Suicidality and Mood: The Impact of Trends, Seasons, Day of the Week, and Time of Day on Implicit and Explicit Cognitions

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Decades of research have established seasonality effects on completed and attempted suicides, with an increase in rates during spring and early summer. Using more than six years of data (April 2012 – November 2018), we used new Prophet models to forecast mood and explicit and implicit measures of self-harm among an online community sample residing in the US and UK (N > 7,975). We decomposed the time series into trends across the years, within years (seasons), weekly, and daily seasonal patterns. Across all outcomes, the long-term changes across the years and the seasonal patterns show the strongest variation on explicit and implicit cognitions, followed by the time of day (negative cognitions peaking around 4 am – 5 am), with the day of the week showing the weakest effects. The data show a general increase of negative cognitions across the six years, paralleling trends in suicide rates and depression prevalence in the US and UK. Autoregressive-integrated moving average (ARIMA) models showed seasonality effects for mood and desire to die among US, UK, and Canadian respondents (N > 10,445), particularly in the group of respondents who previously made a suicide attempt. Negative cognitions were generally the lowest in summer (June) and peaked in winter (December). These negative cognitions precede the rise in suicidal behaviors during spring and early summer. We discuss potential reasons for lagged effects of negative cognitions on suicidal behavior and implicit cognitions, which may be crucial for theoretical advancements. Our findings have implications for the clinical risk assessment of patients with a history of suicide attempts and public policies regarding the availability of health services.

Biography
René Freichel has completed two masters degrees in data science and psychology at the University of Amsterdam. He is currently a PhD candidate working on using advanced data science techniques for research on mental disorders. He has published two preprints that are currently under review at Nature Human Behavior and JAMA Psychiatry.