



# AMBIENT TEMPERATURE EFFECT ON PREGNANCY OUTCOMES: SINGLE CENTER EXPERIENCE FROM BELGRADE

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# INTRODUCTION



- Currently a global warming is occurring which might lead to more frequent and intense environmental disasters such as heatwaves, wildfires and hurricanes.
- This climate change can also have short and long-term effects on the human health.
- Pregnant women and fetus are a vulnerable group as numerous factors including environmental ones can disturb and complicate pregnancy.

# OBJECTIVE

- The study aim was to assess the association between ambient temperatures of the last four weeks of pregnancy with the risk for having a preterm stillbirth.



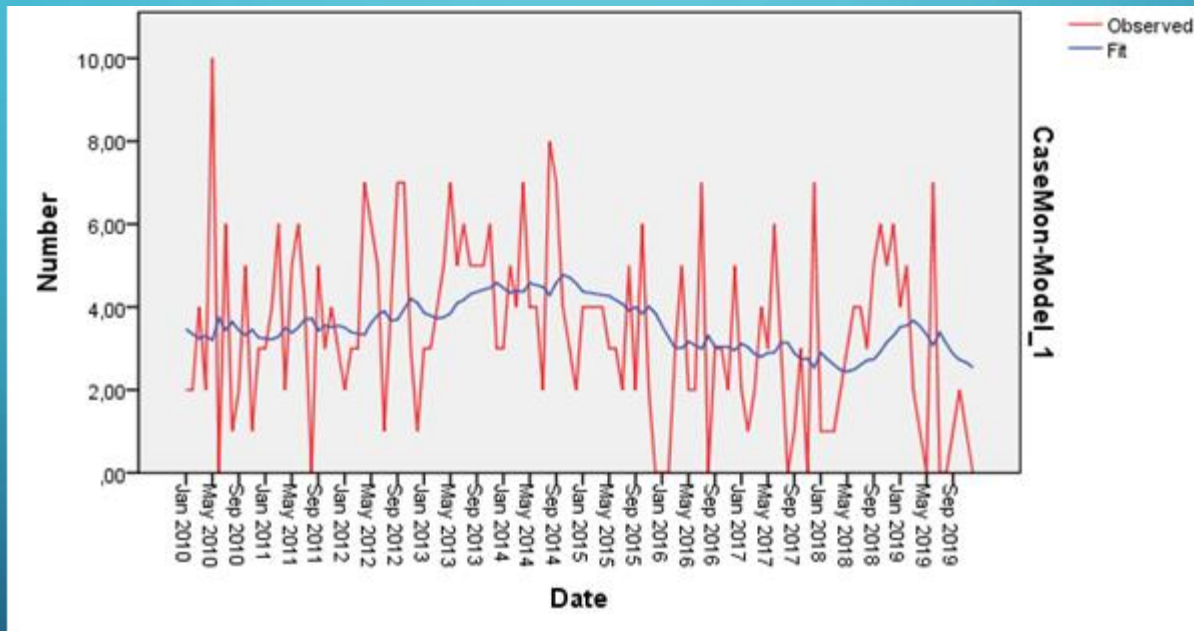
# METHODS

- Study included all pregnant women with preterm stillbirth (<37 weeks of gestation) treated in the Clinic for Ob/Gyn University Clinical Center of Serbia during a ten-year period (2010 to 2019).
- Patient data were taken from medical records.
- We used meteorological data (minimal, mean and maximal temperatures) per year and month for the city of Belgrade which are provided by Republic Hydrometeorological Society of Serbia and are freely available.
- We assessed the impact of the average temperature during the last month of pregnancy with the pregnancy outcome.

# RESULTS

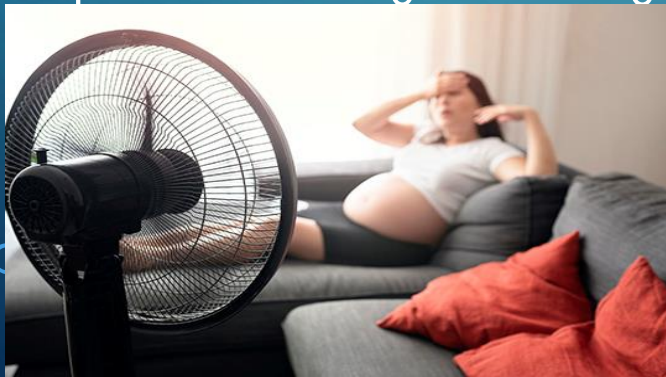
- During the study period 409 stillbirths occurred in our Clinic (1.02% of all deliveries).
- Examined women had in average  $30.93 \pm 5.99$  years of age and were mostly primiparous (54.5%;  $p=0.001$ ).
- There were no significant differences regarding the gender of stillbirth children (males=51.8%; females=48.2%;  $p=0.458$ ).
- Stillbirth delivery mostly occurred in the  $23.8 \pm 2.9$  week of gestation.
- At the time of delivery children in average had  $549.30 \pm 214.75$  grams.

# RATES OF STILLBIRTHS PER MONTH DURING THE EXAMINED TEN YEARS (2010-2019)

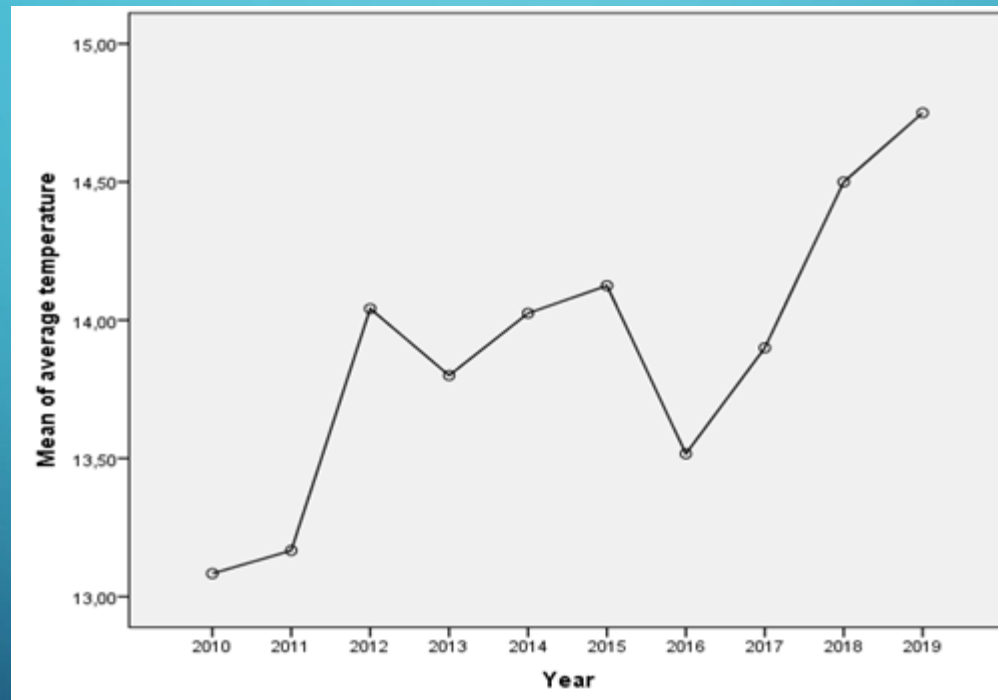


# RESULTS

- In the examined ten-year period mean temperatures ranged from  $-3.3^{\circ}\text{C}$  (January 2017) to  $27^{\circ}\text{C}$  (July 2012).
- The coldest month was January every year, while July and August were generally the hottest months ( $p=0.001$ ).
- April to September are considered as summer and spring months with average temperature  $\geq 15^{\circ}\text{C}$ .
- The hottest years were 2012, 2013 and 2018 with average yearly temperatures  $\geq 15.5^{\circ}\text{C}$ .
- However, there were no significant differences in average yearly temperatures in Belgrade during the examined ten years ( $p=0.738$ ).



# MEAN TEMPERATURES PER YEAR IN BELGRADE, SERBIA BETWEEN THE YEARS 2010 AND 2019





# RESULTS

- Rates of stillbirths were similar in spring and summer compared to autumn and winter months (233 vs. 186;  $p=0.317$ ) as well as if temperatures were  $<15^{\circ}\text{C}$  and  $\geq 15^{\circ}\text{C}$  (200 vs. 209,  $p=0.854$ ).
- Moreover, there was no trend in stillbirth rates in regards to ambient temperatures of the last four weeks of pregnancy ( $p=0.435$ ).

# CONCLUSION

- According to the results of our study the risk for preterm stillbirth was not associated with ambient temperatures of the last four weeks of pregnancy of women in Serbia.
- Further research with more parameters regarding the examined pregnancies as well as environmental factors during a longer periods of time are needed to fully understand the mechanisms of interection between environment and pregnancy health.