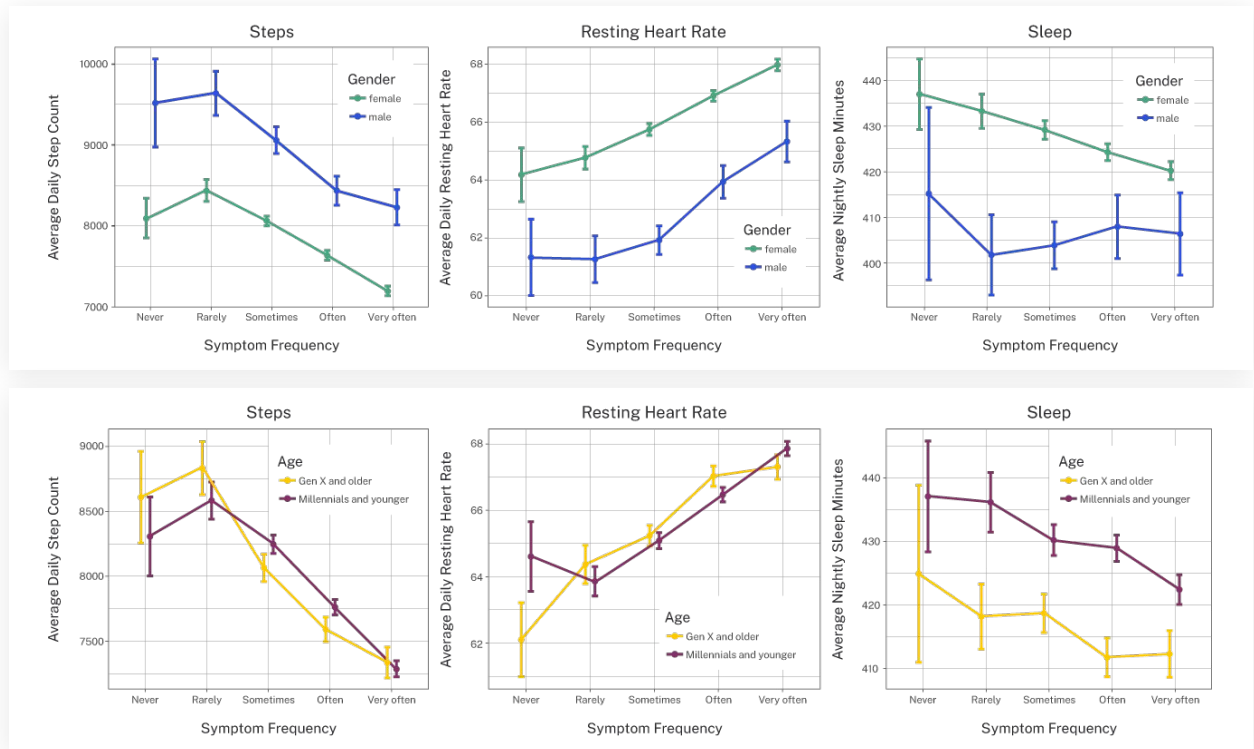


Wearable data help illustrate the impact of fatigue on everyday life

People who experience **more fatigue** walk less and have higher resting heart rates

The relationship between fatigue and sleep is more complex and may depend on factors like gender

Wearable data could help to passively identify individuals with worsening fatigue



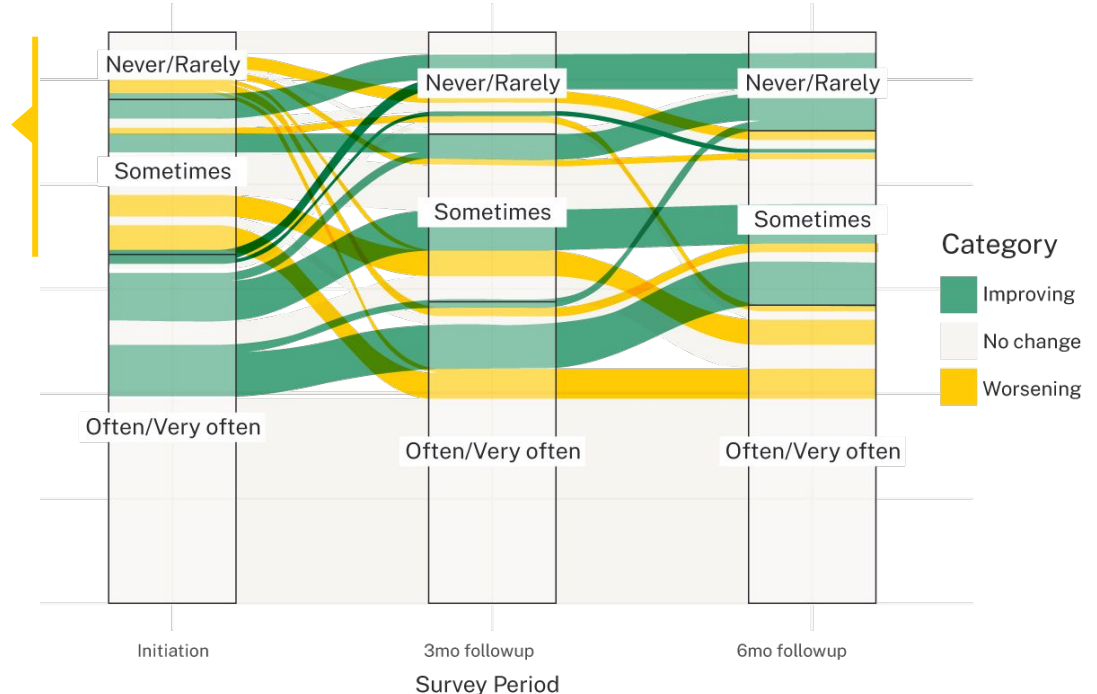
We observed worsening fatigue among some people starting SSRI therapy

Fatigue is a known side effect of SSRIs

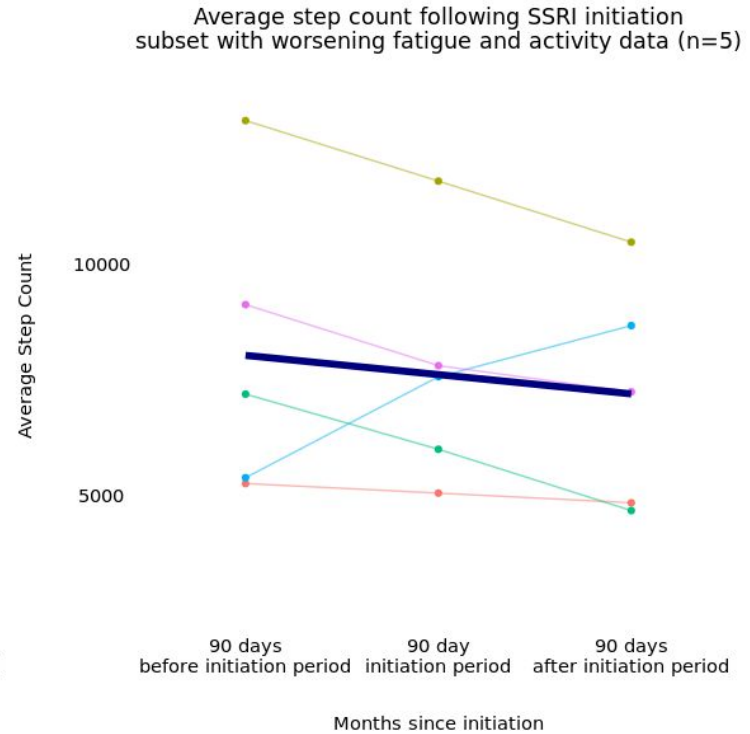
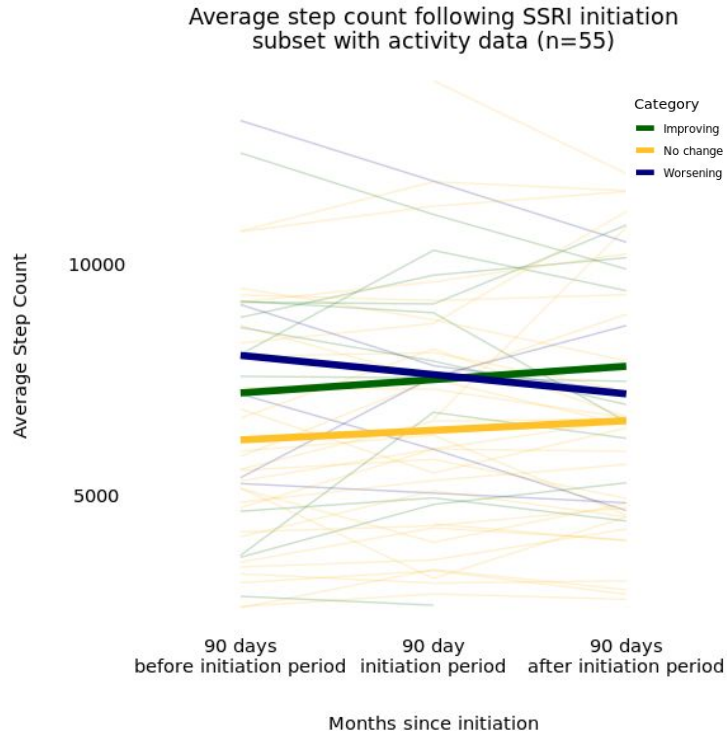
15% reported worsening fatigue within 6 months of starting an SSRI, half of whom experienced worsening within 3 months

Direct from patient symptom reports can help quickly identify those experiencing worsening symptoms to 1) study predictive characteristics and 2) provide support for coping with symptoms

Change in frequency of fatigue symptoms following SSRI use
Subset of individuals starting SSRIs in Month 3
(n=271)



Activity-related metrics like step count may be helpful in signaling changes in fatigue



The who, what, where, and when of unmet needs

Identifying individuals with unmet need in depression

Background



- Despite increased utilization of mental health services in the past decade, there has also been an increase in perceived unmet need ²
- For example, only 54% of adults find benefit from antidepressant medication and the multitude of pathways to recovery remain understudied ³

Why is this important?



- Lack of treatment or undertreatment is a risk factor for poor physical health outcomes in addition to impairment in work productivity and social relationships
- Depression is a heterogeneous condition, and so too are barriers to adequate treatment. Unmet need is likely driven by unique sociocultural and geographical contexts

How can direct to patient data help?

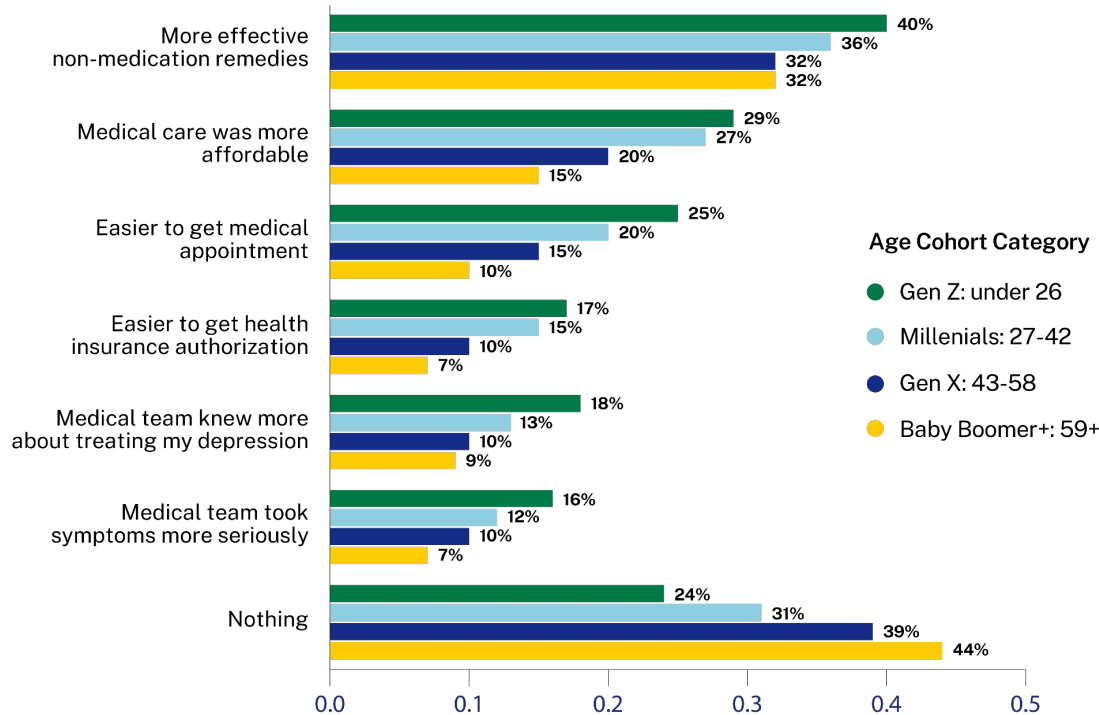


- Depressive episodes can last weeks or months, requiring repeated screening to gain a detailed view of how symptoms manifest; metrics captured in RWD sources like EMRs may be sporadic
- Longitudinal symptoms reports paired with *detailed contextual information* on lifestyle strategies (e.g., exercise) are key to understanding who needs additional support, what type, and when

² Conroy, J., Stamm, K., & Lin, L. (2021). The demographics of unmet need for mental health services. *Monitor on Psychology*, 52(3).

³ Cuijpers, P., Stringaris, A., & Wolpert, M. (2020). Treatment outcomes for depression: challenges and opportunities. *The Lancet Psychiatry*, 7(11), 925-927.

Younger individuals may be at greater risk for undertreatment of their depression

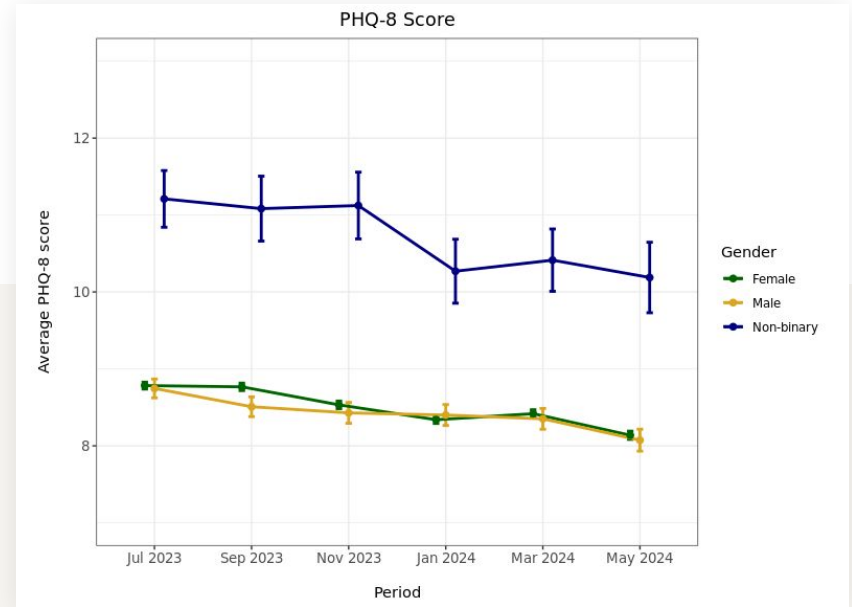
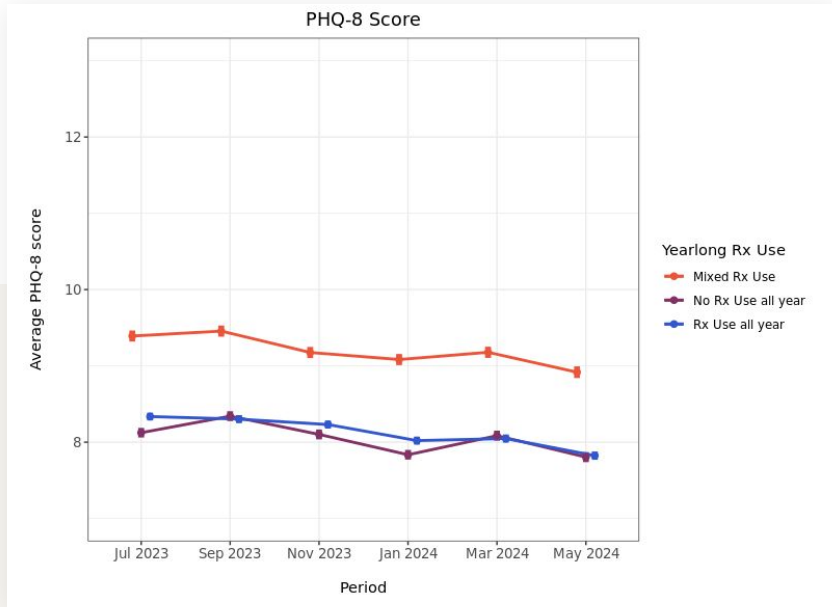


Younger individuals were more likely to wish something was different in their treatment journey across different categories

Younger cohorts also had higher average PHQ-8 scores and rates of not being on Rx medication

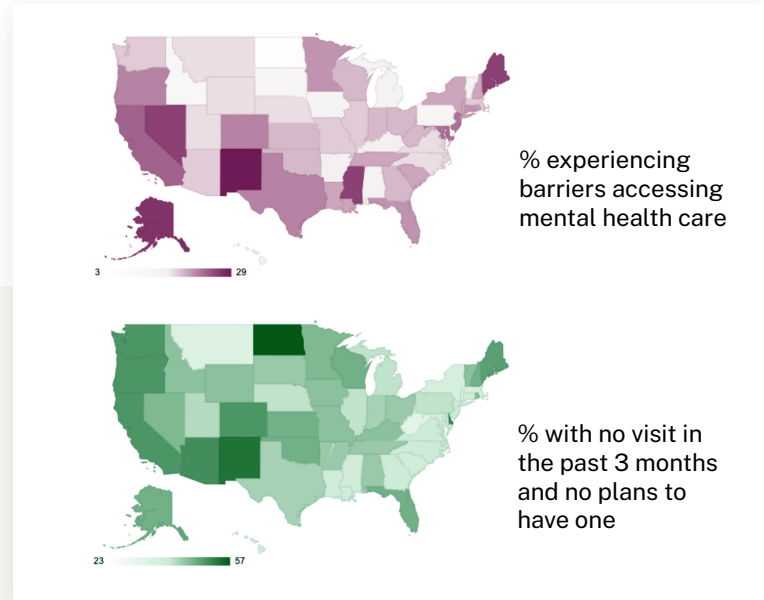
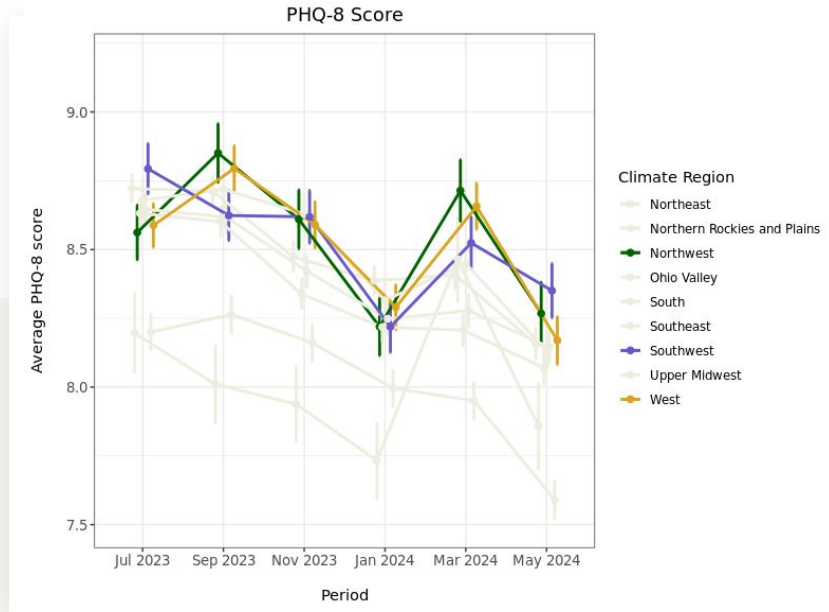
Subgroup analysis of direct to patient data can reveal differing perspectives on health care across key subgroups

Treatment switchers and non-binary individuals experience more severe depression compared to other subgroups



Recurring symptoms reports and PROs from the same individuals can uncover temporal trends within individuals and across groups, which can be used to identify those who need additional mental health support

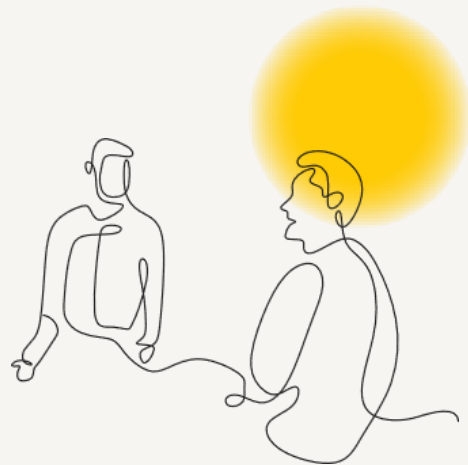
Residents in the West experience more severe depression and are more likely to report barriers to mental health care



Direct to patient data allow for exploration of regional and neighborhood trends in care access and unmet need

Key takeaways

- **Passively collected data** from digital devices tell a story not possible with traditional data collection tactics
 - Ex: Wearable data may be a useful way of detecting changes in fatigue symptoms over time
- A direct connection to individuals allows for **re-engagement** and the ability to capture **longitudinal insights**
 - Ex: 15% of individuals starting SSRIs reported worsening fatigue in the first 6 months of treatment
- Surveys deployed **directly to individuals** are necessary to accurately capture experiences and perceptions
 - Ex: Younger individuals face challenges to accessing treatment and managing their depression



Where can we go next?

Deeper analysis of the current dataset

- Social determinants of health, well-being surveys, comorbidities

Continued growth of the current dataset

- Ongoing data collection

Custom surveys

- Use of virtual care, stigma, etc.

Data linkage

- Claims, EHR, etc.



Evidation's platform provides an ongoing connection to individuals to understand the real-world impact of depression

Patient Experience Data



- Integrate survey and wearable data with claims or EHR to better understand healthcare utilization and build detailed patient journeys, including the patient experience in between healthcare visits and potential confounders in your analysis

Patient Insights



- Identify individuals experiencing specific constellations of symptoms and explore cohort specific-challenges and unmet need
- Identify individuals who recently reported changes in medication or symptom progression to further study drivers

Real-World Studies



- Define subgroups for enrollment in clinical trials of new digital therapeutics or medication
- Launch prospective study with higher frequency data collection to better understand day to day dynamics of depression

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