Typology of drug misuse created from information available in health fora

Elise Bigeard^{1 2} Natalia Grabar¹ Frantz Thiessard²

¹Univ. Lille, CNRS, UMR 8163 - STL - Savoirs Textes Langage, F-59000 Lille, France

²Univ. Bordeaux, Inserm, Bordeaux Population Health Research Center, team ERIAS, UMR 1219, F-33000 Bordeaux, France

> 25th May 2018 MIE 2018 Gotheborg Sweden

Outline

Introduction

Methods

Results

Goal

- ▶ global goal : Analyze drug misuses in internet forums
- today's presentation : How we classified drug misuses in a typology & the contents of our typology

Goal

Typology: systematic classification of the types of something according to their common characteristics

A classification into categories of the different kinds of drug misuses we encountered in internet forums

Goal

Misuse definition for our purpose (different from the WHO definition) :

Use of a prescription drug for a purpose or in a fashion not consistent with medical guidelines

Examples of misuses

- "I was taken to hospital because I messed with sleeping pills to get smashed"
- ▶ "Hello I was supposed to take decapeptyl 1,5 mg this evening but I didn't have the prescription on me and I ended taking 3 mg, did this ever happen to someone?"
- "When I was not feeling well last week, I was already thinking about stopping xanax against my doctor's instructions."

translated from French

Related work

Drug use in social media

[O'Connor et al., 2014] Adverse drug reactions on *Twitter*

[Yang et al., 2015] Unsupervised mining of ADR from *Medhelp*

[Sarker et al., 2015] Review of ADR moditoring with social media

Drug misuse in social media

[Kalyanam et al., 2017] Non medical use of opioids on *Twitter*

[Cameron et al., 2013] Semantic platform for drug abuse epidemiology in social media

Corpus

- ▶ From French health forum *Doctissimo*
- Must contain a drug
- Must be less than 2,500 characters long
- ▶ 1,900 messages
 - 1,400 messages randomly selected
 - 500 messages with various drugs

Manual annotation

Categories:

- ▶ No use "Can someone share their experience with xanax?"
- Normal use "I took a xanax I feel better already"
- ► Misuse "I just took an entire box of xanax do you think it will be enough?"

2 annotators including 1 pharmacologist

Results of annotation

Kappa: 0.46 moderate agreement

No use	53%	999 messages
Normal use	30%	746 messages
Misuse	8%	155 messages

Resulting typology

- Non intentional (27 messages)
 - Contraindication (10 messages)
 - ▶ Drug intake mistake (dosage, missed intake...) (17 messages)
- Intentional (94 messages)

Resulting typology

- Intentional (94 messages)
 - Fear of adverse event (15 messages)
 - Modulate effect (ex :stopping antibiotics because one feels better) (18 messages)
 - Self-medication (3 messages)
 - Searching effect (psychotropic effect, weight loss, suicide) (15 messages)
 - Addiction / habituation (43 messages)

Conclusion

Conclusion

- Various situations of misuse
- Some are related to drug family

Future work

- Larger and more varied corpus
- Use the annotated corpus for automatic classification

Thank you

Questions?



Cameron, D., Smith, G. A., Daniulaityte, R., Sheth, A. P., Dave, D., Chen, L., Anand, G., Carlson, R., Watkins, K. Z., and Falck, R. (2013).

PREDOSE: a semantic web platform for drug abuse epidemiology using social media.

46(6):985-997.



Kalyanam, J., Katsuki, T., Lanckriet, G. R. G., and Mackey, T. K. (2017). Exploring trends of nonmedical use of prescription drugs and polydrug abuse in the twittersphere using unsupervised machine learning. 65:289–295.



O'Connor, K., Pimpalkhute, P., Nikfarjam, A., Ginn, R., Smith, K. L., and Gonzalez, G. (2014).

Pharmacovigilance on twitter? mining tweets for adverse drug reactions. pages 924–933.



Sarker, A., Ginn, R., Nikfarjam, A., O'Connor, K., Smith, K., Jayaraman, S., Upadhaya, T., and Gonzalez, G. (2015).

Utilizing social media deta for parmacovigilance: a review.

Journal of Biomedical Informatics.



Yang, M., Kiang, M., and Shang, W. (2015).

Filtering big data from social media-building an early warning system for adverse drug reactions.

Journal of Biomedical Informatics.