

Background

The development and implementation of suicide prevention interventions require an assessment of the full range of potential risk factors. This study examined the associations between the total number of suicides in a seasonal context and various meteorological parameters in Lithuania as part of the Boreal region, funded by the European Union (AURORA under the Grant Agreement n° 101157643).

Associations between months and daily number of suicides by sex and age in Lithuania, 2001-2021, expressed as rate ratios and 95% confidence intervals

Months	RR (95% CI) All	p	RR (95% CI) Men	p	RR (95% CI) Women	p
December	0.88 (0.82-0.95)	0.001	0.88 (0.81-0.95)	0.001	0.91 (0.76-1.08)	0.257
November	0.98 (0.91-1.05)	0.529	0.96 (0.88-1.03)	0.242	1.09 (0.92-1.29)	0.308
October	1.04 (0.97-1.11)	0.279	1.02 (0.95-1.10)	0.574	1.12 (0.95-1.32)	0.173
September	1.10 (1.02-1.17)	0.008	1.06 (0.99-1.15)	0.106	1.26 (1.07-1.47)	0.005
August	1.23 (1.15-1.31)	<0.001	1.21 (1.13-1.30)	<0.001	1.31 (1.12-1.53)	0.001
July	1.36 (1.28-1.45)	<0.001	1.34 (1.25-1.44)	<0.001	1.44 (1.23-1.68)	<0.001
June	1.35 (1.26-1.44)	<0.001	1.32 (1.23-1.42)	<0.001	1.47 (1.25-1.71)	<0.001
May	1.33 (1.25-1.42)	<0.001	1.32 (1.23-1.41)	<0.001	1.39 (1.19-1.63)	<0.001
April	1.25 (1.17-1.34)	<0.001	1.23 (1.14-1.32)	<0.001	1.40 (1.19-1.63)	<0.001
March	1.09 (1.02-1.17)	0.010	1.08 (1.00-1.16)	0.053	1.18 (1.00-1.38)	0.049
February	0.96 (0.89-1.03)	0.236	0.94 (0.87-1.02)	0.145	1.03 (0.87-1.22)	0.737
January (ref.)	1		1		1	

Conclusion

This Lithuanian case-crossover study showed that suicide risk is linked to seasons and weather. The highest risk was observed in June–July compared to January, across sexes and age groups. Higher temperatures and more daily sunshine increased suicide risk, while higher atmospheric pressure was protective. These findings can help social workers identify high-risk periods using weather forecasts, though more evidence is needed to strengthen season-specific guidance for prevention and policy.

Methods

The study included data on 21,487 cases of suicide in Lithuania between 2001 and 2021. The data were collected from the register of the Institute of Hygiene. The associations between weather variables and the daily number of suicides were assessed using multivariate Poisson regression.

Results

Results: The highest rate ratio (RR) of suicide was observed in June and July (1.35 and 1.36, respectively) compared to January, with a similar pattern across different sexes and age groups. Higher temperatures significantly increased the RR of suicide in the general population, among men, and across all age groups. Additionally, a greater number of sunny hours per day was associated with a higher RR in the entire sample, in both sexes, as well as in the youngest and oldest age groups. Higher atmospheric pressure was identified as a protective factor, reducing the RR in the overall sample, among men, and in the youngest and middle-aged groups. An average relative humidity of 50% or more significantly increased the RR of suicide in the general population and among men.

Characteristics of the cases of suicide in Lithuania by season in sex and age groups

Characteristic	Autumn, n (%)	Winter, n (%)	Spring, n (%)	Summer, n (%)	All, n (%)
All cases	4910 (22.8)	4445 (20.7)	5864 (27.3)	6268 (29.2)	21487 (100)
Men	3984 (22.6)	3676 (20.9)	4796 (27.3)	5132 (29.2)	17588 (100)
women	926 (23.8)	769 (19.7)	1068 (27.4)	1136 (29.1)	3899 (100)
≤40 yr.	1642 (23.0)	1682 (23.5)	1848 (25.9)	1972 (27.6)	7144 (100)
41-55 yr.	1491 (21.8)	1374 (20.1)	1932 (28.2)	2047 (29.9)	6844 (100)
≥56 yr.	1777 (23.7)	1389 (18.5)	2084 (27.8)	2249 (30.0)	7499 (100)



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