

Mental health-related conversations on social media and crisis episodes: a time-series regression analysis.

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Background and aims

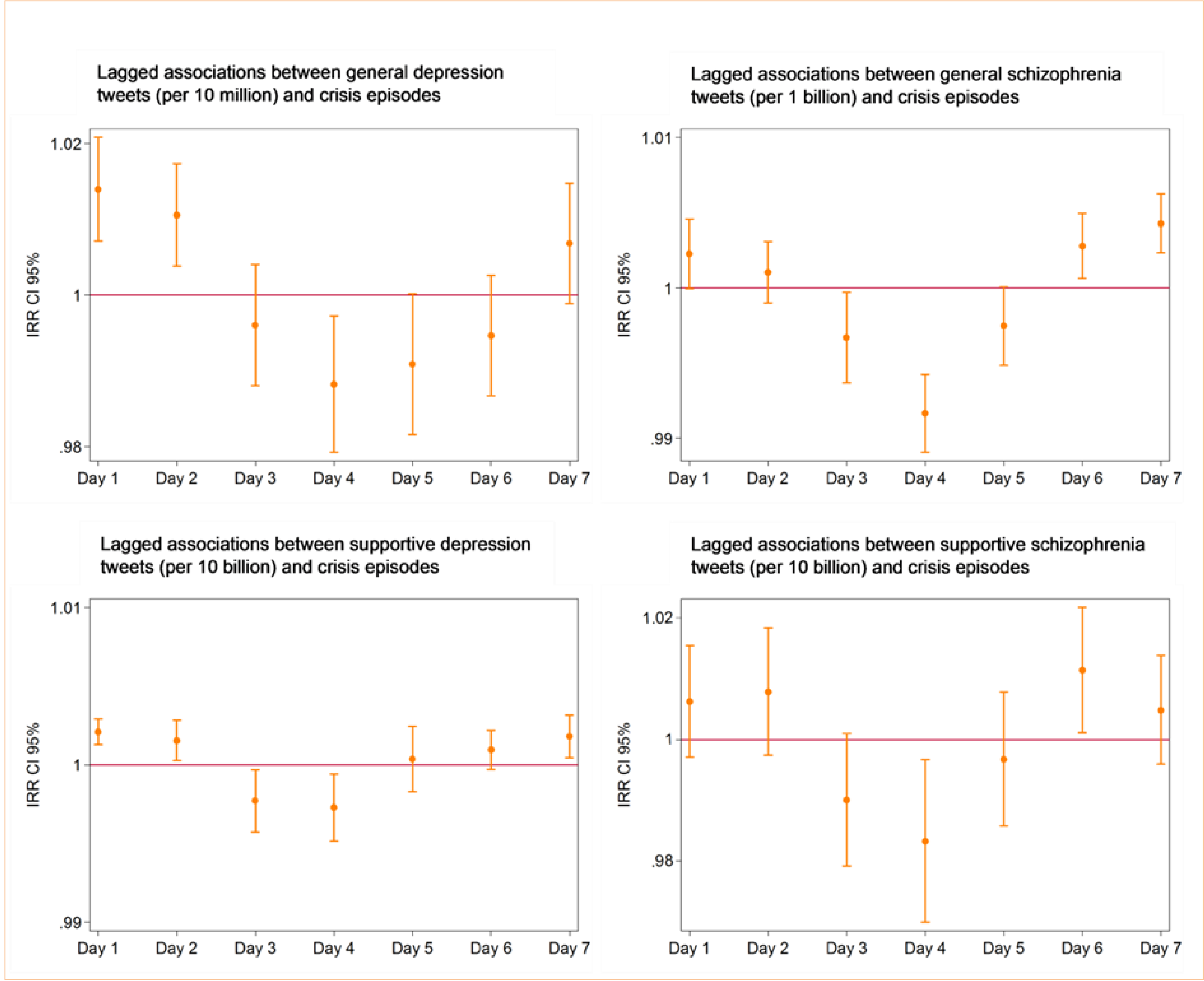
The value of collecting digital information for healthcare monitoring has been progressively recognised. Taking advantage of ‘big data’ from both mental healthcare and social media, we sought to investigate the extent to which day-to-day fluctuations in Twitter discussions about depression and schizophrenia would be associated with mental health crisis episodes in secondary mental healthcare.

Methods

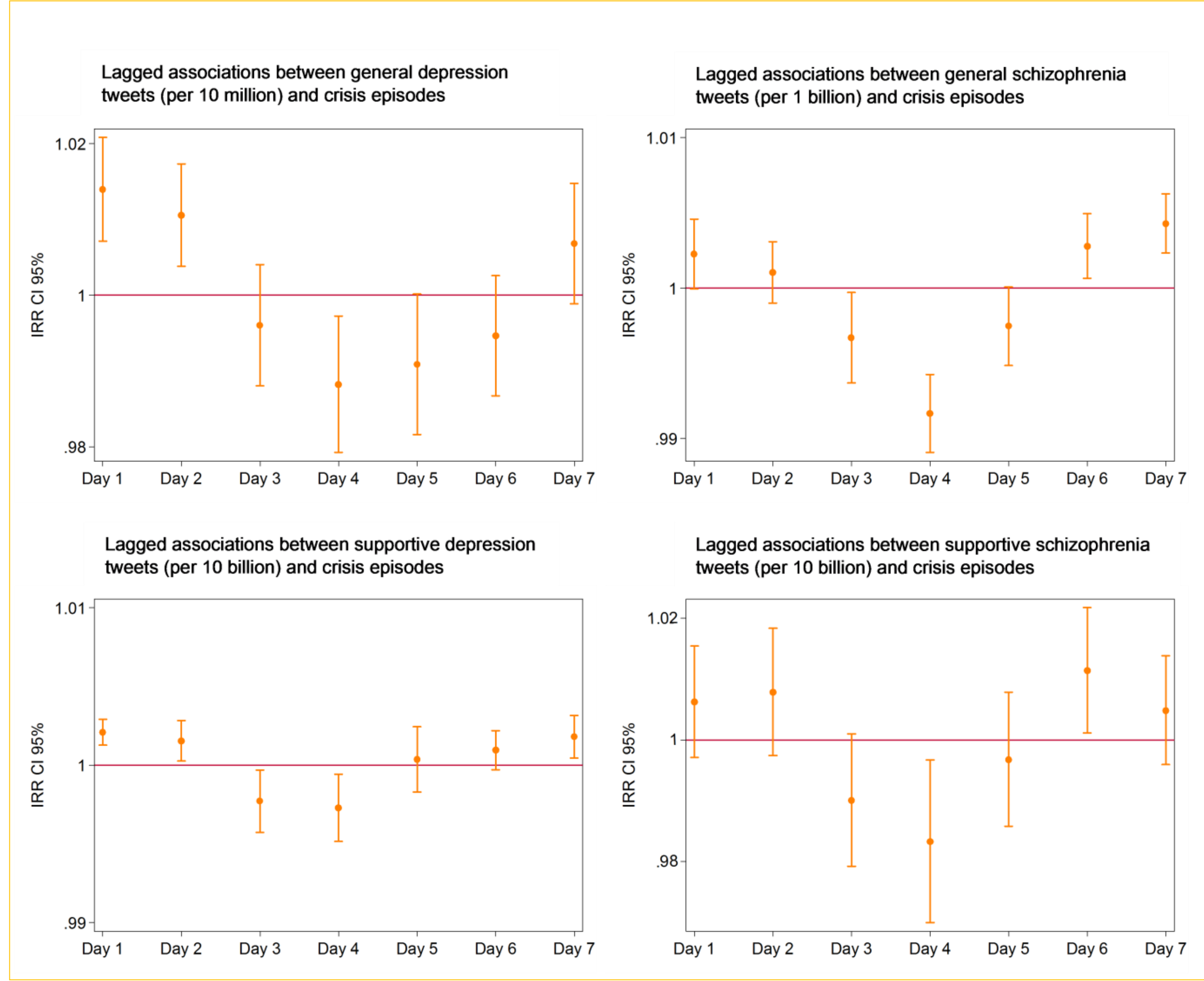
- ❖ Twitter – general/supportive schizophrenia /depression posts
- ❖ SLAM and Camden and Islington (C&I) - crisis episodes (incident inpatient, home treatment team and crisis house referrals)
- ❖ Time series regression analysis adjusted for autocorrelation, year, temperature, seasonality and bed occupancy level – Jan 2010-Dec 2014

Outcomes

- ❖ Higher volume of twitter posts was positively associated with an increase in crisis episodes on the same day
- ❖ 7-day delayed effects showed a pattern of early positive and middle negative associations with a return to positive associations by day 7
- ❖ Results were near identical in SLAM and C&I
- ❖ 9-15% increase in crisis episodes on above-median tweet days



Lagged associations between mental health tweets and SLAM crisis episodes adjusted for autocorrelation, year, temperature, seasonality and occupancy level. The horizontal axis represents the associations lagged over a 7-day period and the vertical axis represents the Relative Risks (RR) with 95% confidence intervals (CI).



Lagged associations between mental health tweets and CI crisis episodes adjusted for autocorrelation, year, temperature and seasonality. The horizontal axis represents the associations lagged over a 7-day period and the vertical axis represents the Relative Risks (RR) with 95% confidence intervals (CI).

Concurrent unadjusted and adjusted associations between daily tweet volumes and daily crisis episodes at the participating sites				
Tweet content	Crisis episodes SLAM		Crisis episodes C&I	
	Unadjusted RR (95% CI)	Adjusted RR (95% CI)	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
Depression - general <sup>1</sup>	1.003 (1.000-1.007)	1.008* (1.002–1.014)	1.000 (0.934–1.003)	1.008* (1.001-1.015)
Schizophrenia - general <sup>2</sup>	1.003** (1.002-1.004)	1.006** (1.004-1.008)	1.002* (1.000-1.003)	1.006** (1.003-1.008)
Depression - supportive <sup>3</sup>	1.002** (1.001–1.003)	1.003* * (1.001–1.004)	1.003** (1.001-1.004)	1.003** (1.001-1.005)
Schizophrenia - supportive <sup>4</sup>	1.014** (1.006-1.021)	1.015** (1.010–1.022)	1.012** (1.004–1.020)	1.014** (1.006-1.022)

<sup>1</sup> per 10 million <sup>2</sup> per 1 billion <sup>3</sup> per 10 billion <sup>4</sup> per 10 billion

Adjusted associations between above-median tweet volume days and daily crisis episodes in SLAM		
Tweet content	Crisis Episodes	
	RR (95% CI)	P value
Depression - general <sup>1</sup>	1.04 (0.98-1.11)	0.181
Schizophrenia - general <sup>2</sup>	1.15 (1.10-1.21)	<0.001
Depression - supportive <sup>3</sup>	1.09 (1.05-1.14)	<0.001
Schizophrenia - supportive <sup>4</sup>	1.10 (1.06-1.15)	<0.001

Discussion

- ❖ Potential for social media to inadvertently impact mental health of vulnerable populations
- ❖ Effects suggest great need for identifying these groups and countering negative messages
- ❖ 7-day associations are consistent with precipitating and longer-term effects
- ❖ Monitoring system to identify risk days and communicate these to services and professionals

