

# Public Reaction to Pharmaceutical Preannouncements on Social Media: A Signaling Perspective

Olivier Caron   Christophe Benavent

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## Slide 2: Context

- ▶ Strategic importance of preannouncements in the pharmaceutical industry.
- ▶ Example: COVID-19 vaccine developments.
- ▶ Challenges: Managing public perception on social media.

**Image:** A timeline of COVID-19 vaccine approvals.

## Slide 3: Research Problem and Objectives

**Problem:** How do preannouncements influence public sentiment?

**Objectives:**

1. Explore public reactions using Twitter data.
2. Analyze sentiment variations and side effects mentions.

**Image:** A visual of the signaling theory framework.

## Slide 4: Theoretical Framework

- ▶ **Signaling Theory:** Managing uncertainty via strategic communication.
- ▶ Dual role: Informing regulators, influencing competitors, and engaging the public.
- ▶ Negativity bias: Negative signals dominate public discourse.

**Image:** Diagram illustrating signaling between companies, regulators, and the public.

## Slide 5: Methodology

- ▶ **Data Collection:**

- ▶ 1.4M tweets narrowed to 150,564.
- ▶ Focus on Pfizer, Moderna, AstraZeneca, and BioNTech.

- ▶ **Techniques:**

- ▶ Named Entity Recognition (NER) with GLiNER.
- ▶ Sentiment analysis with XLM-roBERTa.

**Image:** A flowchart of data collection and processing steps.

## Slide 6: NER Results

- ▶ Identified mentions of side effects:
  - ▶ Pfizer: Fever, cardiac issues.
  - ▶ Moderna: Muscle pain, fatigue.
  - ▶ AstraZeneca: Thrombosis, cutaneous reactions.
- ▶ Insights: Negative associations shape public narratives.

**Image:** Graph of significant side effects for each company.

## Slide 7: Sentiment Analysis

- ▶ **Pfizer:** Surge in positive sentiment after preannouncements but a backlash later.
- ▶ **AstraZeneca:** Dominant negative sentiment due to safety concerns.
- ▶ **Moderna:** Similar patterns as Pfizer but less scrutiny.

**Image:** Sentiment proportion chart for Pfizer.

## Slide 8: Discussion

- ▶ Strategic challenges:
  - ▶ Visibility attracts scrutiny (Pfizer).
  - ▶ Safety concerns dominate narratives (AstraZeneca).
  - ▶ Importance of precise communication.
- ▶ Crisis communication must address negativity bias effectively.

**Image:** A schematic of sentiment evolution across time.



## Slide 9: Practical Implications

- ▶ **For pharmaceutical companies:**
  - ▶ Use advanced tools like NER to monitor public discourse.
  - ▶ Develop transparent, timely communication strategies.
- ▶ **For regulators:**
  - ▶ Collaborate on clear, unified messages during crises.

**Image:** Diagram of collaborative communication strategies.

## Slide 10: Conclusion

- ▶ Contributions:
  - ▶ Insights into public perception of preannouncements.
  - ▶ Application of NER and sentiment analysis in marketing.
- ▶ Future Research: Explore long-term effects on brand trust.

**Image:** Thank you slide with your contact details and conference branding.