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The effects of aircraft noise exposure on objective sleep quality: the results of the DEBATS study in France

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INTRODUCTION

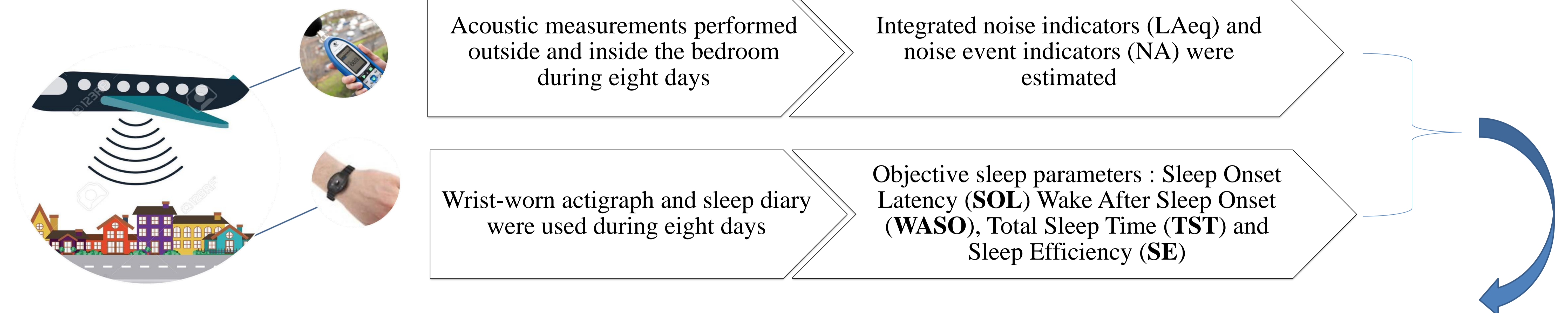
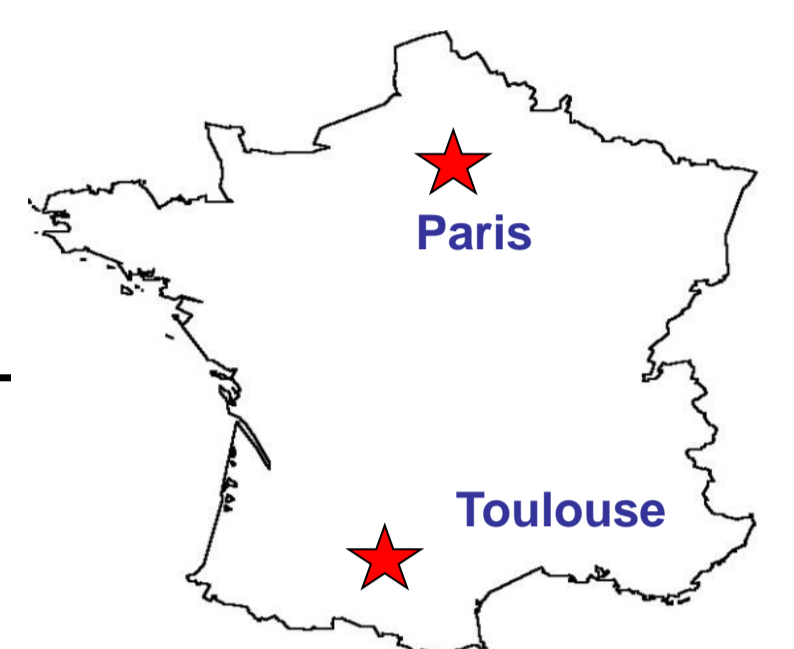
Transportation is a major source of environmental noise pollution. Aircraft noise is perceived as a major environmental stressor. It also constitutes a major issue for public health, particularly in terms of sleep disturbance. Sleep disorder is the most serious consequence of transportation noise in Western Europe with more than 900 thousand healthy life years lost every year.

OBJECTIVE

Our study investigates the association between aircraft noise exposure and objective sleep quality in the population living near airports in France.

METHODS

112 individuals older than 18 and living near Paris-Charles de Gaulle and Toulouse-Blagnac airports,



STATISTICAL ANALYSIS

Logistic regression models with repeated measurements
 Potential confounders: age, gender, marital status, education and BMI.

RESULTS & DISCUSSION

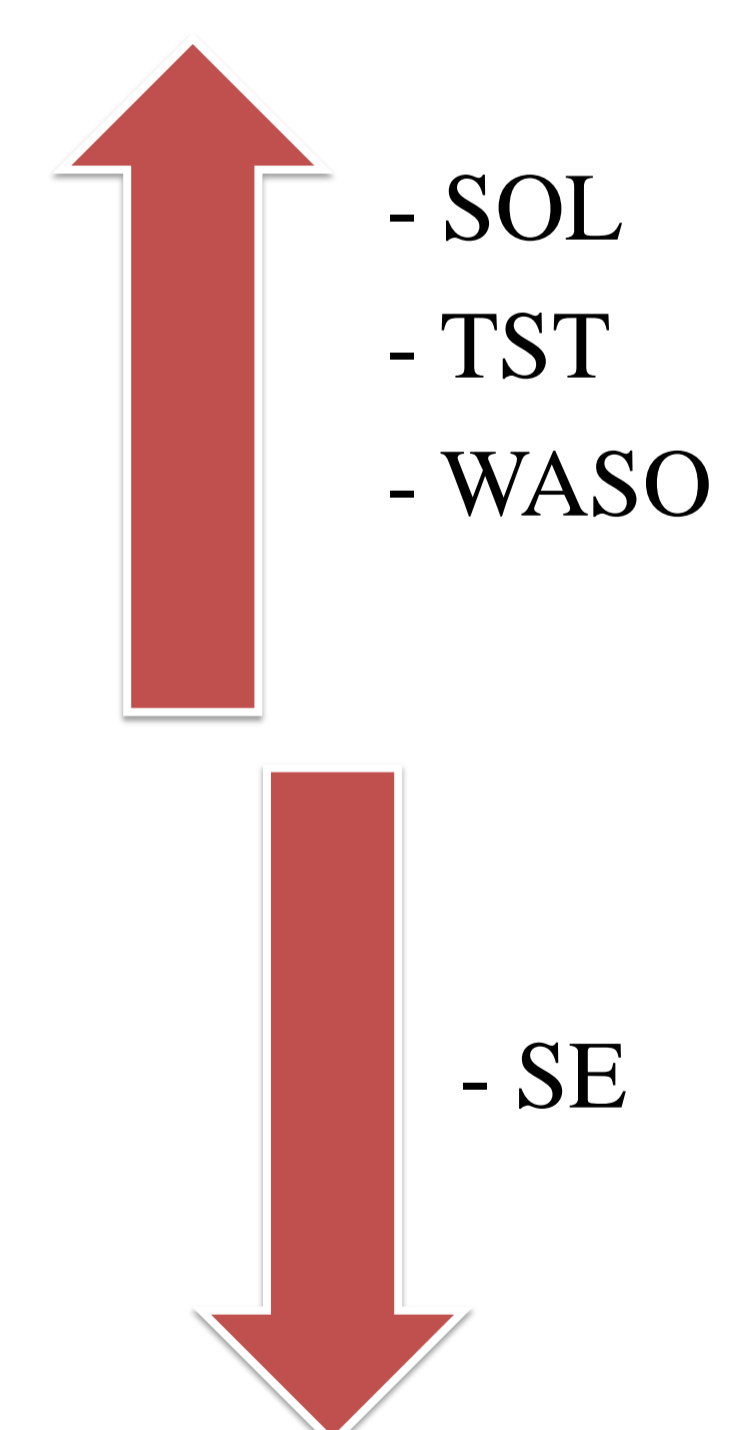
Odds ratios for the relationship between noise indicators and objective sleep parameters

	SOL ≥ 30 min	TST < 6 hr	WASO ≥ 30 min	SE < 90
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Integrated noise indicators				
LAeq,ext ¹	1,07 (0,92-1,24)	0,66 (0,57-0,76)	1,20 (1,05-1,37)	1,17 (0,88-1,55)
LAeq,int ¹	1,26 (1,00-1,60)	0,55 (0,45-0,69)	1,08 (0,88-1,31)	1,30 (0,93-1,81)
Noise event indicators				
NA,ext ²	1,02 (0,96-1,08)	0,69 (0,63-0,76)	1,11 (1,04-1,18)	1,06 (0,99-1,14)
NA,int ²	1,04 (0,97-1,11)	0,69 (0,62-0,76)	1,09 (1,03-1,16)	1,07 (0,98-1,16)

¹Per 10 dBA increase

²Per 10 events increase

Bold values are statistically significant $p \leq 0.05$



- Our study contributes to the overall evidence suggesting that nocturnal aircraft noise exposure may decrease objective quality of sleep.
- In contrast to most studies that found a reduction in TST related to transportation noise, our study showed an increased TST. This could be a matter of behavioral adaption to sleep deprivation.
- Unlike integrated indicators, noise event indicators were significantly associated with almost all the objective parameters of sleep quality.

CONCLUSIONS

- Aircraft noise exposure affects objective parameters of sleep quality not only in terms of noise levels but also in terms of number of events.
- Adaptation mechanisms to sleep deprivation could be observed.
- Noise event indicators have been shown to be more often associated with sleep disturbances than integrated indicators.

Acknowledgments

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