



Motivation

- Field studies need to be conducted in the US to acquire data on sleep disturbance relative to varying degrees of noise exposure
- An inexpensive methodology of using actigraphy and electrocardiography (ECG) has previously been found to sensitive measure of awakenings
- We established the feasibility of having study participar complete unattended ECG and actigraphy measuremen night study near Philadelphia Airport
- Based on lessons learned from the Philadelphia study, methodology was further refined and a second pilot study is being conducted near another US airport

Objectives

- Establish feasibility of unattended acquisition of acoustic and physiologic field data (no field staff)
- Determine field study recruitment methodology that maximizes response rate and minimizes cost

Methods-Community Sleep Survey

Each mailing wave consists of 240 addresses

The following parameters were varied during each wave:

Incentive for returning the survey

- Promised \$2, \$5, or \$10 Amazon gift card (waves 1-5)
- Pre-paid \$2 cash (waves 6-17)

Survey length

- Long (waves 1-7, 10-17)
- Medium (contains all eligibility questions, wave 8)
- Short (additional telephone screening necessary, wave 9)

Subject payment for field study

- \$100 (waves 1-5)
- \$150 (waves 6-9)
- \$200 (waves 10-17)

Survey follow-up

- No follow-up (waves 1-4, 11)
- Pre-notification postcard (wave 5)
- 2-wave follow-up (waves 14-17)
- 3-wave follow-up (waves 6-9, 10, 12-13)

Project 17 **Pilot Study on Aircraft Noise and Sleep**

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Project manager: N. Sizov, FAA

Methods-In Home Sleep Study

e current of aircraft	•	Equipment is mailed to participant's home
	•	An instruction manual and videos are prov to use the equipment
o provide a	•	Physiological Monitoring: 2 cable (1 chann kHz) and body movements (10 Hz)
nts	•	Sound recording equipment: Portable aud with class 1 microphone
nts in a 3	•	Total equipment cost for 1 setup: \$1,130
the	•	Participants take part for 5 consecutive nig
	•	To obtoin a management of studies we sut is in a set

- To obtain a measure of stress, participants (since July 2017) have the option of providing a hair sample for cortisol analysis
- Staff are available by cell-phone to answer questions

Results

	Survey response rate	Interested in in-home study	Interested and eligible for in-home study
PHL Study	NA	4.0%	3.2%
Waves 1-5 Long survey, Amazon gift cards, \$100 payment, no follow-up	3.0%	2.2%	0.6%
Waves 6-7 Long survey, \$2 cash, \$150 payment, 3-wave follow-up	17.2%	9.0%	4.5%
Wave 8 Medium survey, \$2 cash, \$150 payment, 3-wave follow-up	20.8 %	13.0%	4.8%
Wave 9 Short survey, \$2 cash \$150 payment, 3-wave follow-up	22.2%	13.8%	5.4%
Waves 10, 12-13 Long survey, \$2 cash, \$200 payment, 3-wave follow-up	15.6%	8.2%	3.1%
Wave 11 Long survey, \$2 cash, \$200 payment, no follow-up	8.2%	4.1%	0.5%
Waves 14-17 Long survey, \$2 cash, \$200 payment, 2-wave follow-up	10.3%	6.6%	1.5%
Waves 6-17	14.4%	8.3%	2.9%

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Ineligibility Criteria (% of Ineligible Participants)

	% met 1 or	% met 1
	more criteria	criteria only
Arrhythmia	14.7%	5.3%
Works night shifts	14.7%	6.0%
Hearing problems	27.3%	4.7%
BMI>=35 or BMI<17	24.0%	10.0%
Children under 5 yrs	24.7%	10.0%
Sleep disorder	40.0%	9.3%
Sleep medication	22.0%	7.3%
use 3 or more times		
per week		



>85% of surveys were received before 3rd follow-up survey was mailed

- Changes that improved response rate:
 - Redesign of envelopes
 - Payment increase for in-home study to \$150
 - Pre-paid compensation for survey (\$2.00 cash)
 - Follow-up mailings

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Results



Age Distribution of

Respondents

Conclusions

• Mailing of the community surveys has been completed

• In home sleep measurements have been completed for 25 participants

Next Steps

• Complete in-home measurements for the remaining interested participants, 6 are scheduled with an additional 6 -10 expected • Begin analysis of survey, physiological, and noise measurements