



Investigating the social acceptance of Urban Air Mobility

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Telephone survey on the acceptance of civil drones in Germany (2018)

- **Survey method**

Computer-assisted telephone interviews (CATI)



- **Implementation:**

infas GmbH (Bonn, Germany)

- **Number of cases:**

$n = 832$

- **Average duration per interview:**

18 minutes

- **Sample:**

Drawn using a random digital dial design with
landline and mobile phones

(representative for the German population by weighting)

CEAS Aeronautical Journal (2020) 11:665–676
<https://doi.org/10.1007/s13272-020-00447-w>

ORIGINAL PAPER

The acceptance of civil drones in Germany

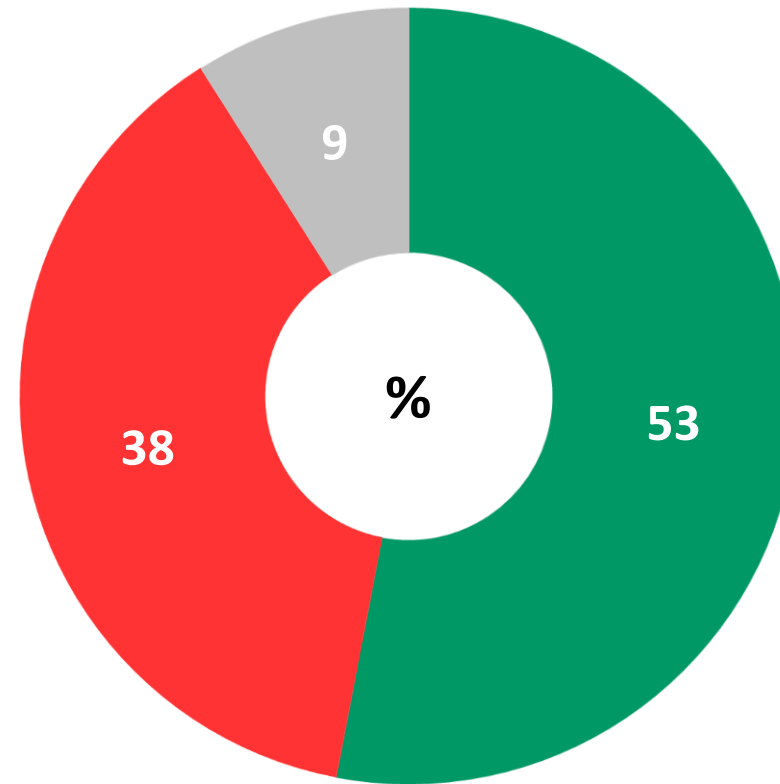
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Telephone survey on the acceptance of civil drones in Germany (2018)

General attitude towards civil drones

- rather positive
- rather negative
- undecided / answer refused



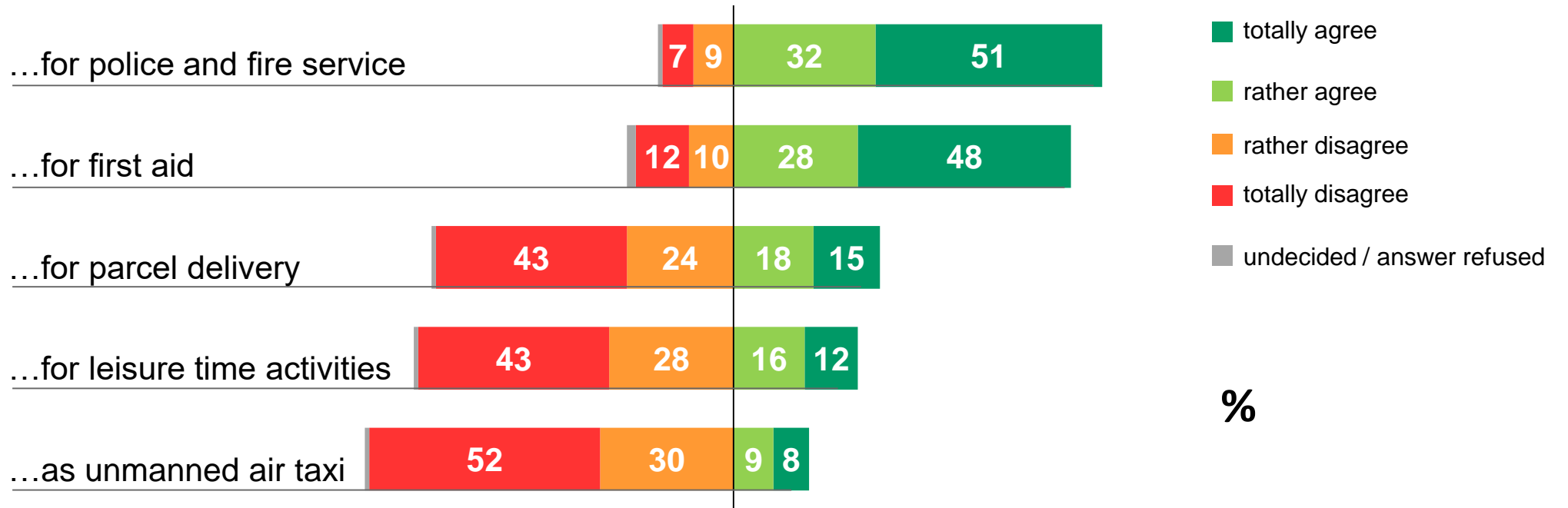
Attitude differed between subgroups, e.g. according to:

- Gender
- Age
- Knowledge about drones
- Experience (having already flown a drone oneself)
- Interest in modern technology



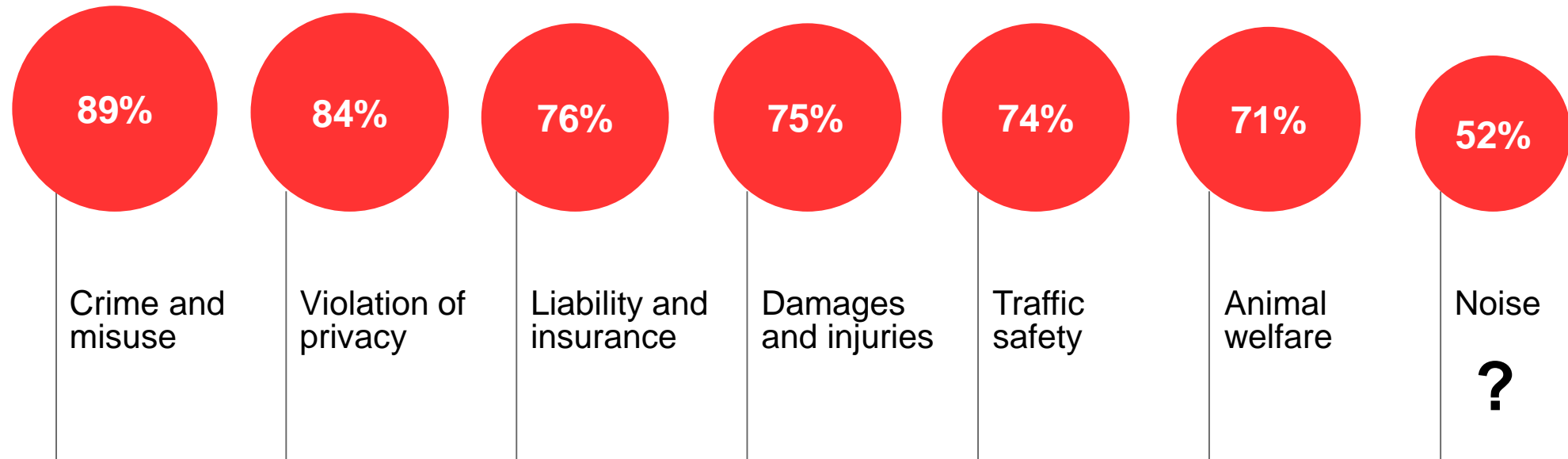
Telephone survey on the acceptance of civil drones in Germany (2018)

Envisioned own usage of civil drones



Telephone survey on the acceptance of civil drones in Germany (2018)

Areas of concern about civil drones



displayed = „rather concerned“



Telephone survey on the acceptance of civil drones in Germany (2018)

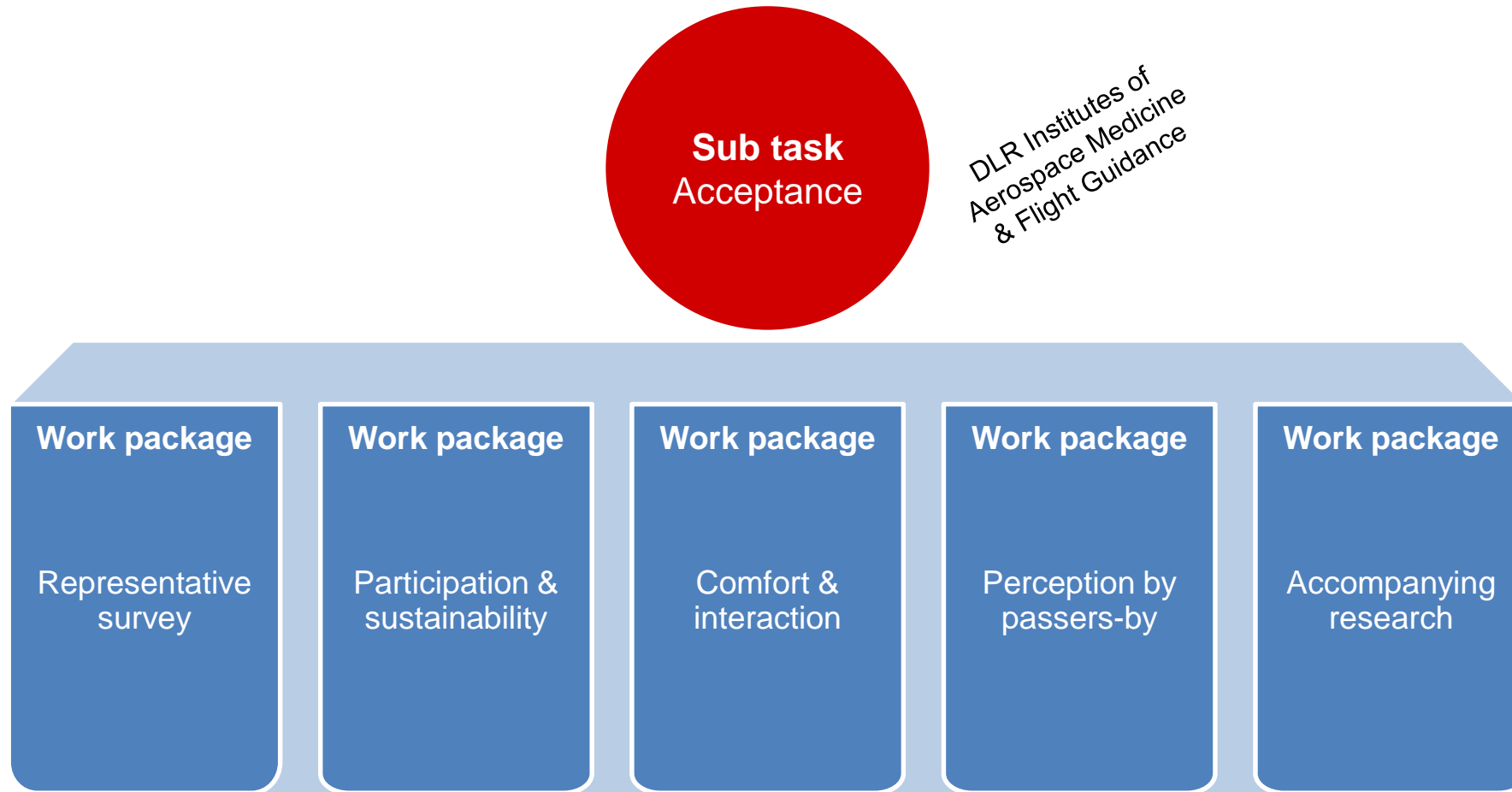
Areas of concern about civil drones

But:

- Noise concerns tended to occur more frequently among those who had already heard a drone
($\chi^2[1] = 3.29, p = .07$)
- Chi-square automatic interaction detection (CHAID):
Noise concerns explained the general attitude towards civil drones best among all seven assessed concerns
($\chi^2[2] = 38.6, p < .001$)



Sub task 'acceptance' of DLR's 'HorizonUAM' project



Sub task ‘acceptance’ of DLR’s ‘HorizonUAM’ project

Representative survey

Approach

- Telephone survey on the acceptance of civil drones in Germany (planned $n = 1000$)
- External market/social research institute → computer-assisted telephone interviews (CATI)
- Focus on noise related aspects, air taxis, and potential changes in opinion (vs. 2018)

Preparatory workshop

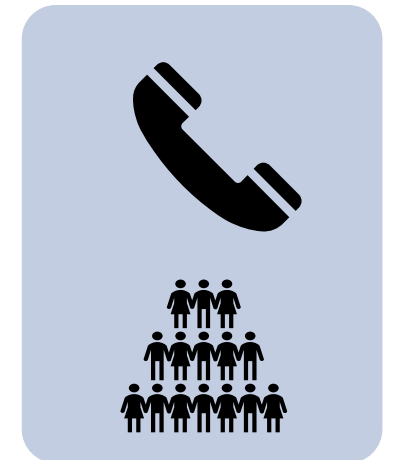
- Held in 12/2020 with experts in the field of drone acceptance
- Participants from DLR & several German research institutes and city authorities

Supplementary analyses

- Of the data from 2018 → conference papers (End et al., 2021, ICBen; Eißfeldt & End, 2021, Inter-Noise)

Current status

- First draft of the questionnaire has been created



Sub task ‘acceptance’ of DLR’s ‘HorizonUAM’ project

Participation & sustainability

Approach (Eißfeldt, 2020, Sustainability)

- Developing a smartphone app with three features:
 - Graphical representation of UAM flight track data
 - (Objective) UAM noise measurements
 - (Subjective) UAM noise assessments
- External IT service provider for programming
- Testing the app at DLR’s National Experimental Test Center for UAS in Cochstedt

Benefit

- Opportunity for adapting flight routes/profiles such that UAM noise can be distributed as fair as possible among residents

Current status

- First draft of app and its functions has been created



Sub task ‘acceptance’ of DLR’s ‘HorizonUAM’ project

Comfort & interaction

Approach

- Determining the perspective of passengers experiencing a virtual flight with an air taxi
- Focus on examining wellbeing and interaction depending on presence/absence of pilot on board, different amounts of available information, and flight route rescheduling after take off
- Airport shuttle use case (Hamburg city center → Hamburg airport)

Technical setup

- Combination of UAM cabin simulator, mixed reality visual system, and 6DoF motion platform

Current status

- Study has been conceptualized (incl. experimental design & flight scenarios)
- Virtual simulation environment is currently being set up



Sub task ‘acceptance’ of DLR’s ‘HorizonUAM’ project

Perception by passers-by

Approach

- Determining the perspective of passers-by experiencing UAVs virtually flying above the city of Braunschweig (incl. an air taxi landing)
- Exp. factors: flight levels, visual density, and presence of UAM sound
(for a similar approach at NLR, see Aalmoes & Sieben, 2021, DICUAM)

Technical setup

- Integration of UAVs into 360° video of an urban scene from Braunschweig presented to participants in VR from the pedestrians’ point of view

Current status

- Data collection has been completed
- Data are currently being analyzed

→ For details and results, see talk by Maria Stolz



Sub task ‘acceptance’ of DLR’s ‘HorizonUAM’ project

Accompanying research

Approach

- Carrying out accompanying research with respect to acceptance / human factors at the request of the project partners
- Evaluation of specific concepts developed in the current project by citizens in the context of workshops and online surveys

Completed work

- Workshops on cabin design were assisted / held in 12/2020
(user-centered design approach) (see upcoming conference paper, Stolz et al., 2021, DASC)

Current status

- Online survey with respect to cabin designs is currently being conducted



Thank you for your attention!



Knowledge for Tomorrow

