

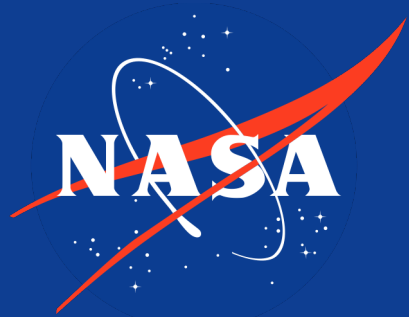
# Focus group study of US pilots on fatigue in short-haul flight operations

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# Background

- **14 CFR Part 117:** Flightcrew Member Duty and Rest Requirements (introduced 2012; implemented 2014)
- Introduced max. flight duty periods according to number of flights and timing of FDP start; min. rest 10h
- Anecdotal evidence suggests short-haul flying associated with fatigue risk

# Objectives

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

# Methods

## Focus Groups

- Focus groups held online
- Anonymous participation
- Content analysis
  - Identify ideas (open coding)
  - Identify themes (axial coding)
  - Rank themes (summative coding)

# 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?

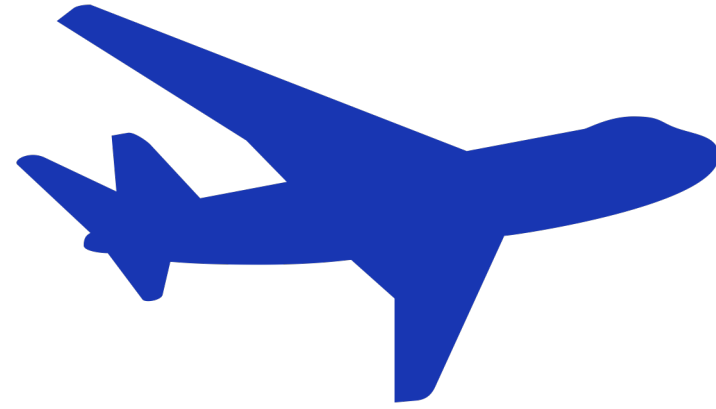
Q3. What type(s) of short-haul operations do you think are the most important for us to study?

# ICAO definition of fatigue

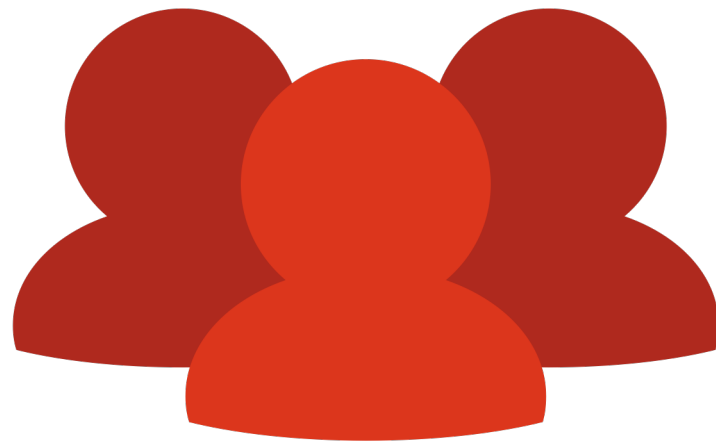
Fatigue is defined as a physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness, circadian phase, or workload (mental and/or physical activity) that can impair a crew member's alertness and ability to safely operate an aircraft or perform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

# Results

Participants



**4 airlines**

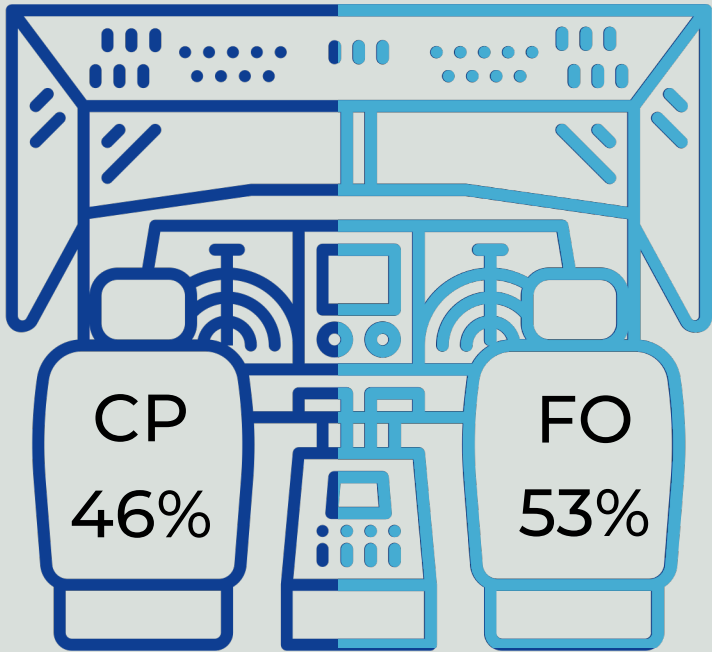


**14 focus  
groups**

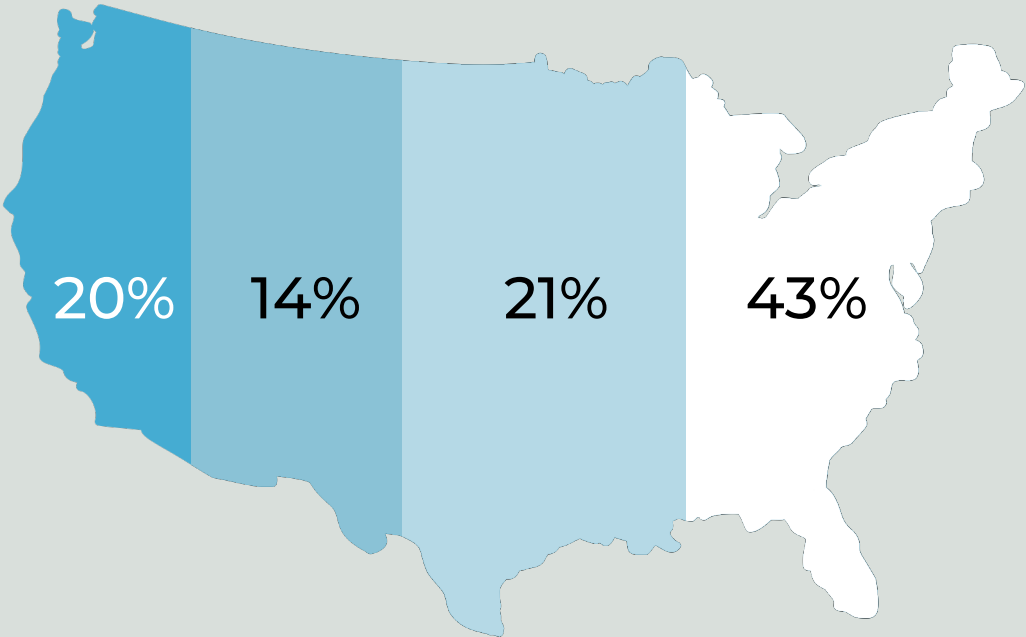


**90  
pilots**

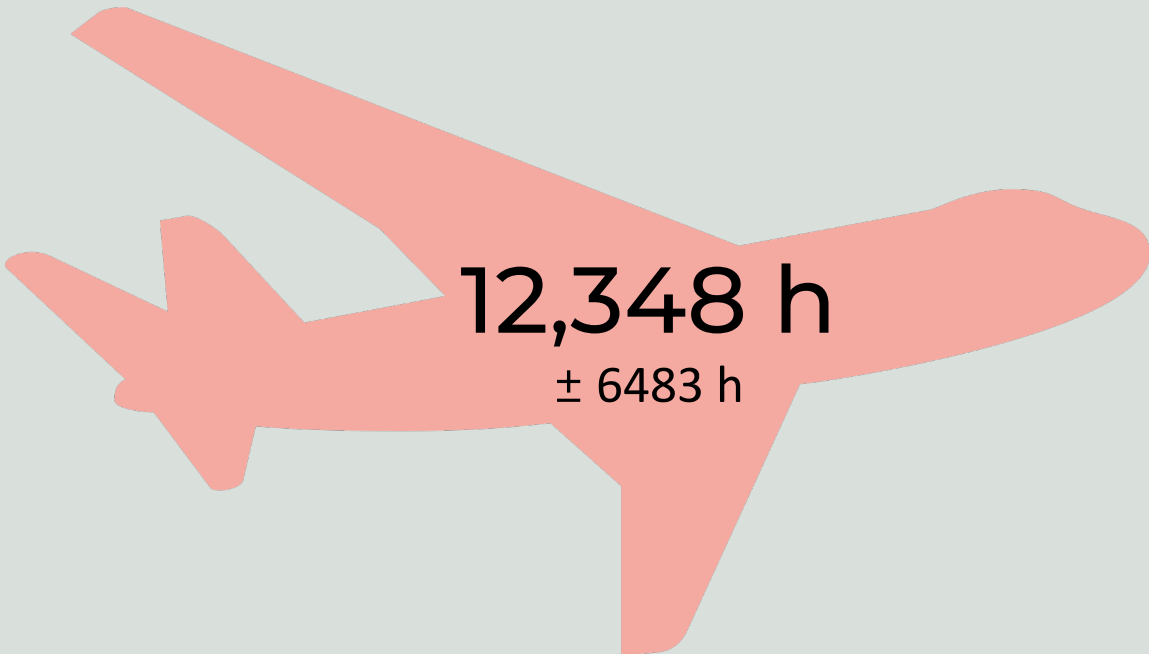
Seat position



Base  
time zone



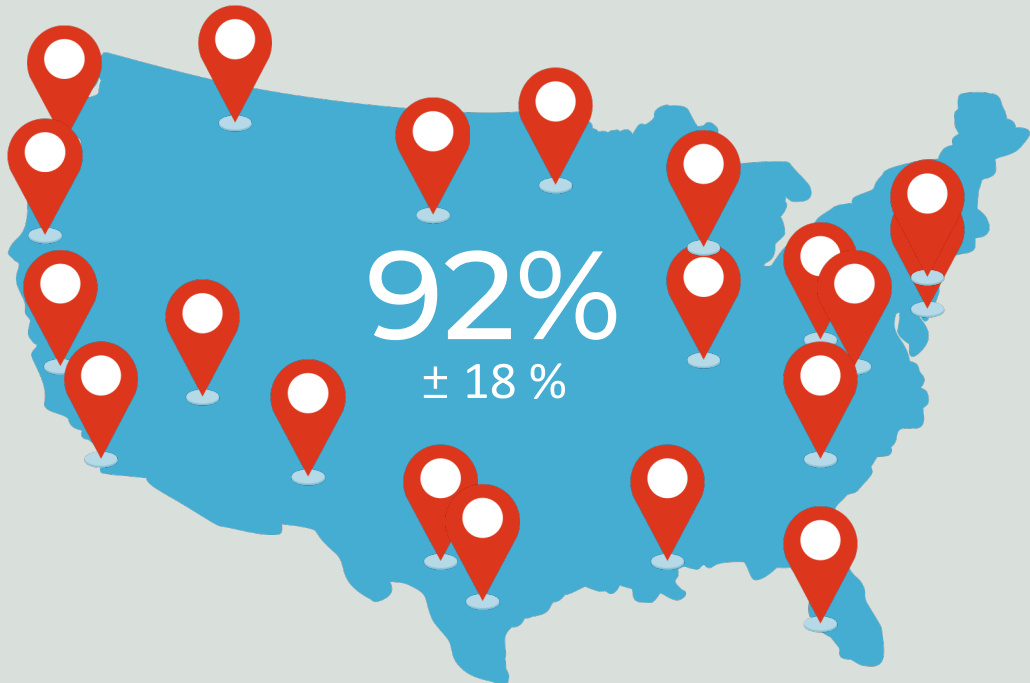
Lifetime  
flying hours



Monthly  
flying hours



Short-haul  
flying



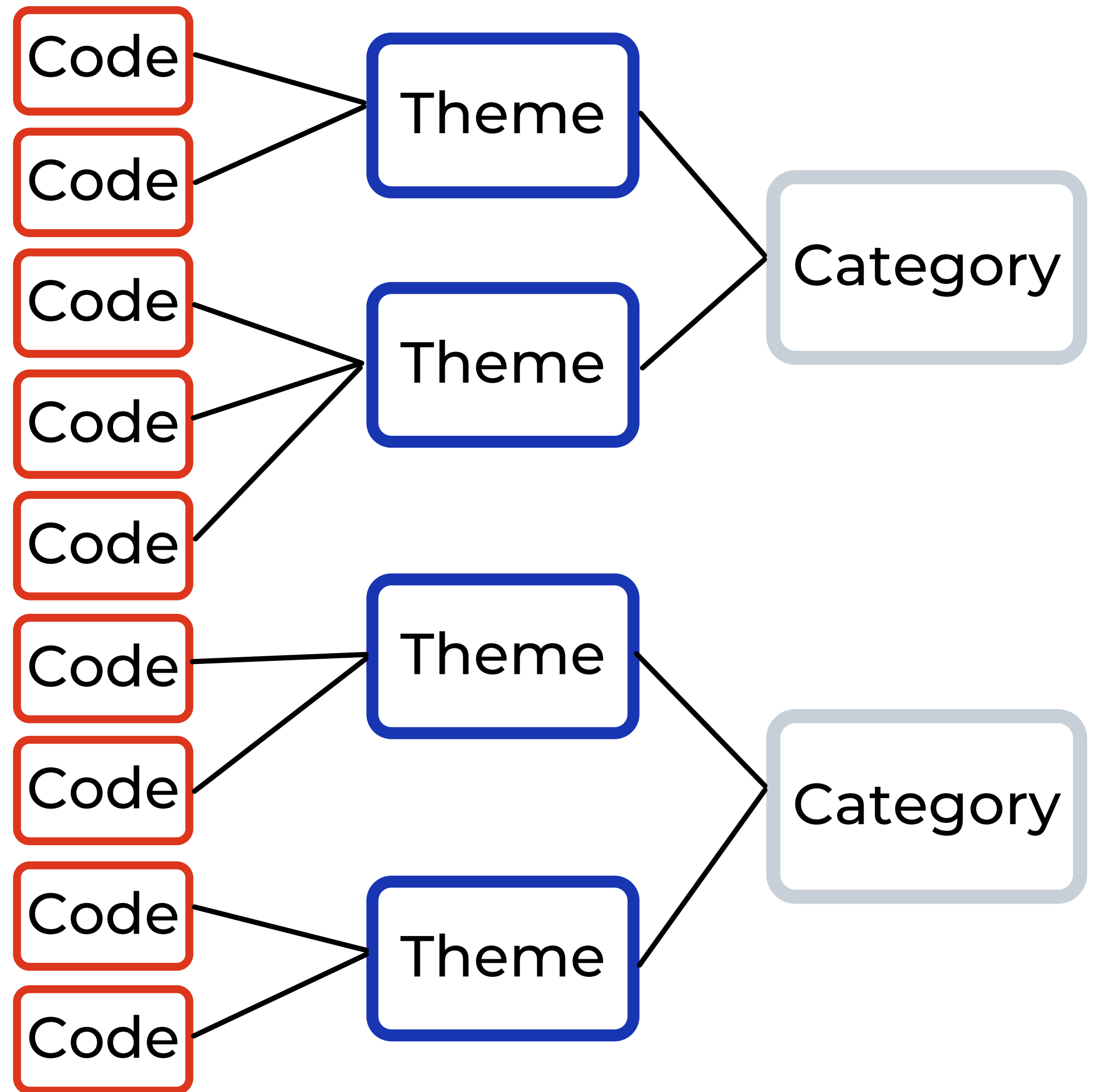
Fatigue role





# Methods

Analysis



## Word cloud of codes



# 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
<b>Total</b>	<b>1625*</b>	

\*incl. 'Other' theme

Theme

# Results

Top themes

## Circadian switches

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

*“There’s a, you know, 9:00 AM show and then a 2:00 PM show, and then a 5:00 AM show. That changing unwillingly is what I find to be most fatiguing because you just never catch up, like, your body doesn’t know what it’s doing.”*

# Results

## Top themes

### Rest duration (layover)

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

*“They kind of expect you’re narcoleptic and then as soon as you get to the hotel you can dive into bed and be asleep. But you need that decompression time where you can get something to eat and then just a little bit of time to decompress. But on those really short ones you’re just not allowed it.”*



# Results

Top themes

## High workload / Hassle factors

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

*“You throw me an airplane with 4 MELs [minimum equipment list], one of which is done incorrectly, you throw in weather, de-icing - suddenly that one leg, 2-hour day becomes fatiguing.”*

# Results

Top themes

## Number of flights

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

*“You know the weather issues, the deicing, all these little factors, you have to do multiple times in a day versus once, if that, in long-haul. And then the recoup time from those factors in long-haul is cruise flight, the lowest workload portion of the flight ... and you just don’t get a lot of it with these multiple legs and short layovers.”*

# Results

Top themes

## FAR 117 issues

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

*“I think that the companies look at these restrictions in [14 CFR Part] 117 not so much as limits to stay away from, but scheduling goals to get close to.”*

## Long sits

*“If you have a 4-hour sit, ...it’s really hard to get your mind back in the game.”*



# Results

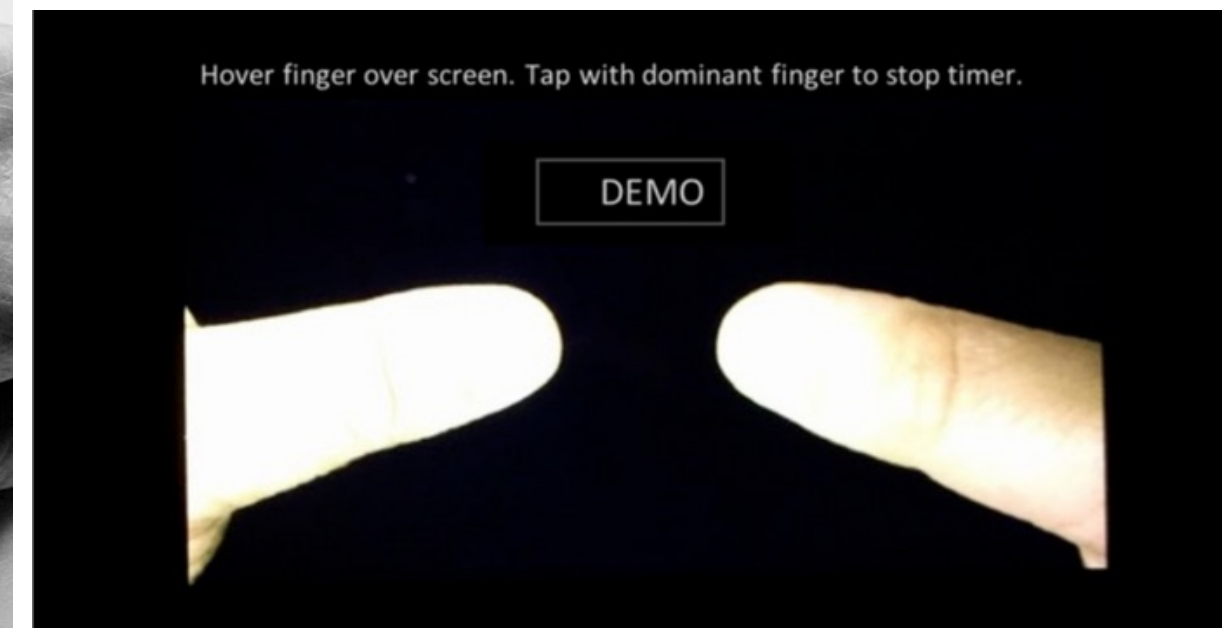
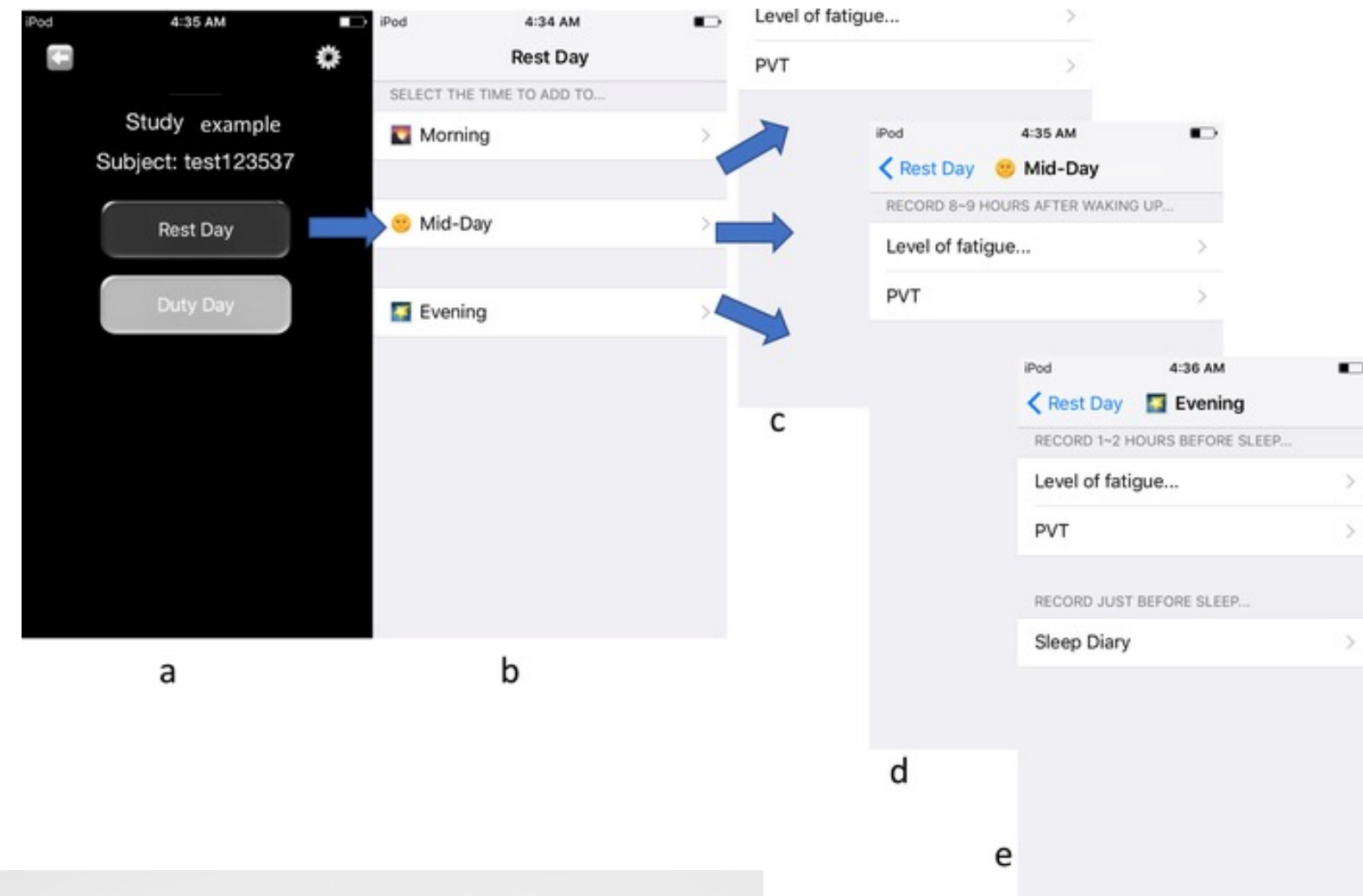
Over-arching categories

Six broad fatigue categories identified:

- **Circadian disruption**
- Workload/hassle factors
- Rest opportunity
- Schedule changes
- Regulation & policy
- Long sits

# Next steps

Data collection tools



Images: Figures in Arsintescu

# Thank you

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Link to paper in  
*Transport Policy*

