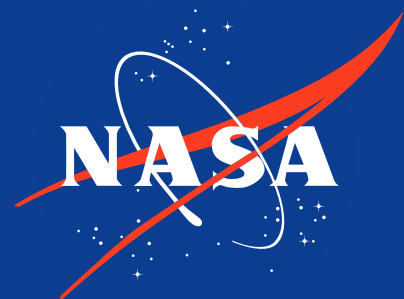


SHORT-HAUL FATIGUE

A focus group study

Cassie J. Hilditch, PhD

Erin E. Flynn-Evans, Thomas Nesthus,
Hannah M. Baumgartner, Lucia Arsintescu,
Kevin B. Gregory, Nick G. Bathurst



Federal Fatigue Management
Working Group | August 2, 2022

Objectives

- Develop the scope of the proposed SH study
- Interview US commercial SH pilots to identify fatigue factors
- Systematic, qualitative approach to capture experiences

ICAO definition of fatigue

Fatigue is defined as a physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness, circadian phase, or workload (mental and/or physical activity) that can impair a crew member's alertness and ability to safely operate an aircraft or perform safety-related duties.

Methods

Focus Groups

- Pilots recruited through emails
- Focus groups held online
- Anonymous participation
 - Letter code, no cameras
- Transcription and note-taking
- Standardized script and questions
- Each participant responded to each question in random order

Methods

Questions

Q1. Are there any types of short-haul operations that you think lead to elevated fatigue?

Q2. Are there any type(s) of short-haul operations that you think are *not* fatiguing?

Q3. What type(s) of short-haul operations do you think are the most important for us to study?

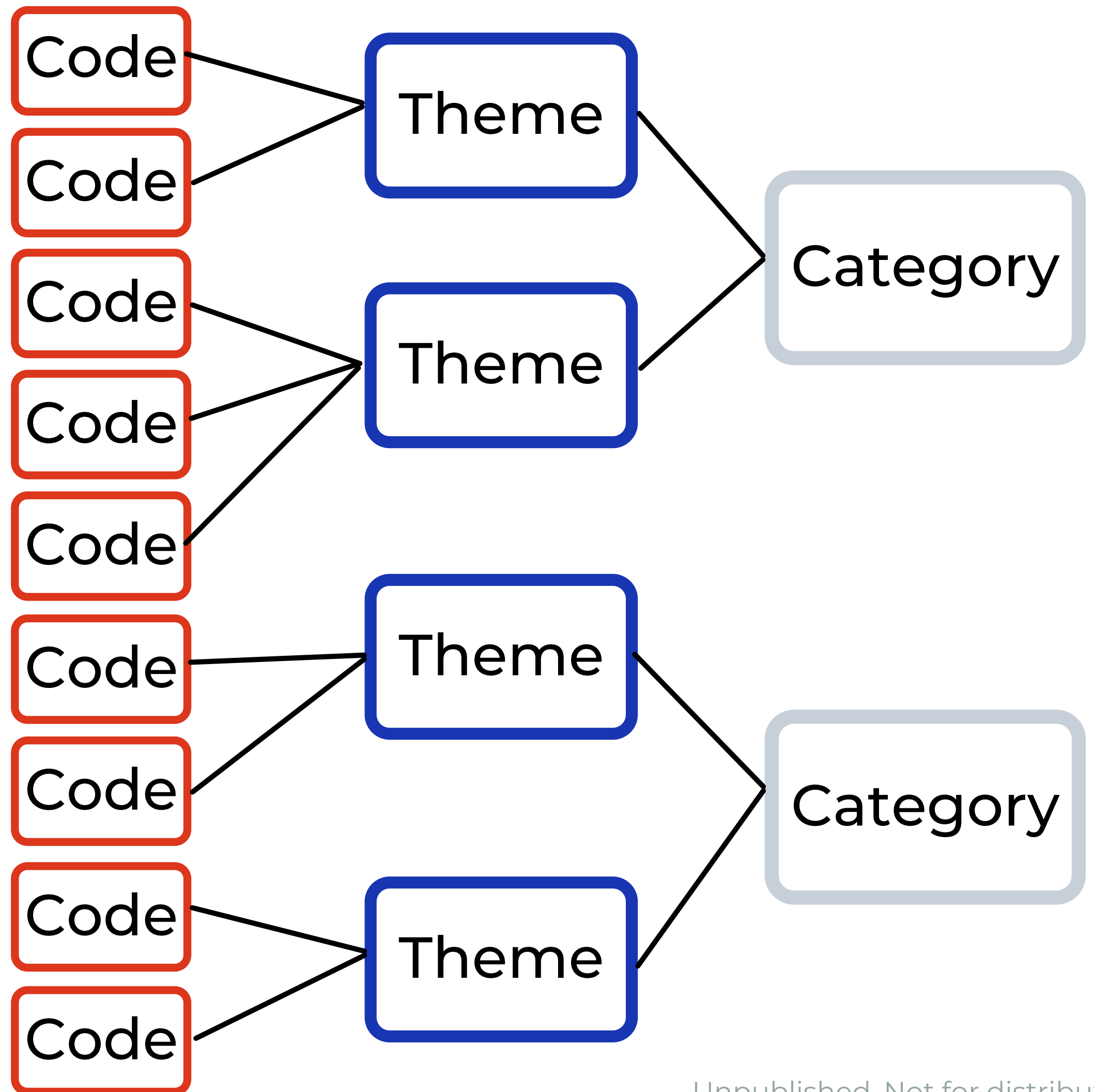
Methods

Analysis

- Cleaned transcripts
- Identified repeating ideas
- Developed code book
- Coded transcripts
- Reviewed and finalized codes
- Code frequencies counted
- Grouped codes into themes
- Themes ranked by frequency

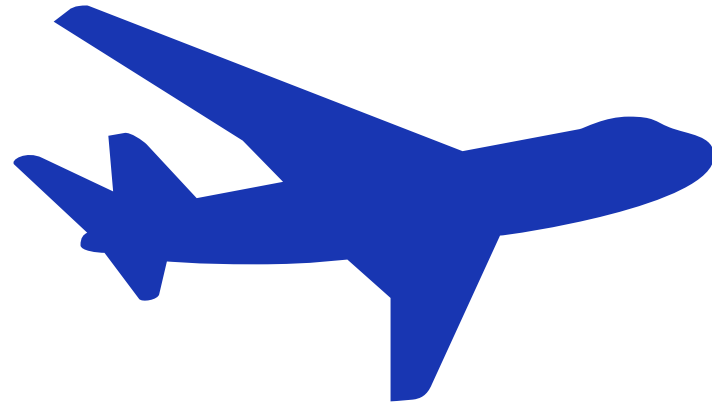
Methods

Analysis

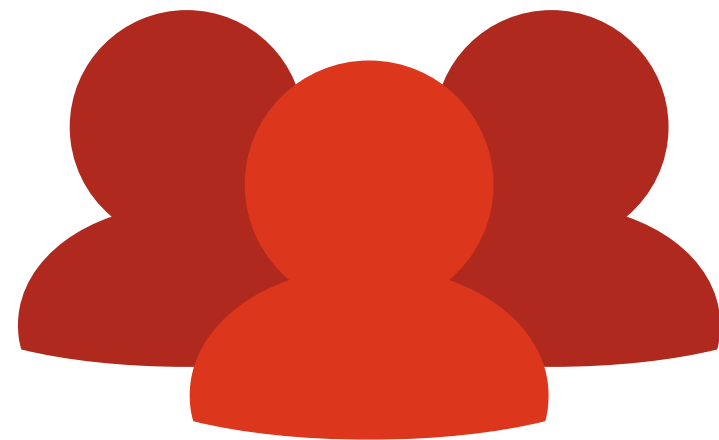


Results

Participants



4 airlines

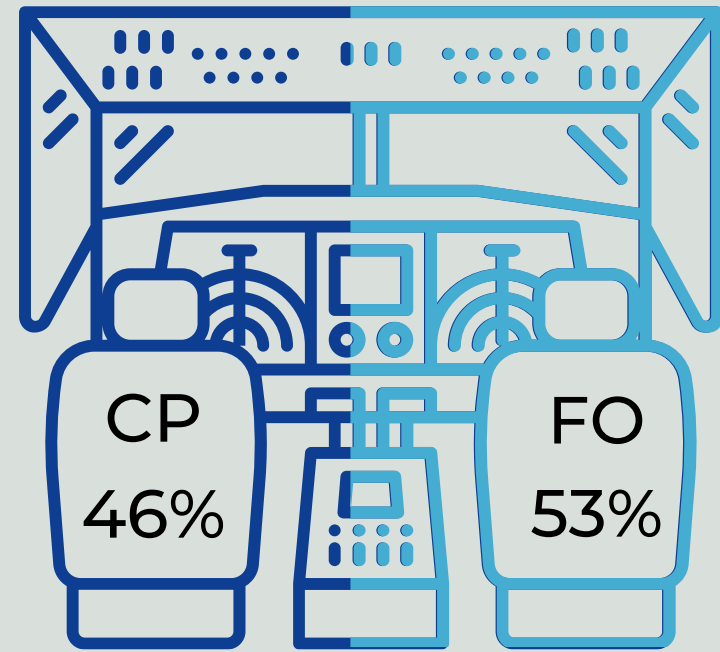


**14 focus
groups**

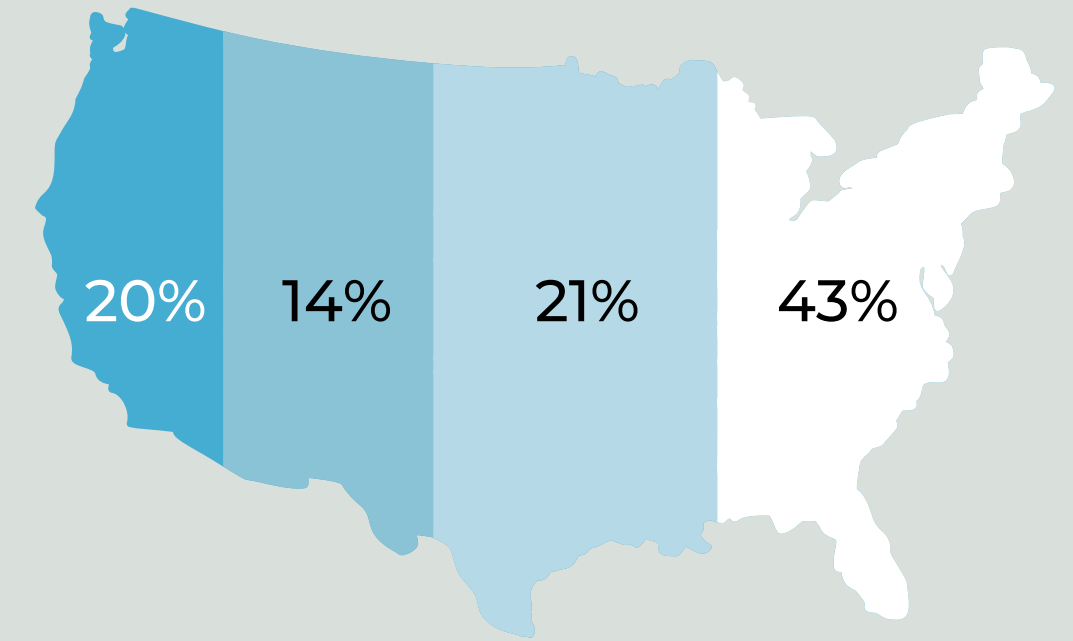


**90
pilots**

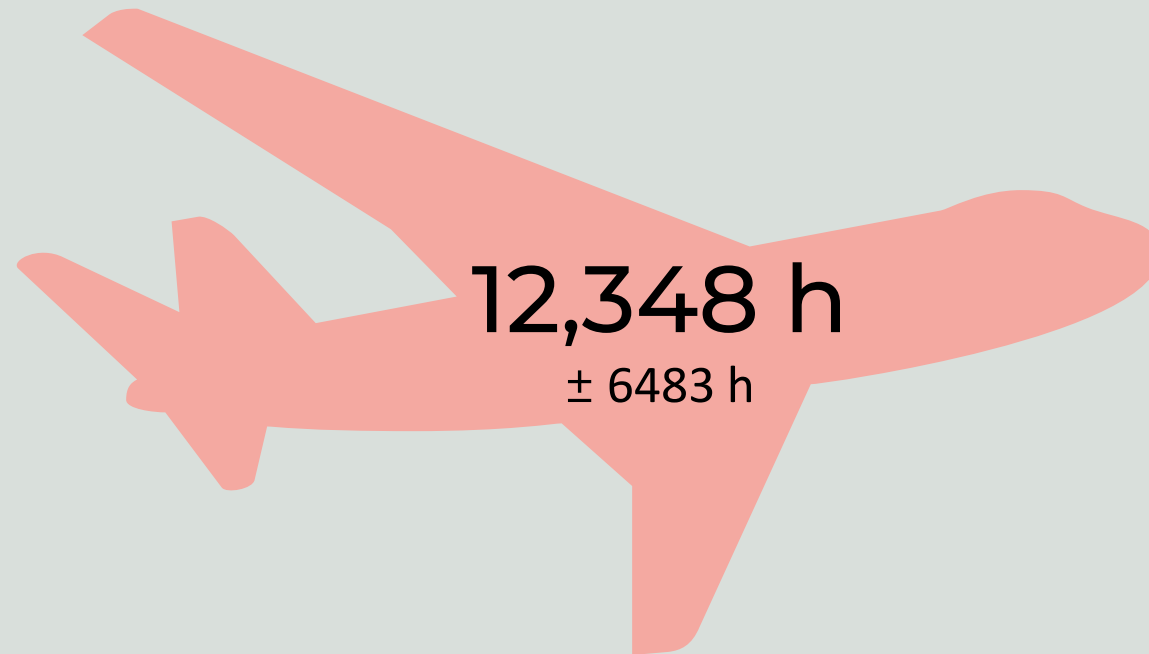
Seat position



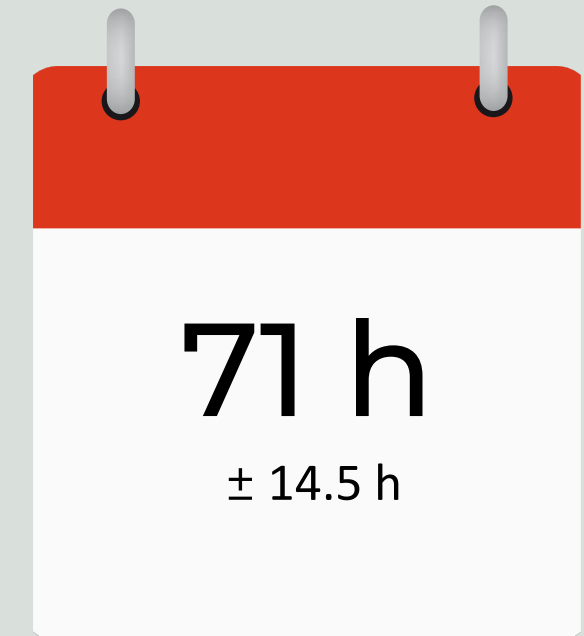
Base time zone



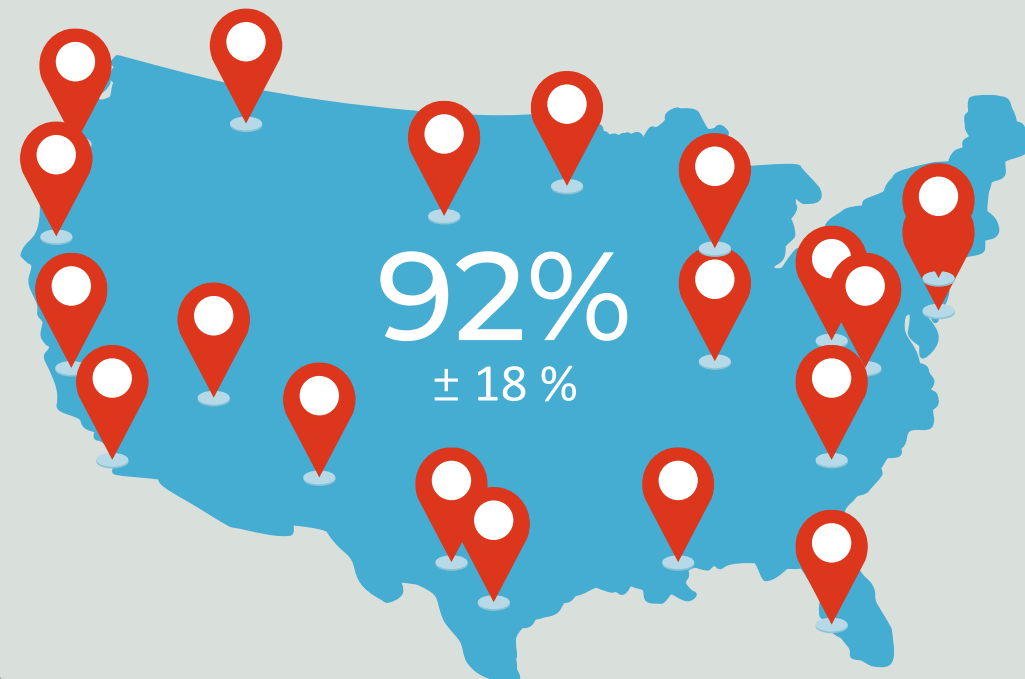
Lifetime flying hours



Monthly flying hours



Short-haul flying



Fatigue role



Results

Over-arching themes



Results

Over-arching themes

Five broad fatigue categories identified:

- Circadian disruption
- Workload/hassle factors
- Rest opportunity
- Schedule changes
- Long sits

Results

Ranking themes

Theme	N	%
Circadian switches	171	10.5
Rest duration (layover)	153	9.4
High WL/ Hassle factors	151	9.3
Number of legs	121	7.4
FAR 117 issues	93	5.7
Long sits	85	5.2
Redeyes	83	5.1
Unpredictability	79	4.9
A/C & crew swaps	73	4.5
Rest timing	73	4.5
Out-of-hours	68	4.2
Earlies	64	3.9
Short turn time	53	3.3
Length of duty	46	2.8
Rest quality	45	2.8
Schedule design	38	2.3
Trip length	37	2.3
Lates	25	1.5
Fatigue calls	24	1.5
Length of legs	20	1.2
Rest - Circ disruption	20	1.2
Deadhead	14	0.9
Total	1625*	

Theme

*incl. 'Other' theme

Unpublished. Not for distribution.

Circadian switches

- Circadian swaps (34%)
- Inconsistent duty times (25%)
- Switching time zones (18%)

Rest duration (layover)

- Short rest (42%)
- Personal factors (30%)
 - Time to eat, exercise
 - Time to wind down

Results

Top 5 themes

Results

Top 5 themes

High workload / Hassle factors

- Weather (30%)
- Maintenance (19%)
- Ground Ops (18%)
- Busy airports (14%)

Number of flights

- >4 flights (41%)
- >2 flights (36%)
- >1 flight (23%)

FAR 117 issues

- FAR limits as goal (37%)
- FAR revisions (24%)
- Computer scheduler (15%)

Results

Top 5 themes

Results

Honorable mentions

Long sits

Redeyes

- General (49%)
- Tag leg (12%)
- Mid trip (8%)

Unpredictability

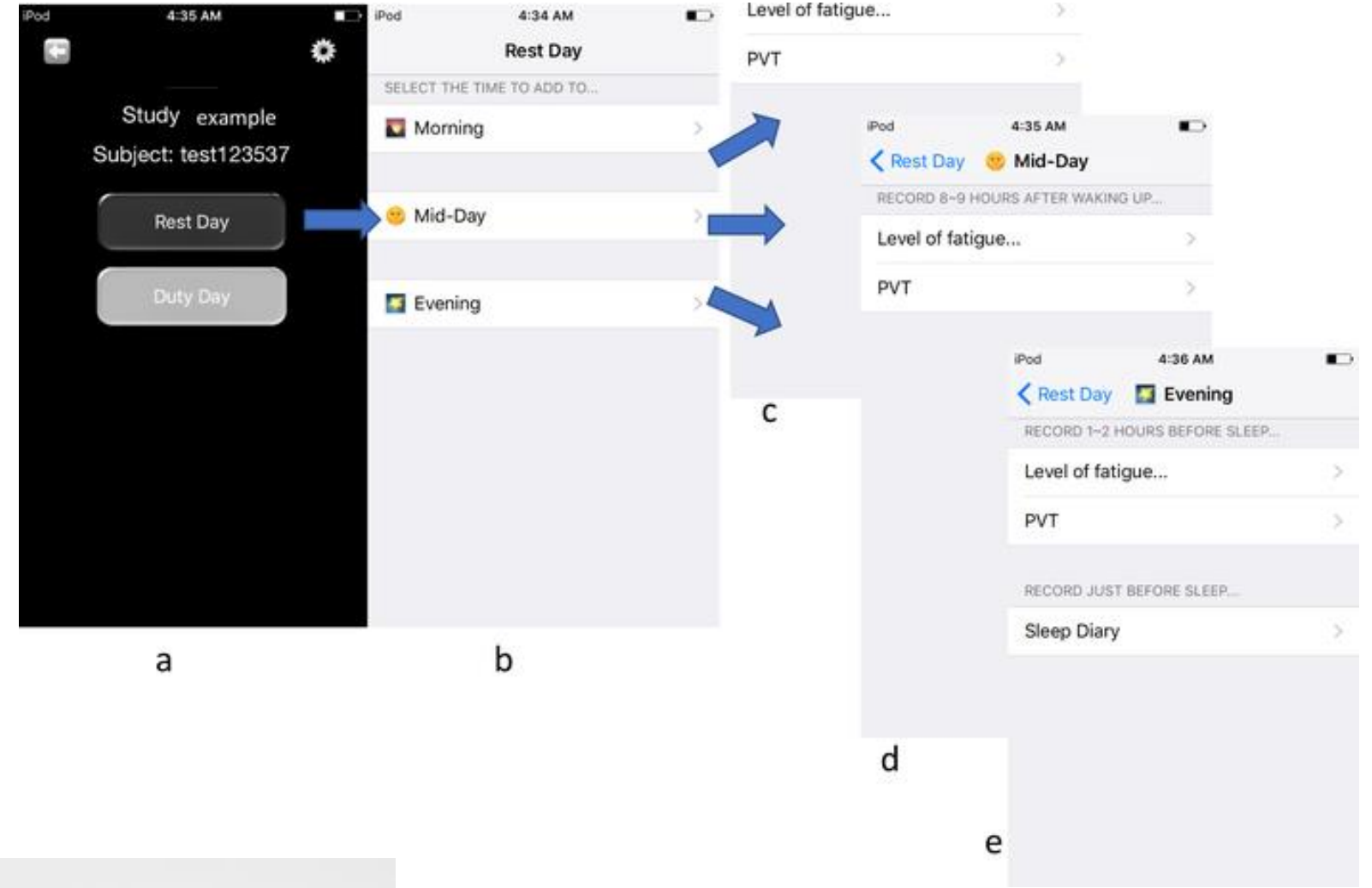
Aircraft & crew swaps

Rest timing

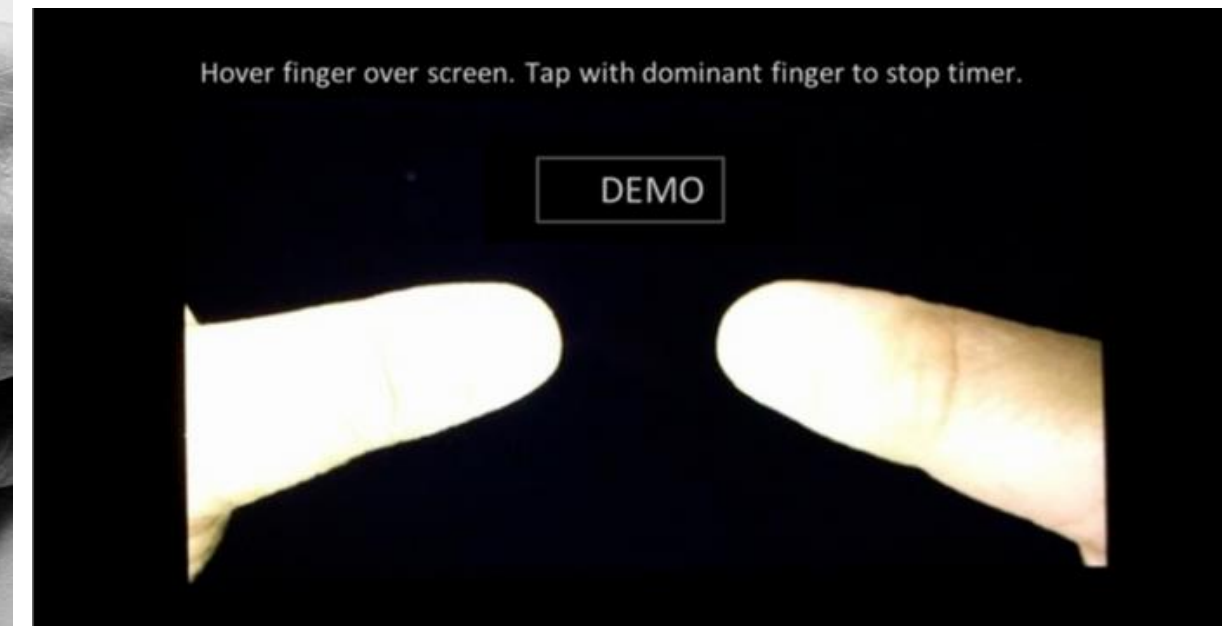
- Redeye rest (44%)
- Day rest (33%)
- Two FDPs in calendar day (23%)

Next steps

Data collection tools



Images: Arsintescu et al.,



Unpublished. Not for distribution.

Thank you

cassie.j.hilditch@nasa.gov

hannah.m.baumgartner@faa.gov

Erin Flynn-Evans, PhD
MPH

Thomas Nesthus, PhD

Nick Bathurst, MA

Kevin Gregory, BSc

Lucia Arsintescu, MA