# EXPOSURES TO PSYCHOLEPTICS AND CARDIOVASCULAR DRUGS DURING HEAT WAVES

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## Objective

Similar to the United Kingdom National Health Service, the German Climate and Health Alliance published a list of drugs problematic during heat waves containing many psycholeptics and cardiovascular drugs [1, 2]. We investigated whether temperature elevation affects exposure to these drugs.

## Methods

In a retrospective study we compared cases of exposure to psycholeptics (PSL-EC) and cardiovascular drugs (CVD-EC) in therapeutic dose and in overdose reported to the Poisons Information Centre (PIC) Erfurt in the heat months June to September of the heat wave years 2003, 2006, and 2015-2019 (HY) with mean air temperature of 17.6 °C and the non-heat wave years 2004-2005, and 2007-2014 (NHY) with mean air temperature of 16.2 °C. Data collected included frequency of cases of exposure, symptom severity, circumstances of exposure, age, and sex of involved persons.

## Results

In the heat months of 2003 to 2019 we observed a discontinuous increase of PSL-EC (2003: 556, 2019:1007) and CVD-EC (2003:153, 2019: 210) (Fig. 1)..

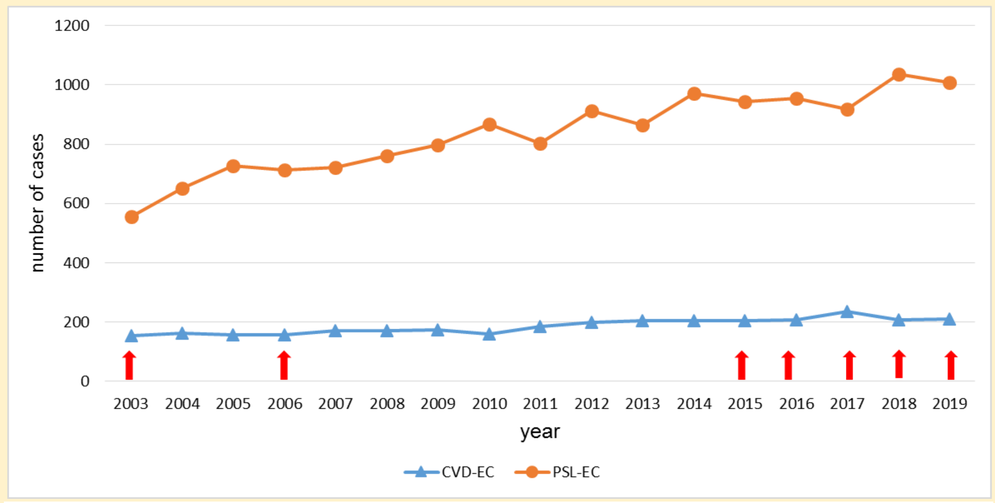


**Fig. 1** Number of cases of human exposures to cardiovascular drugs (CVD-EC) and psycholeptics (PSL-EC) reported to the PIC Erfurt between June to September from 2003 to 2019 in non-heat wave and heat wave years (HY). HY are marked by an arrow (↑).

During HY, similar rates of asymptomatic or mild PSL-EC (64.4 versus 64.0%) but higher rates of asymptomatic or mild CVD-EC (72.3% versus 67.9%) and lower rates of moderate PSL-EL (13.6% versus 12.5%) and CVD-EC (9.3% versus 7.8%) as well as severe PSL-EC (5.7% versus 4.3%) and CVD-EC (4.9% versus 3.4%) were observed than during NHY

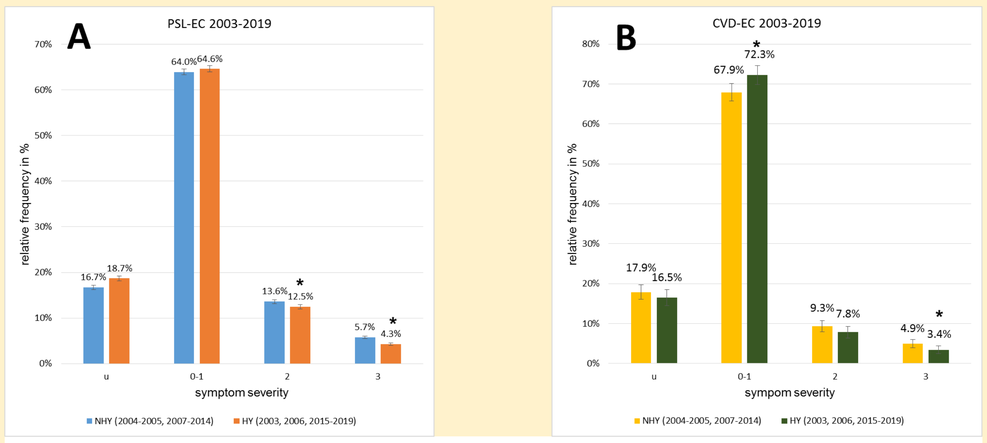


**Fig. 2** Relative frequencies in % +/- 95% confidence intervals ($CI_{95}$) for differences between symptom severity in cases of human exposures to (A) psycholeptics (PSL-EC) and (B) cardiovascular drugs (CVD-EC) reported to the PIC Erfurt between June to September from 2003 to 2019 in non-heat wave (NHY) and heat wave years (HY). Statistically significant differences ($p < 0.05$) between NHY and HY were marked by asterix (*).

Accidental PSL-EC (11.5% versus 9.7%) and CVD-EC (41.6% versus 36.8%) were higher, and PSL-EC (66.9% versus 68.5%) and CVD-EC (48.0% versus 51.0%) in suicidal intention were less frequent in HY than in NHY (Fig. 3).

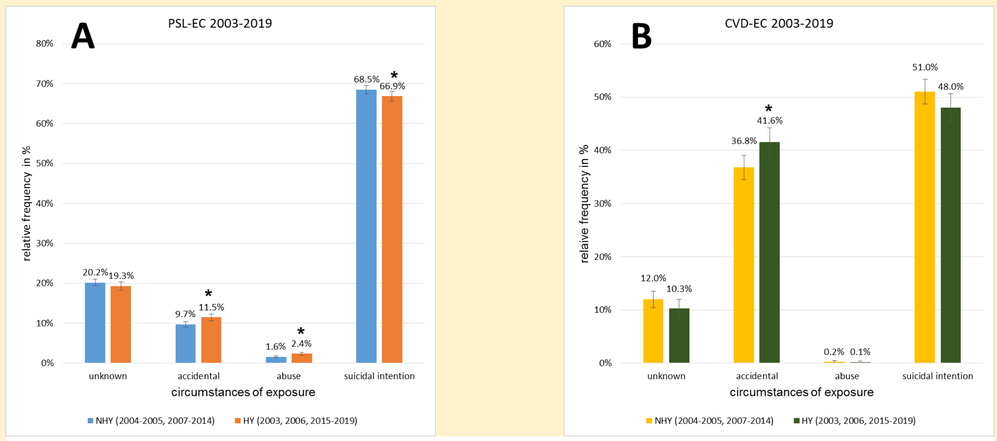


**Fig. 3** Relative frequencies in % +/- 95% confidence intervals ($CI_{95}$) for differences between circumstances of exposure in cases of human exposures to (A) psycholeptics (PSL-EC) and (B) cardiovascular drugs (CVD-EC) reported to the PIC Erfurt between June to September from 2003 to 2019 in non-heat wave (NHY) and heat wave years (HY). Statistically significant differences ($p < 0.05$) between NHY and HY were marked by asterix (*).

During HY, the proportion of adolescents (5.6% versus 4.3%), middle-aged adults (60.1% versus 50.0%), and seniors (14.7% versus 10.1%) was higher in PSL-EC and that of babies (2.3% versus 1.0%), and seniors (19.1% versus 15.9%) was higher in CVD-EC than in NHY (Fig. 4).

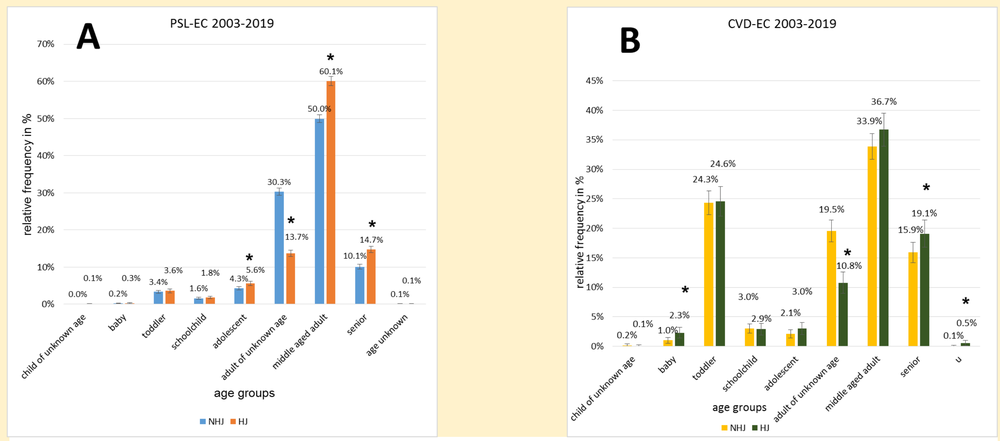


**Fig. 4** Relative frequencies in % +/- 95% confidence intervals ($CI_{95}$) for differences between age groups in cases of human exposures to (A) psycholeptics (PSL-EC) and (B) cardiovascular drugs (CVD-EC) reported to the PIC Erfurt between June to September from 2003 to 2019 in non-heat wave (NHY) and heat wave years (HY). Statistically significant differences ($p < 0.05$) between NHY and HY were marked by asterix (*).

The proportion of genders in PSL-EC (male: 36.2% versus 35.2%, female: 61.0% versus 61.7%) and CVD-EC (male: 43.5% versus 43.0%, female: 50.6% versus 50.2%) remained unchanged during HY and NHY.

## Conclusion

In comparison to non-heat wave years no higher rates of moderate or severe exposure to psycholeptics or cardiovascular drugs were detected in heat wave years, but patients with PSL and CVD medication should be observed carefully during heat waves because PSL and CVD affect the body's usual cooling mechanisms.

## References

1. [1] Deutsche Allianz Klimawandel & Gesundheit [Internet]. Hintergrundinformation Klimawandel: HITZE; 2019 [cited 7 October 2021]. Available from: https://www.klimawandel-gesundheit.de/wp-content/uploads/2019/06/Hintergrund-HITZE.pdf. German.
2. [2] Schmitt-Sausen N. [Climate change: America's doctors engage in climate change debate]. Dtsch Arztebl 2019;116:31-32. German.