

Review of Trends in Health Social Media Analysis

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- **The area under consideration** – Social Media, Medical Forums

It is stated that:

- **31% healthcare professionals** are engaged in professional networking on social media
- **18-24 years olds** are more likely to twice as often seek for health-related information on social media, than 45 to 54 years olds¹, while 90% of the first ones trust medical information shared by others on social media network²
- Moreover, **41% of people** said social media will affect their choice of treatment, clinic and doctor³

¹<http://www.adweek.com>

²<https://searchenginewatch.com>

³<http://thesparkreport.com>

Patients are actively involved in sharing and posting health-related information in various **healthcare social networks**:

- a large source of recent data from all over the world
- diverse information on the majority of health-related topics
- broad distribution of patients and doctors

The healthcare professionals, public authorities as well as general public, patients can use social media to retrieve medical information and communicate about health issues

- ▷ Needs automatic ways to perform analysis
- ▷ In our work, recent advances in this area are discussed, putting special attention to the topic of ADR detection

Topics under consideration

- pharmacovigilance: adverse drug reactions extraction and classification (ADR), monitoring malpractice and drug abuse
- medical concept extraction task for detecting mention of proteins, genes, drugs, diseases, tests and treatments
- relation extraction tasks for extracting relations from texts about drug-drug interactions, drug-symptoms-treatment relations
- prediction of whether people will stay on or leave health forums
- pandemic tracking
- utilizing smoking cessation patterns as well as organizing different anti-smocking and other campaigns

Examples of Posts about ADR on Twitter

Frequent misspellings: "Baek suddenly losing his glow :(nd im losing my abilitiy to speak"; "adderal reeeeeeeallllllly helped my depression but I had terrible s/e's :(Do you have Hypothyroidism?"

Confused sentiment: "I loved effexor for anxiety and depression but it raised my blood pressure too much so I had to stop"

Drug abuse: "Sertraline Buspiron Lexapro and Abilify really messed up. I felt like Theon Greyjoy :("

Drug-drug interaction: "I'm in pain. I mixed my antibiotics with my lexapro, and now I feel like I have the flu. :("

Overall experience: "apparently itching/rash can be a side effect of wellbutrin that doesn't show up for a while after u start taking it? This is fine:("; "copaxone injections in the next week or so, got my health insurance sorted thankfully. Kinda nervous about the side effects"

Other bad sentiment: "not sure id be so brave with the heights! I'm not bad, struggling with appetite, pain and bloating :(may have to dbl humira."; "okay I only have 2 pain pills left :(no more lexapro , my knee hurts . :/"

The following **challenges** occur:

1. short posts formats
2. complexity of human language
3. unbalanced structure of data

Tools:

- Supervised methods – if labeled data is available. Examples: DiegoLab challenge aimed to increase awareness in the analysis of Social Media for the purpose of extraction and classification of ADRs
- Unsupervised – building medical ontologies, topic modeling, clusterization, etc

Thank you for your attention

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