

Motivation

Pandemics and disasters can have **severe negative consequences** on **mental health**. The pandemic may significantly change discussion on **mental health forums**.

Data

Three mental health subreddits: **r/Anxiety**, **r/depression**, and **r/SuicideWatch**. Fifty control subreddits, including: r/AskMen, r/personalfinance, r/relationship_advice.



Posts and comments from January 2017 – May 2020

Methods

Features extracted:

- Daily post count
- LIWC counts (psycholinguistic categories)
- Topics from LDA model
- User graph features

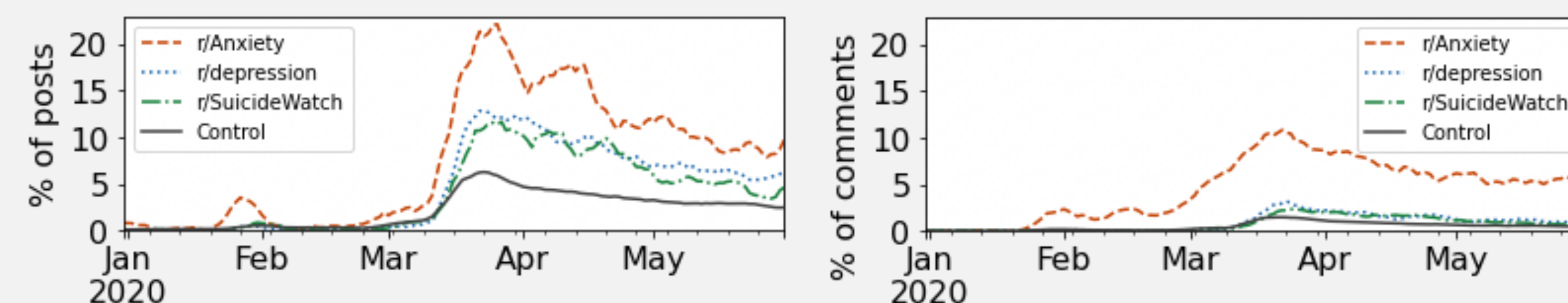
Create a **time series** for each metric and subreddit with **daily values**.

Compute the **difference** (d_{mh}) between the mental health series (s_{mh}) and control series (s_c):

$$d_{mh} = s_{mh} - \frac{1}{|control|} \sum_{c \in control} s_c$$

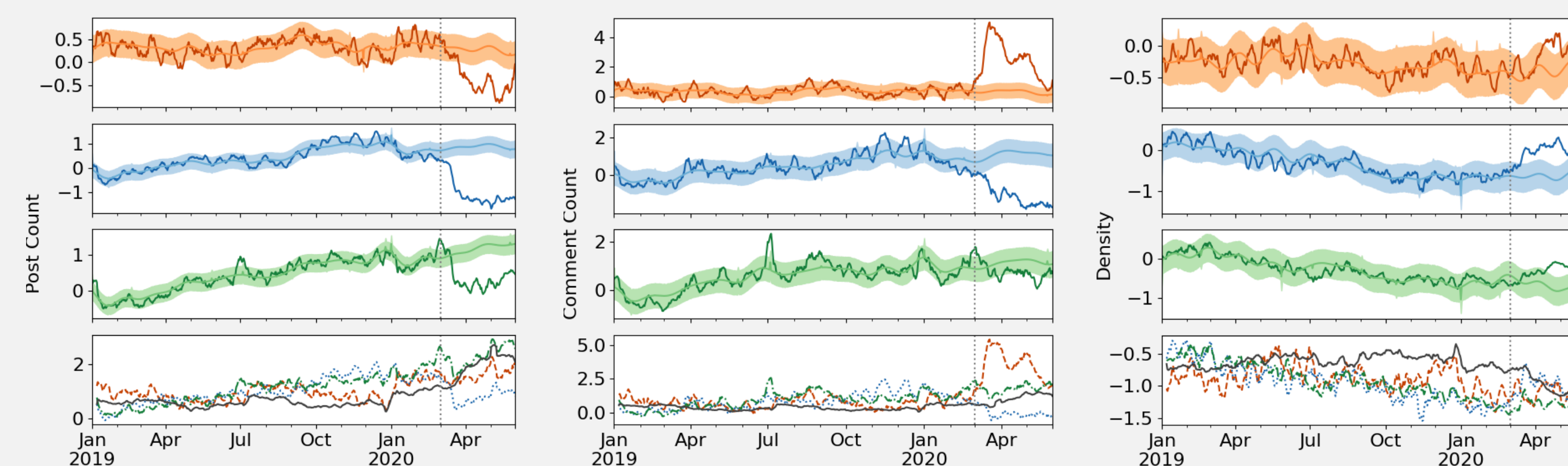
Use **prophet time series model** and **intervention analysis** techniques.

To what extent is COVID-19 discussed on Reddit?

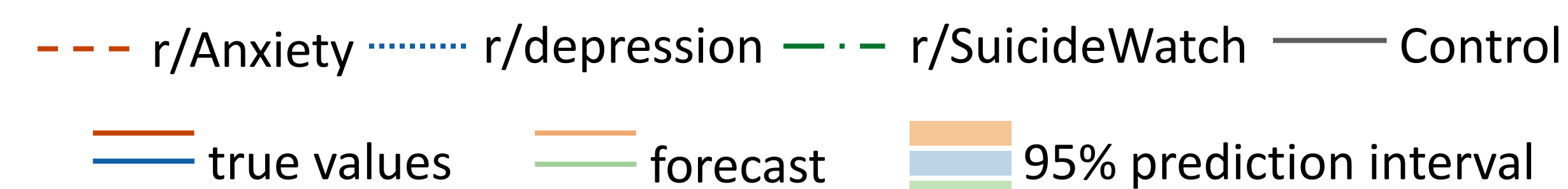


Discussion increased in March, as the virus began having more impact on the US. COVID-19 is discussed more on mental health subreddits, especially **r/Anxiety**.

Has COVID-19 led to changes in engagement and social interaction?

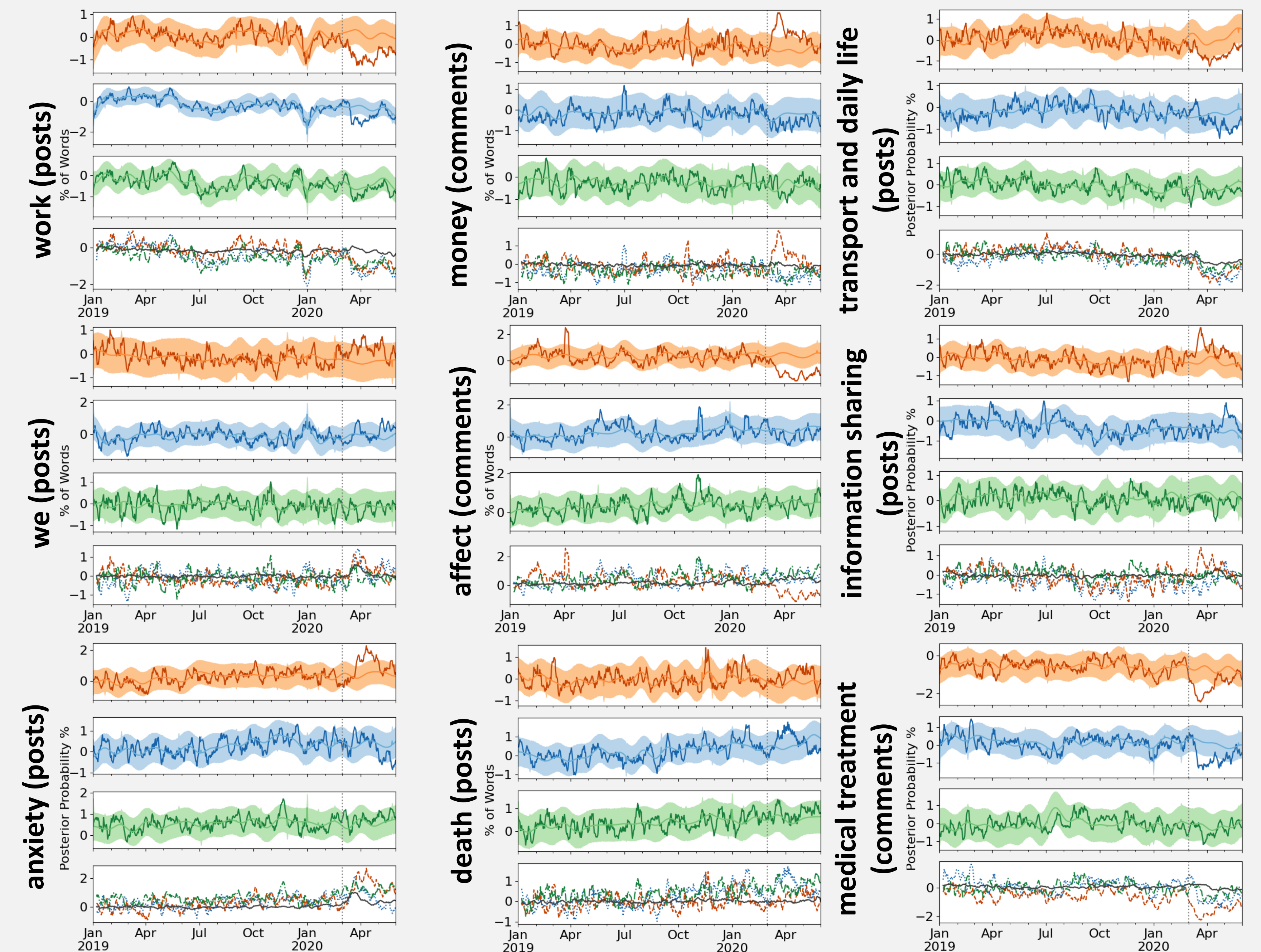


Activity levels drop on most mental health subreddits relative to controls, which could indicate less need for support or more withdrawal from social situations. **r/Anxiety** comments increase with the presence of COVID-19 megathreads. Density increases, indicating more connectedness between users.



The lighter line is the Prophet forecast, the shaded area is the 95% prediction interval, and the darker line is the true value. The first three plots show results for **r/Anxiety**, **r/depression**, and **r/SuicideWatch**, respectively. The final subplot shows the raw series for the individual mental health subreddits and for the average of the controls.

Have changes in conversations spurred by COVID-19 been different in mental health subreddits?



Row 1: Economic concerns may lead to an increase in discussion of money; a decrease in discussion of work goes along with a decrease in ordinary events (transport and daily life).

Row 2: Content shifted towards sharing information instead of emotions. The information sharing topic includes words like “hope”, which along with the increase in “we” are indicative of collective coping.

Row 3: We see some increase in discussion of anxiety and death; we see a decrease in medical treatment, indicating lack of treatment options during the pandemic.

The results sometimes differ between posts and comments, and we show examples with both.