

Comparative Google Trends infodemiology study of search trends related to semaglutide in 25 countries

Poster
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- Worldwide internet interest in semaglutide rose steeply from 2022
- News reporting partially explains interest in some countries
- Interest corresponded with several viral social media posts
- Weight loss was a stronger & more common theme than diabetes

BACKGROUND

Semaglutide is the glucagon-like peptide-1 receptor agonist supplied by Novo Nordisk as Ozempic for type 2 diabetes mellitus (T2DM) patients' long-term weight management, and as Wegovy for weight loss. Promotion by social media influencers made Ozempic popular for non-diabetic weight loss, through off-label prescription. Resultant worldwide supply shortages—as off-label demand outstripped supply—increased health risk for on-label T2DM patients. Regulators and clinicians need insight into the nature of demand for Ozempic, including change over time and regional similarities/differences. Some key social media mentions of semaglutide are:

Table 1: Key social media promotion of semaglutide

Date	Social media promotion
15-Feb-21	Dr Oz show featured a New York Times article on semaglutide
24-Apr-22	Elon Musk tweeted "... semaglutide (aka Ozempic/Rybelsus) appears to be effective in appetite control with minor side effects"
2-May-22	Kim Kardashian wore Marilyn Monroe's dress to the Met gala
2-Oct-22	Elon Musk tweeted "Fasting.... And Wegovy" when asked about his physical fitness
12-May-23	Elon Musk tweeted "Semaglutide actually works" in a weight loss thread

AIM

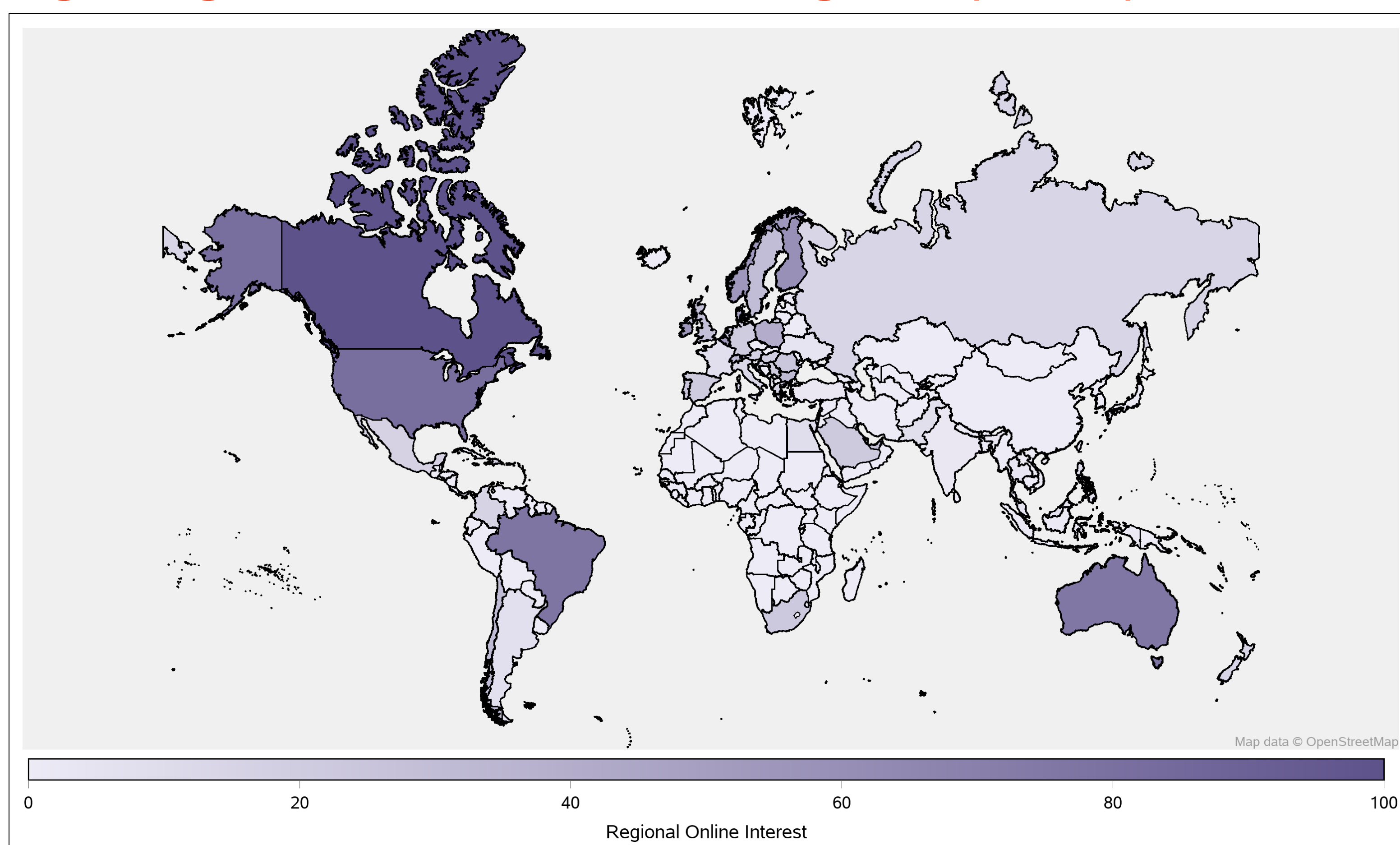
Our study aimed to provide a panoramic insight into global interest in semaglutide, how interest has changed over time, and whether (and in which ways), it responded to social media promotion, as well as what the features of interest in semaglutide were across various countries.

METHODS

We used the **Google Trends (GT) Extended for Health API** and our extraction tool to extract data. First we extracted Regional Online Interest (ROI) from GT worldwide scaled probabilities for all countries (Fig 1). Then we selected 25 countries with sufficient search interest in semaglutide (ROI). We obtained 30 samples of **raw search probabilities** for semaglutide-related searches between 2019–2023 for these countries. We accessed the **top quarterly search queries** per country for semaglutide-related searches between 2021–2023. We obtained semaglutide-related mentions in conventional news media using **ProQuest**. We compared news mentions and search trends per country using **Granger causal analysis**. We examined per-country search trends for significant changes using **Joinpoint regression** and related these to high visibility social media posts. We used **natural language processing** to identify the most salient themes in the top search queries per quarter per country.

RESULTS

Fig 1: Regional Online Interest in semaglutide (2021–2)



Search interest in semaglutide (GT search probability) from the time of initial national approvals (circa 2019) was initially flat but increased dramatically from 2022 in numerous countries (Fig 2).

Granger analysis showed a **variable relationship between news reporting and online search interest**. The best relationships between news coverage and search trends were found in Germany and the UK. Joinpoint regression showed multi-phasic **non-linear patterns in search probabilities** across all countries, necessitating detailed local analysis within each country context. Some **viral social media posts** from the U.S. corresponded to **peaks in search interest** in multiple countries (Fig 3). The Dr Oz show showed the greatest correspondence to search interest peaks. The NLP thematic analysis revealed **new trends emerging over time** (e.g., the so-called "Ozempic face" side effect). Not all countries showed searches for side effects as a theme. The Weight loss theme was identified in all countries, but T2DM in only two countries (Germany and the USA). Country-specific themes related to obtaining Ozempic were common—i.e., local purchasing ('buy', 'get', etc.) of Ozempic together with the name of a prominent local retailer (e.g., Chemist Warehouse in Australia, Boots in the UK, Dischem in South Africa, etc.).

Fig 2: Weekly per-country search interest in semaglutide (2019–23) (y-axis: Google Trends search probability x 10⁷)

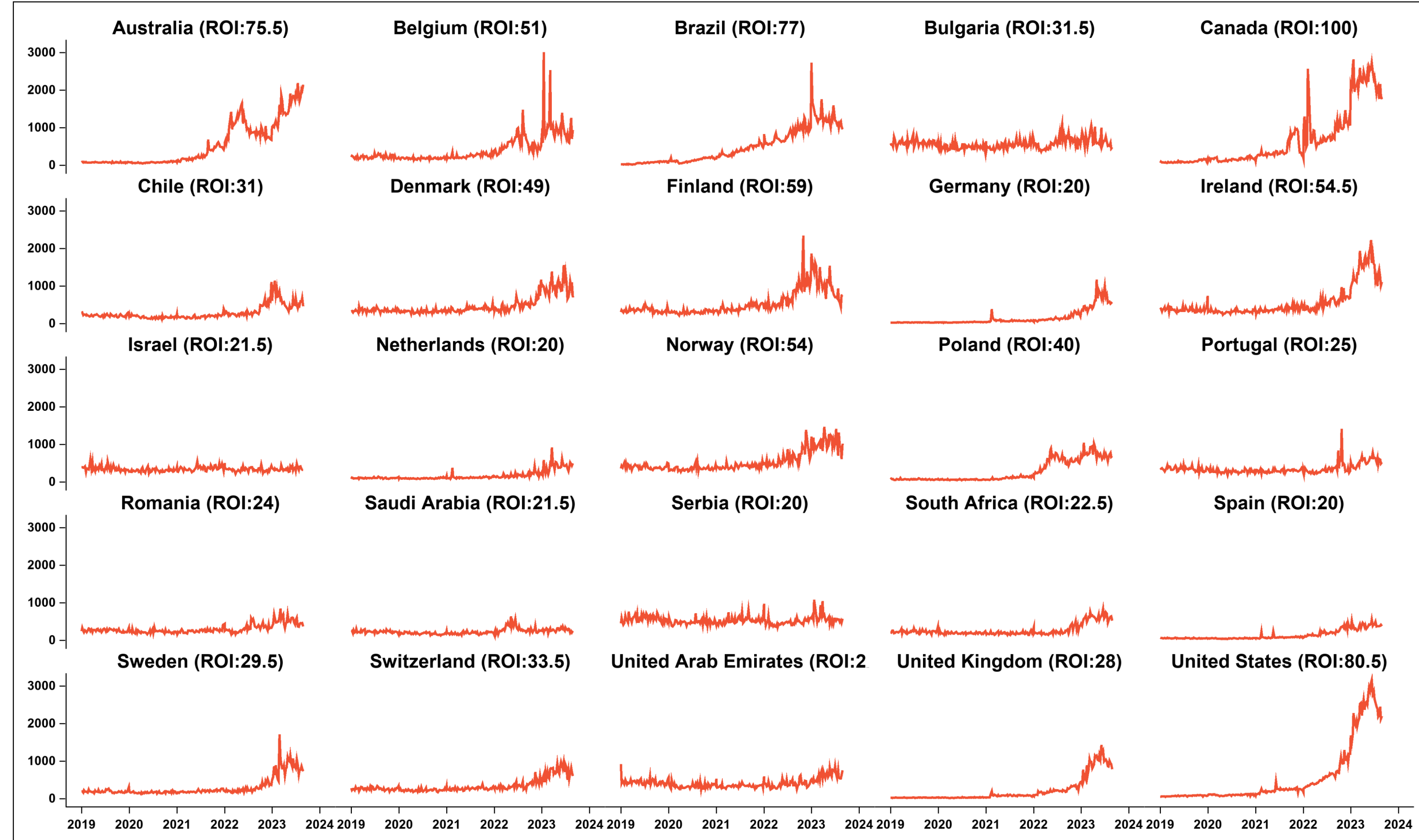
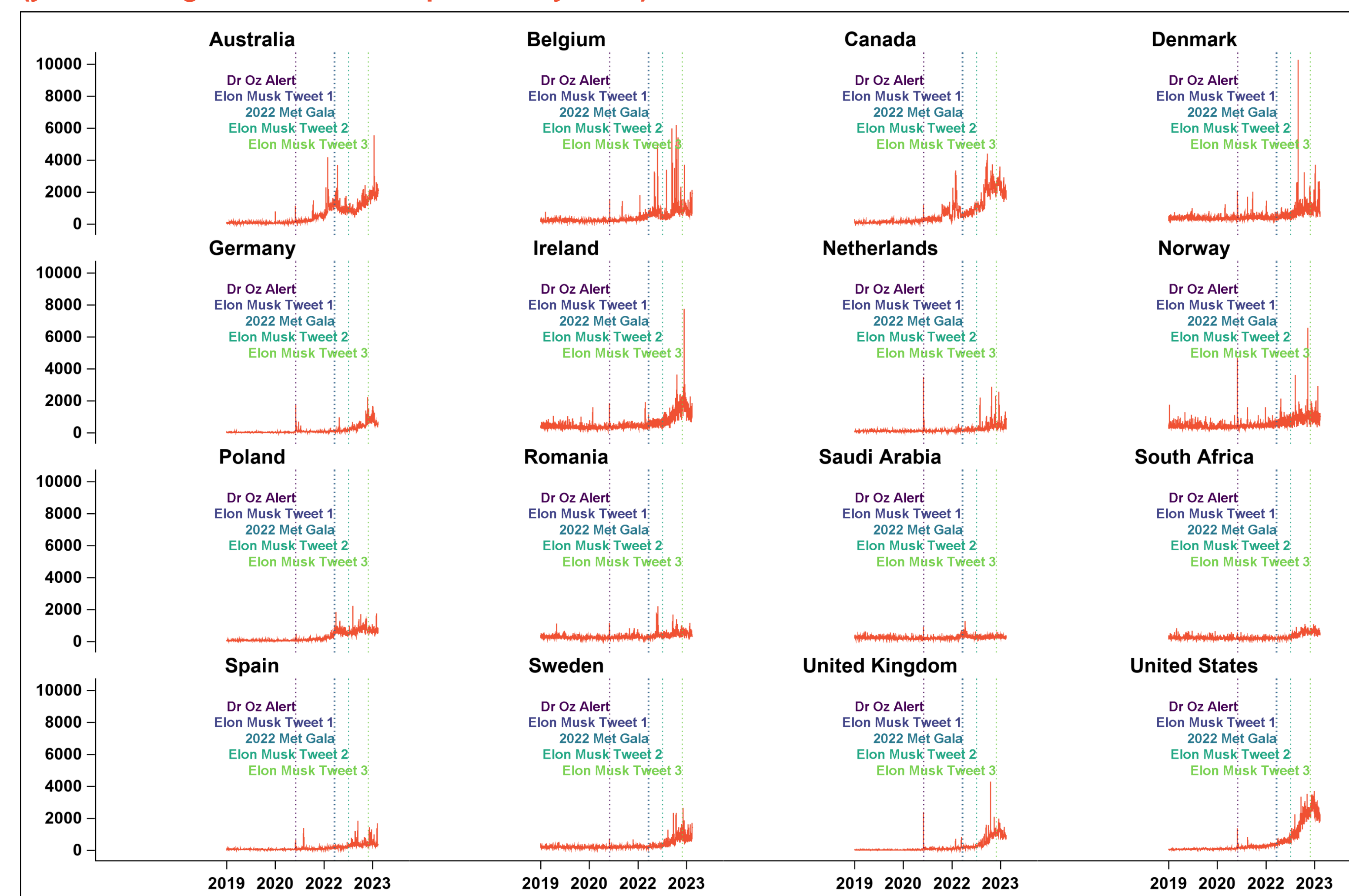


Fig 3: Daily per-country search interest in semaglutide (2019–23) (y-axis: Google Trends search probability x 10⁷)



CONCLUSIONS

GT data gave insights into some semaglutide-related trends. Search query themes revealed new issues over time, highlighting similarities and differences between countries, for a nuanced understanding of regional variation in interest in semaglutide. Our data provide a baseline for further research in each included country.

IMPLICATIONS

Regulators attributed semaglutide shortages to social-media-driven demand for off-label use. A trifecta of i) inadequate supply to patients who need medicines, ii) improper off-label use, and iii) harmful counterfeit medicines flooding markets, combines with public desperation for medical interventions to lifestyle diseases to create a new health risk reality.

ADDITIONAL KEY INFORMATION

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