UGENT 2.0

EVOLVING SOCIAL CHALLENGES FOR AIRCREW AND THE NEED FOR REGULATORY RESPONSE

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IN COOPERATION WITH ECA, ETF AND ENAA
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LIST OF ABBREVIATIONS

Abbreviation	Meaning
ACMI	Aircraft, Crew, Maintenance, and Insurance
AOC	Air Operator Certificate
ATM	Air traffic management
CD	Commanders Discretion
CLA	Collective Labour Agreement
EASA	European Union Aviation Safety Agency
ECA	European Cockpit Association
ETF	European Transport Workers' Federation
EU	European Union
FDP	Flight Duty Period
FRM	Fatigue Risk Management
FRMP	Fatigue Risk Management Plan
FTL	Flight Time Limitations
LFA	Low Fare airlines
SMS	Safety Management Systems

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LIST OF CONCEPTS AND TERMINOLOGY

Concept	Meaning/ definition
AOC	An air operator certificate (AOC) is a certificate that allows an operator to perform specific operations of commercial air transport
ACMI	Aircraft, cabin crew, maintenance and insurance (sometimes wet-lease is used) the leasing of an aircraft with flight crews, possibly cabin crews and maintenance support
Atypical employment	In this study we use, to secure consistency with the 2014 study, the concept of atypical work. Atypical work refers to employment relationships that do not conform to the standard or 'typical' model of full-time, regular, open-ended employment with a single employer over a long-time span. The latter, in turn, is defined as a socially secure, full-time job of unlimited duration, with standard working hours. Although the number of workers in non-standard employment has grown significantly, these workers are still regarded as being in 'atypical' employment. So, for the purpose of this study, 'atypical work' constitutes all forms of employment or cooperation between a member of the cockpit or cabin crew and an airline other than an open-ended employment contract concluded between said crew member and said airline directly. It particularly refers to employment situations such as self-employment, part-time work, temporary and temporary agency work and (chains of) subcontracting/outsourcing companies.
Block time	The time period between an aircraft first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and until the last engine is stopped.
Dry lease	The leasing of an aircraft without any additional support
Duty time	A period which commences when a flight or cabin crew member is required to report for duty that includes a flight or a series of flights.
Home base	The location nominated by the operator to the crew member from where the crew member normally starts and ends a duty period or a series of duty periods and where, under normal conditions, the operator is not responsible for the accommodation of the crew member concerned.
Flight Duty Period (FDP)	Is any period of time during which a crew member performs various tasks in an aircraft. In addition to the ones during flights, an FDP includes those performed by the crew member that occur before a flight segment when the crew member has to report for

	duty and which finishes when the aircraft finally comes to rest and the engines are shut down at the end of the last flight on which he/she is a crew member.
Flight Time Limitations (FTL)	Flight time limitations imposed upon crew members by a regulatory agency and which involve time restrictions per duty period, and for longer terms such as hours per week, per month, per quarter, or per year.
Low- fare/ low-cost airline	An airline company that flies from point to point and in general offers low fares by eliminating traditional passenger services or by charging extra fees for these services. Often used as the opposite of legacy airlines
Network airline/ legacy airline	Full service airline that operates hub-based networks and offers multiclass cabins and offers several services included in the ticket price, often also described as network airlines
Operator	A natural person residing in a Member State or a legal person established in a Member State using one or more aircraft in accordance with the regulations applicable in that Member State, or a Community air carrier as defined in Community legislation. The operator is in particular responsible for managing the day-to day operations, overseeing the flight scheduling and crew assignments, maintaining, implementing safety measures and operating one or more aircraft,
Outsourcing and subcontracting	Often the term outsourcing and subcontracting are used in the aviation sector. Sometimes these terms are used interchangeably, although they might not always have the same meaning and also have another legal connotation. Outsourcing describes the situation where often entire tasks are transferred to an external company that performs these tasks on behalf of the company. It is often seen as a situation where tasks done in-house are being completed by individuals or businesses outside the company that has no affiliation with the first company. So, one has as first company no liability for the employees of the second company. On the other hand, subcontracting involves hiring by a company of an external entity for performing specific tasks for and under the supervision of the first company. Through such a system of subcontracting an external contractor is brought in to perform a certain task. Often a chain of interconnected companies is created where part of the work of a contractor is performed by different (sub) contractors on the basis of commercial contracts where all parties are on an equal footing and work as independent companies (Cremers and Houwerzijl, 2021). In labour-cost reduction oriented chains, main contractors delegate the work to (often dependent) companies mainly to avoid the direct employment of workers. It is this

situation that leads to big concerns. To tackle this situation, the national and European legislator have set-up support mechanisms, as joint and several liability systems, where the contractor together with the subcontractor can be held liable for the employment conditions due by the subcontractor.

But it is however not always easy to draw the thin line between both mechanisms. In this study, the terms of subcontracting and outsourcing are used interchangeably without any consideration about any eventual legal consequences.

CHAPTER 1 INTRODUCTION

"Aviation is becoming more like bus rides".

Study rationale

Ten years after the ground-breaking study *"Atypical Employment in the Aviation Sector"* (Jorens, Gillis, Valcke & De Coninck, 2015), the European aviation landscape has undergone profound changes. The European aviation industry finds itself at the crossroads of rapid transformation and persistent structural challenges. Liberalization, digitalization, and evolving consumer behaviour have significantly reshaped the competitive landscape, while recent global events — including the COVID-19 pandemic and the climate transition (Green transition) — have introduced new pressures on employment models, social protection, and organisational practices within the sector. These developments have intensified concerns around the spread of atypical employment relationships, working conditions, and the mental and physical wellbeing of aircrew — elements that may ultimately affect safety in the sector.

This study aims to provide an updated and evidence-based overview of the current (2024-2025) employment reality for cockpit and cabin crew in European aviation. This follow-up study, conducted by the same research institute, pays particular attention to the continued prevalence of atypical employment forms (such as self-employment, agency work, and cross-border arrangements), the impact of these employment structures on the mental and physical wellbeing of aircrew, and the potential consequences for operational safety. It is designed to support stakeholders, social partners, and researchers in understanding ongoing trends and challenges. While the study of 2015 contained also an in-depth analysis of the European legal provisions applicable to aircrew, this study focuses on the relation between the analysis of the data and the legal framework, also taking into account that the European legal framework did not know any big modifications in the last 10 years.

To achieve this, we combine multiple qualitative and quantitative methods. A comprehensive survey targeting crew members is supplemented with case studies, focus groups with members of the European trade unions (ETF and ECA), representing pilots and cabin crew, and interviews with human resources representatives of airline companies. This mixed-methods approach ensures a robust and nuanced understanding of both the lived experience of crew members and the strategic choices of employers.

In the following sections of this chapter, we provide a detailed overview of the methodological design underpinning this research. Particular attention is given to the motivation for choosing specific empirical tools, the process of constructing the instruments (survey, interview,…), and the inherent limitations that come with this research approach. These segments are structured as follows:

- Motivation: We will go into the motivation of the choice for every research method and tool.
- Construction of the research tool: We describe how the survey, interview guideline,… was designed, including the development of the questions, the piloting process, and the choice of

key themes such as employment conditions, wellbeing, and safety-related attitudes and behaviours.

- Limitations of the Study Method: We critically reflect on the methodological boundaries of this research, including challenges related to self-reporting, sample representation, and sectoral access.

Together, these components aim to ensure both transparency and replicability, while offering valuable insights into the reliability and validity of the findings.

The study ultimately seeks to offer insights that support informed policy debate, social dialogue, and further academic research.

We will do this by reporting the results and reflection in the following chapters:

Chapter 1. Introduction This chapter lays the methodological foundation of the study. It explains the rationale behind our multi-method approach, reflects on practical challenges such as limited employer response, and highlights the ethical considerations and approvals that guided our data collection process.

- Survey This section outlines the development, structure, and implementation of the survey, detailing how the instrument was designed to capture the lived experiences of cockpit and cabin crew across Europe regarding employment, wellbeing, and safety.
- Focus Groups This section describes the focus group discussions, aimed at deepening our understanding of survey results and exploring shared experiences and perceptions among aircrew through collective dialogue.
- Interviews with the Employer Side This part presents the semi-structured interviews with HR managers and employer representatives, shedding light on management perspectives and contextualizing structural challenges from within the sector.
- Informed Consent This section addresses the measures taken to ensure voluntary and informed participation, in line with ethical standards for social science research.
- Ethical Commission We summarize the ethical clearance received from the Ethics Committee of the Faculty of Law and Criminology at Ghent University (19 November 2024), and situate our approach within accepted academic standards for empirical research involving human participants.

Chapter 2. Flying Personnel: Who Are They? In this chapter, we present a demographic and professional profile of the survey participants, offering insight into their age, gender, qualifications, flight experience, and type of airline they work for.

Chapter 3. Remuneration This chapter explores key employment conditions, including payment methods, perceived autonomy, employer obligations, and the overall quality of the employment relationship. We analyse responses related to working time, exploring how aircrew experience regulations around flight time limitations, rest requirements, and definitions of working hours in practice. On top of that we look into the segment 'second Job', where we explore the prevalence and reasons for holding a second job, along with implications for rest, wellbeing, and job security.

Chapter 4. (A)Typical Employment and constructions This section delves into employment arrangements, from direct contracts to agency work and self-employment, offering a typology of (a)typical employment in European aviation. Followed by the analysis of the employment situation and the impact on wellbeing and safety.

We conduct a legal analysis and investigate the different kind of constructions and the possible legal loopholes. Another segment is the element of **'Instructions'** This short segment focuses on the type, clarity, and frequency of work instructions received, and their impact on job predictability and autonomy. This chapter furthermore examines discrepancies in applicable labour and social security law, including perceptions of "legislation shopping" and its effects on employment conditions.

Chapter 5. Wellbeing and Mental Health This core chapter investigates the mental and physical wellbeing of aircrew, identifying key stressors, protective factors, and trends over the past decade. We examine levels of dehumanization, humanization, physical wellbeing, mental health and perceived job insecurity, its contributing factors, and the psychological toll it takes on workers. Next, we consider the determinants for these wellbeing dimensions.

Chapter 6. Safety Culture and Management We explore perceptions of safety culture, including management's commitment to safety, (fatigue) reporting practices, and the role of communication and leadership. Sub chapters pertain to training, FTL and fatigue, Just Culture,...

Chapter 7. Where Are We Flying To? Open Questions / Issues We conclude the new information by reflecting on input from the open questions, unresolved challenges, and suggestions made by respondents, putting forward input for future research, policy, and social dialogue. Subjects are for example: single pilot, AI, retention, focus on sales, …

Chapter 8. Conclusions We end the report with a brief overview of the take-aways, combine them, formulate some general conclusions to then go into the recommendations for policy and future research.

Most of the chapters will be constructed in the following way: we start with a short introduction to the theme, go into the descriptive data, look into the relationship with the other dimensions of the study to be able to reflect about possible legal shortcomings, loopholes,…We end the chapter with the evidence-based take-aways. Thus, facilitating evidence-based proposals for legislative adaptation in chapter 8. We start each chapter with a quote from the open question in the survey. These quotes will also be used in the reflection section, the conclusions and chapter 7. They do not present our own view on the matter as researchers but provide insight in the operational reality of the aircrew themselves.

MIXED-METHOD STRATEGY

To comprehensively investigate the complex relationship between employment conditions, wellbeing, and safety for cockpit and cabin crew in European aviation, this study deliberately adopts a mixed-methods approach. The choice for methodological triangulation is grounded in the ambition to combine the strengths of both quantitative and qualitative research in order to capture not only statistical trends but also the nuanced realities behind them (Creswell & Plano Clark, 2017).

The quantitative component of the research is primarily operationalized through an anonymous online survey. This tool enables the collection of a wide array of data from a geographically dispersed and

professionally mobile workforce — generating large-scale insights into employment types, working conditions, mental and physical wellbeing, and perceived safety practices. These survey data are contextualized using previous datasets gathered by the same research institute between 2014 and 2024, offering a rare longitudinal lens on persistent and evolving trends.

To complement and enrich these findings, the qualitative dimension of the study consists of semi-structured interviews with HR representatives of airline companies and case studies derived from the online survey and focus groups with cockpit and cabin crew. These methods allow for an in-depth exploration of themes such as organisational culture, management styles, and interpersonal dynamics that may not be fully captured through standardized survey items (Kvale & Brinkmann, 2009).

Finally, the empirical components are supported by a systematic review of the legal and academic literature, mapping out the regulatory framework and scholarly debate surrounding atypical employment, psychosocial risks, and aviation safety.

This integrative research design responds to calls in social sciences and labour studies for a holistic understanding of phenomena that intersect regulation, lived experience, and structural employment conditions (Tashakkori & Teddlie, 2010). By drawing from multiple sources of data and analytical lenses, the study aims to provide actionable, evidence-based insights for stakeholders, including policy makers, social partners, and researchers.

Survey

The construction of the survey instrument was a multi-step and collaborative process, aimed at ensuring both validity and relevance to the professional realities of cockpit and cabin crew across Europe. The survey was designed by the UGent research team based on insights from prior literature, earlier empirical research, and thematic gaps identified in the 2015 pilot study. To enhance its quality and field relevance, the questionnaire was developed in close consultation with sectoral stakeholders, including European representatives of the aircrew personnel (European Cockpit Association (ECA) and European Transport Workers' Federation (ETF)), professional associations, and employer representatives (European Network Airlines Association (ENAA)). Their input was instrumental in refining question phrasing, response options, and thematic priorities. A preliminary version of the survey was tested with a small, diverse group of pilots and cabin crew to verify clarity, internal logic, and usability. Feedback from this pilot group led to further refinement of question wording and structure. In parallel, the survey underwent rigorous system testing to ensure full technical functionality of Qualtrics and user-friendliness across devices and platforms. This structured and participatory approach contributed to a robust survey design tailored to the complex and often atypical employment context of European aircrew.

The survey was disseminated through European and airline-specific unions (our partners: ECA, ETF and ENAA), as well as via LinkedIn and Twitter. The European unions, ECA, ETF and ENAA, contacted their national or airline specific counterparts to facilitate targeted dissemination. In addition, the link was shared on the Professional Pilots Rumour Network (PPRuNe: http://www.pprune.org/ and its equivalent platform for cabin crew (http://www.cabincrew.com). Respondents accessed the questionnaire through a Qualtrics link and were given four weeks to participate in the fall of 2024 (an initial three-week period, later extended by one week).

In presenting our findings, we will refer to the respondents as pilots and cabin crew, in line with their self-reported occupational roles. This approach aligns with common practice in survey-based research, where the reliability of findings is contingent on the assumption of respondent honesty and accurate self-identification (Tourangeau & Yan, 2007). While self-report methods are widely used in social and occupational research due to their practicality and direct access to subjective experience, we acknowledge the inherent limitation that such data rely on the veracity and clarity of participants' responses.

On top of that, while online anonymous surveys offer broad accessibility and encourage participation in sensitive topics such as working conditions, wellbeing, and safety culture, they also present several methodological limitations—particularly when targeting a hidden or hard-to-reach population. In the context of European cockpit and cabin crew, the absence of a centralized and publicly available registry complicates the estimation of the total target population, making it impossible to calculate a precise response rate or assess the representativeness of the sample. Moreover, recruitment largely relies on gatekeepers (e.g. unions, professional associations, online networks), which may introduce self-selection bias, as individuals with stronger opinions or more precarious employment situations might be more motivated to respond. Additionally, while anonymity is crucial for protecting respondents in sensitive employment contexts, it prevents follow-up verification and makes it difficult to detect duplicate responses or clarify ambiguous entries. As such, results must be interpreted with caution and considered as a detailed snapshot of experiences and perceptions rather than a statistically generalizable picture of the entire European aircrew population (cf. Tourangeau & Yan, 2007; Wright, 2005). Moreover, anonymous online surveys are particularly vulnerable to fall-out, or drop-off throughout the survey, especially when the questionnaire is lengthy or touches on complex or sensitive topics such as wellbeing or employment precarity. Despite efforts to make the survey accessible and user-friendly (including piloting and interface testing, in between feedback and motivation,…), survey fatigue may have led some participants to abandon the survey before completion, potentially distorting the results and weakening the robustness of certain segments of the dataset (Tourangeau & Yan, 2007; Galesic & Bosnjak, 2009). In 2014, we chose the report the missing answers, now we will work with the valid data. The instances of missing data were not integrated into the graphical representations in this report, in order to preserve the clarity and readability of the visualizations. Including partial responses could distort proportional representations and hinder meaningful interpretation of the results. However, where relevant—particularly in cases of notable fall-out or dropout—we explicitly indicate the valid N-value (i.e. the number of respondents who answered a given question) to provide transparency and context. The reasons for missing data can be diverse: lack of knowledge about a specific contractual or legal situation, survey fatigue, or the sensitive nature of certain topics such as mental health or job insecurity. While the survey design encouraged full participation, respondents were also explicitly informed of their right to skip any question without consequence, in line with ethical guidelines for voluntary participation.

MEASURES

Organizational dehumanization. We used the 11-item Organizational Dehumanization Scale (Caesens et al., 2017) and applied a 7-point rating scale with strongly disagree (1) and strongly agree (7) as scale anchors. A high score indicated a high level of experienced organizational dehumanization (range = 11 to 77). Here is a sample item: My organization makes me feel that my only importance is my performance at work. The present study's Cronbach's alpha (internal reliability) was .929.

Perceived Organizational Support. In view of measuring Perceived Organizational Support, we adopted the 3-item version of the Perceived Organizational Support scale of Eisenberger and colleagues (1986). Each scale item invited respondents to rate a statement on the base of a 7-point rating scale for all items (1 = strongly disagree, 7 = strongly agree). Respondents were presented with the following three statements: 'My airline values my contributions to its wellbeing', 'My airline strongly considers my goals and values' and 'My organization really cares about my wellbeing'. The coefficient alpha of reliability of this scale was 0.92.

Mental Health. We measured mental health using the 14-item Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) (Tennant et al., 2007) (Range = 14 to 56). Scholars have demonstrated the criterion validity of this scale concerning other mental health scales (e.g., General Health Questionnaire (GHQ-12)) (Ng Fat et al., 2017). We applied a four-point Likert-type rating scale with much less often than usual (1), not as often as usual (2), as often as usual (3), and more than usual (4) as anchors. Since the lockdown was about four weeks at the survey's launch, we added the following "in the past four weeks" before each item.

The WEMWBS covers eudemonic and hedonic wellbeing, psychological functioning, and subjective wellbeing with a holistic view of wellbeing (Warwick Medical School, 2019). The higher the score, the higher the self-assessed mental health of the participant. A sample item is: In the past four weeks, I have been feeling relaxed. Cronbach's alpha for the scale was .916.

Physical Health. This is measured with one item: 'How would you generally assess your physical health in the past four weeks?' (1= very bad, 2= bad, 3= moderate, 4= good, 5=very good). This item was developed by Clays (2017; Clays et al., 2021).

Medication use. For medication use, we asked them one general question about six different types of drugs: How often do you use: (1) Sleep medication; (2) Pain killers; (3) Anti-depression medication, (4) Anti-Anxiety medication, (5) Amphetamines, and (6) Alcohol. Each item has a five-point rating scale, ranging from never (1) to very frequently (5). Following Kaufman et al. (2002), an overall index total score of the variety of drugs varies from 6 to 30.

Job insecurity. Researchers measured job insecurity using two items selected from the Job Insecurity Scale (Vander Elst et al., 2014): I will soon lose my job. I feel insecure about the future of my job. We adopted a double-anchored 5-point rating scale (1 = strongly disagree, 5 = strongly agree) (Range = 2 to 10). Cronbach's alpha for the scale was .796. A high score suggests high job insecurity.

Safety climate, culture and behaviour. The instrument is partly based on the Aviation Safety Climate Scale (Evans et al., 2007), the Safety climate and attitude in ground handlers measures to evaluate organizational safety (Diaz & Cabrera, 1997) and the Food safety climate assessment tool (De Boeck et al., 2015). The scale measures two dimensions of safety: (1) Aviation safety work climate (11 items), and (2) Personal aviation safety behaviour (6 items, see next). A sample item for Aviation Safety Work Climate is: "The leaders (e.g. managers, supervisors, ...) I work with are able to motivate their employees to work with the highest attention for safety regulations and safety related issues are addressed by the leaders in a constructive and respectful way." Each item was scored on a 5 point Likert scale (1 = Strongly disagree, 5 = Strongly agree) (the maximum score = 55 for Aviation safety work climate and 30 for Personal aviation safety behaviour). The higher the sum score, the better the perceived aviation safety work climate or conducted personal aviation safety behaviour. Cronbach's alpha for the work climate

scale was 0.936 and for personal safety behaviour 0.819. We determined the critical level for Safety Work Climate at a 43 out of 55, meaning that the respondents give a maximum of a neutral answer on all the statements. Falling below this threshold implies a worrying state of Safety Work Climate.

The survey can be found in addendum.

OVERVIEW OF RESEARCH SAMPLES AND THEIR CHARACTERISTICS, INVOLVED IN THE DIFFERENT STUDIES AND DATA COLLECTIONS.

Ghent University has conducted significant research into (atypical) employment practices and conditions within the European aviation industry. In 2015, Ghent University conducted a comprehensive study on atypical employment in the European aviation sector, commissioned by the European Commission. The research, led by Yves Jorens, Dirk Gillis, and Lien Valcke, focused solely on pilots, examining the prevalence and consequences of non-standard employment contracts. The study found that over 16% of pilots in Europe were employed under atypical contracts, including self-employment, fixed-term contracts, temporary agency work, zero-hour contracts, and pay-to-fly schemes. These forms of employment were particularly common among low-cost carriers. The research highlighted that such employment arrangements often heightened the risk of reduced social security benefits, job insecurity, and lower wages, contributing to a decline in overall working conditions. Legal and regulatory challenges were another concern, as enforcing labour laws proved difficult when airlines employed crews through agencies in countries with less stringent regulations. The legal reflections were the main focus of this study. The study proved highly valuable and has played an important role in shaping discussions about labour practices in European aviation, but one of the conclusions was that further research was needed; a study with a more holistic approach.

This was the inspiration for the research conducted within the context of a doctoral dissertation written by one of the researchers of the research institute IRIS. The dissertation investigates the relationship between employment conditions, job-related wellbeing, and safety behavior among European cockpit and cabin crew. Titled *"Happiness in the Sky? (Atypical) Employment, Job-Related Wellbeing in European Cockpit and Cabin Crew, and the Relationship with Safety (Behaviour)"*, the study combines legal and labour research with empirical analysis to examine how the working environment and management practices affect crew wellbeing and, ultimately, aviation safety.

The research highlights a stagnation or decline in working conditions for European aircrew over the past decade, exacerbated by factors such as the COVID-19 pandemic and the Green transition. These changes have contributed to more dehumanizing management practices and increased pressures on employees, negatively impacting both mental and physical wellbeing. Dr. Valcke emphasizes the important role of trade unions, showing that union satisfaction can buffer against these adverse effects, and that active negotiation culture and social dialogue are key to supporting wellbeing and safety in the aviation sector. In the context of this study, two extra online surveys were conducted; one in the context of the generalized lockdown in de COVID-19 pandemic in 2020 and one study in 2021 at a moment of slow but steady recovery.

For each study that we have done as a research institute and that will be used in this report, we report the background variables (%) of pilots and cabin crew (Table 1.1). This provides the reader with a comprehensive understanding of the questions addressed in each study, enabling a clear comparison of results and trends across the different research phases. It also highlights how each subsequent study

built upon the findings and insights of the previous ones, demonstrating the gradual broadening and refinement of the research scope. By tracing these developments, the reader can appreciate not only the continuity in the research objectives but also the ways in which emerging data, feedback, and contextual factors informed the evolution of the study design and the depth of analysis. This approach offers a nuanced perspective on the cumulative knowledge generated, showing how each study contributes to a more complete understanding of the subject matter.

TABLE 1.1 OVERVIEW RESEARCH SAMPLES AND THEIR CHARACTERISTICS FOR ALL THE DATA COLLECTION MOMENTS

		2014 Pilots	2020 Pilots	2020 Cabin crew	2021 Pilots	2021 Cabin crew	2024 Pilots	2024 Cabin crew
	N =	6633	271	1022	492	471	4092	2869
Air carrier business model	Network/ legacy	45%	32,8%	52,6%	50%	52,6%	46,5%	54,9%
	Low- cost carrier	22%	50,9%	33,6%	31,4%	24,6%	26,3%	28%
	Regional carrier	8%	7%	5,7%	6,1%	10,1%	4,7%	8,7%
	Charter	7%	4,4%	2,0%	3,7%	3,4%	4,1%	3,7%
	Cargo/freight	7%	0,4%	-	4,9%	-	8,6%	0,1%
	Business	4%	0,7%	2,6%	3,4%	5%	2%	2,1%
	Other	6%	3,7%	3,5%	0,6%	4,2%	1%	1,3%
	ACMI	-	-	-	-	-	6,3%	1,2%
	Missing	1%	-	-	-	-	-	-
Gender	Male	-	87,1%	34,1%	94,5%	40,2%	92,9%	37,2%
	Female	-	12,9%	65,7%	5,5%	59,8%	6,8%	62,4%
	Other	-	-	0,2%	-	-	0,2%	0,4%
Age	Under 21	-	-	-	0,2%	0,2%	0,2%	0,9%
	21-30	18%	24%	28,6%	22,5%	12,6%	14,8%	22,8%
	31-40	30%	39,5%	25,4%	33,3%	25,4%	32,8%	25,8%
	41-50	29%	17,7%	27,3%	27%	32,9%	27%	24,5%
	51-60	19%	17%	16,4%	16,4%	25,8%	21,6%	22,4%
	61+	3%	1,8%	2,3%	0,6%	3,2%	3,8%	3,5%

Having relationship	Single	-	25,1%	45,5%	26,6%	33,5%	-	-
	Married	-	68,6%	46,1%	69,7%	58%	-	-
	Widowed	-	0,4%	0,2%	0,2%	0,2%	-	-
	Divorced/separated	-	5,9%	8,2%	3,5%	8,5%	-	-
Having children	Yes	-	55,7%	38,2%	53,5%	45%	-	-
	No	-	44,3%	61,8%	46,5%	55%	-	-
Relationship airline company	Employment contract	79,3%	64,9%	85%	87,4%	92,2%	85,3%	94,7%
	Temporary work agency	5,4%	7,7%	4,2%	3,4%	2,7%	2,9%	1,7%
	Via a company	3,6%	17,7%	5,9%	2,2%	2,9%	1,2%	1%
	Self-employed	4,7%	2,2%	0,6%	6,5%	1,1%	8,5%	2%
	It's a different relationship	2,4%	7,4%	4,2%	0,6%	1,1%	1,2%	0,6%
	Missing	4,6%	-	-	-	-	-	-

CASE STUDY (ANALYSIS AT INDIVIDUAL LEVEL)

The case study segment of this research was developed based on specific patterns and inconsistencies identified within the online survey responses. Cases were extracted from the dataset where discrepancies were observed between declared home base, applicable social security legislation, and labour law—factors that point to potential instances of so-called "legislation shopping" or irregular employment constructions. These selected cases were further supported and contextualized using legal analysis and relevant regulatory frameworks.

In constructing the case studies, we examined the relative proportions of these irregular cases within the broader respondent population. Particular attention was given to variables such as type of airline (e.g., network, low-cost, cargo), nature of the employment relationship (e.g., direct contract, agency, self-employment), and respondents' own perception of their real home base. By comparing the selected cases to the general survey population, we were able to identify trends and assess whether certain employment practices are more prevalent within specific market segments. This comparative lens allows for a more targeted understanding of where legal ambiguity or circumvention is most likely to occur, and how this may affect employment security, workers' rights, and social protection across the European aviation landscape.

Focus groups

To complement and deepen the insights derived from the quantitative survey data, two focus group sessions were organised, each designed to introduce a reflective and interpretative layer to the findings. The focus groups provided a platform for open discussion, collective interpretation, and the triangulation of emerging patterns, allowing us to explore specific hypotheses in greater depth—most notably, the regional variations in employment conditions and wellbeing, with a particular interest in differences between Western and Eastern Europe.

The first focus group, coordinated in collaboration with the European Cockpit Association (ECA), took place on 25 March 2025 and brought together pilots from various European countries. The second session was facilitated by the European Transport Workers' Federation (ETF) on 24 June 2025 and included a broader representation of cabin crew, as well as a smaller group of pilots. Both sessions were structured around six guiding questions, covering key themes such as employment status, social security coverage, safety culture, fatigue, organisational support, and regional disparities.

1. "What is the biggest 'social' threat to aviation?"
2. "Has aviation employment truly evolved in the last decade, or are we just repackaging old problems under new crises?"
3. "What is the one 'unspoken truth' about airline working conditions that management refuses to acknowledge?"
4. "Is worker well-being just an HR buzzword, or do you see real, tangible improvements in mental and physical health support?"
5. "If job security and working conditions keep declining, how long before safety is compromised—and have we already crossed that line?"
6. "If you had the power to enforce one major industry-wide reform tomorrow, what would it be—and why hasn't it happened yet?"

The focus groups did not only serve as a valuable validation instrument for the survey results but also revealed nuanced perspectives and contextualized experiences that would be difficult to capture through structured survey questions alone. In particular, the discussions allowed us to probe the socio-cultural and economic dynamics underpinning employment relations in different European sub regions, thus enriching our understanding of the diversity and complexity of working conditions in European aviation.

Interviews with the employer side

As part of the mixed-method approach adopted in this study, we conducted a series of semi-structured interviews with human resource managers from various airline companies. The interviews were designed to gather structured yet nuanced insights into the employment policies, organisational practices, and perspectives on wellbeing and safety from the employer's side. Our focus was to explore how employment conditions are perceived and managed by those responsible for workforce planning and compliance with labour and safety regulations.

Through established contacts and targeted outreach (in meetings by representatives of ECA and ETF), we were able to secure participation from HR representatives of several network or legacy carriers; Air France, Brussels Airlines, KLM, Lufthansa and SAS. Their input provided valuable context on long-term employment trends, post-COVID restructuring, and the impact of EU-level regulatory developments on contract choices and employee wellbeing.

However, despite repeated attempts, no responses were received from the low-cost carriers, ACMI's,… that were approached. This lack of participation from a significant segment of the industry constitutes a limitation of the study and may reflect broader concerns related to transparency, public scrutiny, or time/resource constraints on the part of those operators. Nevertheless, the input received from the participating employers offers meaningful insight into one side of the sector's employment spectrum and complements the data gathered from workers through other methods. No independent quality check was carried out, as we relied on the professional expertise of the designated HR representative within the airline company. For future research, it would be valuable to integrate a post hoc quality assessment to further strengthen the reliability of the data.

The guideline for the semi-structured interview can be found in addendum.

INFORMED CONSENT

In line with ethical standards for empirical research involving human participants (European Commission, 2015; BPS, 2021), informed consent was systematically obtained prior to data collection for each research method employed in this study. This includes the online survey, the focus group discussions with flying personnel, and the semi-structured interviews with HR representatives of airline companies.

For the **online survey**, participants were first presented with an information sheet outlining the aims of the study, the voluntary nature of participation, data protection and anonymity measures, and their right to withdraw at any point without consequences. Consent was recorded digitally before access to the survey was granted.

In the case of **focus groups**, all participants received a detailed written briefing prior to the session and were asked to give oral consent (recorded) before discussion commenced. Specific attention was paid to creating a safe space that respected privacy and the potentially sensitive nature of some topics, particularly those related to wellbeing and employment status.

For the **interviews with employer representatives**, informed consent was similarly secured, with an emphasis on the voluntary nature of participation and the anonymization of data in reporting. Where relevant, participants were reassured that no identifiable company information would be published without explicit permission. However, many of the interviewees indicated that they were a requesting party for a referral to the company in case of for example good practices, …

Across all methods, participants were given contact information for the researchers should they wish to raise questions, withdraw their participation, or request access to the data. The process of informed consent was designed not only as a procedural necessity, but as a central element in respecting the autonomy and rights of all contributors to this study.

ETHICS COMMITTEE

The empirical components of this research were conducted in accordance with established ethical standards for social science research. Prior to data collection, ethical clearance was formally obtained from the Ethics Committee of the Faculty of Law and Criminology at Ghent University, which granted approval on November 19th, 2024. This procedure aligns with widely recognized principles for ethical research involving human participants, including informed consent, confidentiality, and the right to withdraw (Bryman, 2016; Babbie, 2020). By adhering to these standards, the study ensures methodological integrity and the protection of respondents, in line with the broader framework for empirical legal research.

RESEARCH QUESTIONS AND MODEL

RESEARCH QUESTIONS

This study aims to explore the employment conditions, wellbeing, and safety culture among cockpit and cabin crew operating within the European Union. Against the backdrop of evolving labour market dynamics, increasing atypical employment, and technological transformation in the aviation sector, the research is guided by the following central and subsidiary questions:

CENTRAL RESEARCH QUESTION:

How do employment structures and working conditions in the European aviation sector affect the wellbeing, safety culture, and professional reality of cockpit and cabin crew?

SUB-QUESTIONS:

1. Employment Structures and Legal Complexities

    - What types of employment arrangements (e.g., direct employment, agency work, self-employment, subcontracting) exist for flying personnel in the EU, and what are their legal and social security implications?
    - How do mechanisms such as legislation shopping and varying interpretations of "home base" affect the application of labour and social protection laws?
    - What remuneration models are in place, and how do they affect income stability, or the need for secondary employment?

2. Wellbeing and Mental Health

    - How are the results for health (e.g., mental health, physical health, fatigue, job insecurity) among pilots and cabin crew?
    - How have these indicators evolved over time (comparing data from 2020, 2021, and 2024), and how do they differ across regions, age groups, and occupational roles?

3. Safety Culture

    - How do crew members perceive the safety culture within their airline?
    - Are there differences in how pilots and cabin crew experience safety-related procedures, training, and the application of "Just Culture" principles?

4. concerns raised by the open questions, questions for future research: Sectoral Trends and Technological Change

    - What impact do emerging developments such as single-pilot operations and AI-supported systems have on employment prospects and safety perceptions?
    - How do crew members view the shift towards inflight sales and commercial performance metrics, particularly among cabin crew?

5. Good Practices and Policy Recommendations

    - What examples of good practice can be identified from interviews and open survey input?
    - What legal or policy reforms are needed to better align the regulatory framework with the lived reality of cockpit and cabin crew?

These questions form the backbone of a mixed-method study that includes survey research, qualitative case studies, focus groups, and semi-structured interviews. Together, they aim to provide a comprehensive and critical understanding of the current challenges facing aviation workers in Europe, while contributing to informed policy and legislative debate.

RESEARCH MODEL

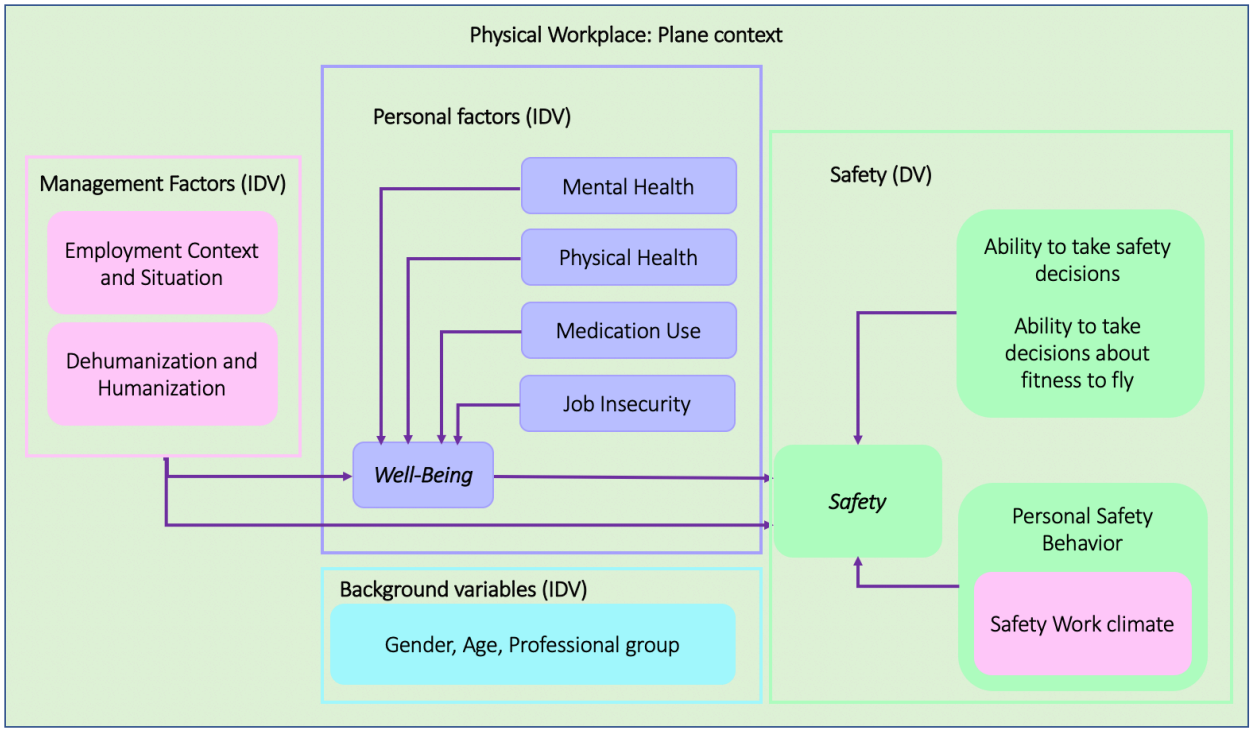


FIGURE 1.1. RESEARCH MODEL

LIMITATIONS OF THE STUDY

- Geographical boundary: This study is situated within the geographical boundaries of the European Union. Focusing on this region enables a coherent analysis of a distinct and shared

regulatory framework. It also allows for the clear definition of the target population—namely, cockpit and cabin crew members, as well as union representatives, who are employed within the EU context.

- Research groups: An additional demarcation of this study lies in its deliberate focus on the employment reality of cockpit and cabin crew. Other key actors in the aviation industry—such as ground handling personnel, air traffic controllers, and technical support staff—are not included within the target population. This choice is methodologically justified, as these occupational groups are generally governed by distinct regulatory frameworks, operate under different employment conditions, and are situated within fundamentally different physical work environments. Unlike aircrew, they are typically bound to fixed geographical locations (e.g. airports, national air traffic systems), which significantly shapes their professional context.
- Time window: The data underpinning this study was gathered over a ten-year period, spanning from 2014 to 2024. This longitudinal timeframe allows for the identification of trends and shifts in employment conditions, wellbeing, and safety culture within the European aviation sector, particularly in light of major sectoral disruptions such as the COVID-19 crisis and the ongoing green transition.
- Research method: One of the central methodological challenges encountered in this study lies in the absence of reliable **qualitative background data** concerning the total population of **cockpit and cabin crew employed across the European aviation sector**. This lack of publicly accessible or systematically gathered information made it impossible to define stratification variables prior to data collection. Consequently, no formal sampling frame could be established. As such, the study relied on a **non-probabilistic convenience sampling approach**, with stratification checks performed **post hoc**. This approach, while pragmatic, introduces well-known methodological constraints.
    - **Convenience sampling**, although advantageous in terms of efficiency, cost-effectiveness, and accessibility, comes with limitations. The absence of formal selection procedures increases the risk of **sampling bias**, including **selective response patterns** and **non-random distribution of survey invitations** (Lavrakas, 2008). Nonetheless, the research team actively mitigated such risks by disseminating the survey through targeted professional channels, including European-level and national trade unions, as well as aviation-specific digital platforms and community forums.
    - Further complicating the methodological landscape is the **lack of precise quantitative parameters** for the target population. As no centralized, transparent data exists on the total number or characteristics of pilots and cabin crew working within the EU, **response rates could not be reliably calculated**, nor could **sample representativeness** be assessed with certainty.
    - Another important limitation relates to **participant attrition**. Survey **drop-out** may be attributed to multiple factors, including a reluctance to disclose sensitive information about safety and wellbeing in the context of precarious employment, the **length and comprehensiveness** of the questionnaire, and a general **survey fatigue** experienced by respondents (Clays et al., 2007). To counteract such effects, the survey instrument was designed to support **participant engagement** through several techniques: guaranteeing **anonymity**, offering **progress indicators**, and using **neutral, non-leading question formats** to prevent response bias (Grimmond et al., 2025).

- In addition, the **COVID-19 pandemic** created further barriers to reaching respondents, particularly given the shifting employment status of aviation workers and the operational challenges faced by unions. Despite support at the European level, **national-level unions did not always distribute the survey** as anticipated, limiting reach and possibly contributing to sample imbalance.
- A further methodological caveat is the study's reliance on **self-reported data**, which raises concerns regarding **common method variance**. Self-reporting introduces the risk that observed associations may be **artificially inflated or suppressed**, due to shared measurement artefacts (Williams & Brown, 1994). To minimize these effects, the researchers ensured participant anonymity and employed **validated measurement instruments** with demonstrated **internal consistency**.
- Lastly, it is important to stress that the **statistical approaches** used—primarily **correlation and regression analyses**—do not permit **causal inference**. While associations between employment conditions, wellbeing, and safety outcomes are explored, no direct causality is assumed (Leary, 2004). Future research would benefit from a **longitudinal and mixed-methods design**, incorporating **qualitative tools** such as in-depth interviews or ethnographic observation to enable a deeper exploration of causality and the underlying mechanisms shaping employment and safety in European aviation.

CHAPTER 2 GENERAL OVERVIEW OF THE SURVEY POPULATION

"My company is not interested in me as a human being. Management is shrewd in applying their own interpretation of written agreements that unfortunately sometimes are not very specific. Always to their benefit. Never to an employee's benefit. Looking forward to retirement. Being an employee in aviation in EU is fucked up by all the fragmentation and mixing of some local country law and some central EU law, some this some that"

INTRODUCTION

This chapter provides a descriptive overview of the population that participated in the online survey in 2024. Understanding the composition of the respondent group is essential to contextualize the findings presented in the following chapters. It allows us to assess the representativeness of the sample, detect possible imbalances, and understand the diversity in terms of employment type, geographical spread, airline segment, and professional background.

We begin by outlining key demographic and professional characteristics of the participants, including their role (pilot or cabin crew), years of experience, gender, and nationality. This is followed by an analysis about their home base, being a member of a trade union and the existence of a CLA.

By mapping the structural features of the respondent group, this chapter sets the stage for the analytical sections that follow. It helps to identify patterns within the broader employment context and to ensure that the interpretations of wellbeing, safety, and legal inconsistencies are anchored in a clear understanding of who our respondents are and under what conditions they perform their work.

FLYING PERSONNEL: WHO ARE THEY?

Are you a member of cockpit or cabin crew?

1. Pilot
2. Cabin crew

58,8% of the respondents indicate that they are a member of the cockpit crew, and 41,5% is a member of cabin crew.

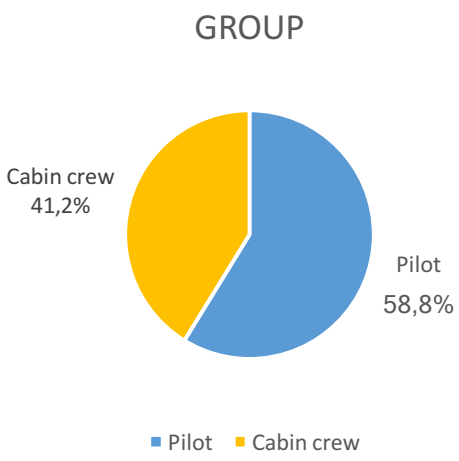


FIGURE 2. 1 GROUP OF AIRCREW

Compared to 2014: In 2014, we only questioned the pilot population, comparison for this question is not relevant.

What is your gender?

1. Male
2. Female
3. Other/prefer not to say

In the general population of respondents, 69,9% of respondents identify themselves as male, 29,7% as female and 0,3% as other. The other has been clarified as non-binary and Female- to- Male non-binary. Within the pilot group 92,9% is male, 6,8% female and 0,2% other (non-binary). For cabin crew, we see a different distribution with 37,2% identifying as male, 62,4% as female and 0,4% as other (FtM non-binary).

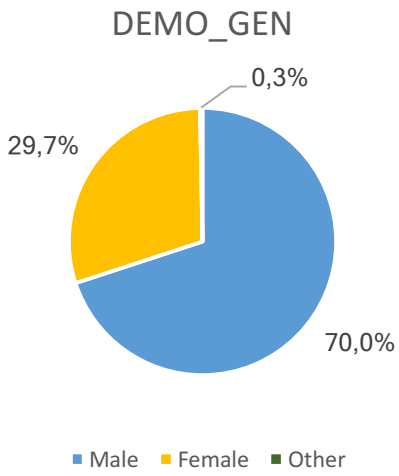


FIGURE 2. 2 WHAT IS YOUR GENDER?

Compared to 2014 (only pilots!): In 2014 we did not question gender.

What is your age?

1. Under 21
2. 21-30
3. 31-40
4. 41-50
5. 51-60
6. 61 and older

Most of the respondents, in the general population, are between 31 and 40 years old (29,9%). Followed by the group op 41 to 50 year olds with 25,9%. 51 to 60 year olds are 21,9% of the general group of respondents and 18, 1 % of respondents is between 21 and 30 year olds. Only 0,4% of respondents are under 21 and 3,7% is above 61.

Within the segment of the pilots, we see a larger segment of respondents between 31 and 40 (32,8%) and 41 and 50 (27%). When comparing with the segment of cabin crew we see a larger segment in the younger bracket of 21 to 30-year-old, 22,8% compared to the 14,8% in the pilot population.

Compared to 2014 (only pilots!): In 2014, the largest group was between 30 and 40 years old (30%), completely in line with our current data. Followed by the group of 40 to 50 (29%), 50 to 60 (19%) and 20 to 30 year olds (18%).

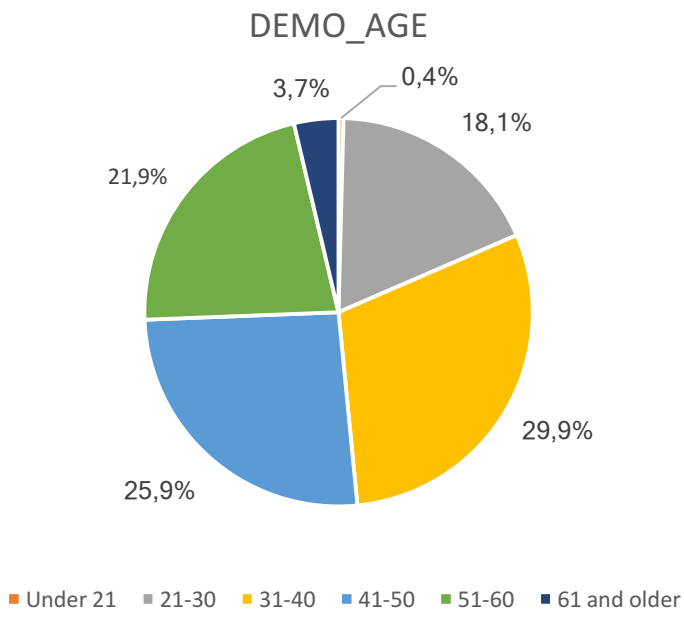


FIGURE 2. 3 WHAT IS YOUR AGE?

How many years of work experience do you have as a pilot/cabin crew?

1. 0-1
2. 1 to 3
3. 3 to 5
4. 5 to 10
5. more than 10

Most of the respondents have more than 10 years of experience, 61,9%, followed by 5 to 10 years of experience (18,3%). Around 10% (11,2%) has 1 to 3 years of experience. We see a slight difference in the distribution when looking at the pilot and cabin crew population. The cabin crew has less experience: for example, 64,1% of pilots have more than 10 years of experience, compared to 58,6% of cabin crew and 9,2% of pilots have 1 tot 3 years of experience compared to 14,2% of cabin crew.

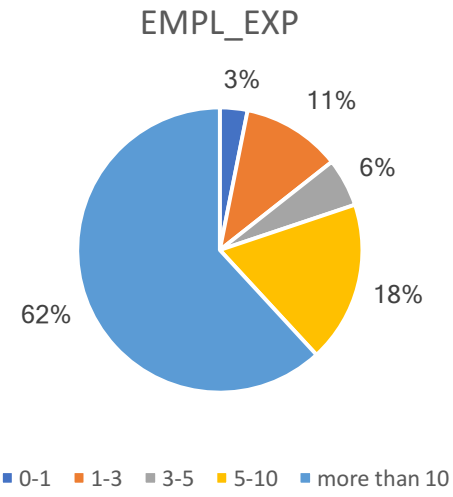


FIGURE 2. 4 HOW MANY YEARS OF EXPERIENCE?

Compared to 2014 (only pilots!): We see a similar distribution: 63% more than 10 years, 18% 5-10 years of experience, 8% 3-5 years, 7% 1-3 years.

I fly

1. Short and medium haul
2. Long haul
3. Mixed

The biggest segment flies short and medium haul, with 55,4% (mostly 3 legs per month (34,4%), followed by a mixed scenario with 24,2% and 20,4% long haul (mostly 4 layovers per month (32,8%)).

Within the group of pilots the segment that flies short and medium haul is larger with 64,5%, compared to 42,3% in the group of cabin crew.

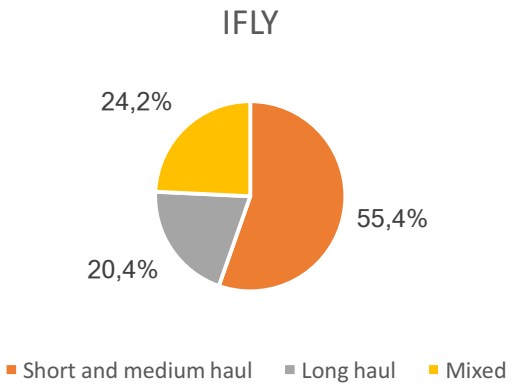


FIGURE 2. 5 I FLY...

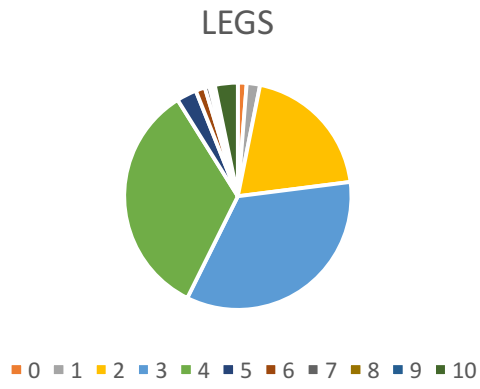


FIGURE 2. 6 HOW MANY LEGS DO YOU FLY PER MONTH?

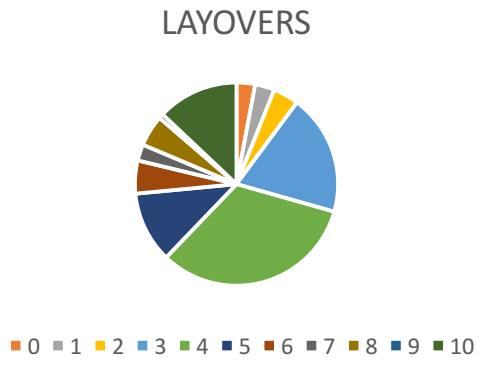


FIGURE 2. 7 HOW MANY LAYOVERS PER MONTH?

Compared to 2014 (only pilots!):71% of respondents indicated to fly medium and short haul and 27% long haul.

What is your nationality?

Drop down list

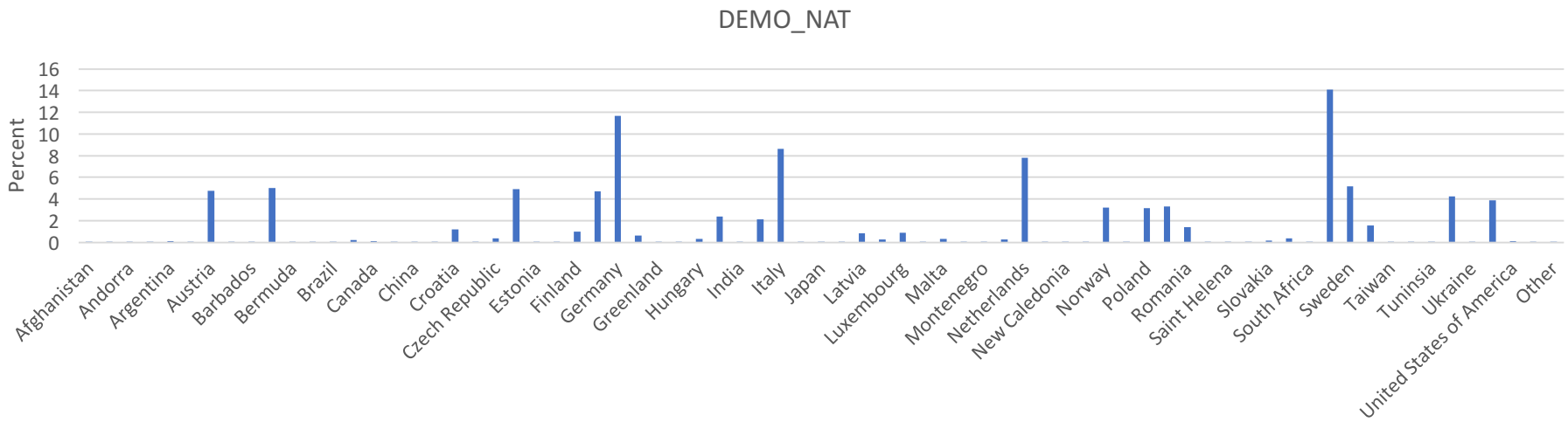


FIGURE 2. 8 WHAT IS YOUR NATIONALITY?

The highest representation, in the general population, is from Spain, with 14,1%, followed by Germany with 11,7%. Next, we see Italy with 8,6%, the Netherlands with 7,8%, 5,2% from Sweden and 5% from Belgium. In the group of cabin crew we see the biggest representation from Germany with 17,2%, followed by Spain (15, 8%) and Italy with 11,3%. For the segment of pilots the biggest group says that they have the Spanish nationality (12,9%), 11,8% says that they have the Dutch nationality and 7,8% the German nationality.

Compared to 2014 (only pilots!): we know a broader representation of nationalities than in 2014, on top of that we have 31 nationalities above the then chosen threshold of 0,2%. In 2014, the top 3 of nationalities was: 1. France (15,1%), 2. The Netherlands (15%), 3. The UK (11,1%).

What kind of airline do you work for?

1. Network airline
2. Low-fare airline
3. Charter airline
4. Regional airline
5. Cargo airline
6. Business aviation
7. Other
8. Helicopter
9. ACMI

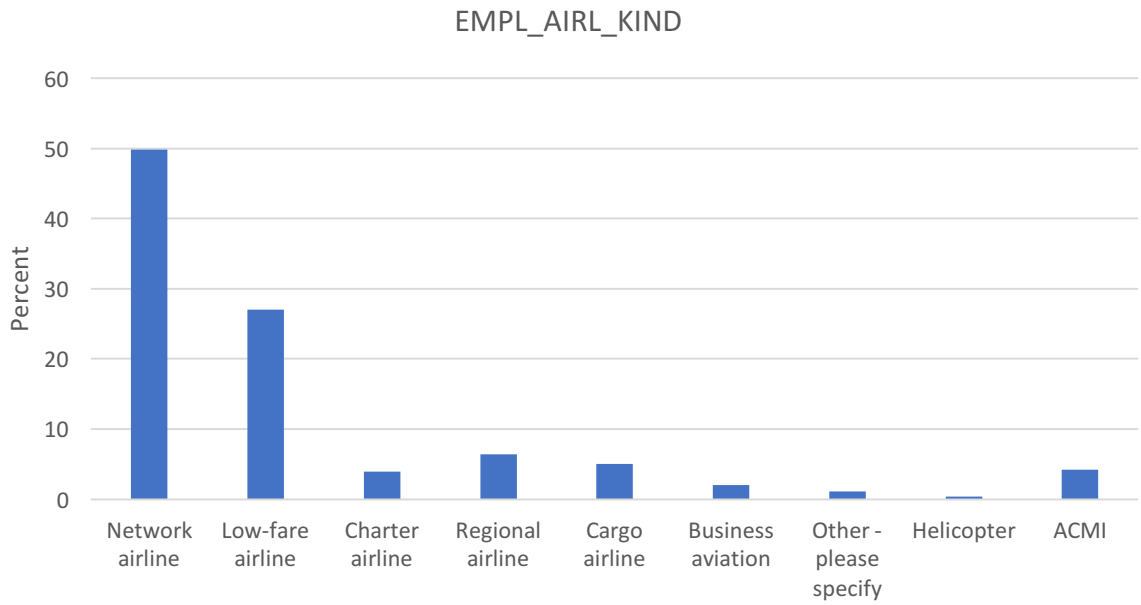


FIGURE 2. 9 KIND OF AIRLINE COMPANY

49,8% of the respondents indicate to work for a network airline, 27% for a low-fare airline, 6,4% for a regional airline, 5,1% for a cargo airline and 4,2% for an ACMI.

In the pilot group, we see slightly higher numbers for ACMI (6,3%) and cargo 58,6%), lower numbers for network airlines with 46,3% and around the same for charter with 4%. In the segment of cabin crew, we see higher numbers for network airlines, 54,9%, regional airlines (8,6%) and low-fare airlines with 28%. But lower for ACMI (1,2%).

Compared to 2014 (only pilots!): The largest group indicated to be working for a network airline company: 45% and 22% said that they are working for a low-fare airline.

What airline do you work for? (open question)

Table 2.1 and 2.2 present the top 30 of the data from 2024 and the top 25 airline companies from the study from 2014.

TABLE 2.1. TOP 30 OF THE AIRLINE COMPANIES 2024

Airline company	Frequency
Ryanair	640
Lufthansa	539
SAS	449
Iberia	426
KLM	349
Austrian airlines	304
Easy Jet	270
Turkish Airlines	268
Norwegian	248
Cargolux	151
ITA Airways	148
Brussels Airlines	145
Iceland	128
Wizz Air	123
TUI	119
Vueling	117
Air France	116
Aer Lingus	114
Swiss	113
Air Europa	105
Air Baltic	86
LOT	77
Luxair	74
Malta air	62
Transavia	62
TAP	58
Croatia Airlines	55
WIDERØE	45
Air Atlanta	43
Lauda	43

TABLE 2.2. TOP 25 OF THE AIRLINE COMPANIES 2014

Airline company	Frequency
Ryanair	650
Air France	627
KLM	565
SAS	429
Easy Jet	223
Norwegian	193
Lufthansa	190
Cargolux	124
TUI	112
Aer Lingus	103
Transavia	102
Alitalia	101
Brussels Airlines	101
Wizz Air	75
British Airways	73
Air Berlin	70
Swissair	69
HOP	58
Cathay Pacific	55
DHL	54
Flybe	54
West Atlantic Airlines	53
Tyrolean	49
Croatia Airlines	44
Iceland Air	43

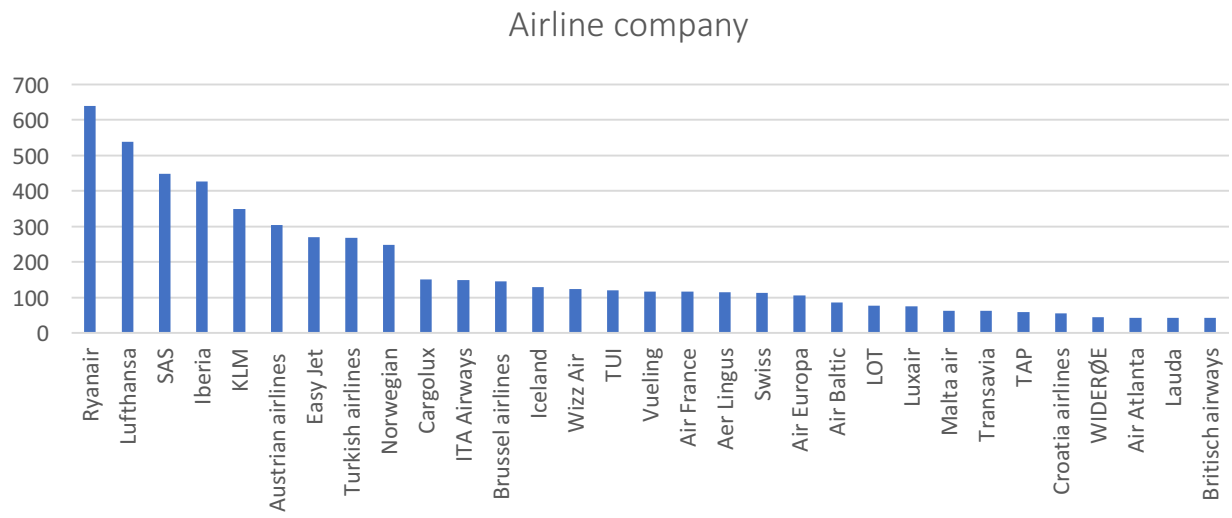


FIGURE 2. 10 AIRLINE COMPANY

This question relied on voluntary responses, which led to some non-responses. It is clear that respondents are concerned about protecting their privacy. Nevertheless, we obtained usable input from 6,570 respondents, with input from over 220 different airline companies. Ryanair is the most represented airline, with 640 respondents (9.7%) indicating they work for the Ryanair Group, followed by the Lufthansa Group with 539 respondents (8.2%). The top three is completed by SAS, with 449 respondents (6.8%).

Is your airline the first airline you work for?

1. Yes
2. No

We see an almost even distribution between the respondents that indicate that their current airline is their first airline (54%) and the segment that indicates to have changed airlines before (46%). We see a bigger segment of pilots indicating to have changed companies, with 54,4%. In contrast with 34% of cabin crew indicating that they have worked for another company.

Compared to 2014 (only pilots!): 49% said that they were still working for their first airline, for 49% that was not the case.

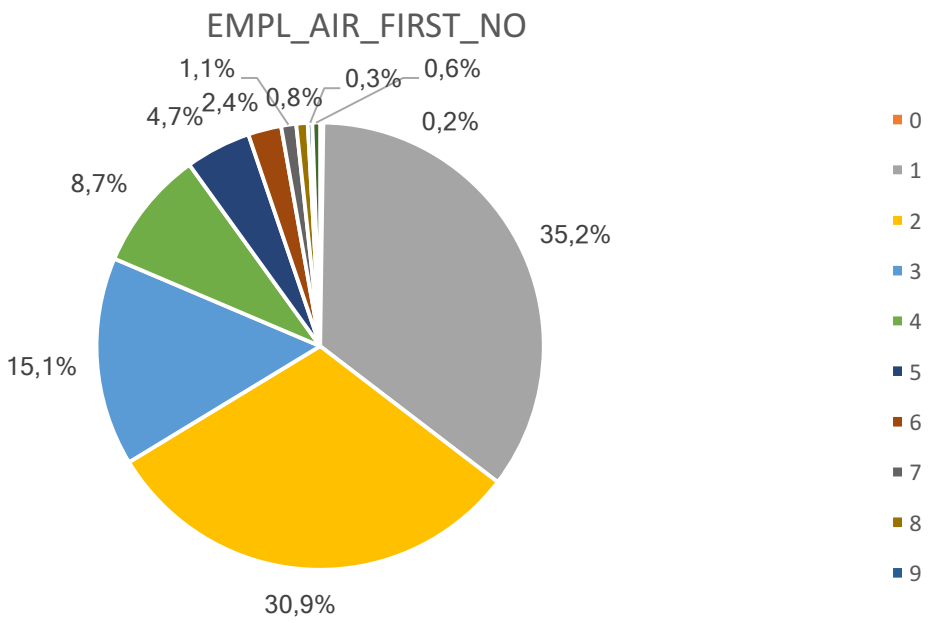
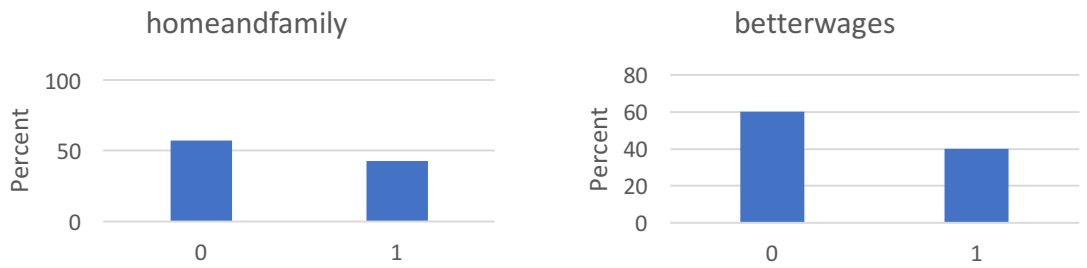


FIGURE 2. 11 AMOUNT OF PREVIOUS AIRLINE COMPANIES

Most respondents have worked for 1 company before their current one, with 35,2%, followed by 2 companies with 30,9%. Almost 10% has worked for 4 other companies before their current company. Pilots have mostly worked for one (32,4%), two (30,2%) or three (15,6%) other companies. Cabin crew have higher percentages for one other company with 41,7%, and lower percentages once above 3.

The motivations for changing companies are very diverse, the respondents had the option to give more than one answer. The 0 stands for no and the 1 indicates that the respondents said that this was a motivation for changing company. The general working conditions are most prevalent given as a motivation for changing. 56,4% of the respondents that have changes airline companies said that this was one of the reasons. Furthermore, we see that being closer to home and family (42,8%), changing between regional and continental (20,9%) and the type of airplane (19,3%) are strong motivators.

And contrary to possible expectations, better wages are not the most determining factor for changing airline companies, with 40,1%. Moreover, the public image is for almost 16% a reason for change.



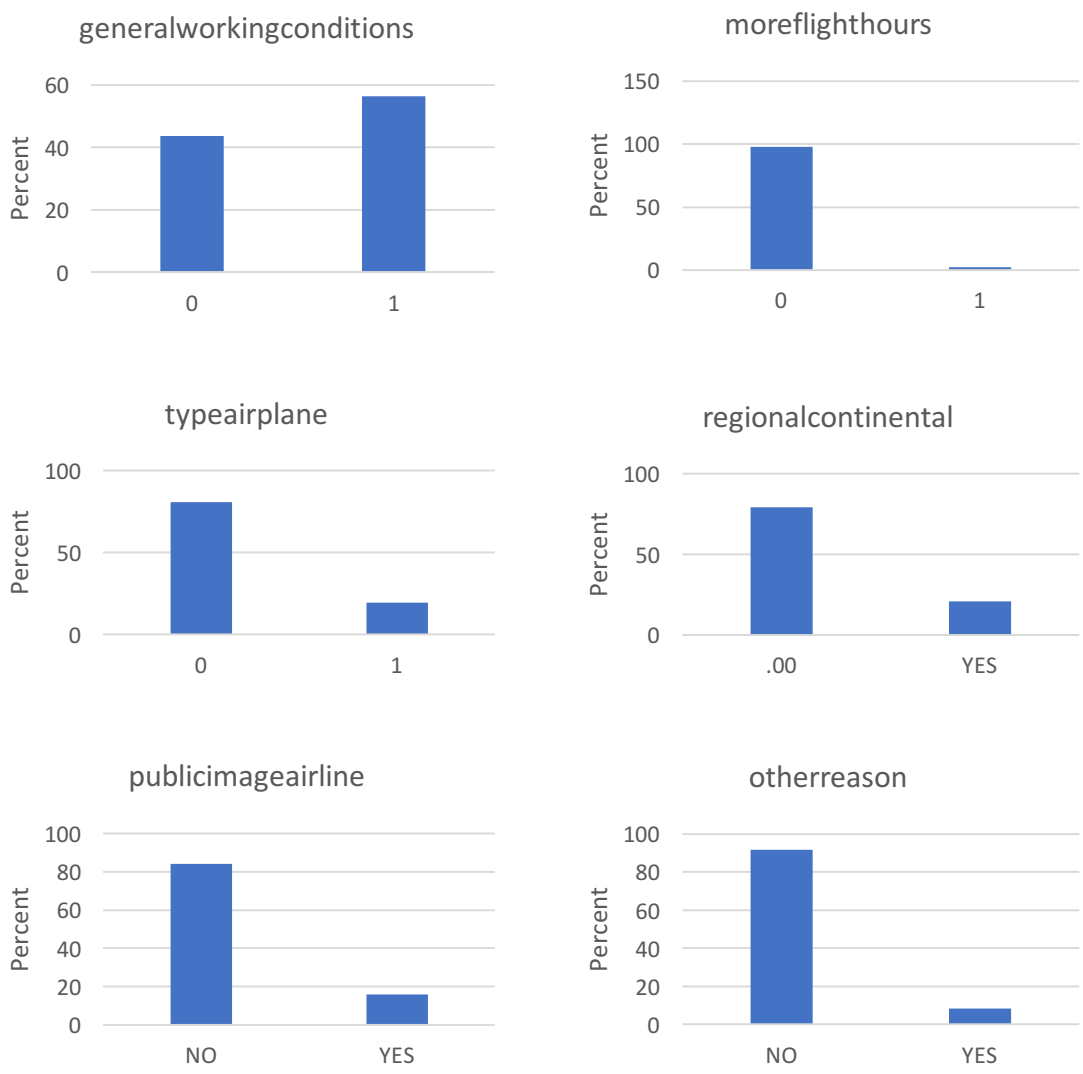


FIGURE 2. 12 MOTIVATIONS CHANGING AIRLINE COMPANIES

The "other reasons" where categorized by the researchers in the following clusters: bankruptcy, mergers and stopping of the airline company, lay-offs or job loss, work-life balance, career advancement, treatment in the previous company. Most determining here was bankruptcy, mergers and stopping of the airline company with 13,2% and lay-off with 3,1%, followed by treatment by the previous airline company (1,4%). When looking at the differences between the pilot and cabin crew population, we see that better wages are more given as an answer by the pilots, with 45,1% compares with 28,5% in the group of cabin crew. Home and family is also indicated more as a motivator by the pilots (47,6%) than by cabin crew (32%). We see the same tendency regarding 'general working conditions', with 58,4% of pilots and 51,8% of cabin crew checking this box.

What is your home base?

Drop down list

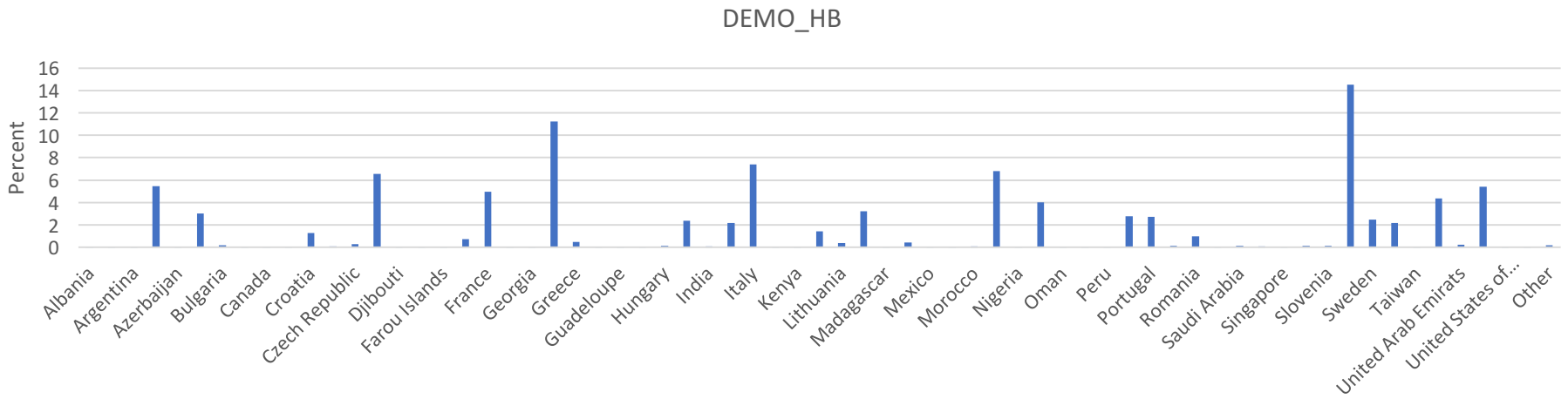


FIGURE 2. 13 COUNTRY OF OFFICIAL HOME BASE

The top 10 of the home bases looks as followed: 1. Spain with 14,5%, 2. Germany, with 11,2%, 3. Italy with 7,4% 4. The Netherlands, 6,8%, 5. Denmark with 6,6%, 6. Austria 5,5%, 7. UK, with 5,4% of the answers, 8. France with 4,9%, 9. Turkiye, with 4,4% and 10. Norway 4%. The Eastern European countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia account for about 6,5% of the given answers. The top 3 for pilots is 1. Spain (13,3%), 2. The Netherlands (10,3%) and 3. France (7,2%), for cabin crew: 1. Germany (18,9%), 2. Spain (16,2%) and 3. Denmark (10,5%).

Compared to 2014 (only pilots!): The top 5 of the home base countries was: 1. France, 2. The Netherlands, 3. UK, 4. Sweden, 5. Germany.

Do you consider this to be your real home base?

1. No
2. Yes

12,3% of respondents indicate that they do not consider their home base to be their real (correct) home base. This percentage is slightly higher for pilots with 14,9%.

Compared to 2014 (only pilots!): 9% said they did not consider their home base to be their real home base.

Do you live in the country where your home base is located?

1. No
2. Yes

85,4% of respondents live in the country of their home base. For pilots that is 81,9% and for cabin crew 90,3%.

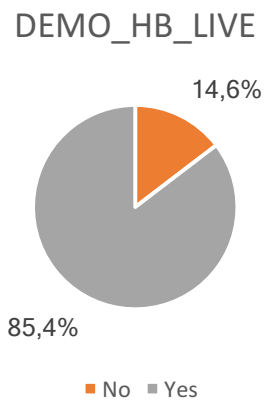


FIGURE 2. 14 DO YOU LIVE IN COUNTRY HOME BASE?

Compared to 2014 (only pilots!): 64% lived in the country of their home base.

Where do you usually start your shift?

1. Home base
2. Operational base
3. Other

Most respondents indicate that they usually start their shift in their attributed home base, more specific 89%. 9,5% say that they usually start their shift in the operational base, and 1,6% choose 'other'. The other is mostly explained as mixed. When looking at the pilot group we see similar numbers, with 87,2% in the home base, 10,9% in the operational base and 1,9% other. For cabin crew the numbers for home base a slightly higher, with 91,4% and operational base is less prevalent with 7,5%.

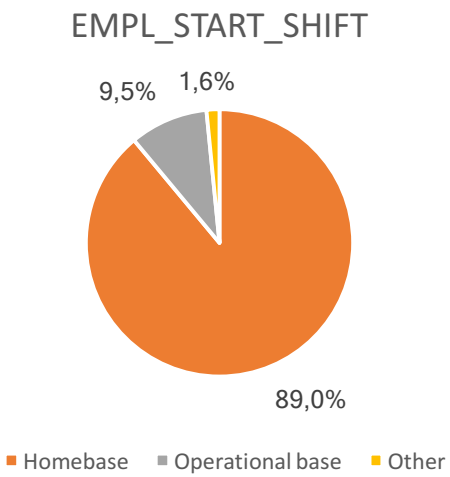


FIGURE 2. 15 WHERE DO YOU START YOUR SHIFT?

Where do you usually end your shift?

1. Home base
2. Operational base
3. Other

The respondents end their shift in 86,5% of the cases at their home base and 11,1% at the operational base. The option 'other' is mostly explained as mixed, layover location, where the aircraft is, … For pilots their shift ends at the location of their home base according to 85,7% of them, for 11,9% at the operational base and 2,5% other. In the group of cabin crew 87,7% end their shift at their home base, 10% at the operational base and 2,3% other.

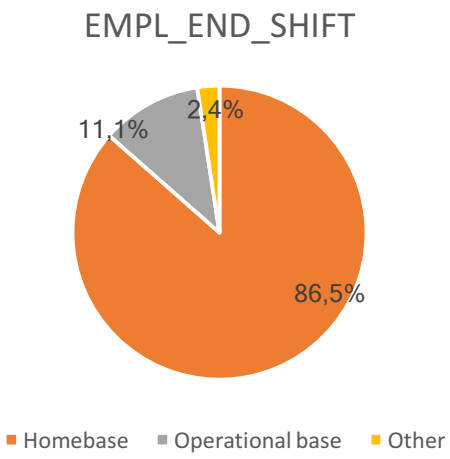


FIGURE 2. 16 WHERE DO YOU END YOUR SHIFT?

Who decides where your home base is?

1. Registered/main office of the airline
2. Regional/local office of the airline
3. Temporary work agency
4. Intermediary
5. You yourself
6. Other

In the general population, the most given answer is registered/main office of the airline company with 76%. Next, we see a 15,4% that say that they themselves can decide where their home base is. Followed by the answer regional/local office of the airline with 4,8% and 2,7% for other. The other is often described as: contract, bidding, by seniority, CLA, not sure, only one base, …

For pilots; 79,8% answered 'registered/main office of the airline company', 10,6% you yourself and 4,6% regional/local office of the airline. In the group of cabin crew the distribution is different with: 70,5% answered 'registered/main office of the airline company', 22,3 % you yourself and 4,6% regional/local office of the airline.

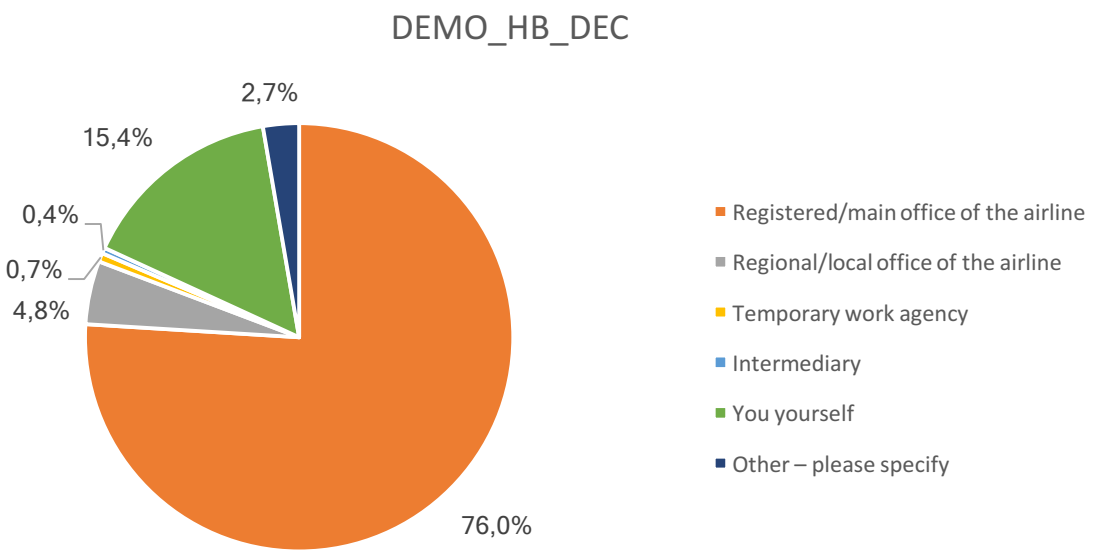


FIGURE 2. 17 WHO DECIDES WHERE YOUR HOME BASE IS?

Compared to 2014 (only pilots!):87% indicated that the registered/main office of the airline company decides on the home base, 8% you yourself, 3% other.

Do you have any say in this matter (determining home base)?

1. Yes
2. No

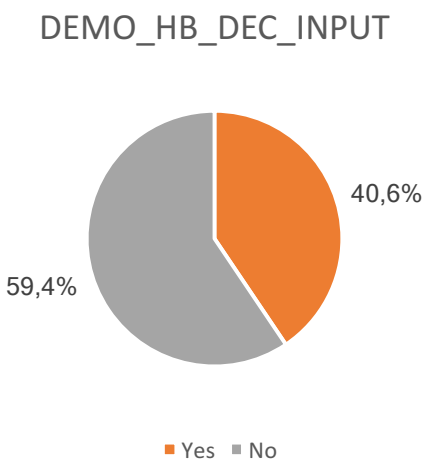


FIGURE 2. 18 DO YOU HAVE A SAY IN THE MATTER OF HB?

59,4% says that they do not have any input regarding the determination of their home base, 40,6% says that they do. When looking at the segment of pilots, 60,8% says that they do not have any input, compared with 57,5% of the cabin crew.

Compared to 2014 (only pilots!):32 % said that they did have input in the decision regarding their home base, 45% said that they did not.

Within what term can your home base be changed?

1. No notice
2. A few days
3. A few weeks
4. A few months
5. Other
6. Change by negotiation

Most participants say that the home base can only be changed by negotiation, 39,1%, followed by 22,6% says other. The other is for example: only one base, after 2 years, after 6 months, seniority, apply, impossible, …

For pilots, it is also mainly by negotiation, with 41,9%, and 23,3% other.

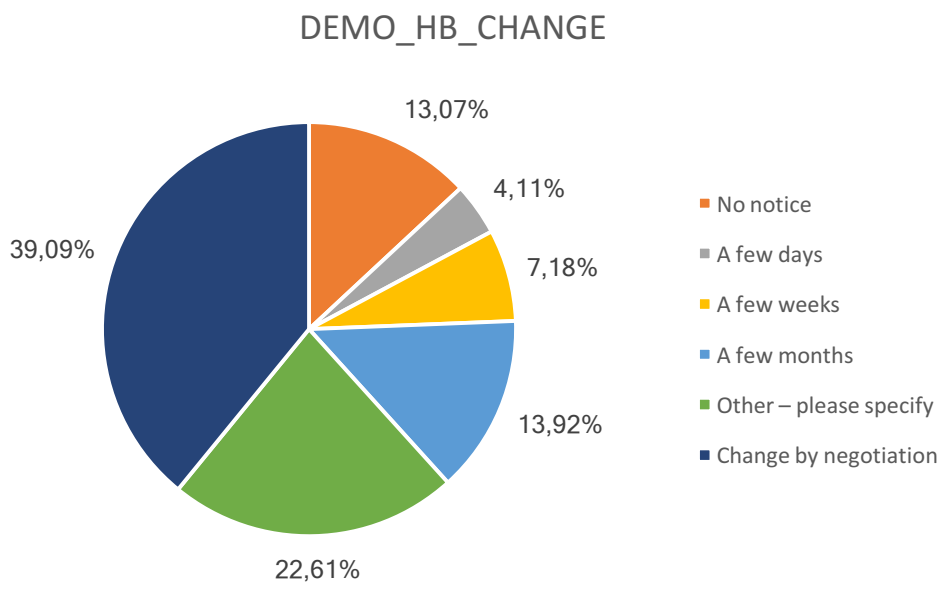


FIGURE 2. 19 WITHIN WHAT TERM CAN THE HB BE CHANGED?

Compared to 2014 (only pilots!): In 2014, the most frequent answer was other, followed by a few months and no notice. Change by negotiation was not an option back then.

UNIONIZATION

DESCRIPTIVES

Are you a member of a trade union?

1. Yes
2. No
3. No, because there are no unions organizing workers in my company
4. No, because I am not able to join a trade union because of my employment situation

20,2% of the respondents say that they are not a member of a trade union, that implies that 79,8% say that they are a member. 5,6% say that this is because there is no union, and 2,6% says it is not possible due to their employment situation. For pilots the degree of syndicalization is 81% and for cabin crew it is 77,9%. In the segment of pilots 7,8% say that there is no union, 3,5% says that it is not possible due to their employment situation. For cabin crew, we see that only 2,1% says that it is because there is no union, and only 1,1% that says that it is because of their employment situation.

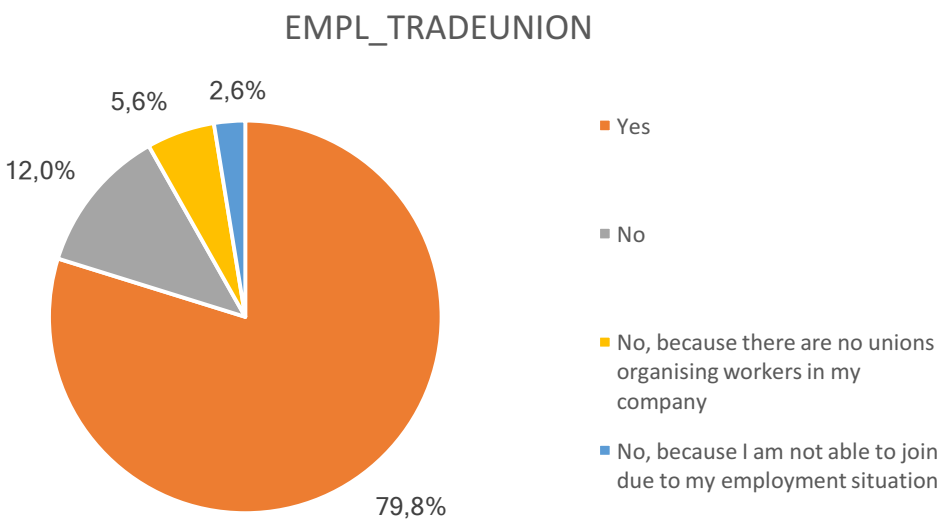


FIGURE 2. 20 ARE YOU A MEMBER OF A TRADE UNION?

20,2% of the respondents say that they are not a member of a trade union. This is not in line with the high numbers for syndicalization in the European aviation sector, that mostly is reported to be between 95 and 100%.

Is there a Collective Labour Agreement at company or group level?

1. Yes
2. No

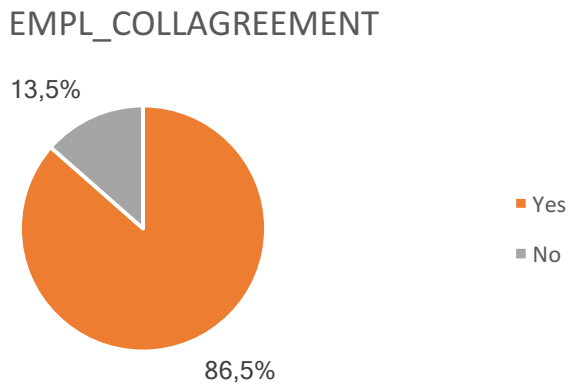


FIGURE 2. 21 IS THERE A CLA?

86,5% of respondents say that there is a collective labour agreement at company or group level. In the group of pilots 82,1% say that there is one, in the group of cabin crew 94,5% agrees with this statement.

Relationship between union membership and subgroups

A significant correlation was found between union affiliation and airline type (X^2= 758.56, df (1,24), p < .001). Union membership varied considerably across airline categories: network carriers reported the highest affiliation at 87%, followed by regional airlines at 82.4%, low-cost carriers at 76%, charter airlines at 70%, business aviation at 59%, and ACMI operators at 35%. Among ACMI employees, 16% reported not joining due to fear.

For pilots, union affiliation also showed a significant relationship with airline type (X^2= 594.72, df (1,24), p < .001). Across most airlines, over 74% of pilots were union members. Exceptions included business aviation pilots (49%) and ACMI pilots (35%), of whom 16.2% refrained from joining due to fear. Notably, 31% of ACMI pilots reported that no union representation exists at their airline. Union membership among cabin crew similarly (significantly) varied by airline type (X^2= 299.38, df (1,21), p < .001). Among ACMI cabin crew, only 36% were union members, with 12% avoiding membership due to fear, while the remaining categories reported much lower percentages citing fear (highest 2.5%). In terms of union availability, 15.6% of charter cabin crew and 40% of ACMI cabin crew indicated that there is no union representation at their airline.

These findings highlight clear disparities in union affiliation across airline types and between pilots and cabin crew, with ACMI and business aviation employees showing the lowest levels of union membership, often influenced by fear or absence of union representation.

Next, the relationship between employment type (typical vs. atypical) and union membership was analysed, revealing significant differences across all groups. A significant effect was observed (X^2= 1287.32, df(1,3), p < .001). Among atypical employees, only 39% reported being union members, compared to 84% of typical employees. Fear of joining a union was reported by 20.3% of atypical employees versus 0.6% of typical employees. Additionally, 23.5% of atypical employees indicated that no union exists at their workplace, compared to 3.6% of typical employees. For cabin crew, the difference was also significant (X^2= 164.39, df(1,3) p < .001). Among atypical cabin crew, 49% were union members, with 10.6% citing fear as a reason for non-membership, and 12.5% indicating that no union exists. Among typical cabin crew, 79% were union members, 0.6% reported fear, and 1.6% reported absence of union representation. For pilots, the relationship between employment type and union affiliation was likewise significant (X^2= 949.50, df(1,3), p < .001). Among atypical pilots, 36.8% were union members, 22.5% were afraid to join, and 25.9% indicated that no union exists. Among typical pilots, 87% were union members, 0.6% were afraid to join, and 5% reported absence of union representation.

These results indicate that atypical employment is strongly associated with lower union membership, higher levels of fear regarding joining a union, and a greater likelihood of working in environments without union representation.

Relations between collective labour agreement and subgroups

A significant correlation was found between the presence of CLA and employment type e.g. typical or atypical employment (X^2= 955.78, df(1,1), p < .001). Among atypical employed respondents only 41,3% said that there was a CLA, compared with 91,2% in a typical situation.

Typical or atypical?	Collective labour agreement	
	Yes	No
Atypical employment	41,3%	58,7%
Typical employment	91,2%	8,8%

TABLE 2. 3 CLA - EMPLOYMENT TYPE

Furthermore, we note a significant difference (X^2= 156.41, df(1,1), p < .001) between the group of pilots and cabin crew. For cabin crew 94,5% said that a CLA was present, compared to 82,1% for pilots. The older segment also indicated the presence of a CLA significantly (X^2= 45.65, df(1,5), p < .001) more than the younger segment, for example: under 21 acknowledged the presence with 77,8%, for 21-30 year it was 80,1% but above 50 years old that is above 90%.

A significant correlation was found between union affiliation and airline type ($X2$= 949.86, df (1,8), p < .001). The presence of a CLA varied considerably across airline categories: network carriers reported the highest affiliation at 95,7%%, followed by regional airlines at 91,8%, cargo at 87,5%, low-cost carriers at 81,7%, charter airlines at 68,4%, business aviation at 55,7%, and ACMI operators at 31,2%.

The presence of a collective labour agreement (CLA) is closely linked to employment type, airline category, occupational group, and age. Typical employees are far more likely to report CLA coverage than atypical employees. Cabin crew indicate a higher presence of CLA compared to pilots, and older respondents report coverage more frequently than younger ones. CLA coverage also varies substantially across airline types, with the highest levels in network and regional carriers and the lowest in ACMI operations. These findings suggest that access to collective representation and negotiated protections is unevenly distributed within the aviation sector, particularly disadvantaging atypical workers and those employed in specific airline categories.

KEY TAKE- AWAYS ABOUT BASIC CHARACTERISTICS OF THE SURVEY POPULATION

1. **Changing companies**: the transition to a different airline company is common and mostly motivated by better general labour conditions and work-life balance related issues more than wage.
2. **The home base is not a stable concept**: In practice, it is often observed that the official home base recorded in contracts or company documentation does not correspond to the crew member's actual operational reality. Moreover, decisions to alter a home base are frequently taken unilaterally by the employer, leaving crew with little or no say in changes that directly affect their working conditions, social security rights, and personal lives. This instability creates uncertainty for aircrew and highlights the need for clearer regulation and stronger safeguards to ensure that the designation of a home base reflects the lived reality of work and provides the required legal and social protection.
3. **Union membership is unevenly distributed**: Employees in ACMI and business aviation show the lowest levels of affiliation compared to those in network or low-fare airlines. Many workers in atypical contracts are reticent to join unions. Atypical forms of employment are closely linked with weaker union presence and participation.
4. **CLA unevenly distributed**: Collective labour agreements are unevenly distributed across the aviation sector. Typical employees, older workers, and those in network or regional carriers are more likely to benefit from CLA coverage, while atypical workers, younger employees, and staff in ACMI operations are disadvantaged, highlighting gaps in collective representation and protection.

CHAPTER 3 REMUNERATION

"As a cabin crew, my salary it's not enough to cover expenses (house, food, food in layovers and life in general). I feel and stressed about my future as I see how the airline doesn't care about us or the passengers, just about profits at all cost. As almost my whole salary is based on extras the company plays that card when they need us to fly even though it is not legal cause we are in our resting hours and we accept because we desperately need the money …"

INTRODUCTION

This chapter delves into the complex landscape of remuneration and contractual working time arrangements among cockpit and cabin crew in European aviation. As remuneration is not only a core element of employment conditions but also a significant determinant of job satisfaction, wellbeing, and perceptions of fairness, a thorough analysis is necessary to understand its role within the broader employment reality of flying personnel.

We begin by examining the extent to which crew members are employed on a full-time or part-time basis, highlighting differences between airline types and employment arrangements. We then explore how work is remunerated, considering base salaries, block hour systems, flight-hour payments, and other compensation mechanisms. Particular attention is paid to the variability and unpredictability of income—issues that emerged frequently in both the survey responses and qualitative data.

In addition, this chapter addresses the prevalence and motivations behind secondary employment. The presence of a second job may be indicative of financial necessity or job insecurity, and provides further insight into the economic precarity experienced by some segments of this workforce.

Together, these analyses allow us to reflect on the adequacy, stability, and transparency of remuneration systems in the aviation sector, and on their wider implications for individual and collective wellbeing, safety, and retention.

FLYING AND WORKING TIME

DESCRIPTIVES

I work

1. Fulltime
2. Part-time
3. Flexible/depends on the month

Most respondents work fulltime, more specific 76,4%, 20,7% works part-time and for 2,9% that is a flexible situation depending on the month. For pilots, it is 79% that works fulltime, 17,9% part-time and 3,1% flexible. For cabin crew; only 72,3% fulltime, 25,2% part-time and 2,5% flexible.

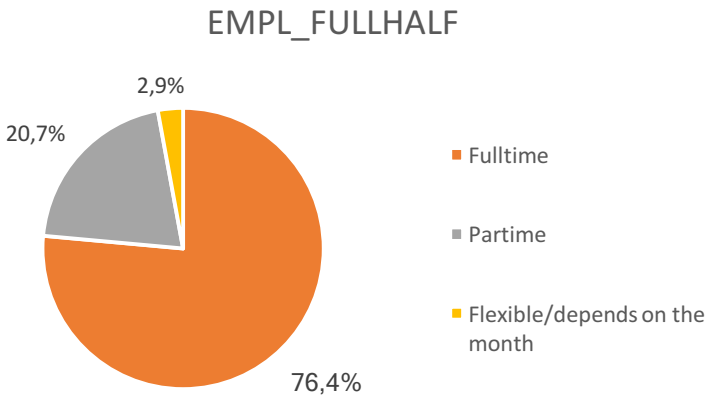


FIGURE 3. 1 I WORK (FULLTIME, PART-TIME, FLEXIBLE)

Are your wages/remunerations paid directly by the airline you mainly fly for?

1. Yes
2. No
3. I don't know

93,1% of respondents indicate that their wages are paid directly by the airline, but 1,4% of them doesn't know who pays them. From the one that indicates that their wages are paid directly, 93,6% says that that is by the registered office of the airline company. For the segment that says that it is not directly paid by the airline, 5,5% of respondents, 55,7% says that it is done by an intermediary, 38,5% by a temporary work agency and 5,8% by other. The other is mostly described as: mother company, client, airline owner.

In case of the pilots, 91,4% of respondents say that they are paid directly, of them 93,2% says that that is by the registered office of the airline company. If not directly paid: 38,6% of pilots say that they are paid by a temporary work agency, 56,2% by an intermediary and 5,2% by other (fake representative, aircraft owner, …).

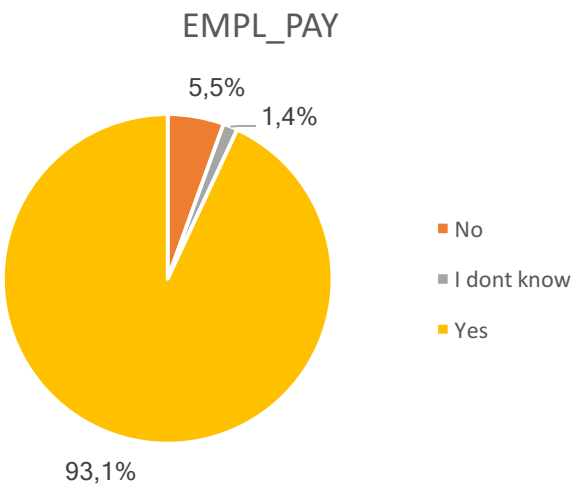


FIGURE 3. 2 ARE YOUR WAGES PAID DIRECTLY BY THE AIRLINE?

For cabin crew, we see that 95,8% say that they are directly paid, in 94,3% of those case by the registered office of the airline company. When not directly paid; 37,2% of them say that they are paid by a temporary work agency, 51,2% by an intermediary and 11,6% by other.

Is your income variable?

1. Yes, I have a minimum fixed income and a part of my income is variable
2. Yes, the totality of my income is variable
3. No, I have a fixed income

7,6% of the respondents indicate that their total income is variable. 20,4% is say that their income is fixed. For pilots, we see that 7,4% of them indicate that their total income is variable, and 25,2% say that they have a fixed income. The latter is only 12,6% for responding cabin crew. Furthermore, 5,7% of them indicate to have an income that is variable in its totality. Variable wage can be considered everything except for a total fixed income in the context of this report.

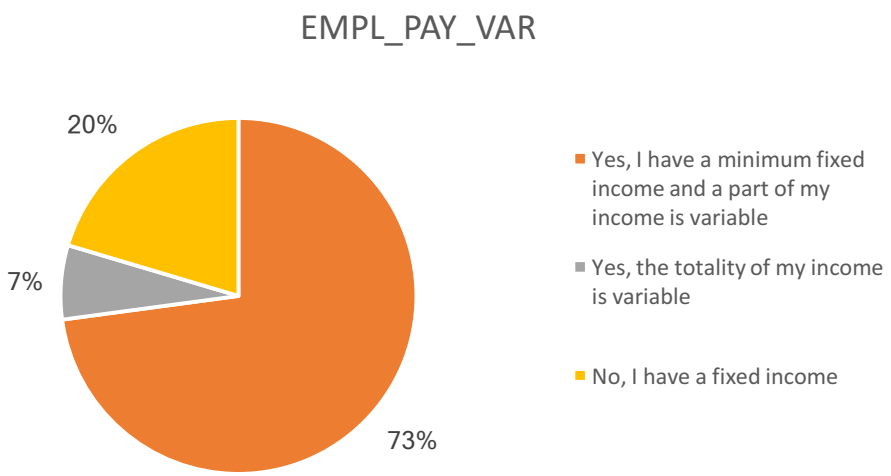


FIGURE 3. 3 IS YOUR INCOME VARIABLE?

How are you paid?

1. Lump sum (fixed amount every month)
2. Lump sum + extras. Following extras are paid…
3. Per hour with a minimum amount of flight hours guaranteed. The amount of hours guaranteed is…
4. Per hour without a minimum number of flight hours guaranteed

Most respondents are paid in a lump sum with extras, with 66,3% (pilots 65,3%, cabin crew 67,9%). 15,1% in a lump sum (pilots 16,8%, cabin crew 12,4%). 14,1% is paid per hour with a minimum amount of flight hours (pilots 13,6%, cabin crew 14,8%). 4,5% per hour but without a minimum (pilots 4,2%, cabin crew 4,9%).

Which activities are paid	Total	Pilot	Cabin crew	2014
Flight hours	98,9%	98,9%	98,9%	61,5%
Positioning	59,4%	61,2%	56,5%	54,9%
Time during layover	79,8%	79,4%	80,4%	46,8%
Hotel	76,2%	76%	76,5%	52,7%
Meals between flights	62,5%	64,9%	58,7%	27,5%
Meals during flights	71,5%	75,5%	64,9%	41%
Uniforms	79,2%	81,6%	75,3%	53,9%
Crew ID	62,8%	66,1%	57,4%	51%

Inflight sales	23,5%	3,4%	56%	/
Sick leave	68,7%	71%	64,9%	/
Maternity leave	47,5%	44,5%	51,9%	/
VISAS	56,6%	58,2%	54,2%	/
Medical for work	59,8%	64,8%	51,8%	/
Non-work related medical	7,8%	8,8%	6,2%	/
Licenses	59,8%	66,1%	49,6%	/
Other	5,9%	6,6%	4,7%	/

TABLE 3. 1 WHAT IS COMPENSATED?

How many hours per month do you work on average, and how many of them are actual flight hours?

The respondents had the change to fill in this question through an open field. In practice this created confusion and inconsistent results. We noted input from 0 till 750 hours. Most frequent answer is 80 hours.

Most respondents are paid in block hours, 74%, for pilots this is lower with 68,5% and for cabin crew it is 83%.

How are your hours counted?

1. Per hour worked
2. Per actual flying hour ('block hours')

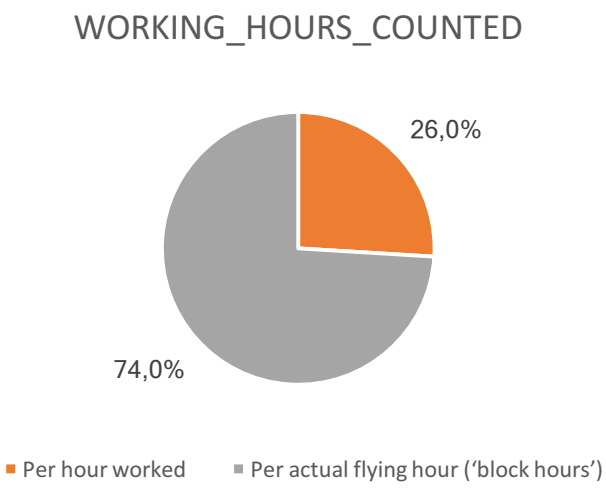


FIGURE 3. 4 HOW ARE YOUR HOURS COUNTED?

Are flight preparations and checks considered and remunerated as hours worked?

1. Yes
2. No
3. One is, the other one is not

Slightly more than half of the respondents say that they are remunerated for flight preparations and checks, 51,3%. Which implies that almost half is not. In the pilot group 35,3% say that they are not and 4,7% says that one is and the other not. For cabin crew we see that only 37% says that they are remunerated.

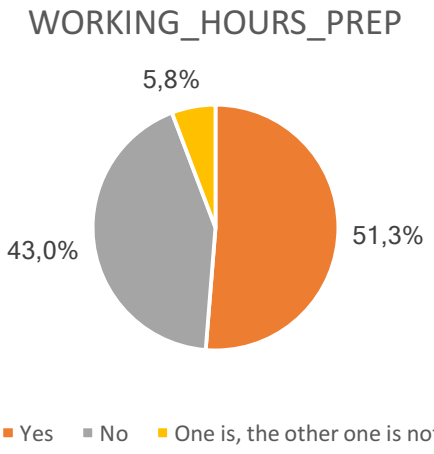


FIGURE 3. 5 PREPARATIONS AND CHECKS REMUNERATED?

Do you consider you have enough time for pre-/post-flight duties, including turnaround?

1. Yes
2. No

56,3% say that they don't have enough time for their pre-/post-flight duties. For pilots this is 46,1% and for cabin crew this is 73,1%.

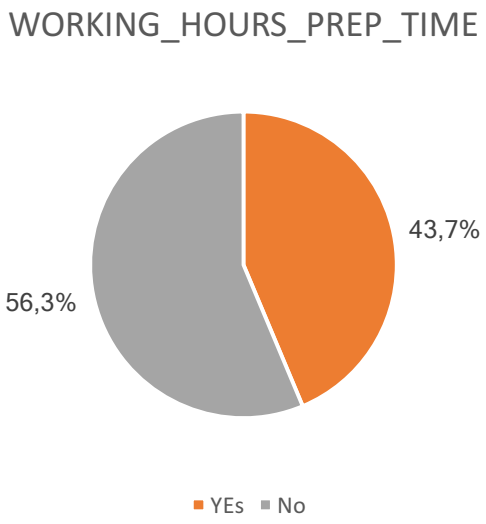


FIGURE 3. 6 ENOUGH TIME PRE-/POST-FLIGHT DUTIES?

SECOND JOB

Do you have other jobs/remunerated activities?

1. Yes, because of e.g. financial reasons, intellectual stimulation, …
2. No

Almost 18% of respondents say that they have another job or remunerated activity. For pilots this is 16,9% and for cabin crew 19,4%. In the general population, from the 18%, 34,4% say that this job is inside the aviation industry (for example: consultant, engineering, flight instructor, pseudo-pilot, simulator instructor, trade union, safety expert, …) and 65,6% say that the job is outside of the industry (for example: bartender, advisor, cashier, education, family business, fitness trainer, hospitality, IT, personal assistant, real estate, sales person, software development, technician, wine importer,…). For pilots; 53,5% inside the aviation industry and 46,5% is outside the industry. For cabin crew only 8,1% say that the job is inside the industry and 91,9% is outside the aviation industry.

Compared to 2014 (only pilots!):13% said that they had other activities. Data collections done by our research group shows that 9% of cockpit and cabin crew in 2020 indicated to have a second or third job. In 2021 that was 22,6% of which 73,1% is conducted outside of the aviation industry.

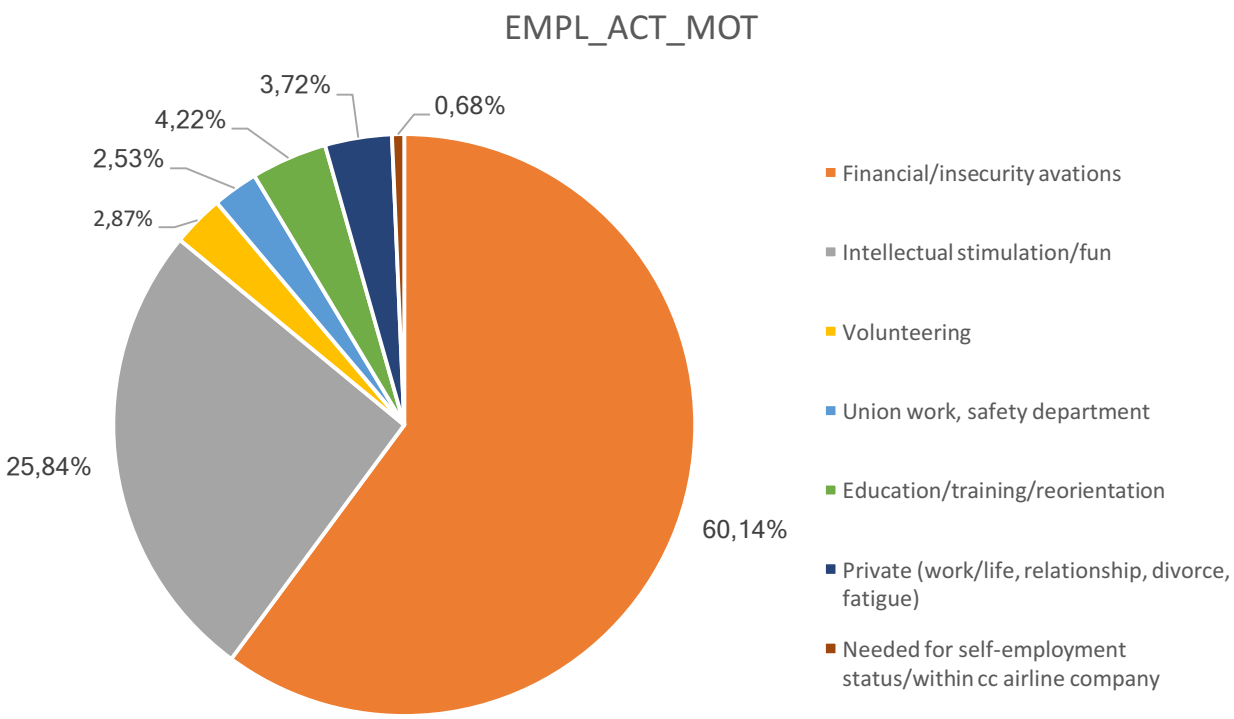


FIGURE 3. 7 WHAT IS THE SECOND JOB?

Motivations for having this second job are diverse, we recoded the open questions in seven categories:

Motivation	General	Pilot	Cabin crew
Financial	60,1%	49,5%	70,7%
Intellectual stimulation/fun	25,8%	34,9%	16,8%
Volunteering	2,9%	3,1%	2,7%
Union work, safety department	2,5%	4,1%	1%
Education/training/reorientation	4,2%	4,4%	4%
Private (work/life, relationship, divorce)	3,7%	2,7%	4,7%
Needed for self-employment status	0,7%	1,4%	0%

TABLE 3. 2 MOTIVATIONS SECOND JOB

RELATIONSHIP BETWEEN RESEARCH VARIABLES AND SUBGROUPS

The prevalence of holding a second job was compared between pilots and cabin crew (group level). Overall, 16.9% of pilots and 19.4% of cabin crew reported having at least one additional job. While the difference is marginal, it was statistically significant ($X2$=6,37, df(1,2), $p < .05$).

Across all respondents, the primary motivation for holding an extra job was financial (60.1%), followed by intellectual stimulation or enjoyment (25.8%), with other reasons accounting for approximately 14%.

When comparing motivations between groups (pilots and cabin crew), significant differences emerged ($p < .001$). Among pilots, 49.5% cited financial reasons and 35% cited intellectual or enjoyable reasons. In contrast, cabin crew reported higher financial motivation (70.7%) and lower intellectual motivation (17%).

These results indicate that, although the proportion of employees holding a second job is similar between pilots and cabin crew, the underlying motivations differ notably, with cabin crew more likely to work additional jobs for financial reasons, while pilots more frequently cite intellectual or personal fulfilment.

The relationship between type of employment (typical vs. atypical) and work status (part-time, flexible, full-time) was examined, revealing significant differences (X^2= 270.08, df= (1,2) $p < .001$).

Among atypical employees, almost 8% reported working part-time, compared to 22,1% of typical employees. Flexible working arrangements were more common among atypical employees (12.9%) than typical employees (1.8%). Full-time employment was relatively similar across both groups, with 79.5% of atypical employees and 76.1% of typical employees working full-time.

These results indicate that atypical employment is associated with a higher prevalence of flexible working arrangements and a lower proportion of part-time work compared to typical employment, while full-time employment remains broadly comparable between the two groups.

Next, the relationship between airline type and work status was analysed and found to be significant (X^2= 467.683, df= (1,16), $p < .001$). Airlines such as low-fare, helicopter, business aviation and cargo carriers showed a higher proportion of full-time employees. Part-time work was primarily observed in network, regional, other and charter airlines, while flexible arrangements were most common in ACMI, helicopter and business operations (up to more than 18%).

Type of airline company	Work status		
	Full-time `	Part-time	Flexible
Network airline	70,3%	28,3%	1,5%
Low-fare airline	86,4%	10,9%	2,8%
Charter airline	75,4%	19,8%	4,8%
Regional airline	76,9%	21,2%	1,9%
Cargo airline	79,9%	18,2%	1,9%
Business aviation	79,7%	14,4%	5,9%
Other	73,1%	21,2%	5,8%
Helicopter	88%	0%	12%
ACMI	78,1%	3,4%	18,6%

TABLE 3. 3 TYPE OF AIRLINE - WORK STATUS

Significant differences were observed between part-time and full-time employees across multiple wellbeing measures, including mental health, job insecurity, dehumanization, and general health. Overall, part-time employees reported:

- Better mental health
- Lower levels of dehumanization
- Reduced job insecurity
- Higher general health

Among cabin crew specifically, the same pattern emerged: mental health and general health were highest among those working part-time, dehumanization and job insecurity were lowest, although the effect sizes were small.

These findings suggest that part-time employment is associated with slightly better wellbeing outcomes compared to full-time work, despite the modest magnitude of these effects.

The relationship between type of employment (atypical vs. typical) and non-regular payments was examined, revealing a significant effect (X^2= 485.58, df(1,2), p < .001).

Employees with typical employment were far more likely to receive a minimum fixed income, with 91% reporting fixed payments compared to only 8.1% of atypical employees. In contrast, flexible or non-regular payments were more common among atypical employees, with 42.9% receiving flexible payments compared to 57.1% among typical employees.

Overall, fixed income arrangements were predominantly associated with typical employment, whereas atypical employment was linked to greater variability and flexibility in payment structures.

KEY TAKE- AWAYS ABOUT REMUNERATION AND SECOND JOB

1. **Different motivations for second jobs**: While pilots and cabin crew take on second jobs at similar rates, cabin crew are more often financially driven, whereas pilots tend to seek intellectual or personal fulfilment.
2. **Employment type shapes work patterns**: Atypical employment is linked to more flexible arrangements and less part-time work, though full-time employment in low-fare are high.
3. **Part-time linked to wellbeing**: Part-time work shows slightly better wellbeing outcomes compared to full-time, even if the effect size is modest.
4. **Great concerns can be noticed about payment structure:** There are significant concerns regarding payment structures in the sector. These concerns become particularly visible when crew members are absent for medical reasons, as pay entitlements are often unclear, insufficient, or inconsistently applied. Similar issues arise in the periods between flights, where payment gaps or reduced compensation leave crew members exposed to financial insecurity. Such practices not only undermine stable income but also place additional pressure on individuals to continue working despite illness or fatigue.

CHAPTER 4 (ATYPICAL) EMPLOYMENT AND CONSTRUCTIONS

"Many Airlines (low cost as legacy carriers) tend to start new, unregulated airlines with lower wages, less security, less participation etc. on a regular basis"

"We are fake self-employees as we can't take absolutely no decisions about anything"

INTRODUCTION

Apart from fuel costs, wage costs and social security premiums often represent one of the highest cost elements for airlines. Due to growing competition, airline companies tried to reduce the unit of labour cost. To achieve this result several options are open (Doganis, 2019) freezing or reducing wages; reducing staff numbers, out-sourcing labour-intensive activities either to other countries or to other suppliers and finally by franchising certain operations to smaller operators.

More and more labour costs became influenced through as well a mixture of economic and social factors in the airline's home country as by management action. Achieving lower wages by employing flight or cabin crews who have as their base and point of employment lower wage countries is seen as an interesting method. In addition, setting-up or acquiring low-wage airlines which are used to operate services on their behalf, often with smaller aircrafts (often also avoiding the major hubs), can be seen as a further instrument to reduce costs.

This chapter examines the prevalence and implications of atypical employment forms within European aviation.

We begin by unpacking the notion of atypical employment and the diversity of contractual constructions encountered in the survey population. After presenting the descriptives we go into the analysis of the possible impact of the employment relationship on the other dimensions of the research model: wellbeing and safety.

Building on previous legal and empirical work in the field, we discuss the juridical consequences of these arrangements for individual workers, including their access to social security, labour rights, and occupational protections.

Particular attention is paid to the phenomenon of "legislation shopping", in which companies actively structure employment relations to benefit from favourable labour or social security legislation in other jurisdictions—often at the expense of the workers' protections. We also examine the role of "instructions" and authority in the contractual relationship, which are critical in distinguishing between genuine self-employment and disguised employment.

This chapter provides the necessary legal and conceptual groundwork to assess the real-world impact of these employment models on wellbeing, job quality, and ultimately, safety in the aviation sector.

WHAT IS (A) TYPICAL EMPLOYMENT? TYPES OF EMPLOYMENT/SUBCONTRACTING

In this study, atypical work constitutes all forms of employment or cooperation between a member of the cockpit or cabin crew and an airline other than an open-ended employment contract concluded between said crew member and said airline directly. It particularly refers to employment situations such as self-employment, part-time work, temporary and temporary agency work and (chains of) subcontracting/outsourcing companies. While such arrangements offer flexibility for airline companies, they also raise serious concerns regarding legal certainty, worker protection, and enforcement.

The situation of sub-contracting and outsourcing is prevalent in aviation, just like in a many other industrial sectors. In a sector where flexibility is so important, it comes as no surprise that this is a sound business model. While subcontracting chains are not as such ipso facto bogus (see e.g. ACMI) the problem pops up in case such outsourcing activities hide as such bogus constructions and as such lead to further social dumping. The situation becomes indeed different from the moment when this business model is used purely in order to focus on reducing labour costs. In such cases the risk for lower pay levels and poorer working conditions is prevalent. Outsourcing techniques become then an inspiration for social engineering and the engineering of bogus constructions. In such cases these constructions comes down to avoiding applicable legislation, i.e. labour, social security, as well as tax legislation. In such circumstances the difference between sound legal constructions and bogus situations becomes very thin where the reality of the situation could be questioned. The most problematic situation appears when the constructions are basically set-up to support the client, rather than the provider. Intermediary companies who act as broker, can be found who are legally subcontractors but in reality, do nothing more than provide workforce (labour). In most cases, the same parties can be identified: a 'client' seeking to acquire 'labour', a 'worker' willing to provide (sell) his or her labour, and, depending on the ingenuity of the 'construction', a third party, acting as a 'broker' or an 'agency' acting as go-between between the airline company and the aircrew member. In many bogus situations, a chain of subcontractors can be observed: not only will there be an intermediary between the client (the one who finally needs the services) and the provider of the services (often this would be the employee of the client, if not for the bogus construction), there will also be one or more intermediaries between the first subcontractor and the last subcontractor in the chain (Subgroup on social matters related to aircrew, 2022b).

What relationship do you have with your airline company?

1. I have an employment contract with the airline directly
2. I work for the airline via a temporary work agency with which I have an employment contract
3. I work for the airline via an enterprise of firm
4. It is a different relationship
5. I work for the airline as a self-employed worker via a cooperation agreement concluded with the airline directly
6. I work for the airline as a self-employed worker via a cooperation agreement concluded with an agency or Brooker.

DESCRIPTIVES FOR EMPLOYMENT

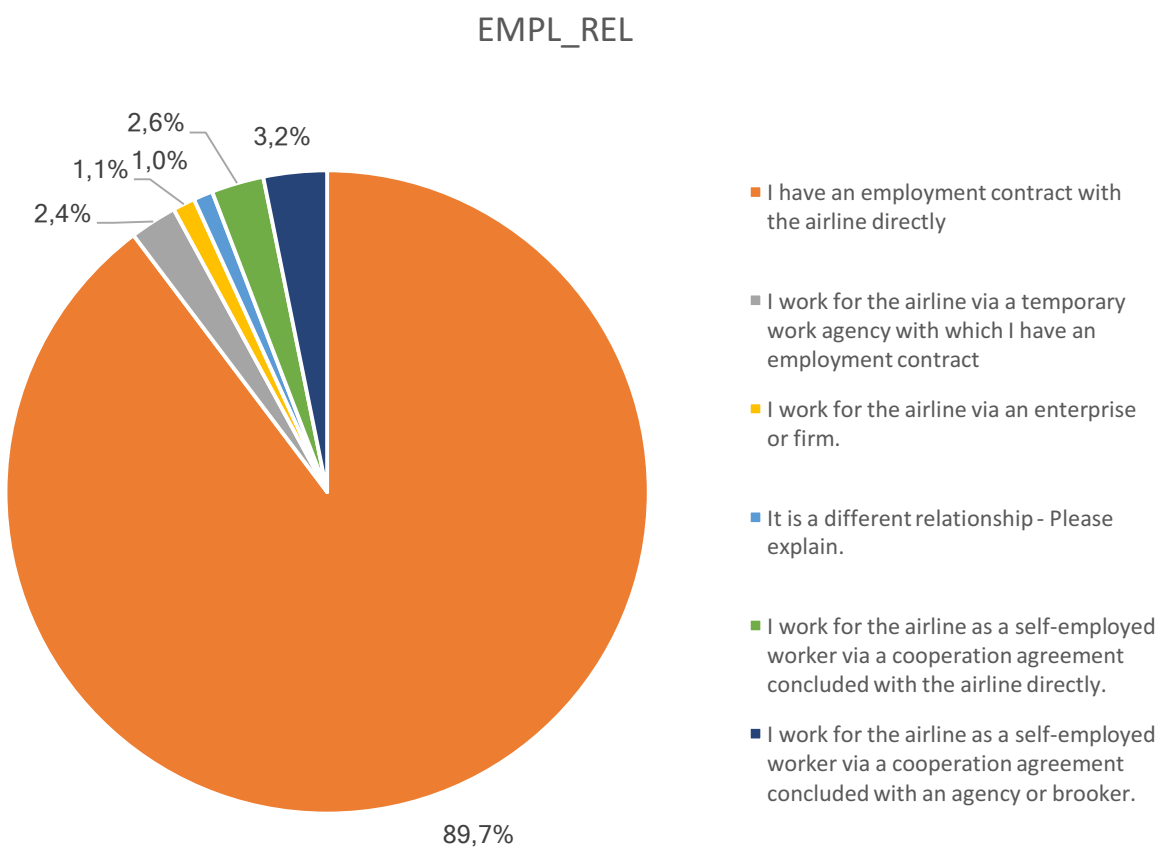


FIGURE 4. 1 EMPLOYMENT RELATIONSHIP

89,7% of the respondents say that they have an employment contract with the airline directly, in thus typical employed. 10,3% is atypically employed, with the highest numbers for self-employment. For pilots the numbers are the following: 86,2% directly, 13,8% atypically employed. 4,8% say that they work for the airline as a self-employed worker via a cooperation agreement concluded with an agency or Brooker and 3,7% say that they work for the airline as a self-employed worker via a cooperation agreement concluded with the airline directly. In the segment of cabin crew, we see higher numbers for typical employment, see 94,7%, and 1,7% via a temporary working agency.

Compared to 2014 (only pilots!): in 2014 about 16% was atypical, with 79,3% saying that they have a direct employment contract with the airline company.

What kind of employment contract? *(only answered if for previous question: 1 or 2)*

1. an open-ended employment contract
2. a fixed- term employment contract
3. a stand-by/ on-call contract

Of the respondents that where given this question, 88% say that they have an open-ended employment contract, 11,9% says that they have a fixed term employment contract and 0,1% say that they have an on-call contract. For pilots that is 89,6% valid percentage that indicate to be working with an open-ended employment contract and 10,2% with a fixed term employment. In the segment of cabin crew, 85,5% has an open-ended employment contract, 14,4% says that they have a fixed term employment contract and 0,1% say that they have an on-call contract.

Compared to 2014 (only pilots!): We see almost the same numbers in 2014: 87% open-ended, 13% fixed-term and 0,3% stand-by

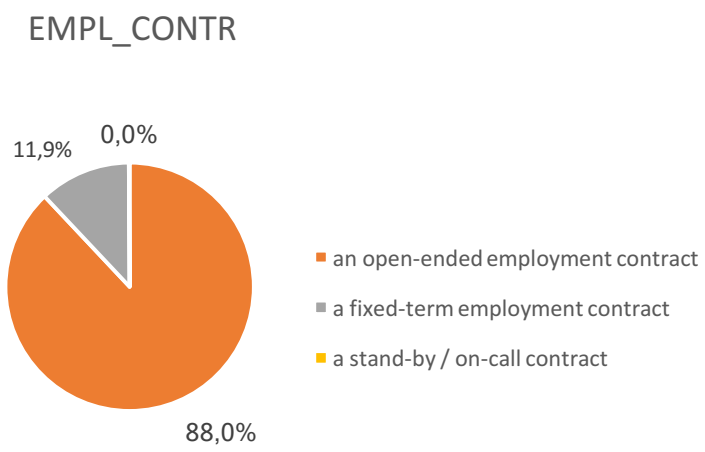


FIGURE 4. 2 WHAT KIND OF CONTRACT?

Are you a shareholder in the enterprise? *(only answered if for previous question: 3 'I work for the airline via an enterprise or firm')*

1. No
2. Yes, I am the only shareholder in the company
3. Yes, together with another pilot/member of cabin crew
4. Yes, together with another partner

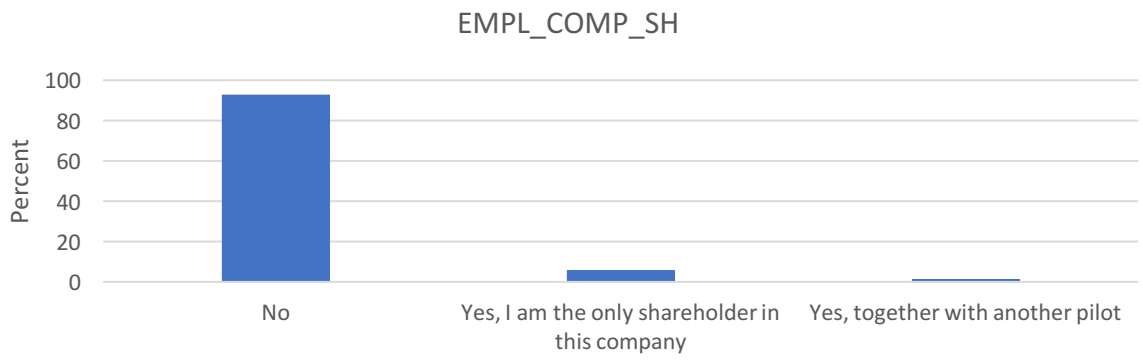


FIGURE 4. 3 SHAREHOLDER IN THE ENTERPRISE?

Most of the respondents say that they are not a shareholder in the company, with 92,8% saying no. 5,8% of the respondents that are given this question say that they are the only shareholder of the company, the other options are less prevalent. For pilots those numbers are: 91,1% no, 6,7% yes and only, 2,2% yes with another pilot. For cabin crew, the only chosen options are: 95,8% no, 4,2% yes and only shareholder of the company.

Compared to 2014 (only pilots!): In 2014 12% was shareholder in the company, 27% said that that they were shareholder together with another pilot.

INSTRUCTIONS

Instructions play a central role in ensuring safe and efficient operations within the aviation sector. Understanding who provides these instructions and what they entail is critical for assessing operational clarity, compliance, and crew wellbeing. Questions looking at the decision-making process, hence the freedom respondents have in exercising their function and authority, are an important indicator to look at as they also demonstrate a certain indication of an eventual (bogus) employment relationship. The main reason being the expectation that typically employed persons, would not really have a lot of freedom in this decision-making process. Bogus self-employment occurs when a person who is an employee is classified other than as an employee so as to hide his or her true legal status and to avoid or evade costs that may include (higher) taxes and social security contributions. On the other hand, genuinely self-employed workers are not ipso facto impossible in the aviation sector. But It is clearly a difficult task to demarcate between on the one hand direct employment/genuine self-employment and on the other hand genuine self-employment/bogus self-employment. Also in bogus subcontracting

schemes, the fundamental question that raises here is to find out the true relationship between the client, the airline company on the one hand and the intermediary contractor. In many occasions, it is not excluded that the client's authority over the service provider is so strict that this company is not acting in a capacity as subcontractor but rather as a strawman who falls under complete subordination of the airline company. The main issue is to find out if these subcontracting chains that are not as such ipso facto bogus (see e.g. ACMI) do hot hide as such bogus constructions and as such lead to further social dumping. One may not lose sight of the fact that this raises issues about the identification of the operator, who determines the social security legislation, just as other liability issues, FTL's …

In this segment, we first examine the sources of instructions. Following this, we explore the content and scope of these instructions, including operational, safety-related, and administrative elements, to provide a comprehensive picture of how guidance is communicated and implemented in day-to-day aviation practice.

TABLE 4. 1 INSTRUCTIONS ARE COMING FROM…

Instructions are coming from…	Total	Pilot	Cabin crew	2014
Registered office of the airline/ airlines headquarters	86,8%	91,5%	80,2%	92,2%
Regional office of the airline	13,3%	10,5%	17,4%	5,2%
Temporary work agency	1%	1,3%	0,5%	1,8%
Intermediary	1%	0,8%	1,3%	0,8%
You yourself	1%	0,9%	1,1%	1,2%
Other	0,7%	0,7%	0,8%	/

The primary source for instructions is the registered office of the airline or the airline headquarters, in line with the results in 2014 where 92,2% if pilots choose this option. This question allows participants to choose more than one option, resulting in a second place for the regional office of the airline for 13,3% of the current total population and a stronger representation for cabin crew with 17,4%. In 2014 only 5,2% of respondents (only pilots) said that they received instructions from the regional office. Less prevalent are instructions coming from the temporary work agency (1%), the intermediary (1%) and themselves (0,7).

TABLE 4. 2 INSTRUCTIONS INVOLVE …

What do these instructions involve?	Total	Pilot	Cabin crew	2014
Schedules	87,4%	92,3%	80,5%	92%
Flight routes/flight plan	79,6%	87,7%	68,1%	85,6%
Maximum daily/monthly flight hours	71,4%	74%	67,7%	63,5%

Safety and operational aspects	80%	84,4%	73,9%	73,9%
Working hours	74,9%	78,4%	70,1%	70,1%
Training requirements	81,9%	86%	76%	82%
Crew composition	76,5%	81,8%	69,1%	79%
Other	1,4%	0,9%	2,2%	/

The main subject for instructions are the schedules with 87,4% of respondents agreeing with this option, followed by training requirements (81,9%) and safety and operational aspects (80%). The least chosen option was maximum daily/monthly flight hours with 71,4% for the total population, 74% for pilots and 67,7% for cabin crew. The other is mostly subscribed as: holidays, everything, fatigue reports, sales targets, working conditions,…

Evaluate the following statement: "I can modify the instructions of the airline based on e.g. objections regarding flight safety, liability, or regarding health and safety."

1. Strongly agree
2. Somewhat agree
3. Neither agree nor disagree
4. Somewhat disagree
5. Strongly disagree

More than half of the respondents (51,7%) does not feel able to modify the instructions based on safety objections, they choose option 3 to 5. 30,7% indicate that they somewhat agree with the statement and 17,6% strongly agree. For pilots, we see that the percentage is slightly higher regarding feeling able to modify: 43,2% choose option 3 to 5. 34,3% somewhat agree and 22,5% strongly agree. In the group of cabin crew we see a different pattern with 65,4% feeling not able to adjust the instructions based on safety objections, choosing option 3 to 5 and only 9,9% strongly agreeing with the statement.

Compared to 2014 (only pilots!): In 2014 we did not present option 3, Neither agree nor disagree. We saw higher percentages agreeing with the statement: 82% said that they somewhat agree or strongly agree with the statement.

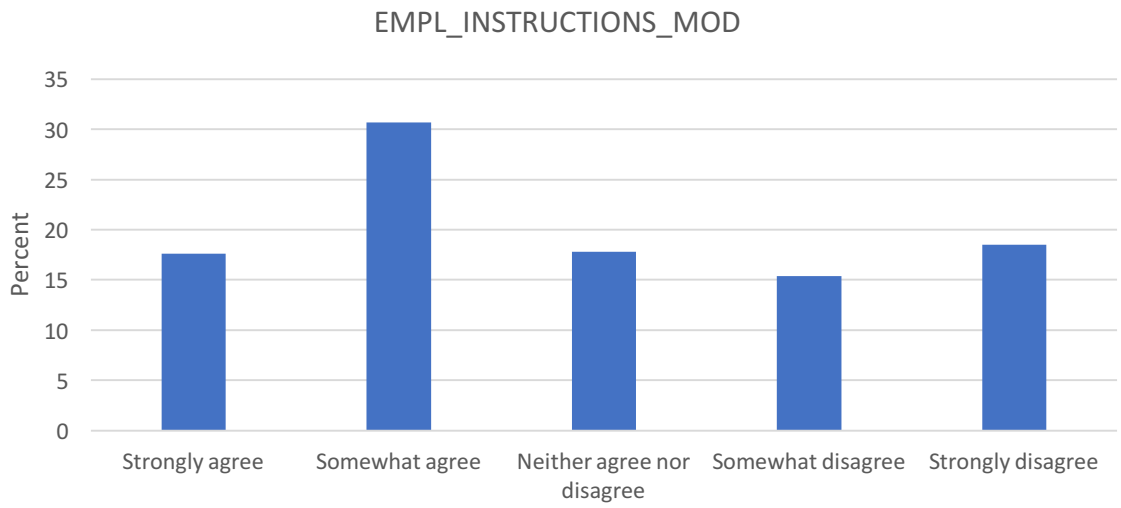


FIGURE 4. 4 I CAN MODIFY INSTRUCTIONS BASED ON SAFETY OBJECTIONS

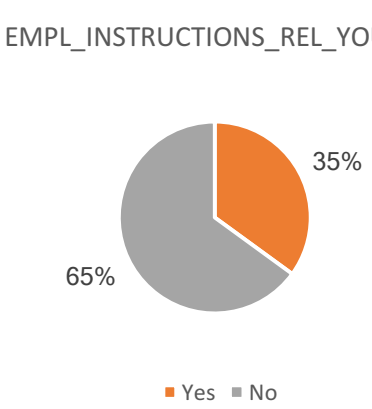
Who decides valid safety objections	Total	Pilot	Cabin crew	2014
Registered office of the airline/ airlines headquarters	82%	83,7%	79,5%	69%
Regional office of the airline	10%	8,6%	12%	2%
Temporary work agency	0,5%	0,6%	0,3%	0%
Intermediary	1,3%	1,1%	1,5%	1%
You yourself	15,9%	23,3%	5,4%	26%
Other	2,8%	2,6%	3,2%	2%

TABLE 4. 3 SAFETY OBJECTIONS ARE EVALUATED BY…

The other is mostly determined as: captain of the flight, purser, don't know, LBA/EASA, safety department, …

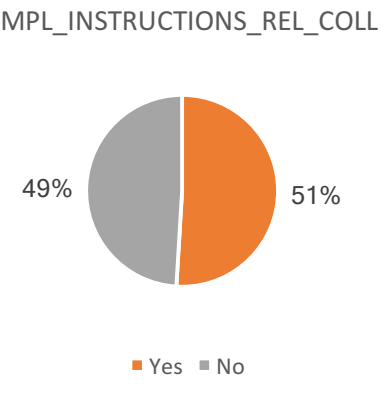
Safety objections are predominantly evaluated by the registered office or headquarters of the airline (82%), a notable increase compared to 2014, when only 69% of pilots selected this option. In 2014, the captain was cited in 26% of responses; in 2024, this figure decreased slightly to 23.3%. The regional office was mentioned less frequently, with 12% of cabin crew and 8.6% of pilots indicating this option.

Are you sometimes reluctant to take such safety decisions out of fear for possible negative consequences for your professional career?



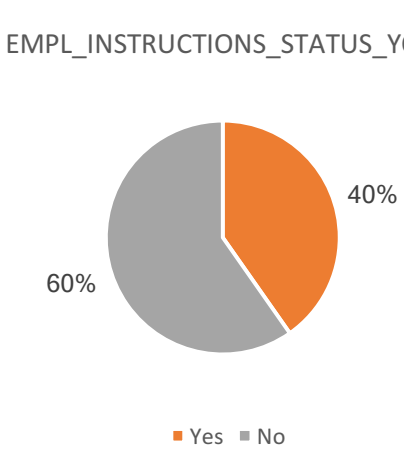
For pilots 29,9% agreed with this statement, in the group of cabin crew this is 42,9%.

Are your colleagues sometimes reluctant to take such safety decisions out of fear for possible negative consequences for their professional career?



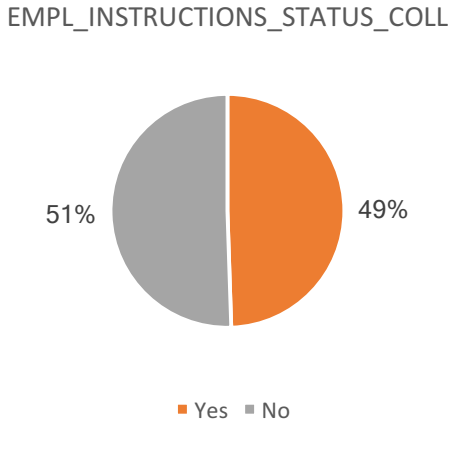
For pilots 46,2% agreed with this statement, in the group of cabin crew is 58,3%.

Do you think that your employment status may affect your ability to take such decisions?



For pilots 35,1% agreed with this statement, in the group of cabin crew this is 48,2%.

Do you think that your colleagues' employment status may affect their ability to take such decisions?



For pilots 43,8% agreed with this statement, in the group of cabin crew this is 48,2%.

FIGURE 4. 5 WILLINGNESS TO MAKE SAFETY DECISIONS AND ITS DETERMINANTS

Evaluate the following statement: "I can decide not to fly for legitimate reasons of illness, fatigue, etc."

1. Strongly agree
2. Somewhat agree
3. Neither agree nor disagree
4. Somewhat disagree
5. Strongly disagree

53,8% of respondents feel able to decide not to fly because of sickness and/or fatigue (strongly agree). 20,8% feels not able to do so, in different degrees (option 3 to 5). For pilots 58,2% strongly agree, 24,8% somewhat agree (together 83%) and about 17% does not feel able to do so when necessary. For cabin crew, we see that only 46,9% strongly agrees, 26,5% somewhat agree and 26,5% does not feel able to do so.

Compared to 2014 (only pilots!): 93% of respondents choose strongly agree and somewhat agree in 2014.

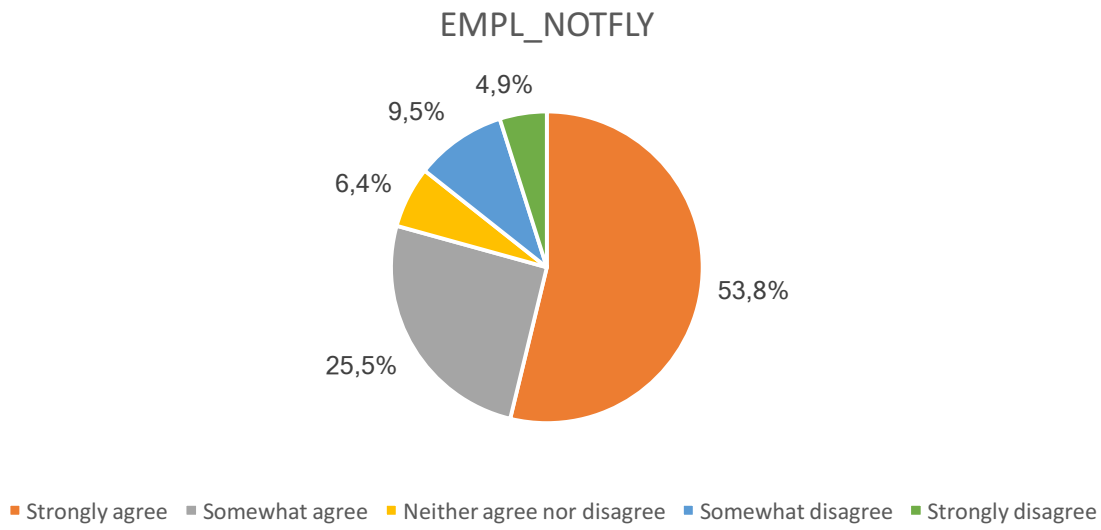
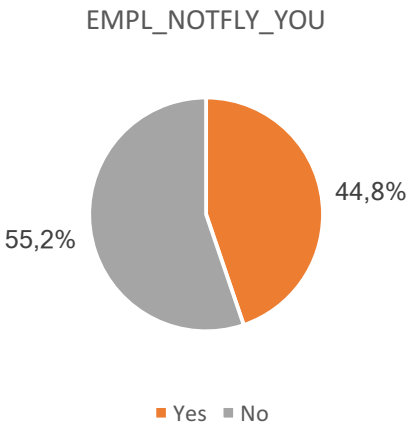
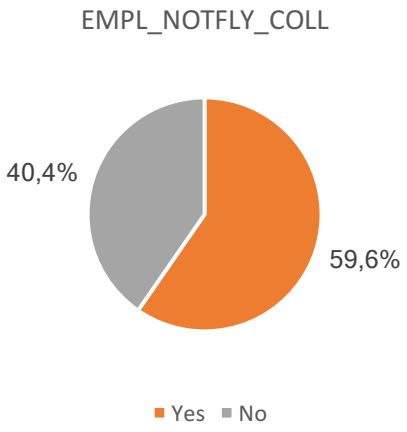


FIGURE 4. 6 I CAN DECIDE NOT TO FLY DUE TO ILLNESS, FATIGUE, ETC.

Are you sometimes reluctant to take such decisions about fitness to fly out of fear for possible negative consequences for your professional career?	*Are your colleagues sometimes reluctant to take such decisions about fitness to fly out of fear for possible negative consequences for their professional career?*



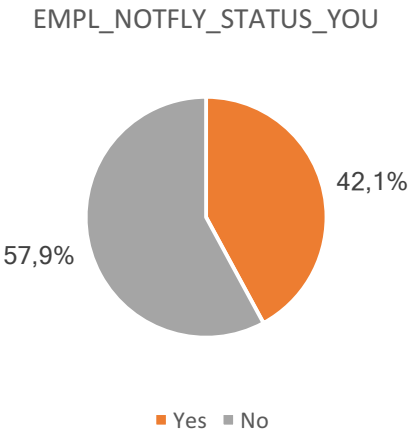


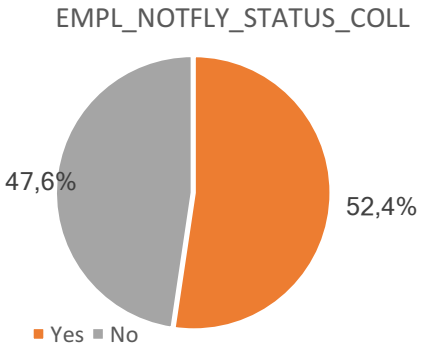
For pilots 36,9% agreed with this statement, in the group of cabin crew this is 57,3%.

For pilots 50,8% agreed with this statement, in the group of cabin crew this is 73,6%.

Do you think that your employment status may affect your ability to take such decisions?

Do you think that your colleagues' employment status may affect their ability to take such decisions?





For pilots 35,9% agreed with this statement, in the group of cabin crew this is 51,8%.

For pilots 44,5% agreed with this statement, in the group of cabin crew this is 64,8%.

FIGURE 4. 7 WILLINGNESS TO NOT FLY AND ITS DETERMINANTS

Compared to 2014 (only pilots!): 28% said that they are reluctant to take such decisions, 43% said that they taught that their colleagues are reluctant.

Are you sometimes reluctant to take safety or health decisions for fear of possible negative consequences for your income?

1. Yes
2. No

In the general population, 46,1% said that they are reluctant to take safety and health decisions out of fear of possible negative consequences for their income. For pilots this is 37,9% and for cabin crew this is 59,1%.

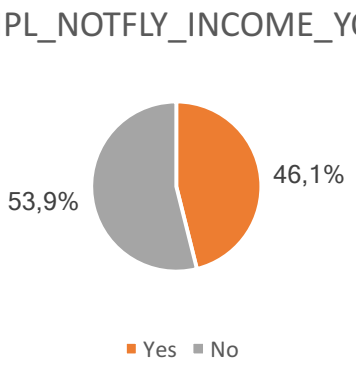


FIGURE 4. 8 RELUCTANT TO TAKE SAFETY OR HEALTH DECISIONS BECAUSE OF INCOME?

RELATIONSHIP BETWEEN RESEARCH VARIABLES AND SUBGROUPS

GENERAL TYPICAL – ATYPICAL

This section explores the associations between employment type—typical versus atypical—and a range of contextual and demographic factors, including age, employee group, type of airline, home base in Eastern Europe, flight legs and layovers, and applicable legal frameworks. In the next two sections, special attention is given to workers in atypical arrangements, including self-employed pilots, personnel hired through temporary work agencies, and those operating under wet-lease (ACMI) contracts. The analysis aims to highlight vulnerabilities and potential areas for policy and organizational intervention.

GROUP

When analysing differences and trends regarding typical and atypical employment we start with a comparison at group level. The prevalence of atypical employment was compared between pilots and cabin crew, revealing a significant difference (X^2= 130.75, df(1,1), p < .001). Among pilots, 13.8% were employed under atypical arrangements, whereas only 5.3% of cabin crew reported atypical employment.

These results indicate that atypical employment is more common among pilots than cabin crew, highlighting differences in employment structures between the two professional groups.

AGE

An analysis of age in relation to employment type shows that atypical employment is more prevalent among younger employees. This trend is particularly pronounced for those under the age of 21, where

41.4% of employees are in atypical employment. Overall, younger age groups, especially those below 40, are more likely to hold atypical positions compared to older employees.

Moreover, a significant relationship was found between atypical employment and the fact that one considers their home base to be their real home base (X^2 = 20.84, df(1,5),p < .001). disagreeing with their home base as a real home base is most common among employees aged 21 to 30, with 15.5%, and decreases progressively with age, reaching 8.9% among those aged 61 and older.

Similarly, the analysis of payment arrangements shows that younger employees are more likely to receive payment from an entity other than the airline or to be unsure about the payment entity. This relationship was also statistically significant (X^2= 63.76, df(1,10), p < .001), highlighting that younger workers are more often subject to complex contractual conditions.

These findings indicate that the entry-level segment of aviation workers faces both a higher likelihood of atypical employment and greater contractual complexity, emphasizing the need for targeted monitoring and support for these groups.

KIND OF AIRLINE COMPANY

Another important dimension in examining the distribution of typical and atypical employment concerns the type of airline for which respondents work. The question is whether distinct patterns can be observed between airline categories and the prevalence of atypical employment (X^2=1149,55, df(1,8), p < .001).

	Atypical employment	Typical employment
Network airline	3,8%	96,2%
Low-fare airline	12,9%	87,1%
Charter airline	21,1%	78,9%
Regional airline	6,4%	93,6%
Cargo airline	8,5%	91,5%
Business aviation	15,8%	84,2%
Other	16,4%	83,6%
Helicopter	10,7%	89,3%
ACMI	65%	35%
Total	*10,3%*	*89,7%*

TABLE 4. 4 KIND OF AIRLINE - TYPICAL/ATYPICAL

The analysis demonstrates a highly-pronounced effect in the case of ACMI operators, where the distribution shifts almost entirely: 65% of respondents in this category reported atypical employment (in contrast with 10,3% in the total population and 3,8% in Network airlines. Elevated levels of atypical employment are also observed in several other segments, including charter airlines (21.2%), airlines categorized as “other” (16.4%), business aviation (15.8%), and low-fare carriers (12.9%).

These results indicate that atypical employment is not evenly distributed across the sector but is instead strongly associated with specific airline business models. In particular, ACMI operations appear to rely structurally on atypical forms of employment, while other categories such as charter, business, and low-fare airlines also display higher-than-average reliance on such contracts.

HOME BASE IN EASTERN EUROPE

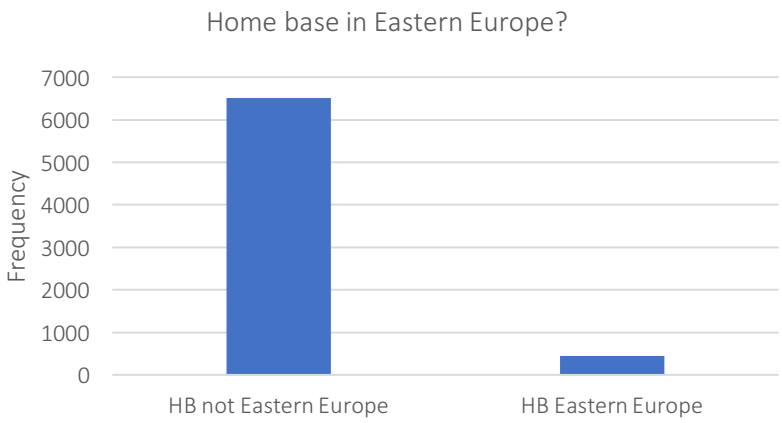


FIGURE 4. 9 HOME BASE IN EASTERN EUROPE?

Subsequently, we examined the distribution of typical and atypical forms of employment in Eastern Europe compared to the remainder of Europe. For the purposes of this analysis, Eastern Europe is defined as comprising Lithuania, Estonia, Latvia, Poland, Czechia, Slovakia, Hungary, Romania, and Bulgaria. It is important to note that only a relatively small proportion of respondents (6.4%) reported having a home base in Eastern Europe, which has implications for the representativeness of the findings.

Among respondents with a home base outside Eastern Europe, 92.6% reported being in typical employment, while 7.4% indicated atypical employment. By contrast, within the group of respondents based in Eastern Europe, atypical employment was reported by 52.4%, while 47.5% reported typical employment (X^2= 895,98, df(1,11), p < .001).

TABLE 4.5 HB EASTERN EUROPE - TYPICAL/ATYPICAL

	Atypical employment	Typical employment
Home base in Eastern Europe	52,5%	47,5%
Home base not in Easter Europe	7,4%	92,6%

This striking divergence suggests a substantially higher prevalence of atypical forms of employment among aircrew operating out of Eastern Europe, although the relatively limited sample size warrants cautious interpretation.

LEGS AND LAYOVERS

An additional area of analysis concerns the number of flight legs operated by respondents, differentiated by employment type (typical versus atypical contracts) and airline business model (network versus low-cost carriers). A similar approach was applied in relation to layovers.

Starting with employment type, an independent-samples t-test was conducted under the assumption that atypical workers would operate more legs than those in typical contracts. Contrary to this assumption, the results indicate a one-sided significant difference in the opposite direction: respondents with typical contracts reported flying slightly more legs (t=-1.777, df(1,3704), p < .05). However, the effect size was very small, suggesting limited practical relevance of this finding.

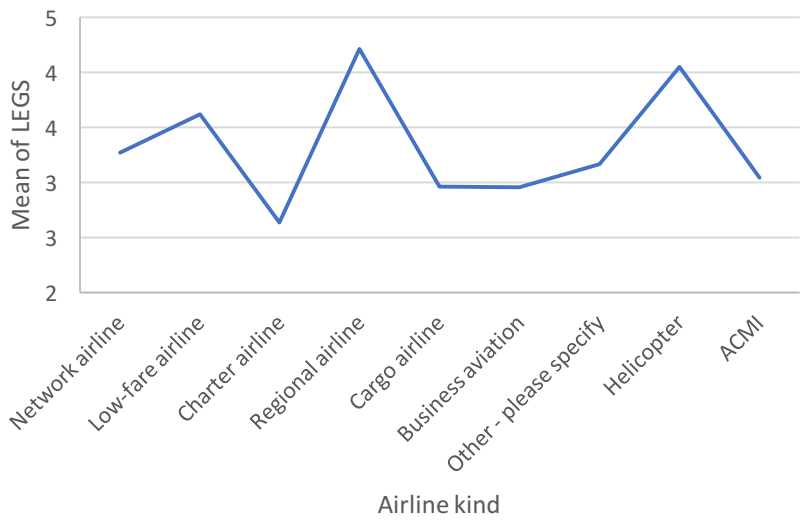


FIGURE 4. 10 LEGS - KIND OF AIRLINE

When analysing airline business models, a significant effect for the number of legs flown was detected, $F(1,8) = 20.54$, $p < .001$. Post-hoc comparisons (see Figure 4.10) indicate that network carriers operate significantly fewer legs than low-fare carriers. Regional airlines display the highest number of legs, while charter airlines operate the lowest.

A comparable analysis was conducted for layovers. Here, a significant overall effect was observed, ($F(1,7) = 96.29$, $p < .001$). Post-hoc testing procedure showed significant differences across multiple comparisons:

- Network carriers compared to cargo and business aviation.
- Low-fare carriers compared to cargo, business, and ACMI operators.
- Regional carriers compared to cargo and business aviation.
- ACMI operators compared to network, low-fare, charter, regional, and "other" categories.

These findings suggest that while employment type (typical vs. atypical) shows only marginal differences in the number of legs and layovers, airline business models exert a much stronger influence on work patterns, particularly with respect to flight frequency and opportunities for layovers.

APPLICABLE LAW

Another dimension of analysis concerns the relationship between the type of employment and the applicable (labour) law. Specifically, we sought to determine whether the legal framework governing a contract is associated with distinct patterns of employment.

The results indicate a highly significant association ($X^2 = 1494.42$, df(1,20), $p < .001$). When the applicable labour law corresponds to the official home base of the employee, the clear majority (93.2%) reported direct employment, with only 3.1% indicating self-employment. A different pattern emerges when the applicable labour law is linked to the registered office of the employer: here, only 65.1% reported direct employment, while 23.5% identified as self-employed.

An interesting observation appears in cases where respondents indicated that the applicable labour law corresponds to the registered office of their own company. In this category, 66.2% reported direct employment, a finding that may suggest confusion in how the question was interpreted, given the apparent inconsistency of being "directly employed" under the law of one's own company.

Finally, when the applicable law was reported as that of the country of residence, respondents again overwhelmingly reported direct employment (91%), with only 2.8% identifying as self-employed.

Taken together, these findings highlight clear differences in employment form depending on the legal framework applied to the contract. In particular, linking labour law to the employer's registered office appears to coincide with a substantially higher incidence of self-employment, suggesting that the choice of applicable law may serve as a mechanism for structuring atypical contractual arrangements.

INSTRUCTIONS

The last dimension that we looked into when looking into associations with type of employment (typical versus atypical) was the willingness to modify instructions regarding to safety and the willingness to decide not to fly because of illness or fatigue. The results indicate a significant association with the willingness to modify due to safety reflections (X^2 = 114.65, df(1,4), p < .001) and with the willingness not to fly because of illness or fatigue (X^2 = 157.38, df(1,4), p < .001).

We know that in the general population more than half of the respondents (51,7%) does not feel able to modify the instructions based on safety objections, they choose option 3 to 5. 30,7% indicate that they somewhat agree with the statement and 17,6% strongly agree. But when looking at atypical employment (Table 4.6), almost 68% does not feel able to modify the instructions based on safety objections, in contrast with 49,8% in typical employed respondents.

TABLE 4. 6 RELATIONSHIP AIRLINE - MODIFY INSTRUCTIONS DUE TO SAFETY

Kind of relation with the airline company	"I can modify the instructions of the airline based on e.g. objections regarding flight safety, liability, or regarding health and safety"				
	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Atypical	7,1%	25,3%	17,3%	20,9%	29,4%
Typical	18,9%	31,3%	17,9%	14,7%	17,2%

TABLE 4. 7 RELATIONSHIP AIRLINE - DECIDE NOT TO FLY DUE TO ILLNESS, FATIGUE

Kind of relation with the airline company	"I can decide not to fly for legitimate reasons of illness, fatigue, etc."				
	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Atypical	32,5%	30,6%	9,8%	17,5%	9,6%
Typical	56,2%	24,9%	6%	8,5%	4,3%

Next (Table 4.7), 53,8% of respondents in the general population strongly agree that they are able to decide not to fly because of sickness and/or fatigue. 20,8% feels not able to do so, in different degrees (option 3 to 5). When combining these results with the type of employment we note the segment that does not feel able is 36,9% and only 32,5% strongly agree.

SELF-EMPLOYED

Focusing on self-employment, main trends regarding safety, job security, well-being, working hours, and legal clarity are as follows[1]:

- Mental Health: Self-employed crew report significantly less favourable outcomes for mental health compared to those in direct employment.
- Dehumanization: Directly employed crew report the lowest levels of dehumanization (i.e., the best situation), whereas self-employed crew experience the highest levels (i.e., the worst). This difference is significant ($p < .001$).
- Job Insecurity: Direct employment shows the lowest job insecurity. In contrast, self-employed crew and those working through a work agency report distinctly higher job insecurity.
- Fatigue Reporting: Willingness to report fatigue (higher values indicating worse conditions) is highest among self-employed crew, reflecting a greater burden and unwillingness to report.
- Personal Safety Behaviour: Self-employed crew report less favourable perceptions of personal safety. This trend is not observed for agency-based crew.
- Safety Work Climate: Self-employed crew perceive the work climate as more negative, with a slight dip observed for agency workers.
- Medication use: No significant differences are observed across employment types.

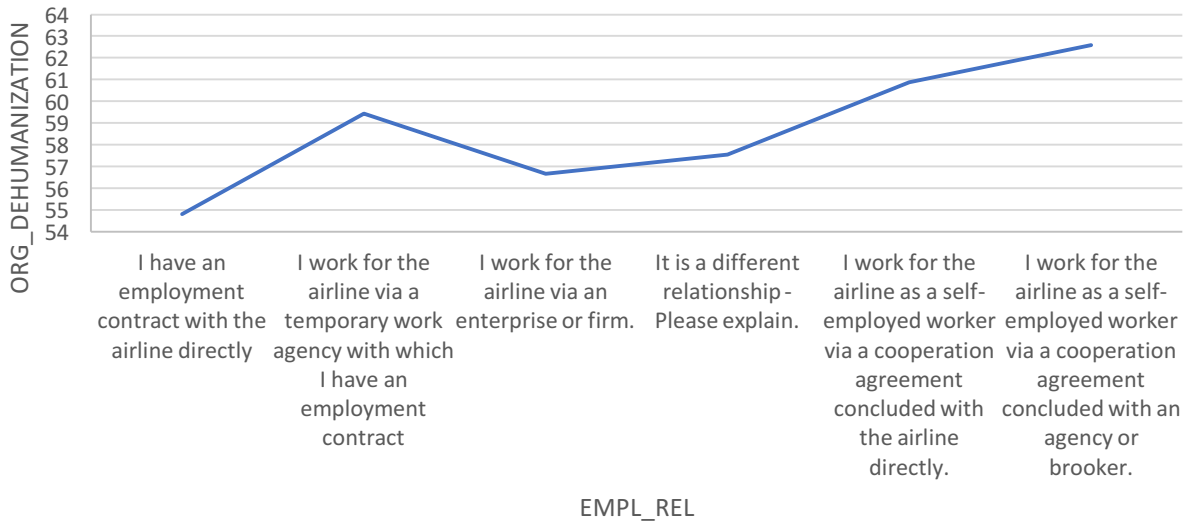


FIGURE 4. 11 RELATIONSHIP WITH AIRLINE - DEHUMANIZATION

Overall, self-employed crew consistently report less favourable outcomes across multiple dimensions of work-related well-being, including mental health, dehumanization, job insecurity, fatigue, and safety perceptions. In contrast, directly employed crew generally experience more favourable conditions, while agency-based crew show intermediate patterns. These results highlight the potential

[1] Given the size of the output table for this analysis we refrain from reporting specific F-values. Statistical data are only concluded when pointing at critical findings. More information can be obtained by the authors of this report.

vulnerabilities associated with self-employment in the aviation sector, particularly regarding psychosocial risks and perceptions of safety.

With regard to atypical employment, an important question is whether patterns can be identified between the location where contracts are signed and the type of atypical employment they represent. Given the sample distribution, this analysis was conducted at a clustered level, distinguishing between respondents with a home base in Eastern Europe and those based in the rest of Europe.

The results reveal significant differences between the two clusters (F (1,5) = 1555.97, p < .001). Among respondents outside Eastern Europe, 92.6% reported being directly employed, while only 47% of respondents based in Eastern Europe reported such direct employment. Conversely, self-employment is markedly more common in Eastern Europe: 26.5% of respondents reported being self-employed through a cooperation model, compared to only 1% among respondents outside the region.

These findings indicate that atypical forms of employment are not only more prevalent in Eastern Europe but also take on different contractual forms compared to the rest of Europe. This suggests that regional labour market structures and regulatory environments may shape both the likelihood and the specific modalities of atypical employment among aircrew.

TEMPORARY WORK AGENCY

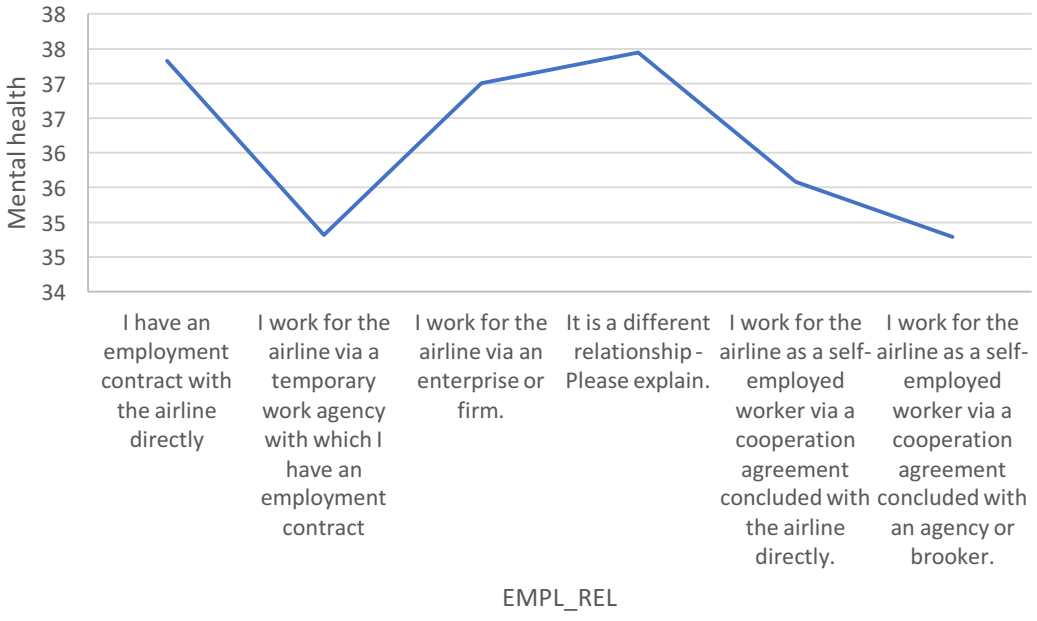


FIGURE 4. 12 RELATIONSHIP WITH AIRLINE - MENTAL HEALTH

Focusing on temporary agency work, main trends regarding safety, job security, well-being, working hours, and legal clarity are as follows:

- Mental Health: Crew employed through a work agency report significantly poorer mental health compared to directly employed crew (see Figure 4.12).

- Dehumanization: Directly employed crew report the lowest levels of dehumanization (i.e., the best situation), whereas agency-employed crew report less favourable values, though not as extreme as self-employed crew.
- Job Insecurity: Agency-employed crew report higher job insecurity compared to direct employment, though effect sizes are small.
- Fatigue Reporting: Willingness to report fatigue is slightly elevated in agency-employed crew, mostly in line with directly employed crew, more positive than self-employed workers but the differences are minor.
- Personal Safety Behaviour: Perceptions of personal safety for agency-employed crew are slightly lower to directly employed crew and higher than for self-employed workers.
- Safety Work Climate: Agency work is associated with slightly less favourable perceptions of the work climate, though the effect is modest.
- Medication: No significant differences are observed across employment types.

Temporary agency crew experience somewhat worse outcomes compared to directly employed crew, particularly regarding mental health and dehumanization, but overall effect sizes are small. Safety perceptions are largely comparable to direct employment, while job insecurity and fatigue show minor increases. These findings suggest that while agency work introduces some vulnerabilities, they are generally less pronounced than those observed for self-employment.

ACMI/ WET- LEASING

Crew employed under ACMI arrangements show markedly more pronounced differences in work-related well-being and safety compared to other kinds of airline companies. In this group, 65% of crew fall under atypical employment arrangements, representing a complete shift in the distribution of employment type. While other atypical sectors such as charter, business, low-fare, or "other" types of work also show elevated levels of atypical employment, the effect is particularly pronounced in ACMI.
ACMI crew report significantly poorer outcomes across multiple domains, including mental health, dehumanization, job insecurity, fatigue, and perceptions of safety, suggesting that ACMI work is associated with a heightened vulnerability. Compared to other sectors, ACMI employees are less likely to be unionized and report less clarity about where to seek support for mental health issues, with some indicating fear of addressing such concerns within their company.

These findings indicate that ACMI employment creates a work context in which crew face multiple compounded risks, both in terms of psychosocial stressors and structural support, making them a highly vulnerable group within the aviation sector.

INSIGHTS FROM AIRLINE INTERVIEWS AND AIRCREW FOCUS GROUPS

As part of this study, interviews and focus groups were organized with representatives of both employee and employer organisations. Their views are outlined below to provide the reader with a 360° perspective.

INSIGHTS FROM THE INTERVIEWS AIRLINE STAKEHOLDERS: EMPLOYMENT CONDITIONS

BIGGEST CHALLENGES ABOUT EMPLOYMENT

- **Symmetrical regulatory burdens** at national and EU levels put EU aviation competitiveness under pressure compared to non-EU carriers (e.g. increased location costs and unilaterally burdensome EU regulations).
- **Global geopolitical developments** (wars, political conflicts) undermine stability in the sector and the safety of the operations.
- **High inflation and rising consumer prices** create a difficult economic environment.
- **Weakening economy** further strains the industry.
- **Labour and skills shortages** increase workload and stress for employees.
- **Rising demand for qualified new hires** to meet operational and safety needs.
- **Supply chain issues**
- **Decarbonisation of aviation,** and the needed investments

Initiatives taken by the airline companies

- Consideration of budget limits while **prioritizing crew comfort**, for example: Ensuring hotels are centrally located within cities to allow crew mobility and leisure during stays.
- **Accessible workplace design**, with barrier-free buildings.
- **Employee training and engagement** through workshops and online courses on mental and physical health.
- **Flexible scheduling**: Crew can request adjustments to their schedule for medical, mental, or personal reasons.
- Agreement improving **working conditions for pregnant and breastfeeding crew members**.
- Option for pilots on medium-haul flights to choose their monthly off-days.
- Guaranteed alternating work schedules for senior pilots (aged 60+).
- Negotiated agreements aimed at maintaining good working conditions and work-life balance.
- Ongoing adaptation of work environment, methodologies, and health/life programs to match generational and lifestyle changes.
- Integration of health, fatigue, and safety considerations in crew training, with proactive adjustments based on emerging trends.
- Use of wet-leasing:
    - **Wet-lease use limited to exceptions** (e.g., unexpected aircraft maintenance).
    - **Specific agreements with unions** on wet leasing are included in the CLA.
    - **Pilot shortage** has increased reliance on wet leasing to meet network demand.
    - **Implementation only after agreement** with the pilots' union.
    - Refusal to charter with non-EU airlines, companies that use Pay-to-Fly schemes, or that use fictitious operational/crew bases
- No engineering with home base, very limited use of atypical employment situations.

Insight from the focus groups with aircrew: employment conditions

Legal and Regulatory Gaps

- In some countries, such as Denmark, there is no alignment between aviation law and civil labour law. This legal vacuum allows companies to introduce practices without sufficient oversight. Pilots are often forced to negotiate every protection into Collective Labour Agreements (CLAs), which is not a sustainable solution in the long term.
- Malta has emerged as a hub for self-employment practices, home bases outside Europe (e.g., Dubai), and the use of subsidiaries or acquisitions of low-cost carriers to mimic network airline

practices. While such models may appear compliant on paper, they raise concerns about fairness and long-term sustainability.
- The responsible actor in complex contractual or wet-leasing arrangements is not always clearly defined, creating uncertainty in accountability.

Employment Practices and Labour Relations

- The growing share of low-cost and ACMI operators has contributed to a weakening of pilots' and cabin crew's terms and conditions over the last decade, a development acknowledged across both focus groups.
- Aircrew often demonstrate limited long-term commitment to airlines, partly due to unstable employment terms and conditions. This lack of loyalty, in turn, generates additional costs for employers. The latter does inspire an attempt to improve the working environment when realized by the airline companies.
- Airlines that rely on less favorable employment practices frequently recruit younger pilots, who are perceived as less likely to challenge existing conditions.
- There are still good airlines to work for but their unions are fighting in a marathon to protect those conditions.

Management and Organizational Culture

- Short-term financial thinking dominates, with senior management often judged on annual results. This focus overlooks the reality that strategic investments in employment conditions and staff well-being are cost-saving in the longer term.
- There is a widely-shared perception that "the better the profit, the better the conditions" should be the norm. In practice, the opposite trend is observed, with profits not being translated into improved employment conditions.
- The intensity of work has increased compared to a decade ago due to digitalization, automation, and higher passenger volumes, leaving less time for crew to perform their tasks effectively.

Operational Realities

- Wet-leasing and ACMI arrangements are sometimes used by airlines to outsource responsibility. While some companies refer to ethics agreements with their ACMI partners, enforcement remains inconsistent, and in certain countries penalties exist but are only effective when actively applied.
- On-time performance continues to dominate airline priorities, although "on-time" often only counts from take-off onwards. Some airlines acknowledge that planned turnaround times are unrealistic and have introduced dedicated departments to review feasibility, occasionally adjusting turnaround schedules.

Labour Market and Retention

- Declining wages and deteriorating conditions are key drivers of brain drain and low retention rates. For cabin crew, wages are sometimes reported as comparable to retail work, but without the benefit of a predictable schedule or the ability to return home after a shift.
- Management is often perceived as overlooking the link between consistency, stable conditions, and quality service provision.

KEY TAKE- AWAYS ABOUT ATYPICAL EMPLOYMENT

1. **Structural and regional disparities**: Atypical employment is more prevalent among pilots than cabin crew, concentrated in ACMI and certain low-fare or charter operations, and significantly more widespread in Eastern Europe due to local regulatory and labour market conditions.
2. **Contractual frameworks as drivers**: The choice of applicable labour law and airline business model strongly shape employment forms, with ACMI and Eastern European bases showing structural reliance on atypical or self-employment arrangements (also supported by the report of European Labour Authority, 2025).
3. **Legal certainty concerning labour and social security law**: People in a-typical employment situations and certainly those in ACMI situations, suffer the most from lack of legal certainty concerning their labour and social security situation. This uncertainty creates a climate of vulnerability, in which access to core provisions such as sick pay, pensions, or unemployment benefits may be limited or non- existent. In ACMI operations especially, social engineering practices are frequently combined with complex or even bogus contractual constructions, which are designed to minimize costs but at the same time erode workers' legal and social protection. These patterns not only undermine fair competition but also jeopardise equal treatment across the sector.
4. **Instructions**: The ability and willingness of crew members to challenge or adapt airline instructions when they raise concerns about flight safety or occupational health and safety is not uniformly distributed across the workforce. Our findings indicate that employment status plays a decisive role: workers in more precarious or atypical forms of employment report feeling less empowered to raise objections or deviate from instructions, even when safety considerations are at stake. By contrast, those in stable and secure contractual arrangements demonstrate a higher degree of confidence in voicing concerns and acting upon them. A healthy safety culture therefore depends not only on formal reporting systems or training, but also on ensuring that all crew exercise professional judgement without fear of retaliation or job insecurity.
5. **Wellbeing and safety risks**: Self-employed crew face the poorest outcomes across wellbeing, job security, fatigue, and safety, while agency work presents moderate risks; direct employment remains the most favourable arrangement.
6. **The interviews** reveal that European airlines face mounting external pressures—ranging from asymmetrical regulatory burdens, geopolitical instability, and economic volatility to skills shortages and supply chain constraints—while simultaneously needing to invest in decarbonisation. Despite these challenges, companies are actively implementing initiatives to safeguard crew well-being and retention, such as flexible scheduling, health and safety programs, negotiated agreements on working conditions, and careful use of wet leasing (under union oversight). This dual reality highlights the need for policies that both strengthen competitiveness and reinforce sustainable, worker-centered employment practices in European aviation.

LEGISLATION SHOPPING: APPLICABLE LABOUR AND SOCIAL SECURITY LAW

Which country's legislation is applicable to your cooperation/contract with the airline?

Drop down list

The top three of the applicable legislation is: 1. Spain (13,5%), 2. Germany (10,4%), and 3. The Netherlands (7,3%). For Pilots that is 1. Spain (12,2%), 2. The Netherlands (10,9%), and 3. France (6%) and for cabin crew 1. Germany (20%), 2. Spain (15,7%), and 3. Denmark (9,9%)

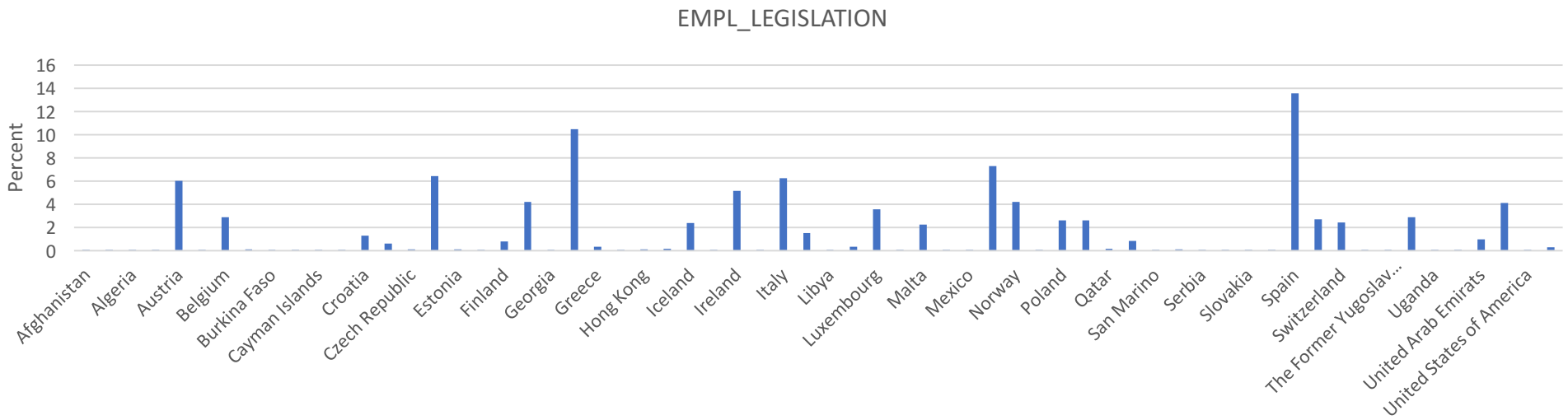


FIGURE 4. 13 COUNTRY APPLICABLE LEGISLATION

What countries labour law is applicable to you?

Drop down list

The top three of the applicable labour law is: 1. Spain (14,4%), 2. Germany (10,9%), and 3. The Netherlands (7,4%). The pilots have a top three that look as follows: 1. Spain (13%), 2. The Netherlands (11%), 3. France (6,4%) and for cabin crew: 1. Germany (20,5%), 2. Spain (16,6%), 3. Denmark (10,8%).

TABLE 4. 8 COUNTRY OF LABOUR LAW IS THE COUNTRY OF...

This country is...	General	Pilot	Cabin crew
the country of your official home base.	90%	88.6%	92.3%
the country of the registered office of the airline you fly for.	5.8%	6.8%	4.2%
the country of the registered office of your own company.	1.1%	1.3%	1.0%
the country where you live.	1.2%	1.0%	1.6%
a different country. - please specify	1.8%	2.4%	0.9%

Compared to 2014 (only pilots!): The top 3 was 1. France, 2. The Netherlands, 3. UK.

Where do you pay your social security contributions?

Drop down list

We see that the top 3 exists of 1. Spain with 14,8%, 2. Germany with 11,5% and 3. Italy/The Netherlands with 7,4%. For pilots, we start with Spain (13,5%), then go to The Netherlands (11%), followed by France (6,8%).

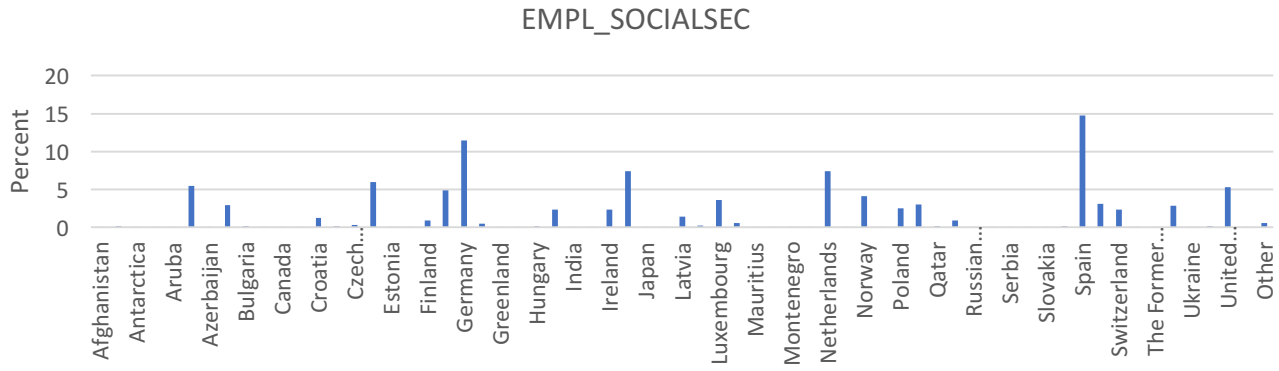


FIGURE 4. 14 WHERE DO YOU PAY YOUR SOCIAL SECURITY CONTRIBUTIONS?

This country is...	General	Pilot	Cabin crew
the country of your official home base.	93.2%	92.7%	94.0%
the country of the registered office of the airline you fly for.	2.5%	2.8%	2.0%
the country of the registered office of your own company.	0.6%	0.8%	0.4%
the country where you live.	2.7%	2.4%	3.2%
a different country. - please specify	0.9%	1.3%	0.4%

TABLE 4. 9 COUNTRY SOCIAL CONTRIBUTIONS IS THE COUNTRY OF ...

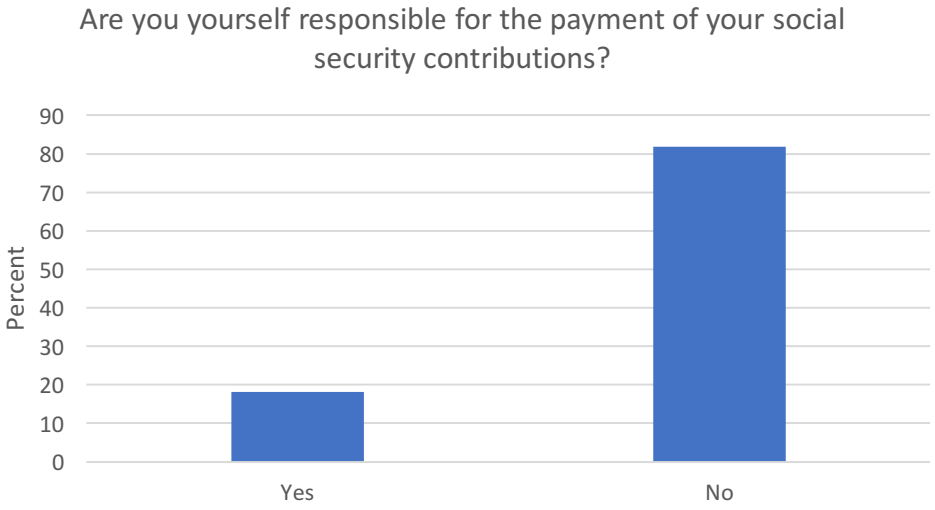


FIGURE 4. 15 YOU YOURSELF RESPONSIBLE FOR SOCIAL SECURITY CONTRIBUTIONS?

In general, about 18,1% said that they are responsible for their own social security contributions, for pilots this is 17,5% and for cabin crew 19,1%.

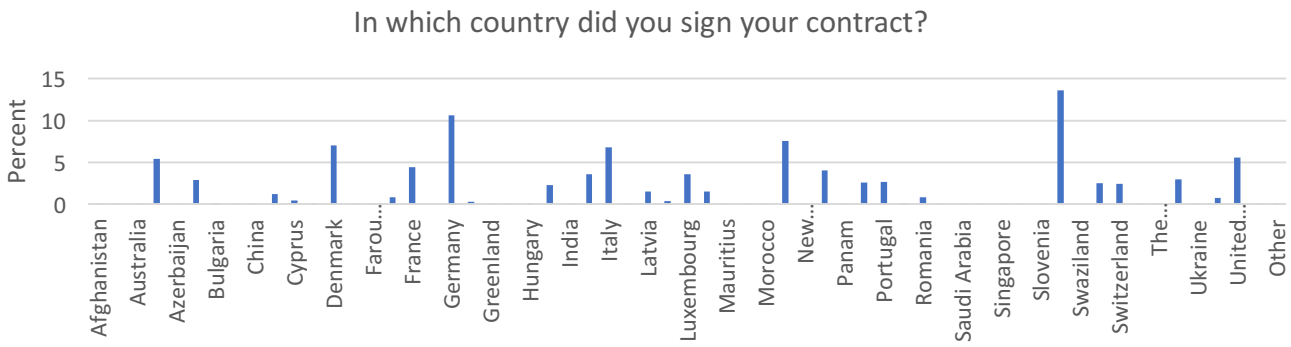


FIGURE 4. 16 WHICH COUNTRY DID YOU SIGN YOUR CONTRACT?

ADDITIONAL SYNTHESIS: ANALYSIS OF RELATIONSHIPS OF CASE STUDY AND GENERAL POPULATION WITH SOCIAL AND LABOUR LAW

Cabin personnel (pilots and cabin crew) are per definition international, leading to a complex situation where it is often extremely difficult to determine the applicable legislation. Due to the variety of international connecting factors in the aviation sector, it is far from easy to determine which legislation -labour and social security law- applies to air crew. International instruments therefore try to link an international situation to a (set of) applicable legislations. For labour law, this is the Rome I Regulation[2]. One may not forget that this Regulation has a universal character. Consequently, this instrument applies not only to situations where there is a link with one of the Member States of the European Union. The conflict rules of the Regulation can also give rise to the application of the laws of a country which is not a member of the European Union. Consequently, the rules apply to the nationals of a Member State and persons with their domicile or residence in the Member States as well as to nationals of third-party countries with their domicile or residence in the latter countries. And while under labour law, free choice being the basic principle -so one can also chose the legal system of an exotic country- this does not prevent certain protective measures from other states to be applicable. This reality leads to a complex situation where several systems apply simultaneously and where legal certainty is often completely missing. For social security law, the Coordination Regulations [3], aims to make the person concerned subject to one legislation, indicating the home bases as the connecting factor. So, it is quite common that in an international environment as aviation, a complex interplay of labour and social security can be encountered and nothing precludes that to a person the labour law (s) and social security law of different countries apply. But also, due to the different character - public and private- of social security and labour law, it is as such not excluded that transnational companies use this legal complexity and 'shop around' looking for cost-cutting legal social engineering. In some circumstances this could be combined with "bogus" constructions where a particular legislation could be made applicable to workers. This entails that employers can seek to employ individuals in Member States which provide for the economically most advantageous hiring conditions, although this is often to the detriment of the individual employee and its employment reality. Making a worker subject to a "cheaper" social security legislation by playing with the facts and circumstances, so that a State cost-cutting legal engineering which under normal circumstances would not apply is 'made' applicable to their situation, is a paramount example. Some outsourcing techniques have been further inspiration for social engineering and the engineering of bogus constructions.

Our aim is not to provide a comprehensive account of this social engineering and the constructions (we refer the report of Jorens et al., 2015 for the basic schemes of the basis for constructions), but rather to present a set of indicators which, especially when considered collectively, offer meaningful insights and could be seen as red flags that have a signalling function. The latter lead to possible social fraud and social dumping, certainly when they are combined with signals of bogus-constructions. As such they play a yardstick and indicate that it is recommended that further investigation is carried out because

[2] Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I).

[3] Regulation (EC) No 883/2004 of the European Parliament and of the Council on the coordination of social security systems; Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 on the coordination of social security systems.

there is a high probability that we are dealing with a case of circumventing certain legislation. Certainly, people working in a-typical employment situation might become victim of such social engineering, although it can also be found back in typical employment situations. We describe here some of these red flags as well for social security as for labour law. It will remain however a challenging task for (labour) inspection services to control the (a)typical forms of employment (also when the crew is based outside the territory) and to combat possible forms of abuse of (a)-typical work.

The following section does not present a narrative but summarizes the key findings in a pointwise manner. The logic follows from the data analysis and case study results, highlighting patterns that may signal structural issues or potential red flags in the employment and regulatory context of aircrew.

SOCIAL SECURITY LAW

1. Taking into account the home base as connecting factor for social security contributions, it is important to find out where the real home base is situated. As demonstrated above, 12,3% of respondents indicate that they do not consider their official home base to be their real (correct) home base. This percentage is slightly higher for pilots with 14,9%.

2. The social security contributions need to be paid in the country of the home base, if not the case, this could raise questions. On the basis of a case study, we looked at the situation where a discrepancy can be found between the official home base (A), the place where social security contributions are paid (B), and the country of labour law/law applicable to the cooperation. (C) (as such 4 different situations are possible: A≠ B = C, A ≠ B ≠C; A=B=C and A= B ≠ C).

This section presents a case study derived from our survey data, focusing on instances where respondents reported inconsistencies between their officially designated home base, the country in which social security contributions are paid, and the country of the applicable labour law. Such discrepancies provide insight into the complex regulatory and organizational arrangements within the aviation sector, highlighting situations in which the formal administrative framework does not fully align with the operational or legal realities experienced by aircrew. By examining these cases, we aim to illustrate the practical implications of cross-jurisdictional employment and the potential red flags for atypical or non-standard work arrangements.

Based on this case study, it can be inferred that respondents experiencing discrepancies between their home base, the country of social security contributions, and the applicable labour law are five times more likely to be employed in atypical work arrangements compared to the general population, and ten times more likely to work in an ACMI context.

About 5,7 % of the whole population falls within this group of respondents that report an inconsistency. This percentage is slightly higher for pilots with 7,3% of the total population of pilots and slightly lower for cabin crew with 3,5% of the total population of cabin crew.

As shown in Figure 4.17, the majority of respondents in this group are employed by low-cost (30.6%) or ACMI (29.6%) airlines, followed by network carriers (14.8%) and cargo operators (11.8%). The figure also highlights differences from the overall population, enabling a comparison between the case study respondents and the general survey population.

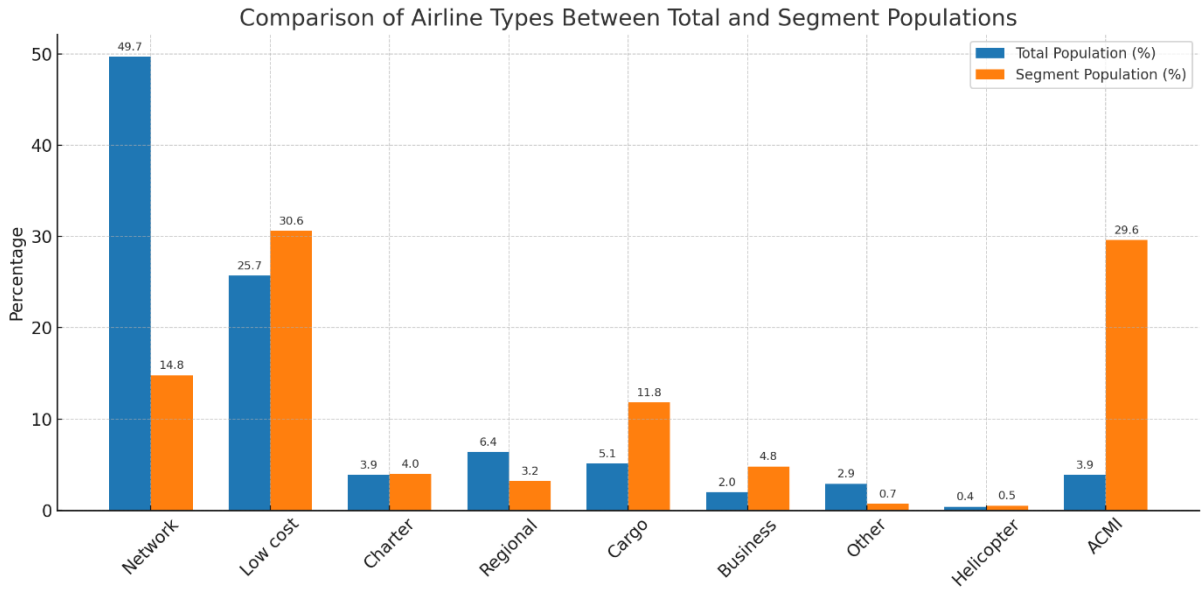


FIGURE 4. 17 COMPARISON OF AIRLINE TYPE TOTAL AND SEGMENT POPULATION

Regarding their relationship with the airline (Figure 4.18), approximately half of these respondents hold a standard employment contract (49.9%), while the other half are employed atypically. Among the atypical arrangements, the largest subgroup consists of self-employed individuals engaged via an agency or broker (29.1%), followed by self-employed personnel contracted directly by the airline (9.8%) and those employed through a temporary work agency (7%).

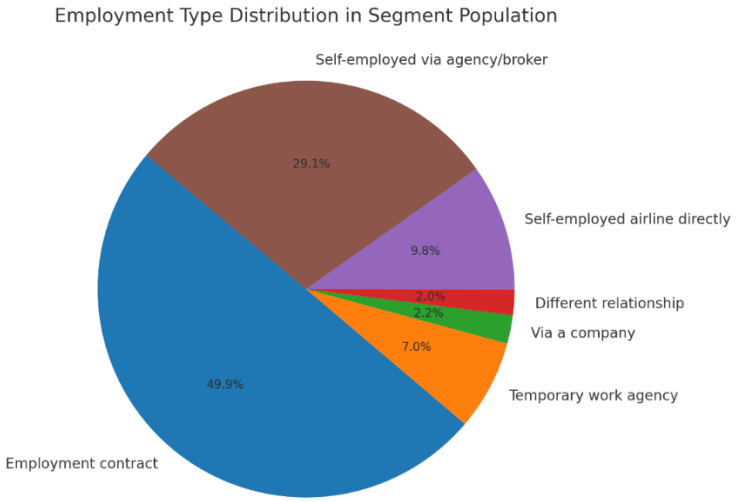


FIGURE 4.18 EMPLOYMENT TYPE DISTRIBUTION IN SEGMENT POPULATION

Figure 4.19 again allows for comparison between the case study respondents and the general survey population.

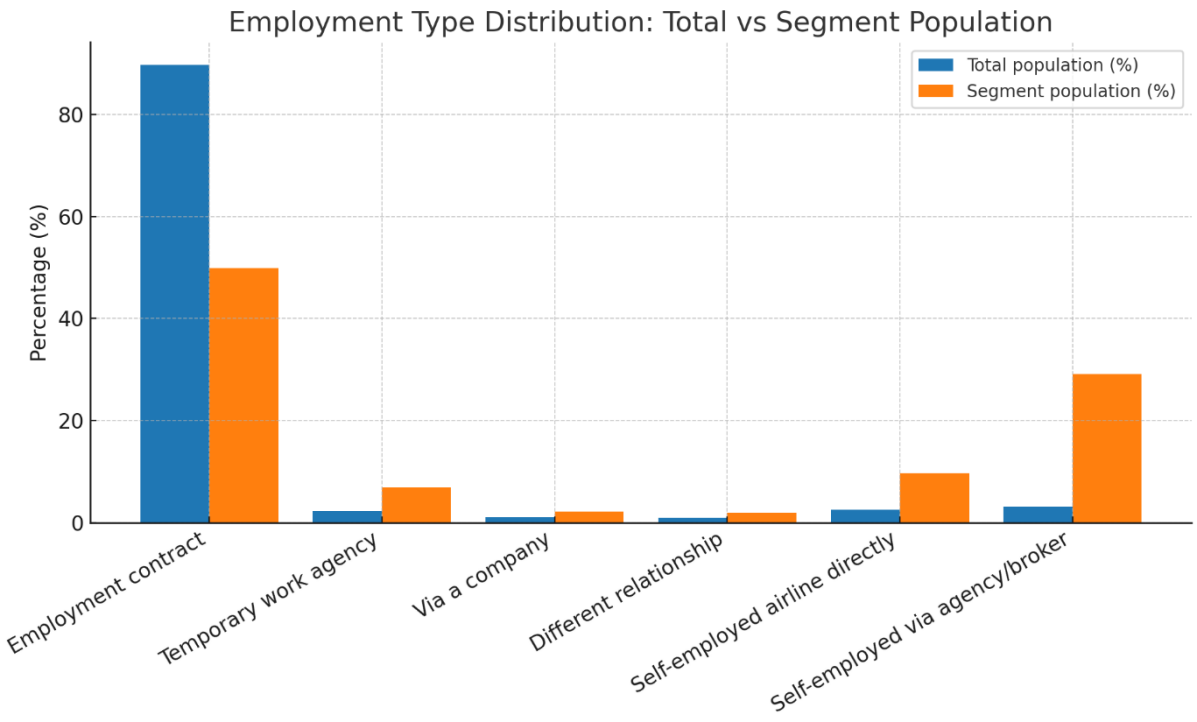


FIGURE 4. 19 EMPLOYMENT TYPE DISTRIBUTION TOTAL VERSUS SEGMENT POPULATION

3. For people working in an atypical situation, there is 3 times more chance that they do not agree with the assigned home base

TABLE 4. 10 HOME BASE REAL? - TYPICAL/ATYPICAL

Home base real?	Typical or atypical employment	
	Typical	Atypical
Yes	91,6%	76,3%
NO	8,4%	23,7%

X^2=186,303, df (1,1), p>.001 (two-sided)

4. But at the same moment we also notice that the home base, a concept that should offer a more stable character for defining the applicable social security legislation, is not always that …stable. At least it is not very complicated to change the home base. From the total research population (pilots and cabin crew) 59,4 % says (see Figure 2.18) that they do not have any input in this decision to change a home base, even without any notice (13,07 %) or in a period from a few days, weeks or months. …A swift change of the home base is as such very plausible and the concept of home base has an empirically supported volatile character.

5. It is up to the operator to decide where the home base is situated, although uncertainties with respect to this concept lead to the situation that the operator cannot be only deemed to be the airline company. Notably, in the general population, nearly one in four respondents (24%) report that the home base is decided by an entity other than the airline's registered or main office—most commonly by the individual employee (15.4% of the total population) or, in some cases, by a local office. This distinction is

significant, as the entity responsible for determining the home base may serve as an implicit indicator of the effective employer.

TABLE 4.11 WHO DECIDES HOME BASE - TYPICAL/ATYPICAL

Who decides where the home base is?	Typical or atypical employment		
	Typical	Atypical	Total
Registered/main office	91,6%	8,4%	100%
Regional/local	84,2%	15,8%	100%
Temporary work agency	17,8%	82,2%	100%
Intermediary	48,3%	51,7%	100%
You yourself	86,7%	13,3%	100%
Other	87,7%	12,3%	100%

X^2=348,6, df (1,5), p>.00

6. Looking within the context of the case study, we can conclude that respondents with a typical contract have 10 times more the chance that the registered office decides where the home base is. In cases where the temporary work agency decides, respondents in the case study have more than 4 times the chance to be atypical.

7. We can also notice that from those respondents who state that the official home base is not the real (correct) home-base, 10 times more people start their shift from the operational base, indicating that the operational base will presumably also be the home base (see relevant table, real home base = 4,7% and not real home base say 43,4%).

TABLE 4. 12 HOME BASE REAL - START SHIFT

Home base real?	Where start shift?		
	Home base	Operational base	Other
Yes	94,1%	4,7%	1,2%
NO	52,1%	43,4%	4,4%

X^2=1348,115, df (1,2), p>.001

8.The assignment of a home base outside Europe, can be seen as another indicator that the home base rule has already become obsolete and allows for new forms of evasion: for the determination of the

social security legislation applicable to a crew Member with a home base outside the European Union, the home base rule would not easily apply, since it falls outside the EU. In most cases, the rules of working in different Member States would apply, which would mostly result in the legislation of the Member State of establishment of the airline being applicable, whereas the home base rule was adopted to avoid this kind of results!

Approximately 1.2% of respondents (83 respondents) report having a home base outside of Europe, primarily in the United Arab Emirates, Saudi Arabia, and Qatar. For the purposes of this study, the United Kingdom (375 respondents) is included within Europe in accordance with the 2014 study (pre-Brexit), and Turkiye is also considered part of Europe.

LABOUR LAW

As we indicated before, to determine the applicable labour law, or the law applicable to the cooperation agreement, is far from easy. The international instrument dealing with this issue in Europe, the Rome I-Regulation[4], works with a multi-stage composite connecting factor. This means that if the first point of connection does not lead to the allocation of the applicable legal system, matters proceed to the next rung on the reference ladder. The general principle of autonomy of the will of the parties applies. However, if the parties have not made a choice, then the law will be specified on the basis of a number of objective points of connection[5]. According to these rules, the worker enjoys the protection of the legislation of the country where he or she does his or her work, i.e. the *lex loci laboris*, not least because it can be expected that the contract of employment will have a close connection with this country.

But even if a choice has been made, the worker can never lose the protection offered by the mandatory provisions of another country with which there is a close connection. These mandatory provisions institute a sort of minimum protection. These are those provisions of labour law installed in favour of the employee and which may not be deviated from by agreement. The free choice for the legal system of an 'exotic country' therefore does not prevent certain provisions of a different legal system from being applicable. In principle, this is the legislation of the country where the worker 'habitually' works in performance of his or her contract, unless the contract of employment is 'more closely connected' with another country. This indicates that it is a matter of exception and must therefore be considered restrictive.[6]

1.Looking at the applicable labour law (see Figure 4.8), 90% reports the country of applicable labour law, being the country of the official home base (i.e. 88,6% for pilots and 92,3% for cabin crew). In 5,8% this is the country of the registered office of the airline one flies for.

For the good order, in principle nothing opposes that for labour and social security law (the home base) a different legislation applies. At the same moment however, differences between these two legislations could be seen as a first indication of possible engineering.

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[4] Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I

[5] Article 4 and following of Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I).

[6] The problem with highly mobile workers of course being the determination of the place where they habitually carry out their activities.

2. Within the case study described above, the biggest diversion regarding proportion from the general population can be noted for the ACMI arrangements. Although ACMI workers represent only 3.9% of the total survey population, they make for 29.6% of the population in the case study based on inconsistencies. In contrast, network airline employees—which account for 49.7% of all respondents—make only 14.8% of the respondents that are part of the case study.

3. Among respondents included in the case study, 35.6% believe that their official home base does not reflect the actual or 'real' home base (see figure 4.20), in contrast with 12,3% in the general research population.

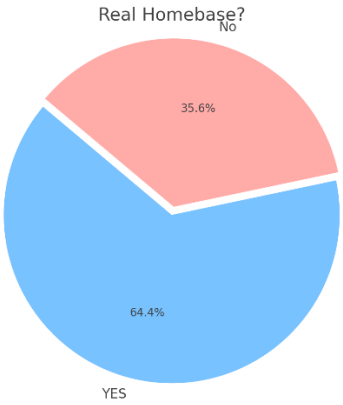


FIGURE 4. 20 REAL HOME BASE IN SEGMENT POPULATION

4. Among respondents experiencing discrepancies between their official home base, the country of social security contributions, and the country of applicable labour law (the case study), 50.1% are employed atypically. Of these respondents with an atypical employment situation, 42 % indicates that the labour legislation applicable to their cooperation is related to the registered office of the airline company, but an almost even high number (40%) indicates that another country is competent (see Table 4.13). Only a very limited number of people, 9%, stated that this is the country where the official home base is located. Also, only 7,5% indicate that this is the country where they established their own company.

This does show that the relation between the service provider and the client, is clearly dominated by …the client who will determine the conditions/price for cooperation.

TABLE 4. 13 ATYPICAL EMPLOYED - LABOUR LAW RELATED TO…

Home base	Registered office airline company	Registered office own company	Country where I live	Other
Count = 18 9%	Count= 84 42%	Count= 15 7,5%	Count= 3 1,5%	Count= 80 40%

5. This is also further demonstrated when looking at the relation between these respondents and the question from whom they get their instructions? E.g. from those people who collaborate as a self-employed via an agency/brooker (3,2% of the general population), 29% in our case study population 86,2% indicates that they get their instruction via the registered office of the airline company. For self-employed people (2,6% of the total population), almost 10% (9,8%) in the case study population that is 89,7%.

CHAPTER 5 WELLBEING AND MENTAL HEALTH

"I feel like a criminal just for being sick"

"xxx does not value me as an employee. It treats me as a Crewcode (number) and nothing else. There is no regard for Mental wellbeing or physical wellbeing. It prides itself in profit over human wellbeing. It has a poor toxic workplace culture and a culture of fear. This fear originates from the amount of people they sack for stupid reasons and because they can get away with it…"

INTRODUCTION

This chapter addresses the central issue of physical and mental wellbeing among cockpit and cabin crew in European aviation. Wellbeing, understood here in a multidimensional sense, is analysed through a combination of indicators including self-reported physical health, medication use, fatigue, mental health status, experiences of (de)humanization in the workplace, and levels of job insecurity. These elements are not only essential to assess the individual quality of working life, but are also increasingly recognized as key determinants of operational safety in high-responsibility sectors such as aviation.

We begin with a descriptive overview of the current state of wellbeing among aircrew, drawing from the 2023 survey data and, where possible, comparing results with earlier datasets from 2020 and 2021 to identify potential trends or shifts over time. Particular attention is given to fatigue and its reporting, the use of medication as a coping mechanism, and the perceived erosion or reinforcement of human dignity in the workplace.

The chapter then proceeds to a more granular analysis of wellbeing outcomes by subgroups, including occupational role (pilot v. cabin crew), age group, and geographic region. This approach enables us to detect structural differences in experience and vulnerability, and to highlight which groups may be most at risk under the current employment conditions. The insights gained here will feed into the broader reflection on how employment practices and organisational cultures affect both the health of workers and the safety of the sector, allowing reflections about the current legal framework.

WELLBEING AND MENTAL HEALTH IN EUROPEAN AVIATION

The wellbeing and mental health of aviation personnel—particularly cockpit and cabin crew—have become increasingly prominent concerns within the European aviation sector. This evolution reflects broader shifts in working conditions, employment precarity, and operational demands that have reshaped the landscape in which crew members operate. Research shows that flying personnel are exposed to a range of stressors, including irregular schedules, fatigue, time zone shifts, high responsibility, and limited autonomy, all of which can contribute to mental strain (Bor et al., 2010; Kole et al., 2024).

Fatigue and work-related stress remain central issues. While aviation has long recognized the operational risk posed by fatigue, especially for flight crew, the lived experiences of crew members

suggest that current regulations do not always adequately reflect actual workload or rest opportunities (see Chapter 6 Safety). Studies highlight the cumulative effect of duty time, standby periods, and sleep disruption on both physical health and cognitive performance (Caldwell et al., 2009; Jackson & Earl, 2006). For cabin crew, the increasing commercial pressure to engage in inflight sales, alongside safety and service responsibilities, has added to psychological strain (Shi et al., 2024).

Dehumanizing management style and the absence of transformational leadership further erode mental wellbeing. The growth in non-standard employment contracts—such as zero-hour contracts, self-employment, and agency work—has led to heightened insecurity and reduced access to social protection for many crew members (Valcke, 2024). Empirical studies confirm that perceived job insecurity is a strong predictor of anxiety, depression, and reduced job satisfaction (De Witte et al., 2016; Virtanen et al., 2005). In aviation, this is compounded by the transnational nature of employment, which often leaves workers uncertain about applicable labour rights, home base status, and entitlements under social security systems (Jorens et al., 2015).

The COVID-19 pandemic intensified these trends, with many crew facing furlough, layoffs, or rapidly changing contractual conditions. Several studies reported a sharp increase in mental health issues among aviation workers during this period, including symptoms of burnout, PTSD, and chronic stress (Elliott et al., 2023; Brooks et al., 2020). Though traffic has since resumed, the psychological aftermath continues to affect the workforce but further data is needed to evaluate the situation anno 2025, we want to contribute to this knowledge with this study building on the research done in the framework of the dissertation of Dr. Valcke (Valcke, 2024). The study revealed that over the past decade, there has been a notable decline in working conditions, exacerbated by the COVID-19 pandemic and the green transition. These factors have intensified stressors related to wages, job security, and working conditions, leading to a more dehumanizing management style. Consequently, the mental and physical well-being of crew members has significantly deteriorated, with a corresponding negative trend in safety behavior. A key finding of the research is the identification of union satisfaction as a significant buffer against these adverse effects. The study emphasizes that, despite heightened awareness of the impact of well-being on safety, airline management often fails to recognize the correlation between human capital and safety outcomes. This oversight underscores the need for a paradigm shift in the aviation industry, advocating for a more human-centred approach to employment and safety practice

Stigma around mental health also remains a barrier. Despite growing awareness, pilots and cabin crew are often reluctant to report psychological distress, fearing repercussions for their medical certification or employability. Research suggests that mental health-related self-reporting is underrepresented and that fear of losing the license remains a major deterrent (Wu et al., 2016). This culture of silence may hinder early intervention and increases the risk of undetected mental health problems affecting both individual wellbeing and operational safety.

To address these challenges, aviation regulators and employers must adopt a comprehensive, preventive approach to mental health and wellbeing—one that includes improved work-rest balance, psychosocial risk assessments, non-punitive reporting systems, and accessible psychological support. In addition, harmonized European labour law protections could mitigate the mental health impacts of fragmented and precarious employment arrangements. We will go into those elements in the reflection section of this chapter.

RESULTS

DESCRIPTIVES

PHYSICAL HEALTH AND MEDICATION USE

How would you generally assess your physical health in the past four weeks?

1. Very bad
2. Bad
3. Moderate
4. Good
5. Very good

The general health is mostly evaluated as good (43,5%) and moderate (27,4%) by the participants (N= 6963) of the study. In total around 42% of them are not positive about their physical health (Very bad (1,9%), bad (12,7%) and moderate). 14,4% report their physical health as very good.

Pilots report slightly higher positive results; with 48,3% good and 18,7% for very good. The segment that is not positive is smaller with 33,1% (Very bad (1,2%), bad (8,7%) and moderate (23,2%). For cabin crew, we see less positive results: 7,1% for very good, 35,6% for good and 57,2% not positive (moderate (34,5%), bad (19,5%), very bad (3,2%)).

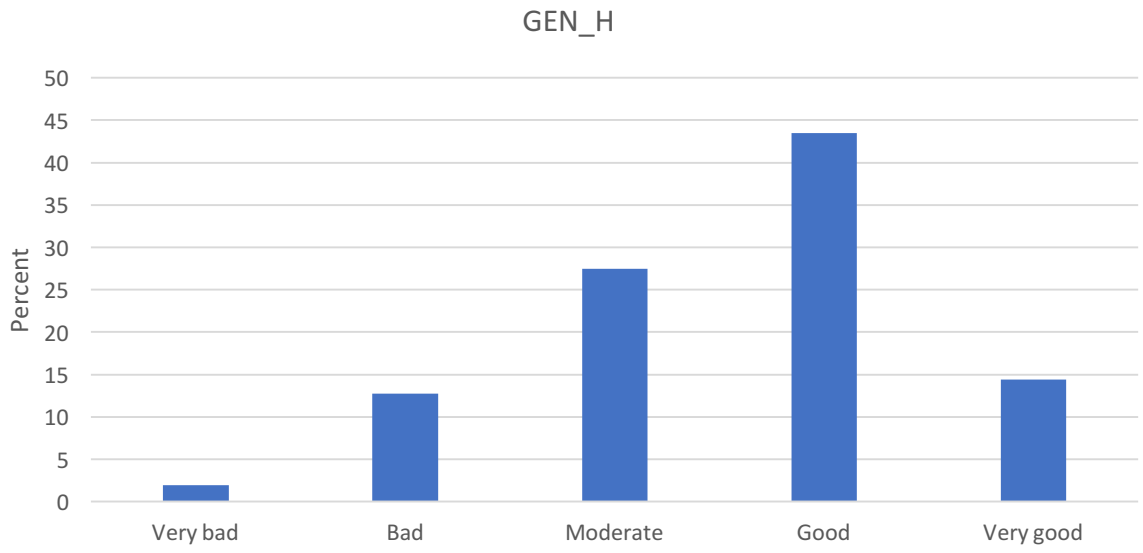


FIGURE 5. 1 HOW WOULD YOU ASSES YOUR PHYSICAL HEALTH IN THE PAST FOUR WEEKS?

Compared to 2014 (only pilots!): not asked in 2014 but we do have data from 2020 and 2021. In 2020, almost 50% of respondents said that their physical health was good or very good. In 2021, the segment that reported good and very good was higher with 65%. For pilots, it was 62,5% at that moment in time, and for cabin crew 64,7%.

How often did you use the following types of medication in the past four weeks?
(*Never – once a week – 2or 3 times -4to6 times a week- daily)*

1. Sleep medication
2. Pain killers
3. Antidepressants
4. Anti-anxiety medication
5. Amphetamines
6. Alcohol

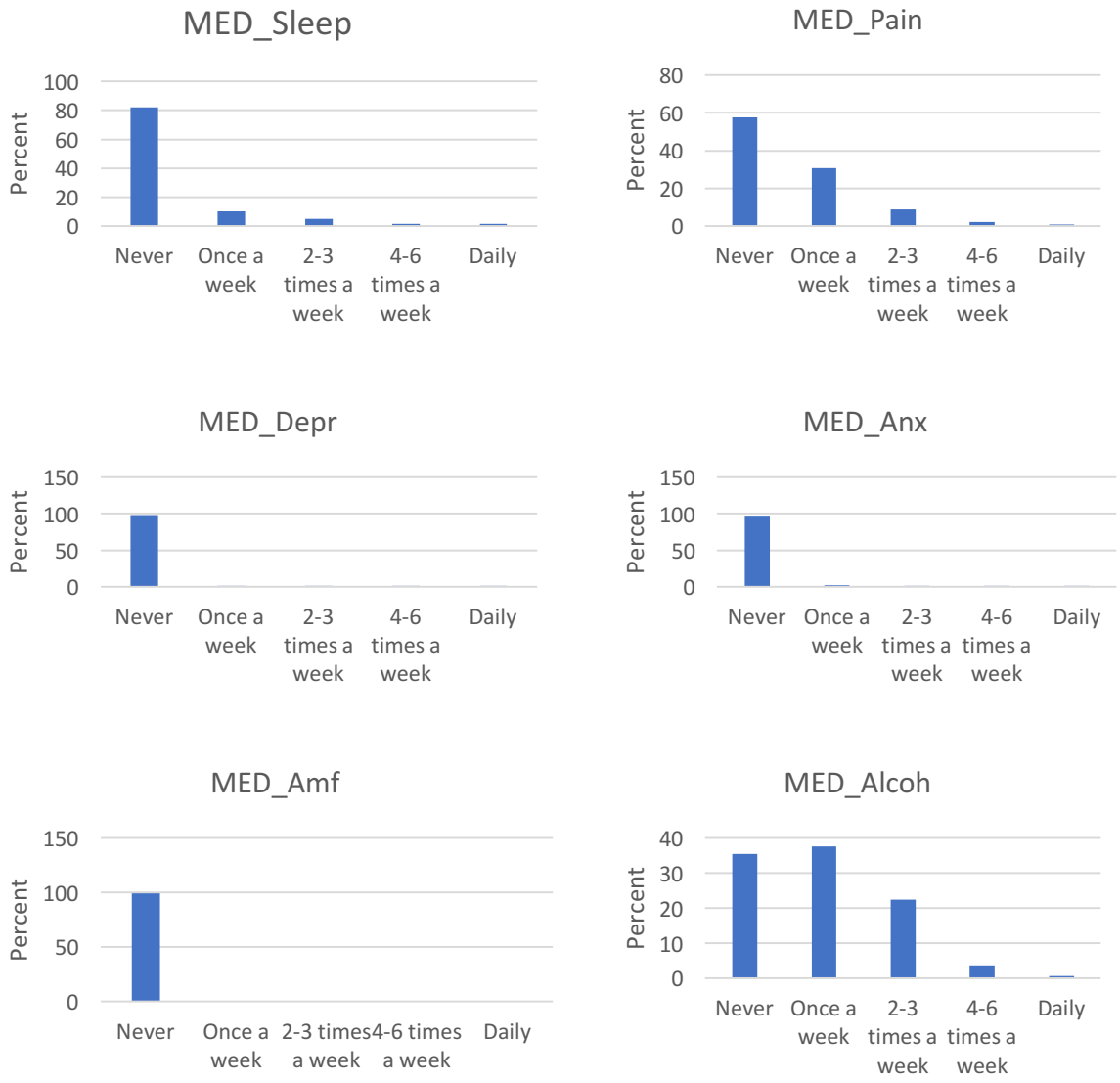


FIGURE 5. 2 MEDICATION USE

The reported medication use is low, with the highest results for alcohol where 37,6% says that they drink once a week (pilots 38,4%, cabin crew 36,3%), 22,4% 2 to 3 times a week (pilots 24,9%, cabin crew 18,2%), 3,8% 4 to 6 times a week (pilots cabin 4%, crew 3,4%) and 0,7% said that alcohol use was a daily occurrence (pilots 0,5% and cabin crew 1%). Followed by the use of pain medication where 30,7% (26,5% for pilots, cabin crew 37,6%) says that they use it once a week (over the past four weeks), 8,7% 2 to 3 times a week, 2,2% 4 to 6 times a week and 0,8% daily.

HUMANIZATION AND DEHUMANIZATION

The following expressions gauge your vision of the attitude of the airline towards you, as their worker. To what extent do you agree with the following statements regarding your experience in the past four weeks?

(Strongly disagree – disagree - somewhat disagree- agree nor disagree-somewhat agree- agree- strongly agree)

1. My airline values my contribution to its wellbeing
2. My airline strongly considers my goals and values.
3. My organization really cares about my well-being
4. My airline makes me feel that one worker is easily as good as any other
5. My airline would not hesitate to replace me if it enabled the company to make more profit
6. If my job could be done by a machine or a robot, my airline would not hesitate to replace me by this new technology
7. My airline considers me as a tool to use for its own ends
8. My airline considers me as a tool devoted to its own success
9. My airline makes me feel that my only importance is my performance at work
10. My airline is only interested in me when they need me
11. The only thing that counts for my airline is what I can contribute to it
12. My airline treats me My airline treats me as if I were a robot
13. My airline considers me as a number a robot
14. My airline treats me as if I were an object

The first three statements measure organisational humanization and the other eleven measure organisational dehumanization. The higher the sum score on organisational humanization (org_pos) the more they feel valued and supported by the airline/organization, this with a minimum score of 3 and a maximum of 21. Above 15 can be considered a positive reporting about organisational humanization. 76,5% of respondent's (N= 5274) report result below 15, in thus reflecting a negative perception of the humanization attitude of the employer. For pilots that number is lower with 71,3% under the threshold, and for cabin crew higher with 85,4% under the threshold.

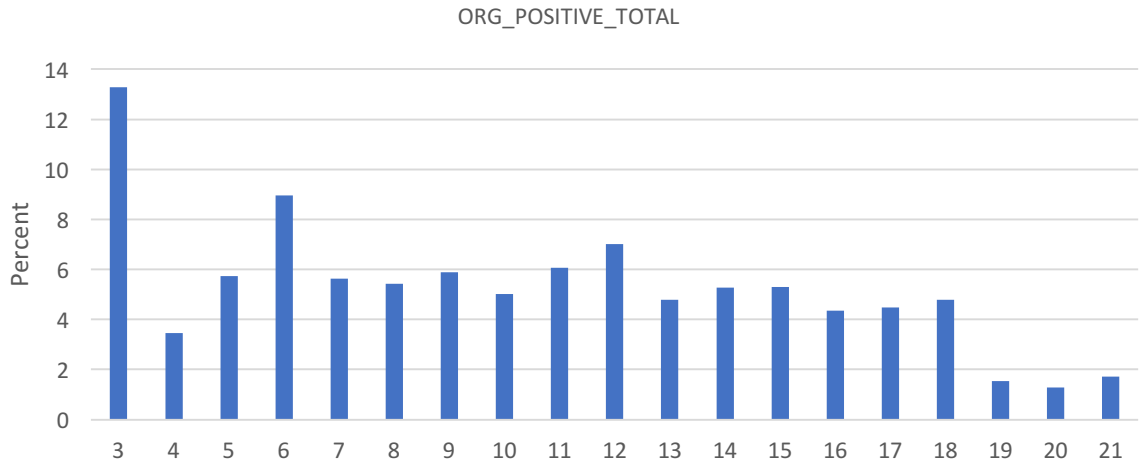


FIGURE 5. 3 HUMANIZATION TOTAL

For organisational dehumanization, we note that the higher one's scale sum score for organizational dehumanization, the more one is considering him- or herself or experiencing dehumanized by his/her organization. The minimum score is 11 and the maximum score is 77. The threshold is 44 (11 statements at neutral of confirming level). Experience with organizational dehumanization in study sample is high with a mean of 55,36 out of a maximum of 77, and with a large standard deviation (SD= 14,78). 78,3% scores above the threshold. For pilots that number is 72,5% and for cabin crew it is 88%.

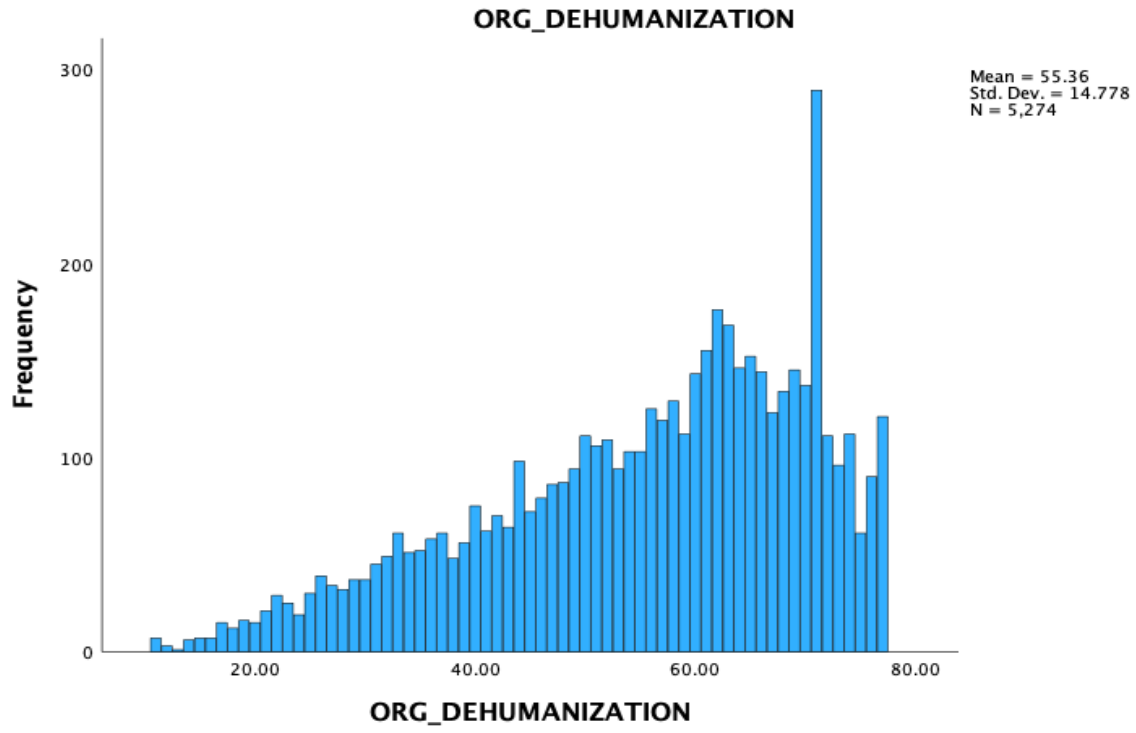


FIGURE 5. 4 DEHUMANIZATION TOTAL

Compared to 2014 (only pilots!): not asked in 2014 but we do have data from 2020 and 2021 (pilot and cabin crew). Results for organisational dehumanization in the study sample of 2020 was high (M=55,30 out of a maximum of 77) with a large standard deviation (SD= 15,36). Experience with organizational

dehumanization in study sample of 2021 was also high with an even higher mean than in 202O (M=56,01 out of a maximum of 77) with a large standard deviation (SD= 14,951).

In 2021, we added organisational humanization and noted that a positive attitude of the company towards their employees is experienced by a low number of respondents, 77,3% reports levels below the neutral statements. (M= 9,8 out of a maximum of 21, SD= 5,12). For pilots this was 74% and for cabin crew 81%.

MENTAL HEALTH

Below are some statements about feelings and thoughts, please tick the box that describes your experience in the past four weeks?

(much less than usual – not as often as usual – as often as usual- more than usual)

1. I have been feeling optimistic about the future
2. I have been feeling useful.
3. I have been feeling relaxed
4. I have been feeling interested in other people
5. I have had energy to spare
6. I have been dealing with problems well
7. I have been thinking clearly
8. I have been feeling good about myself
9. I have been feeling close to other people
10. I have been feeling confident
11. I have been able to make up my mind about things
12. I have been feeling loved
13. I have been feeling interested in new things
14. I have been feeling cheerful

The higher one's mental health scale sum score, the higher/better one's self reported mental health, the minimum possible score is 14 and the maximum possible score is 56. We see that the results are low as shown by a mean sum score on the scale of 34,17 out of maximum of 56 (SD=7,41). The threshold for positive results is 42 and above (as often as usual (3) and more than usual (4) x 14). 68,1% of the respondents fall below that threshold and a 16,3% exactly meets the neutral standard of 42. For pilots 60,7% falls below (20,9% meets the neutral standard) and for cabin crew we note that 80,4% fall below the threshold, and 8,8% meets the neutral standard of 42.

Compared to 2014 (only pilots!): not asked in 2014 but we do have data from 2020 and 2021 (pilot and cabin crew). Results for mental health in the study sample of 2020 is low as shown by a mean sum score on the scale of 32,35 out of maximum of 56 (SD=8,75), and a mean item score of 2,3 (32,35/56) on the applied 4-point answer scale. In 2021, the results for the total group of respondents was also low as shown by a mean sum score on the scale of 34,95 out of maximum of 56 (SD=8,38), and a mean item score of 2,5 on the applied 4-point answer scale. For cabin crew the mean sum score on the scale was

34,87 out of maximum of 56 (SD=8,47) and for pilots the mean sum score on the scale was 35,02 out of maximum of 56 (SD=8,32).

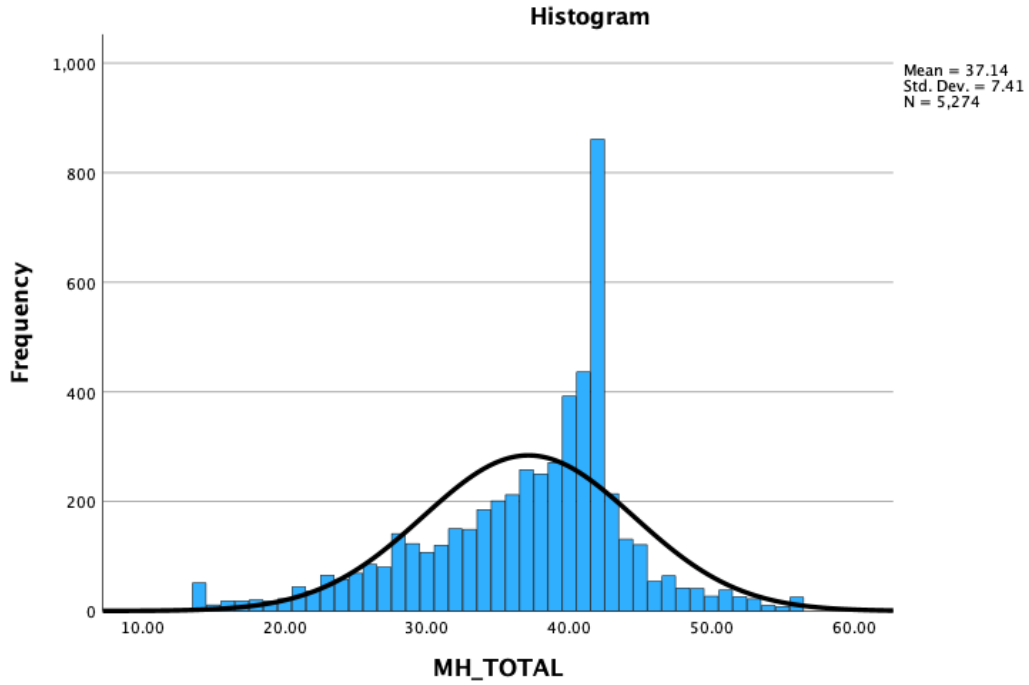


FIGURE 5. 5 MENTAL HEALTH TOTAL

Regarding my psychological health and safety, for example during the COVID-19 pandemic, I know where or whom to go to within the structure of the airline if needed

1. Yes, I know where to go to, and I would address these matters internally (at work, with body within organisation or appointed by the employer).
2. Yes, I know where to go to but I would never address these matters internally (at work, with organ within organisation or appointed by the employer)
3. No, I don't know
4. No, because there is no organs/person/… appointed by the employer
5. Other

45,8% of respondents know where to go and would address these matters internally, the other segment of the respondent is not willing or does not know about a point of contact where they can go about their psychological health and safety. 32,3% says that they know where to go but that they are not willing to address this within the context of their airline company. 14,2% does not know where to go and 5,2% says that there is no point of contact. 2,4% say other. Other is for example: "Yes, I partially know where to go, but having taken advantage of those resources they did more harm than good." And "Yes, I know where to go but the pressure of the airline or the financial costs often make me don't want to go". For pilots, we see that 48,9% of them know where to go and would address these matters internally. 31,7% say that they would not address these matters internally and 12,8% does not know where to go. From cabin crew 40,6% would address these matters internally, the other segment of the respondent is not willing of does not know about a point of contact where they can go about their

psychological health and safety. 33,4% says they would not address these matters internally and 16,7% does not know where to go.

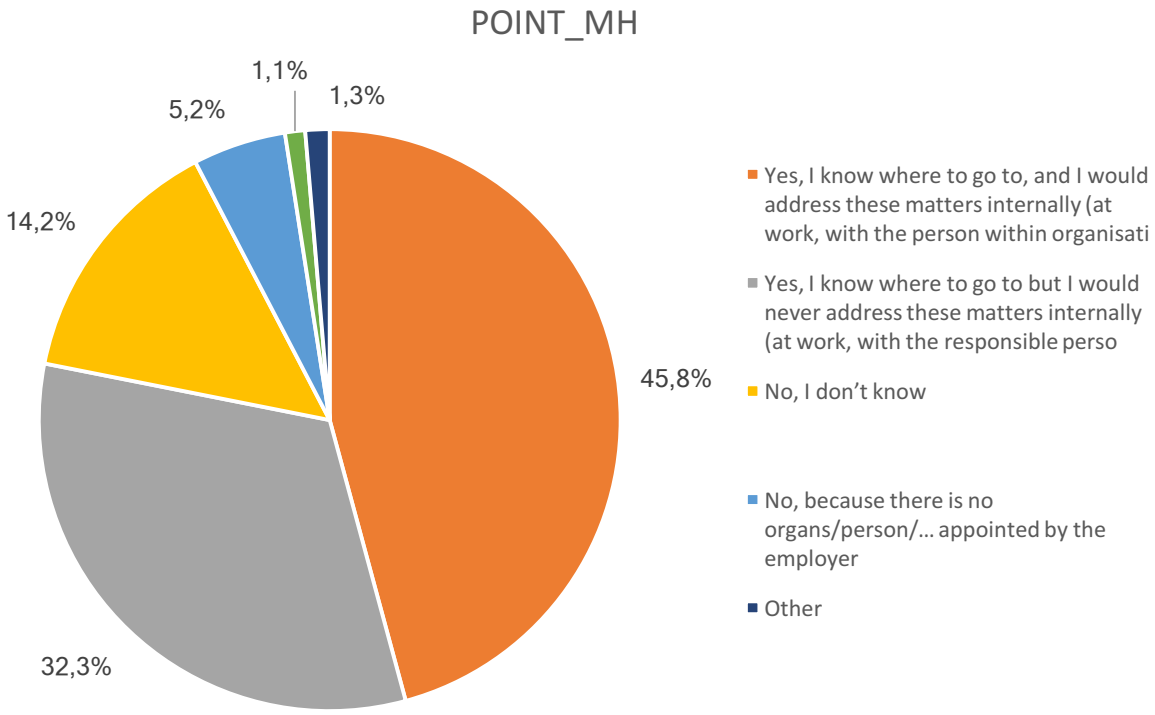


FIGURE 5. 6 DO YOU KNOW WHERE TO GO REGARDING YOUR (MENTAL) HEALTH?

Compared to 2014 (only pilots!): not asked in 2014 but we do have data from 2020 and 2021 (pilot and cabin crew). In 2021 44,4% of pilots knew where to go with mental health issues within the company and would address these with this institution.

JOB INSECURITY

Please indicate to what degree you can agree with the following statements
(Strongly disagree –somewhat disagree- Neither agree nor disagree-somewhat agree- strongly agree)

1. Chances are, I will soon lose my job
2. I feel insecure about the future of my job

FIGURE 5. 7 JOB INSECURITY TOTAL

The higher the score, the higher the job insecurity. The minimum score is 2 and the maximum score is 10. We consider results between 1 and 5 as positive (61,1%, pilots 68,2% and cabin crew 49,3%), 6 and 7 as moderate (26,7%, pilots 22,3% and cabin crew 34,1%) and from 8 to 10 (12,2%, pilots 9,5% and cabin crew 16,6%) as true job insecurity.

RELATIONSHIP BETWEEN RESEARCH VARIABLES AND SUBGROUPS

This section examines the associations between well-being dimensions and key factors including age, employee group, type of airline, and home base location in Eastern Europe. The analysis aims to uncover patterns in mental and physical health, job insecurity, organizational managerial climate, and perceptions of dehumanization across different subgroups within the European aviation workforce.

GROUP

An analysis was conducted comparing pilots and cabin crew using independent samples t-tests (two-sided). For most variables, equal variances could not be assumed; therefore, Welch's correction was applied. Only in the case of job insecurity and safety work climate did Levene's test show no significant differences in variances, so the first reported value was used (equal variances assumed). The mean difference provides an indication of both the size and the direction of the differences between the groups.

The results show that pilots report significantly higher results for general health than cabin crew ($F(1, 5271) = 19.174$, $p < .001$). With regard to medication use, cabin crew score significantly higher, indicating more frequent medication use ($F(1, 5272) = -13.288$, $p < .001$). On positive organizational climate, pilots report more favourable outcomes ($F(1, 5272) = 12.394$, $p < .001$). Dehumanization is significantly higher among cabin crew, meaning that pilots again report more favourable experiences ($F(1, 5272) = -14.673$, $p < .001$). For mental health, pilots report significantly more favourable scores ($F(1, 5272) = 17.624$, $p < .001$). Finally, regarding job insecurity, cabin crew report higher levels of insecurity, while pilots experience more stability ($F(1, 5272) = -14.134$, $p < .001$).

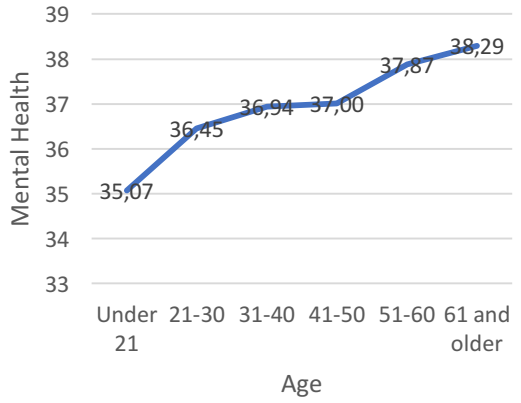
In sum, across nearly all indicators pilots show more favourable outcomes than cabin crew, with significant differences in health, medication use, organizational climate, dehumanization, mental health, and job insecurity.

AGE

Older aircrew show greater awareness of where to seek mental health support, with a clear linear relationship between age and this knowledge and willingness. The proportion reporting "don't know" decreases from 33% in the youngest group to 7% in the oldest group, while the proportion indicating "there is none" remains consistent across all age groups ($F(1,25) = 118.83$, $p < .001$). Willingness to address mental health issues internally does not vary substantially by age.

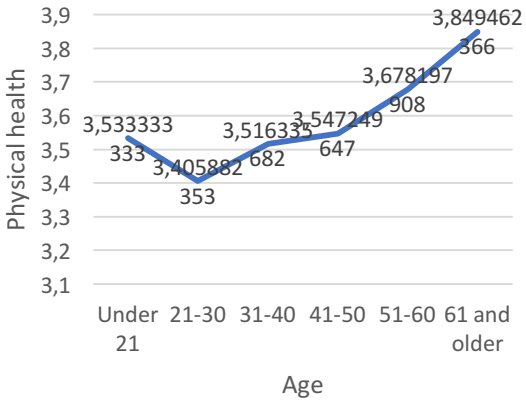
Mental Health

Mental health outcomes show a significant age effect. Crew aged 21–30 report poorer mental health compared to those aged 51–60 ($p < .001$), indicating that older workers experience better mental well-being. Among pilots, the least favourable outcomes are found in the youngest group (21–30) and those aged 41–50.



Physical health

General health shows a significant difference when looking at age group-level. Crew aged 21–30 report poorer general health compared to the older segments of the population, specifically those aged 51–60 and 61 and older ($p < .001$), indicating that health outcomes improve with age. Among pilots, the 31–40 age group reports less favourable general health compared to colleagues aged 51–60 and 61 and older.

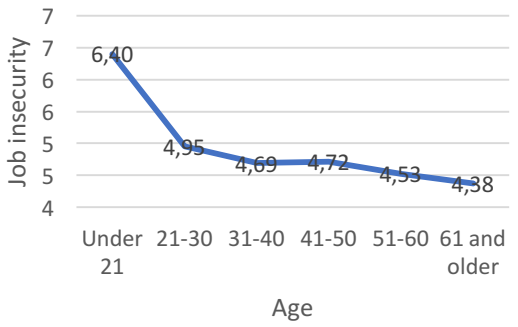


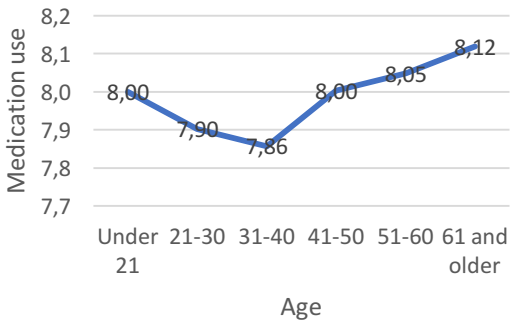
Job insecurity

Job insecurity shows a clear age-related pattern. Crew members aged 21–30 report significantly higher levels of insecurity compared to those aged 51–60 ($p < .001$) and those aged 61 and older ($p < .01$). This indicates that older crew experience greater stability and security in their employment, while younger crew feel more vulnerable.

Medication use

When analysing outcomes across age groups, no significant differences were found in medication use for the total population. However, among pilots a clear age effect emerged: those aged 21–30 reported significantly less favourable outcomes compared to the 41–50 and 51–60 age groups.



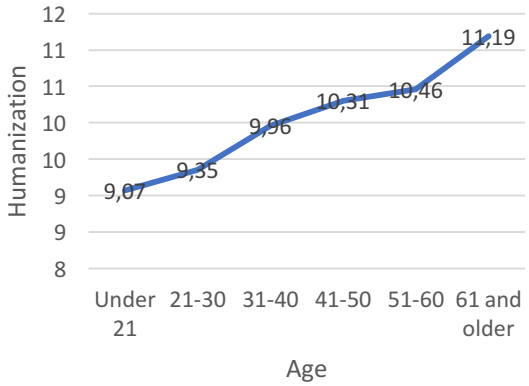


Humanization

Humanization scores reveal an age effect in the total population: crew aged 21–30 report significantly less favourable perceptions compared to all older group above 41. Among pilots, however, differences across age groups are not statistically significant.

Dehumanization

Dehumanization does not show significant differences between the age groups.



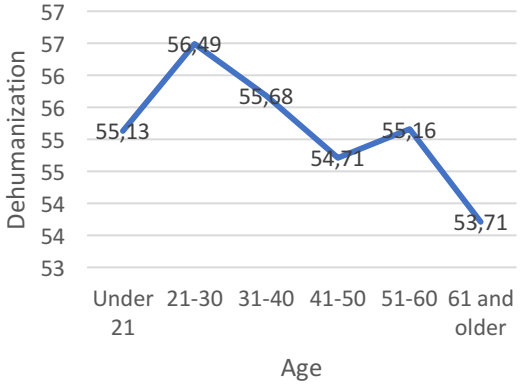


FIGURE 5. 8 RELATIONSHIP AGE - WELLBEING DIMENSIONS

Across the different dimensions of well-being, a consistent age effect emerges: younger crew members, particularly those aged 21–30, tend to report less favourable outcomes in terms of general health, mental health, job insecurity, and perceptions of the organizational climate. In contrast, older age groups, especially those aged 51–60 and 61 and above, consistently report more favourable outcomes, reflecting greater stability, resilience, and more positive evaluations of their work environment. While some nuances exist within the pilot population, the overarching trend suggests that well-being in the aviation sector improves with age and experience, highlighting younger crew as a more vulnerable group.

KIND OF AIRLINE

The kind of airline is predictive for significant differences with most analyses, with the exception of medication use (not significant at *p*>.001 level). Taking into account unequal variances between groups, the alternative Tamhane F value was considered, thus remaining conservative with our interpretations of the data.

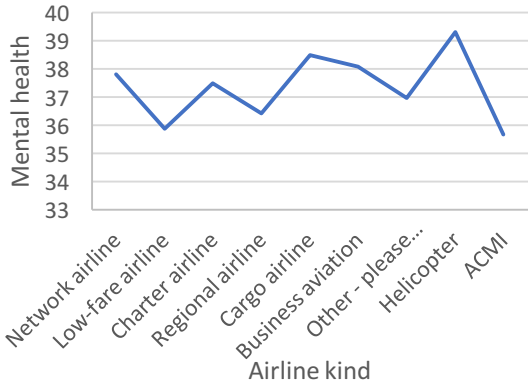


FIGURE 5. 9 AIRLINE KIND - MENTAL HEALTH

Mental health by airline type (higher scores = better) reveals several significant differences (F=11.55, df(8,5265, *p* < .001). Network airlines score significantly higher than both low-fare carriers (*p* < .001) and ACMI operators (*p* < .05). Low-fare airlines report significantly poorer outcomes than network and cargo airlines (*p* < .001). Respondent working for cargo airlines report significantly higher results than both respondents working for low-fare and ACMI (*p* < .001). Finally, ACMI shows the worst results, scoring significantly lower than cargo (*p* < .001).

Results for the association of physical health and the kind of airline only shows a limited number of significant differences (F=10.87, df(8,5265, *p* < .001). Network airlines report significantly more favourable outcomes than both low-fare carriers and ACMI operators (*p* < .001). Low-fare airlines perform significantly less favourable than network and cargo airlines (*p* < .001). Cargo airlines, in turn, report significantly more favourable physical health outcomes than low-fare airlines (*p* < .001).

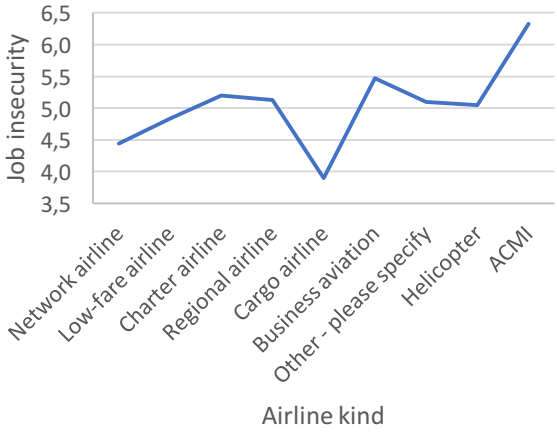


FIGURE 5. 10 AIRLINE KIND - JOB INSECURITY

Job insecurity in correlation with the airline type shows distinct patterns (F=30.44, df(8,5265, *p* < .001). Respondents working for network airlines report significantly lower job insecurity (*p* < .001) compared to low-fare, regional, business, and ACMI carriers, with only cargo performing slightly better. Low-fare airlines score significantly worse than network and cargo (*p* < .001), but still significantly (*p* < .001) better than ACMI. Charter airlines also differ significantly (*p* < .001), with outcomes worse than cargo but better than ACMI. Regional airlines report higher insecurity than network and cargo (*p* < .001), yet significantly better outcomes than ACMI. Cargo stands out with the most favourable results, scoring significantly better than all types except helicopter and "other." ACMI, by contrast, records the worst outcomes, performing significantly worse than all categories except business, helicopter, and "other."

Humanization knows the following significant differences when looking into the association with the kind of airline company (F=25.35, df(8,5265, $p < .001$); respondents that work for network airlines report significantly ($p < .001$) higher results for humanization (better) than the respondents working for low-fare airlines and ACMI. Low-fare airline workers, in turn, report significantly ($p < .001$) lower numbers for humanization than the ones working for network airlines, cargo airlines and business aviation. Cargo outcomes are significantly ($p < .001$) higher than for low-fare airlines and ACMI. Finally, respondents working for ACMI's report significantly ($p < .001$) lower scores than the ones working for network and cargo.

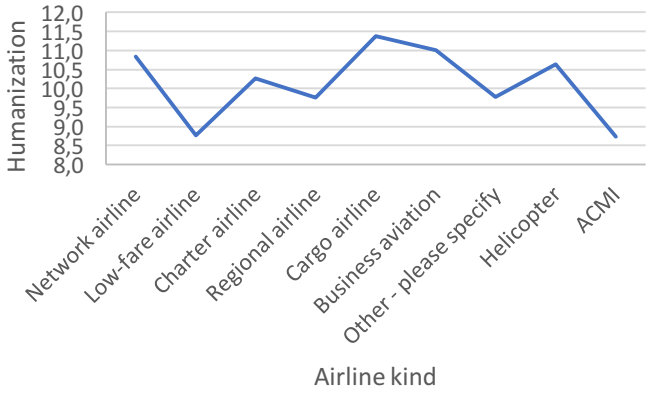


FIGURE 5. 11 AIRLINE KIND - HUMANIZATION

To conclude our analysis of the relationship between well-being dimensions and airline type, we examine dehumanization (F=32.77, df(8,5265, $p < .001$). Significantly less positive outcomes are observed for employees of low-fare airlines and ACMI compared to network airlines. Low-fare airline staff report notably higher dehumanization scores ($p < .001$) than those in network, charter, regional, cargo, and business aviation. Charter employees fare significantly better than low-fare ($p < .001$) and ACMI staff ($p < .05$). Regional airlines also show significantly more positive outcomes than low-fare ($p < .001$), while cargo employees outperform both low-fare and ACMI ($p < .001$). ACMI respondents, in contrast, report the least favourable outcomes, scoring worse than network and cargo airlines.

Awareness about where to go about matters of wellbeing, is highest among personnel working for cargo and network airlines, while it is lowest in ACMI operations (31%). Between 30% and 38,7% of respondents are unwilling to address mental health issues internally. The highest levels of uncertainty ("don't know") are reported by personnel in ACMI (20%), low-fare (19,2%) and business aviation (18,9). The absence of an internal support organ is most pronounced in ACMI (14.2%), compared to low-fare airlines (8.4%) and less than 5% in all other airline types ($F(1,40) = 248.76$, $p < .001$).

Overall, the analysis reveals that airline type is a strongly associated with well-being outcomes. Network and cargo airlines consistently show the most positive results across dimensions such as mental health, physical health, humanization, and dehumanization, while low-fare and ACMI operators tend to perform poorer, with ACMI employees often reporting the least favourable outcomes. Charter, regional, and business aviation generally fall in between, highlighting clear differences in workplace conditions and perceived well-being across airline types.

HOME BASE IN EASTERN EUROPE

Analysis by home base region reveals notable differences in well-being outcomes. Respondents based in Eastern European countries report significantly lower physical health compared to those based elsewhere (t= 3.05, df(1,5271, $p < .01$). Levels of humanization are also significantly (t= 7.21, df(1,5272, $p < .001$) lower for Eastern Europe (mean = 8.1) compared to other regions (mean = 10.2), while

organizational dehumanization (t=-5.85, df(1,5272), p <.001) is higher (worse) in Eastern Europe (mean = 60) versus non-Eastern Europe (mean = 55, p < .001). Additionally, mental health scores are significantly lower for Eastern European respondents (t=3.64, df(1,5272,p < .001), and job insecurity is markedly higher in this group (t= -6.53, df(1,5272), p < .001), highlighting a consistent pattern of more challenging working conditions in Eastern European home bases.

In summary, respondent based in Eastern Europe consistently report lower well-being and higher job insecurity, indicating more challenging working conditions compared to their counterparts in other regions.

TYPICAL/ATYPICAL EMPLOYMENT

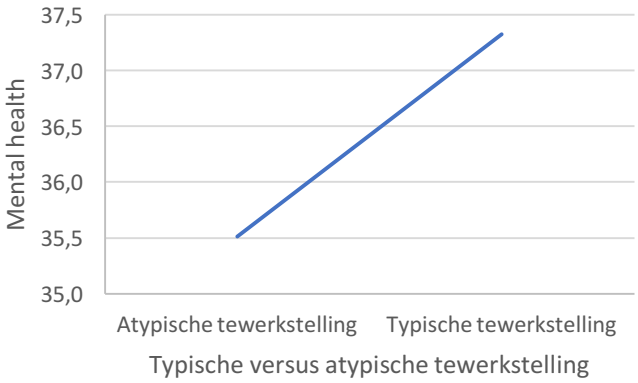


FIGURE 5. 12 TYPICAL/ ATYPICAL - MENTAL HEALTH

First, in terms of wellbeing; the results again indicate significant differences (F = –5.36, df(1,5272), p < .001). Mental health outcomes were more favourable among typically employed crew members compared to their atypically employed counterparts. This suggests that the contractual framework under which crew operate is associated with meaningful differences in perceived well-being. Dehumanization scores are significantly more favourable for those in typical employment compared to atypical contracts, and job insecurity is also significantly lower for typical workers than for those in atypical arrangements (p < .001). No significant differences were observed in medication use between the two groups.

Among those in typical employment, 48% reported that they know where to go within their organization for well-being support. In contrast, only 28% of atypically employed respondents indicated the same. The proportion of respondents unwilling to address well-being issues internally was similar across both groups. However, significant differences emerge in other categories: 24.2% of atypically employed respondents stated that they do not know where to turn, compared to 13.1% of those in typical employment. In addition, 11.8% of atypical respondents indicated that no internal body or mechanism was available to address well-being concerns, whereas this was reported by only 4.4% of typically employed respondents.

Together, these findings underline that atypical employment is not only linked to contractual and organizational differences but also has implications for individual outcomes in terms of safety reporting and mental health. While atypically employed crew appear less likely to report safety issues, they also demonstrate lower levels of well-being, highlighting the complex interplay between employment structures and psychosocial outcomes. Furthermore, the findings suggest that atypically employed crew face considerable barriers in accessing organizational structures for well-being support. Not only are they less likely to know where to go for assistance, but they are also more likely to report the absence of internal mechanisms altogether.

Schedule

In analysis of the association between work schedule—full-time, part-time, and flexible—and well-being dimensions reveals significant differences across groups. Mental health is significantly worse for full-time workers compared to part-time (F= 10.73, df(2,3265), p < .001), with part-time employees showing the most favourable outcomes, while flexible workers score lower than part-time (p < .001). Scores for physical health are also significantly (F= 9.65, df(2,3265, p < .001) higher for part-time employees than for full-time workers. Dehumanization scores are significantly (F= 36.97, df(2,3265, p < .001), higher (worse) for full-time workers compared to part-time, while part-time employees report the most positive outcomes; flexible workers fall in between but are less favourable than part-time (p < .001). Job insecurity is lowest for part-time workers, higher for full-time, and highest for flexible schedules (F= 43.43, df(2,3265, (p < .001).

In conclusion, part-time work is consistently associated with the most favourable well-being outcomes, whereas flexible and full-time schedules tend to be linked with higher dehumanization, poorer mental and physical health, and greater job insecurity.

Insights from Airline Interviews and Aircrew Focus Groups

As part of this study, interviews and focus groups were organized with representatives of both employee and employer organisations. Their views are outlined below to provide the reader with a 360° perspective.

Insights from the interviews with Airline Stakeholders: Wellbeing dimensions

Assessing wellbeing at work

- Annual survey going into the satisfaction and well-being of the aircrew, for this airline company HR reported that the employees (ground/cabin/cockpit) reported feeling fit and energetic at work. Managers were rated very well to well regarding well-being and health promotion.
- Another airline company indicated that they do a weekly review of the open input from crew (pilots, cabin crew and ground handling). They also calculate a stress level for their employee's and publish this information.

Initiatives taken by the airline companies

- Initiatives to improve daily well-being (e.g., new uniforms with updated grooming rules, giving crew more personal choice and flexibility).
- **Confidential support structures**, including internal confidential advisors and external professional coaches available for personal or work-related issues.
- **Dedicated communication platform** ("Sherlock") with a well-being page to centralize and promote initiatives related to employee well-being.
- Implementation of a **"nutrition traffic light" system** in company canteens to promote healthier dietary choices.
- **Comprehensive health management programs**, including preventive company integration management (BEM), medical examinations, check-ups, vaccinations, and access to psychosocial counselling. But also contact and access to for example: GIMD (corporate social

work) or MAD (Medicine, alcohol and Drugs, a program to support aircrew who are struggling with addiction)

- **Wide range of informational resources** such as lectures, podcasts, newsletters, and exhibition stands on health and occupational safety. Other airline companies also indicated that the union plays a significant role in distributing the necessary material and information regarding mental health.
- **Promotion of healthy lifestyles** via sports activities, healthy meals, and the introduction of a nutrition traffic light system for balanced diet choices.
- **Peer support structures** including CISM, the Mayday Foundation, and internal health insurance collaborations.
- **Open-door HR policy**: Crew members can approach Human Resources at any time to address difficulties.
- **Internal medical services**: xxx provides access to its own medical staff, including psychiatrists, with free and anonymous consultations for pilots.
- **GAIN program**: A pilot-managed, independent support program preserving anonymity, providing assistance for non-technical difficulties.
- Continuous monitoring and enhancement of crew well-being through the **"Voice" engagement tool**.
- **Peer Support Program** including access to an aviation psychologist, providing specialized mental health support tailored to the aviation context.
- Collective Labour Agreement (CLA) providing tools for a supportive pilot work environment.
- HR programs integrated with **Flight Operations** to manage well-being and safety issues.

Insight from the focus groups with aircrew: Wellbeing dimensions

Management Culture and Organizational Approach

- Aircrew are frequently perceived by management as "assets" to be optimized, rather than as individuals with personal limits and needs. This asset-based approach has led to situations where crew members report fainting from exhaustion or leaving the profession altogether due to burnout.
- Management often appears reluctant to acknowledge the central role of well-being, treating financial results as paramount while neglecting the human dimension.
- Initiatives on well-being are generally reactive rather than proactive. Changes that benefit crew are typically introduced only after strong pressure from staff rather than from genuine recognition of their value. However, there are examples of more participatory approaches, where crew are involved in shaping programs and deciding budget priorities.
- A concerning trend is the increasing use of "management by fear," where well-being is not explicitly linked to safety outcomes.

Peer Support and Well-being Programs

- Peer support programs for pilots, as legally required, are often undermined by poor implementation—for instance, assigning former managers as "trusted persons," which erodes trust.
- Cabin crew, who are not legally guaranteed peer support, frequently express frustration at being excluded from such schemes. At the same time, positive examples exist: some airlines have developed robust peer support structures for cabin crew, which participants describe as offering substantial added value.

Awards and External Reputation

- Airlines often receive external recognition for well-being-related achievements (e.g., "family-friendly airline" awards). However, these accolades are perceived by employees as disconnected from their lived realities; staff frequently leave such companies because actual conditions remain incompatible with family or personal life.

Working Environment and Material Conditions

- The physical working environment is deteriorating in some airlines. Cabin space is reduced to maximize passenger capacity, equipment such as ovens and toilets is poorly maintained, and staff face increasing challenges in performing their tasks effectively.
- Cabin crew also report growing difficulties in dealing with unruly passengers, who increasingly show a lack of respect for staff authority and professionalism.

Work-Life Balance and Delays

- Frequent delays and cancellations exacerbate work-life balance issues for crew, adding stress and unpredictability to their schedules. This is perceived as one of the most significant threats to both well-being and retention in the sector.

Key take- aways Wellbeing dimensions

1. **Professional Role and Age:** Pilots consistently report more favourable well-being outcomes than cabin crew, including in health, mental health, medication use, organizational climate, and job security. Furthermore, younger crew (21–30) are the most vulnerable group, with less favourable outcomes across multiple well-being dimensions, while older groups (51+) report significantly better health, stability, and resilience.
2. **Airline Business Model and Region:** The type of airline is clearly associated with employee well-being. Network carriers and cargo airlines generally report the most positive outcomes, due to more stable contracts, structured career paths, and more supportive work environments. In contrast, low-cost carriers and especially ACMI operators tend to show poorer well-being, reflecting more atypical employment, higher job insecurity and less support. Regional differences are also significant: respondents based in Eastern Europe consistently report lower wellbeing and greater job insecurity, highlighting the impact of more challenging labor market conditions and weaker regulatory protections.
3. **Employment Structures:** Atypical employment arrangements, including temporary contracts and self-employment, are consistently associated with poorer well-being, and limited access to organizational support. Crew in these positions are also less willing to report safety issues, likely due to job insecurity and weaker integration into company structures. Self-employed crew face the highest psychosocial risks, while directly employed crew enjoy more stable conditions. These differences underscore the critical impact of employment type on both employee wellbeing and safety engagement.
4. **Work Schedules:** Part-time work correlates with more favourable well-being outcomes. Flexible and full-time schedules, in contrast, are linked to poorer health, greater dehumanization, and higher job insecurity.
5. **The interviews** show that interviewed airlines (all with a network-profile) increasingly recognize crew well-being as a cornerstone of safe and sustainable operations, implementing a wide range of

initiatives—from annual and weekly monitoring tools, confidential support structures, and dedicated medical services to peer support programs and lifestyle promotion. These practices illustrate a shift toward proactive, holistic well-being management that combines organizational responsibility, union involvement, and accessible support, trying to ensure that aircrew feel fit, supported, and engaged in their work.

CHAPTER 6 SAFETY CULTURE AND MANAGEMENT

"Aviation safety is not taken into the necessary consideration, and I feel the general attitude is like "everything is fine until it's not…"

"Economical factors are more important than anything in most companies, they care about safety and well-being only when it doesn't cost money otherwise they go to the bare minimum legally and even less"

INTRODUCTION

This chapter focuses on the perceptions, practices, and organisational dimensions of safety within European aviation, as reported by cockpit and cabin crew. Safety has long been regarded as the cornerstone of the aviation industry, traditionally approached from a technical and procedural standpoint. However, the evolving recognition of human and organisational factors has placed increasing emphasis on the role of workplace culture, wellbeing, fatigue, and training in shaping safety outcomes.

We begin with a descriptive analysis of the survey results related to safety perceptions, fatigue, reporting culture (particularly Just Culture), and adequacy of training. Where feasible, we draw comparisons with earlier datasets from 2020 and 2021 to explore developments over time and assess whether safety culture has improved, declined, or remained stable amidst growing labour flexibilisation and post-pandemic operational pressures.

Finally, we delve into subgroup analyses, comparing responses between pilots and cabin crew, across age groups, and across different regions in Europe. This layered approach allows us to identify systemic concerns, regional discrepancies, and occupationally specific vulnerabilities in the safety landscape of today's aviation industry. This chapter also integrates qualitative insights derived from interviews with HR representatives from network carriers, highlighting best practices, and diverging approaches to managing safety from an employer perspective.

RESULTS

DESCRIPTIVES

Please read each of the following safety statements and indicate if you: strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), or strongly agree (5) within the context of your (previous) employment situation. Be honest in your answers. There are no right or wrong answers. Please mark only one number per statement.

We see safety as a broad term. It is about avoiding adverse outcomes (accidents and incidents) through a set of methods, principles and practices that have been developed to identify and eliminate (or attenuate) dangers at all levels: technical, personal (e.g. mental health), sociological, for passengers and personnel, etc *(Strongly disagree –somewhat disagree- Neither agree nor disagree-somewhat agree-strongly agree)*

1. The superiors (managers, supervisors, etc.) I work with set clear objectives concerning (flight) safety and are clear about their safety-related expectations.
2. The superiors (managers, supervisors, etc.) I work with are able to motivate their employees to work with the highest attention to safety regulations and address safety-related issues in a constructive and respectful way.
3. The importance of (flight) safety is permanently visible by means of, for example, written communication from leaders, posters, signs and/or icons, etc.
4. Pilots are able to openly discuss safety problems with their superiors and/or colleagues.
5. At my work, superiors (management, supervisors, etc.) consider safety to be of great importance. For example, they consider safety more important than keeping to the schedule.
6. The superiors (management, supervisors, etc.) involve employees actively in safety-related matters.
7. When safety issues are reported, management acts quickly to correct these problems/issues.
8. At my work, training is given at regular intervals to refresh and update knowledge, especially when new procedures or equipment are introduced.
9. Management allocates sufficient resources to safety, for example sufficient time, staff, funds, protection materials and infrastructure.
10. At my work, superiors (management, supervisors, etc.) have a realistic picture of the potential problems and risks related to (flight) safety.
11. My colleagues at work are alert and attentive to potential problems and risks related to (flight) safety.
12. At my work, I put in extra effort to improve (flight) safety (e.g. voluntary tasks or activities which promote (flight) safety).
13. I possess the necessary knowledge to maintain or improve (flight) safety.
14. In case of a safety issue at my work, I know where to go and what to do.
15. I believe that it is important to maintain (flight) safety at all times to prevent safety problems, events and incidents.
16. I follow the highest standards of (flight) safety when I am at work (e.g. wearing all required protective equipment, applying the correct safety regulations).
17. When an error, near miss or problem occurs regarding (flight) safety, I report this as soon as possible via the appropriate channels (e.g. incident report, supervisor).

The instrument consists of two segments: Safety Work Climate with 11 statements and Personal safety behaviour with 6 statements. Safety Work Climate Safety work climate refers to employees' shared perceptions of the policies, practices, and procedures that signal the priority an organization places on safety in the workplace. It reflects the collective sense of how seriously safety is taken, how consistently it is supported by management, and how it is enacted in day-to-day operations. Personal safety behaviour on the other hand refers to the individual actions and practices of employees that contribute to maintaining safety in the workplace, including adherence to safety procedures, use of protective equipment, and proactive efforts to identify, avoid, or report hazards.

The higher the score, the better for both segments. The threshold for safety work climate is 44, The results are low with a mean of 39,73 out of a max of 55, and with a big standard deviation (SD= 10,25). 58,6% of respondents report levels below the dangerous level of 44 out of 55, which illustrates that these respondents always report neutral or negative answers. For pilots, it is 56,7% under the threshold and for cabin crew 61,8%.

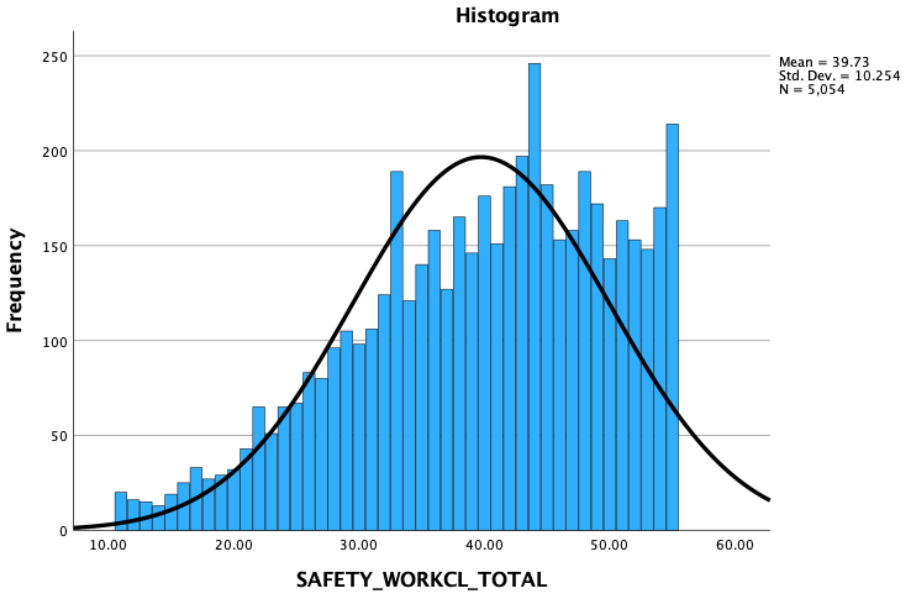


FIGURE 6. 1 SAFETY WORK CLIMATE TOTAL

The results for Personal safety behaviour are better (M= 26,45, out of a max of 30), with a small standard deviation (SD= 3,34). Only 14,8% of respondents report levels below the threshold of 24 (always reporting neutral of negative answers). For pilots, we note 14,3% falling under the threshold and for cabin crew 15,7%.

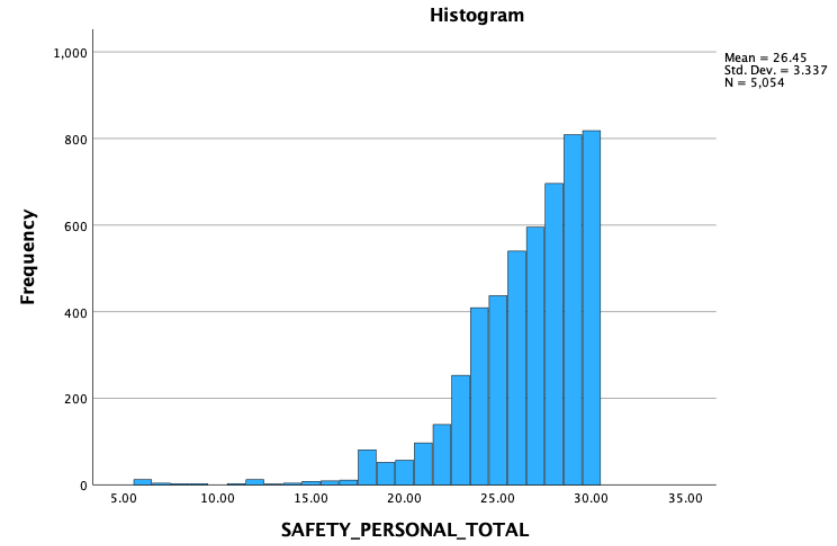


FIGURE 6. 2 PERSONAL SAFETY BEHAVIOUR TOTAL

Compared to 2014 (only pilots!): not asked in 2014 but we do have data from 2021 (pilot and cabin crew). Then, 53,3% of respondents reported levels below the threshold of 44 out of 55 for safety work climate, which illustrates that these respondents always report neutral or negative answers. That was 56% for pilots and 50,2% for cabin crew. For Personal safety behaviour, we note that 12,1% for the general group, 13,7% of pilots and 10,3% cabin crew fell below the threshold of 24.

When an error, near miss or problem occurs regarding (flight) safety, I report this to…

1. My direct supervisor
2. The management of the (airline) company
3. The management of the airport
4. The civil aviation authority
5. I don't know
6. Other

Most respondents indicate that they report errors, near misses or problems to the management of the airline companies (55,6%), followed by the direct supervisor with 54,6%. We do note that the latter is most prevalent in cabin crew but that pilots say that they primarily report to management of the airline company.

TABLE 6. 1 I REPORT ERRORS, NEAR MISSES OR PROBLEMS TO…

I report this to	Total	Pilot	Cabin crew
My direct supervisor	54,6%	49,8%	62,7%
The management of the (airline) company	55,6%	57,9%	51,7%
The management of the airport	4,3%	5,2%	2,8%

The civil aviation authority	20,4%	24,8%	13%
I don't know	0%	0%	0%
Other	15,7%	17,4%	12,8%

When fatigued…

1. I always report
2. I sometimes report
3. I never report
4. Other

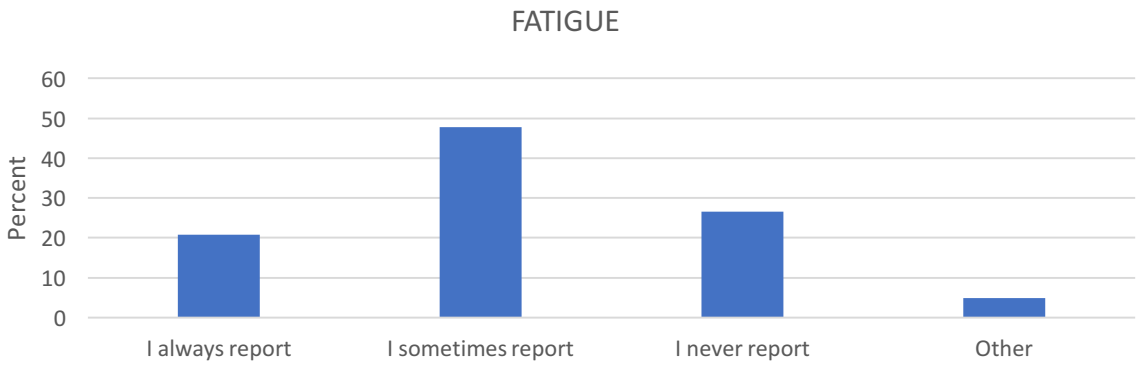


FIGURE 6. 3 FREQUENCY FOR FATIGUE REPORTING

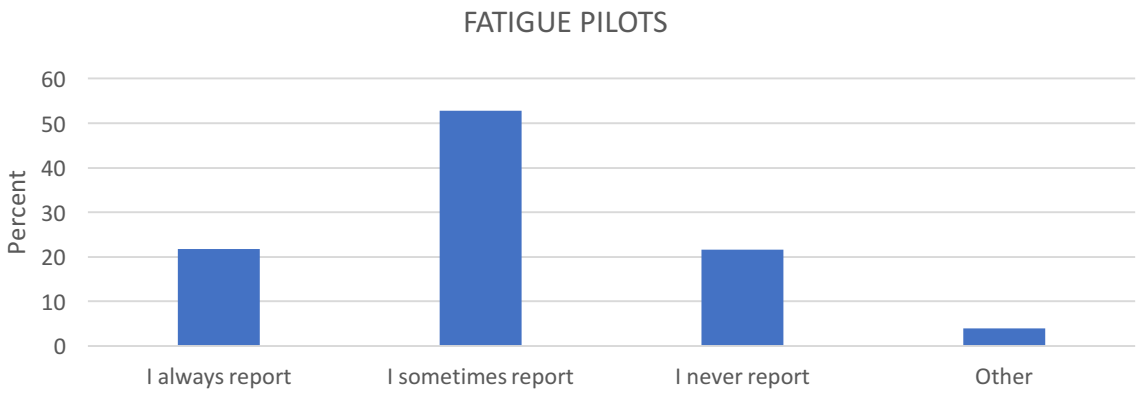


FIGURE 6. 4 FREQUENCY FOR FATIGUE REPORTING PILOTS

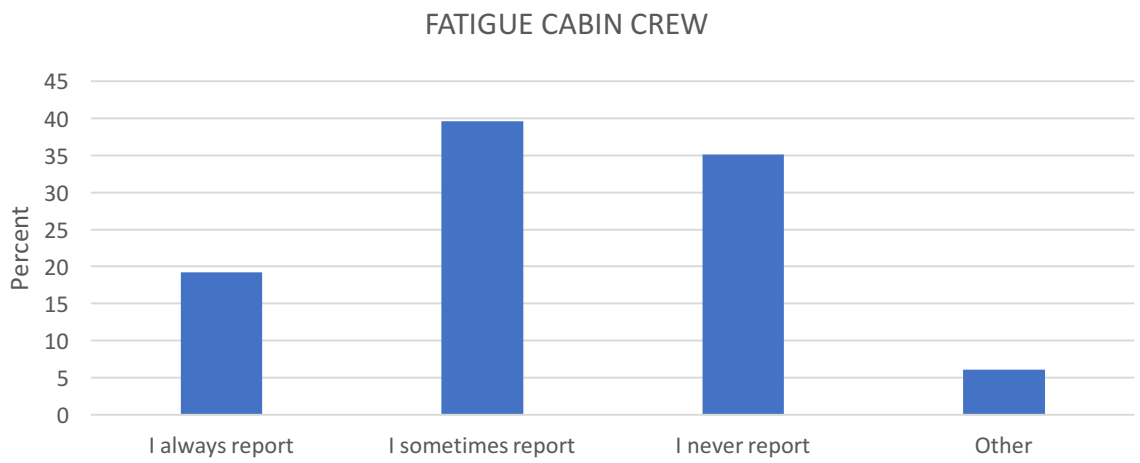


FIGURE 6. 5 FREQUENCY FOR FATIGUE REPORTING CABIN CREW

A small segment of the respondents (N= 5257) say that they always report fatigue (20,8%). Most of them indicate that they sometimes report (47,8%), I never report (26,6%) and 4,8% other. In the group of pilots 52,7% say that they sometimes report, and 21,6% say that they never report. For cabin crew the biggest segment is 'I sometimes report' with 38,6%, followed by never reporting with 35,1% and only 19,2% indicating that they always report

RELATIONSHIP BETWEEN RESEARCH VARIABLES AND SUBGROUPS

This section explores the associations between safety-related dimensions and key demographic and occupational variables, including age, employee group, type of airline, and whether the respondent's home base is in Eastern Europe. By examining these relationships, we aim to identify patterns in perceived safety behaviour and organizational safety climate across different subgroups within the European aviation workforce.

GROUP

The analysis of safety dimensions by professional group shows that cabin crew report slightly higher scores for personal safety behavior (t=-8.75, df(1,5271), p <.001). For safety work climate, however, pilots score significantly higher (t=-2.83, df(1,5271), p < .01), indicating a more positive perception of their organizational safety environment. In contrast, fatigue reporting is significantly less likely among cabin crew compared to pilots (t=-8.96, df(1,5271), p < .001), pointing to important differences in how safety-related issues are addressed across occupational groups.

Overall, pilots report a more positive safety work climate and greater willingness to report fatigue, while cabin crew score slightly higher on personal safety behavior but are significantly less likely to report fatigue.

AGE

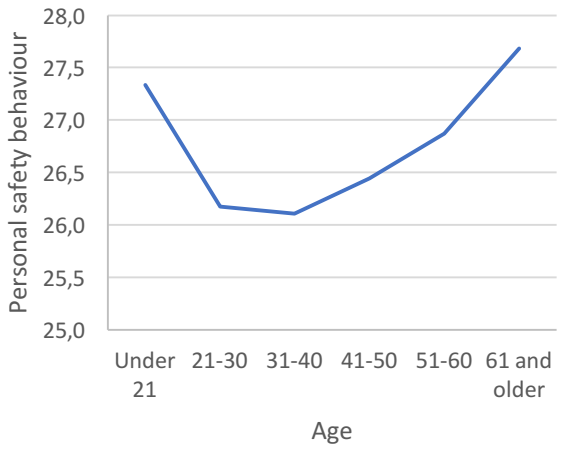


FIGURE 6. 6 AGE - PERSONAL SAFETY BEHAVIOUR

Looking at the graph (fig 6.20) personal safety behaviour (higher scores indicate better outcomes) reveals clear age difference: respondents aged 21–30 report significantly less favourable results than those aged 51–60 and 61+; the 31–40 group scores significantly less favourable than the 51–60 and 61+ groups; 41–50 scores lower than 61+; 51–60 scores more favourable than 21–30 and 31–40 but lower than 61+; and the 61+ group reports the most favourable outcomes overall, indicating that older respondents perceive their personal safety more positively (p <.001).

For pilots specifically (F=7.63, df(4,3150), p < .001), those aged 21–30 report less favourable results than the 51–60 (p < .01) and 61+ (p < .001) groups; 31–40 scores lower than 51–60 (p < .01) and 61+ (p < .001); 41–50 scores lower than 61+; 51–60 is better than 21–30 and 31–40 (p < .01); and the 61+ group reports higher outcomes than all other age groups at p < .001, except compared to 51–60 at p < .05.

Safety work climate (total; higher scores indicate better outcomes) shows that respondents aged 21–30 report significantly less positive results than those aged 61 and older (p < .001). The 31–40 age group also reports significantly lower scores than the 51–60 and 61+ groups. Overall, younger respondents report a less favourable safety work climate compared to older age groups. For pilots, specifically (F=3.86, df(4,3150), p <.01), those aged 21–30 report lower, in thus less favourable outcomes than every other age segment, except for the 60+ group (p < .01).

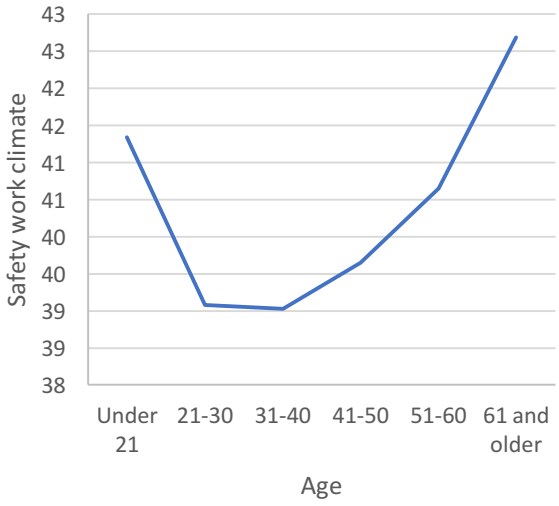


FIGURE 6.7 AGE - SAFETY WORK CLIMATE

Fatigue reporting shows a clear age pattern: respondents aged 21–30 report fatigue less frequently than those aged 41–60; the 41–50 group is more willing to report fatigue than the 21–30 group, and the 51–60 group is also more willing than the 21–30 group, indicating that older respondents are generally more forthcoming in reporting fatigue (p < .001). In pilots, we don't observe related significant differences based on age.

Overall, the analysis indicates a clear positive association between age and the safety dimensions: older respondents consistently report higher scores for safety work climate, personal safety, and fatigue reporting, suggesting that older crew members perceive their safety environment more positively and are more willing to acknowledge and report safety-related issues than their younger counterparts.

KIND OF AIRLINE COMPANY

When examining personal safety behaviour, clear differences emerge between airline types (F=9.30, df(8,5045), $p < .001$). Respondents employed by network airlines report significantly higher levels of personal safety behaviour compared to those working for low-fare carriers and ACMI operators ($p < .001$). Low-fare airlines show lower outcomes than network airlines, while ACMI reports the least favourable results, significantly less positive than those of network airlines ($p < .001$).

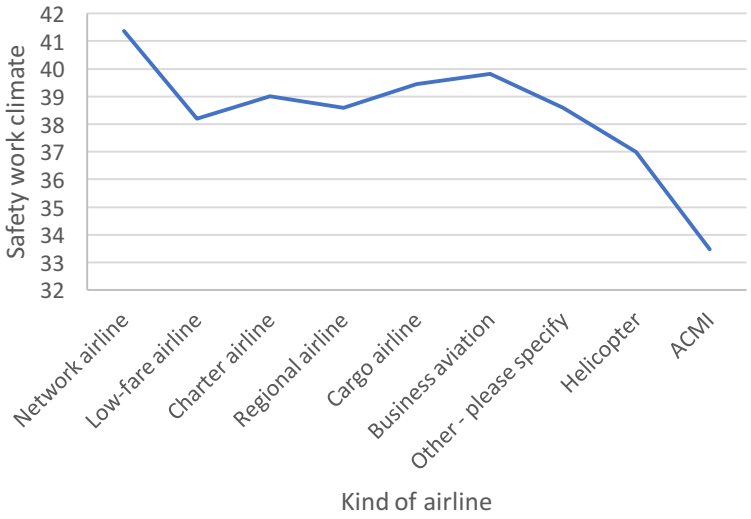


FIGURE 6. 8 KIND OF AIRLINE - SAFETY WORK CLIMATE

Safety work climate shows significant differences depending on the kind of airline company (F=23.54, df(8,5045), $p < .001$). Network airlines report the most positive results (the higher the better), significantly higher than low-fare and ACMI airlines ($p < .001$). Low-fare airlines report less favourable outcomes than network, cargo, and business airlines. Cargo airlines show higher, in thus more favourable results than low-fare and ACMI ($p < .001$), while business aviation scores higher than low-fare ($p < .001$). ACMI airlines report the least favourable safety work climate compared to network and cargo airlines.

Fatigue reporting shows clear distinctions between airline types (F=7.30, df(8,5048), $p < .001$). Respondents working for network airlines are more willing to report fatigue than those employed by low-fare airlines, while cargo airlines demonstrate the most favourable outcomes ($p < .001$). Respondents working for low-fare carriers indicate to be significantly less willing to report about fatigue than respondents working for both network and cargo airlines ($p < .001$). Regional airlines report less positive results than cargo airlines ($p < .001$), and business aviation also scores significantly less favourably than cargo ($p < .001$). Cargo stands out with the best results overall, outperforming all airline types except for "other" and helicopter operations.

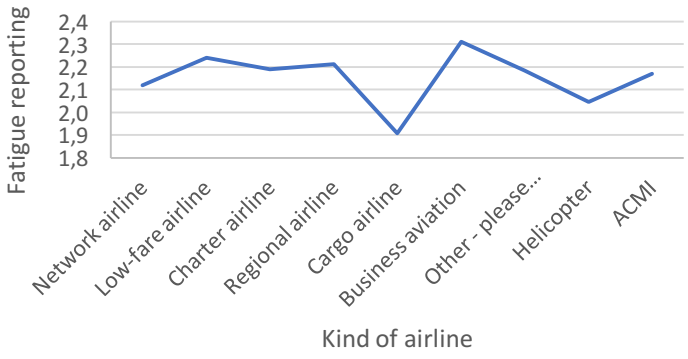


FIGURE 6. 9 KIND OF AIRLINE - FATIGUE REPORTING

The analysis of the relationship between airline type and safety dimensions reveals a consistent pattern in which network and cargo airlines achieve the most favourable results across different indicators,

including safety work climate, personal safety behavior, and fatigue reporting. In contrast, low-fare carriers and ACMI operators systematically report less positive outcomes, indicating weaker safety climates, lower levels of personal safety behavior, and reduced willingness to report fatigue. Business and regional airlines occupy an intermediate position, occasionally performing better than low-fare and ACMI but not reaching the positive levels observed in network and cargo airlines. Overall, the findings suggest that the kind of airline is strongly associated with safety culture and behavior, with network and cargo operations providing a more supportive and robust safety environment compared to low-fare and ACMI models.

KIND OF RELATIONSHIP WITH THE AIRLINE COMPANY

Personal Safety Behaviour (F= 15.04, df(5,5048, *p*<001*)*

Respondents with a direct employment contract report significantly more positive outcomes for personal safety behaviour than respondent that are self-employed, both with a contract directly (mean difference = -1.64, $p < .001$) with the airline and via a brooker (mean difference= -1.67, $p < .001$), the rest does not know a statistic significant difference.

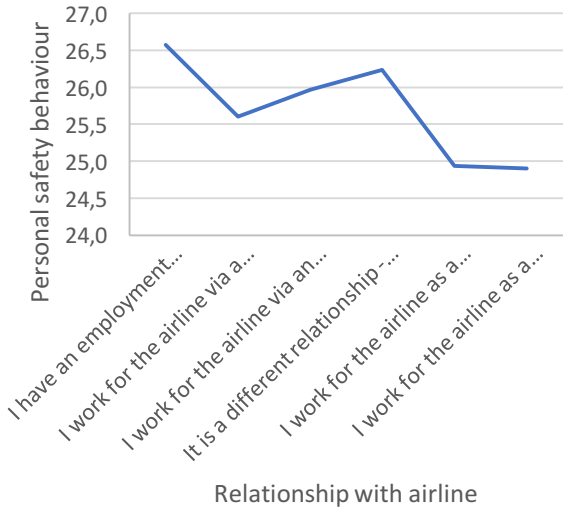


FIGURE 6. 10 RELATIONSHIP AIRLINE - PERSONAL SAFETY BEHAVIOUR

Safety work climate(F= 23.71, df(5,5048, *p*<001*)*

Respondents with a direct employment contract report significantly more positive outcomes for safety work climate than those working through a temporary work agency or as self-employed workers, both with a contract directly (mean difference = -4.18, $p < .001$) with the airline and via a brooker (mean difference = -7.09, $p < .001$), and vice versa.

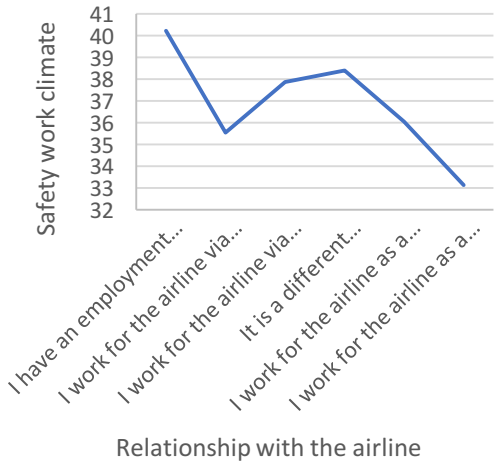


FIGURE 6. 11 RELATIONSHIP AIRLINE - SAFETY WORK CLIMATE

Fatigue reporting (F= 7.99, df(5,5051, p < .001)

Respondents with direct employment contracts are significantly more willing to report issues (lower scores indicate greater willingness) than self-employed workers with a cooperation agreement directly with the airline company (mean difference = .38, $p < .001$). Similarly, those working through a temporary work agency are more willing to report than self-employed workers with a direct cooperation agreement (mean difference = -.43, $p < .001$). Self-employed workers with a direct cooperation agreement with the airline company are less likely to report fatigue than respondents with either a direct employment contract or a temporary work agency. Self-employed workers with a cooperation agreement via a broker are also less likely to report fatigue than respondents with a direct contract (mean difference=.22, $p < .01$).

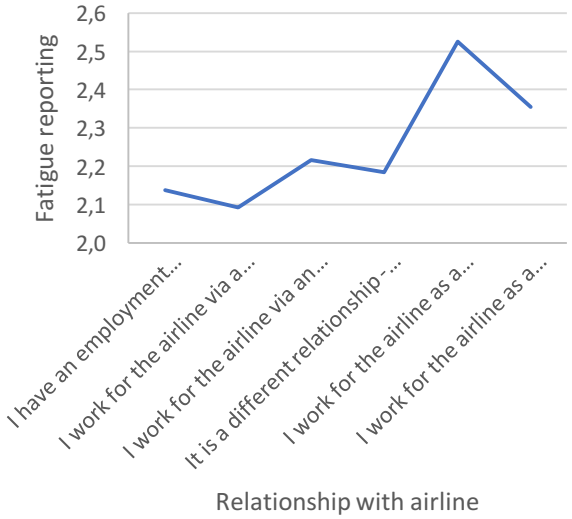


FIGURE 6. 12 RELATIONSHIP AIRLINE - FATIGUE REPORTING

Overall, the results demonstrate that direct employment contracts are consistently associated with more favourable safety outcomes across all dimensions, including personal safety behavior, safety work climate, and willingness to report issues or fatigue. In contrast, self-employed workers—particularly those engaged through direct cooperation agreements or brokers—report significantly weaker safety climates, lower levels of safety behavior, and reduced readiness to report fatigue, highlighting the heightened safety risks linked to atypical forms of employment.

TYPICAL/ ATYPICAL EMPLOYMENT

A further analysis explored the relationship between type of employment and self-reporting of fatigue levels and overall safety. The results show significant correlations across several dimensions.

First, with respect to fatigue reporting, a significant effect was observed ($F(1,5255) = 4.44$, $p < .001$). In line with our hypothesis, crew members in atypical employment reported safety-related issues significantly less frequently than those in typical employment. This finding should be interpreted with caution, as it may reflect underreporting among atypically employed crew rather than a genuine reduction in safety concerns.

Beyond fatigue reporting, the survey also included several indicators related to safety culture and decision-making. These allow for a more detailed comparison between the impact of typical and atypical

employment on this dimension. When analysing contract type, significant differences emerged across all four safety-related variables. The strongest effect was observed for *safety work climate total*, where the deviation in mean scores was most pronounced. Across all variables, respondents with atypical contracts consistently reported less favourable outcomes compared to those with typical contracts. This suggests that atypical employment is systematically associated with weaker perceptions of safety climate.

Further analysis examined the relationship between employment status and the capacity to take safety-related decisions (Q70–Q73). A significant effect was found for the first question (F (1,6204) = 114.21, p < .001), where atypically employed respondents scored higher, indicating greater difficulty in taking such decisions. In other words, crew in atypical employment report having less influence or autonomy in matters of safety. Among pilots, the pattern is even more pronounced (F (1,3827) = 187.28, p < .001), again showing that atypical contracts are linked to reduced decision-making power regarding safety.

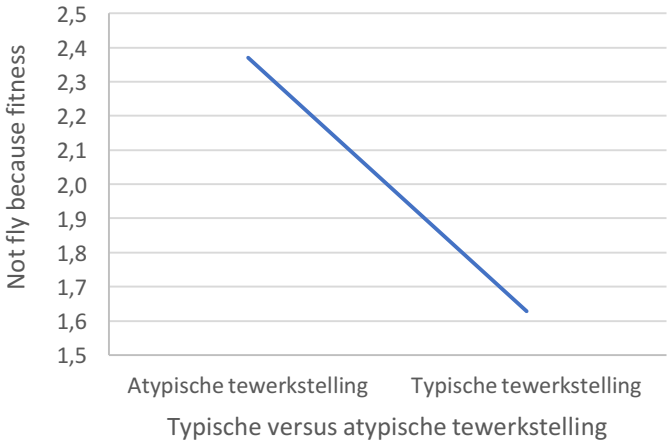


FIGURE 6. 13 TYPICAL/ATYPICAL – NOT FLY BECAUSE OF ILLNESS, FATIGUE,…

A similar pattern emerges for questions addressing the ability to make decisions about fitness to fly (Q74, Q75, Q103, Q104, Q105, Q215). A one-way ANOVA revealed a significant effect, with atypically employed respondents scoring significantly higher—meaning they experience greater difficulty in exercising discretion about whether they are fit to operate (F (1,6015) = 153.45, p < .001). Among pilots, this effect is even stronger (F (1,3638) = 216.64, p < .001).

Taken together, these findings highlight a consistent pattern: while safety climate and safety-related decision-making are compromised across atypical contracts, the effects are particularly pronounced among pilots. This suggests that atypical employment not only undermines perceived safety culture but may also limit the autonomy of aircrew to make critical decisions about safety and fitness to fly.

HOME BASE IN EASTERN EUROPE

Respondents with a home base in Eastern Europe report significantly lower levels of personal safety behavior (p < .001) and safety work climate (p < .001), as well as a significantly lower willingness to report fatigue (p < .001).

In conclusion, respondents based in Eastern Europe consistently report less favourable outcomes across all safety dimensions, indicating a structural disadvantage in safety culture and reporting willingness.

TOTAL PICTURE FOR SAFETY AND OTHER RESEARCH DIMENSIONS -TESTING THE FULL THEORETICAL MODEL

The final step in our analysis involved testing the full model, with the objective of identifying the most influential factors for the four safety dimensions previously examined. From a legal perspective, we

hypothesized that the employment situation—classified within the cluster of management factors—would be among the most decisive elements. For clarity of interpretation, the independent variables in our study were grouped into three clusters: **(1) Management factors**, including dehumanization, humanization, type of airline, and relationship with the airline; **(2) Personal factors**, comprising mental health, physical health, medication use, and job insecurity; and **(3) Background variables**, encompassing professional group, gender, and age.

The table below (Table 6.2) presents the results of the regression analyses. Separate analyses were conducted for each of the four aviation safety indicators to examine their associations with management factors, personal factors, and background variables. A stepwise linear regression approach was applied, and only statistically significant results are reported in the table.

TABLE 6. 2 REGRESSION ANALYSES: TESTING THE FULL MODEL

	Safety work Climate	Personal aviation safety behaviour	Ability to make the decision to not fly because of not fit to fly (mental or physical)	Ability to modify instructions due to safety objections
	F (8,5052) = 602.842 *** aR^2= 0.489	*F* (8,5052) = 108.04 *** aR^2= 0.146	*F* (8,5272) = 272.16 *** aR^2= 0.316	*F* (8,5272) = 265.685 *** aR^2= 0.287
			Management factors	
Dehumanization	*B* = -0.057** aR^2 = 0.003 *t* = - 5.418***	*B* = 0.015*** aR^2 = 0.002 *t* = 3.387***	*B* = 0.007 *** aR^2 = 0.003 *t* = 4.852***	*B* = 0.011*** aR^2 = 0.008 *t* = 6.937***
Organizational Support/humanization	*B* = 0.923*** aR^2 = 0.421 *t* = 29.231***	*B* = 0.138*** aR^2 = 0.089 *t* = 10.360***	*B* = - 0.069 *** aR^2 = 0.248 *t* = - 16.821***	*B* = - 0.085*** aR^2 =0.233 *t* = - 17.505***
Type of airline company	*B* = -0.418*** aR^2 = 0.006 *t* = -7.826***	*B* = -0.093*** aR^2 = 0.003 *t* = -4.162***	*B* = 0.022 ** aR^2 = 0.001 *t* = 3.127***	B = 0.031*** aR^2 =0.002 *t* = 3.555***
Relationship with the airline	-	-	*B* = - 0.246 *** aR^2 = 0.005 *t* = - 5.103***	B = - 0.356*** aR^2 =0.010 *t* = - 6.119***
			Personal factors	
Mental Health	*B* = 0.171*** aR^2 = 0.026 *t* = 9.183***	*B* = 0.065*** aR^2 = 0.027 *t* = 8.330***	*B* = - 0.010 *** aR^2 = 0.002 *t* = - 4.4029***	-
Job insecurity	*B* = -0.516*** aR^2 = 0.014 *t* = -9.510***	*B* = -0.141*** aR^2 = 0.008 *t* = -6.176***	*B* = 0.053 *** aR^2 = 0.016 *t* = 7.534***	B = 0.019*** aR^2 =0.001 *t* = 2.276***
Medication use	-	-	*B* = 0.022 ** aR^2 = 0.001 *t* = 2.931***	-

Physical Health	*B* = 0.935*** aR^2 = 0.005 *t* = 6.614***	B = 0.289** aR^2 = 0.004 *t* = 4.854***	*B* = - 0.128 *** aR^2 = 0.026 *t* = - 6.931***	B = - 0.092*** aR^2 =0.004 *t* = - 4.587***
		Background variable		
Professional Group	*B* = 1.704*** aR^2 = 0.013 *t* = 6.175***	B = 0.664*** aR^2 = 0.008 *t* = 6.933***	-	B = 0.477*** aR^2 =0.029 *t* = 13.406***
Gender	*B* = 1.319*** aR^2 = 0.002 *t* = 4.669***	-	-	-
Age	-	B = 0.188*** aR^2 = 0.005 *t* = 4.785***	*B* = - 0.125*** aR^2 = 0.014 *t* = - 10.217***	B = - 0.030*** aR^2 =0.001 *t* = - 2.035***

Notes. *p < .05 **p < .01 ***p < .001. aR2 = adjusted explained variance, B= unstandardized regression weight b-value. We only report the significant results.

Research question: How is aviation safety related to aviation management factors?

We see that dehumanization is significantly associated with all four dimensions of safety. For every increase with one unit in Dehumanization we observe a decrease of .057 in Safety Work Climate, an increase with .015 for Personal Safety Decisions and an increase with .007 for Ability to make fitness to fly decisions and .011 for Ability to make safety decisions. Next comes humanization, the segment with the most significant results; for an increase with one unit in Organizational support or humanization we note an increase with .923 in Safety Work Climate, .138 in Personal Aviation Safety Behaviour, a decrease with .069 in Ability to make fitness to fly decisions and .085 for Ability to make safety decisions. The type of airline company knows significant results for the four safety dimensions: for an increase with one unit type of airline we note a decrease with .418 in Safety Work Climate,.093 in Personal Aviation Safety Behaviour, a decrease with .022 in Ability to make fitness to fly decisions and .031 for Ability to make safety decisions. Finally, within the cluster for management factors, comes the relationship with the airline company or the contrast between typical and atypically employed workers. The segment that would be most determining by our own hypotheses but the results show lower numbers than for humanization and dehumanization and only significant results for the two dimensions regarding the ability to make the necessary decisions: for an increase with one unit for atypical/ typical we note a decrease with .046 in Ability to make fitness to fly decisions and .356 for Ability to make safety decisions.

In conclusion, the results of the analysis reveal statistically significant associations between management factors and various aviation safety indicators. Collectively, personal factors accounted for 43% of the variance in perceived Safety Work Climate, 9,4% in variance for Personal Aviation Safety Behaviour, 25,7% of the variance in the self- assessed Ability to make fitness to fly decisions, 24,4% of the perceived Safety Decisions Personal and 1.7% of the variance of the Ability to make safety decisions.

Research question: How are personal factors related to aviation safety?

The only two items in this cluster that know significant effect on all dimensions of safety are Physical health and Job Insecurity. For every increase with one for Job insecurity, we note an observed decrease of .516 in Safety Work Climate, a decrease of .065 in Personal Aviation Safety Behaviour, an increase

with .053 in Ability to make fitness to fly decisions and .019 for Ability to make safety decisions. Next, for every increase with one for Physical health we see an increase with .935 in Safety Work Climate and .289 in Personal Aviation Safety Behaviour, a decrease with .128 in Ability to make fitness to fly decisions and .092 for Ability to make safety decisions

The item with the highest explanatory power is mental health, significant for every dimension except for Ability to make safety decisions. Medication use only knows significant results for Ability to make fitness to fly decisions with an increase of .022 for every increase with one.

To conclude, the analysis results point at a less pronounced relationships between personal factors and aviation safety indicators than management factors. Personal factors explained 4,5% of the variance in the perceived Safety Work Climate, 3,9% in variance for Personal Aviation Safety Behaviour, 4,5% of the variance in the self- assessed Ability to make fitness to fly decisions, 0,5% of the perceived Safety Decisions Personal and 1.7% of the variance of the Ability to make safety decisions.

Research question: How is aviation safety related to background variables of the crew?

Gender mirrors the lowest association with our safety dimensions. Only Safety Work Climate knows an explained variance of 0,2% based on gender and for every increase in gender we note an observed increase of 1.319 in Safety Work Climate. Professional group explains a total of 5% in variance for three out of the four safety dimensions. 2,9% of variance in Ability to make safety decisions is explained by group, followed by 1,8% of variance of Safety Work Climate and 0,8% of variance in Personal Aviation Safety Behaviour. For every increase with one for professional group (pilot is 1 and cabin crew is 2) we note an increase with 1.704 for Safety work climate, illustrating more favourable results for cabin crew than for pilots, and increase of .664 for Personal Aviation Safety Behaviour and increase of .477 for Ability to make safety decisions. Age also know significant associations with three out of the four safety dimensions: with every increase by one we nota an increase with .188 for Personal Aviation Safety Behaviour, and a decrease of .125 for ability to make decisions about fitness to fly and a decrease with .030 for the ability to make safety decisions. It explains 0,5% of variance of Personal Aviation Safety Behaviour, and 1,4% of variance for ability to make decisions about fitness to fly and 0,1% of variance of the ability to make safety decisions.

Research question: To what extent is aviation safety related to aviation management factors, personal factors and background variables of the crew?

The regression models demonstrate substantial explanatory power. We see for example that 48,9% of variance in Safety Work Climate is explained by our model, 14,6% in variance for Personal Aviation Safety Behaviour, 31,6% of variance for ability to make decisions about fitness to fly and 28,7% of variance for the ability to make safety decisions.

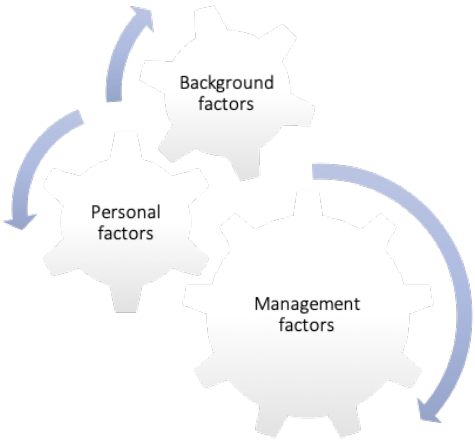


FIGURE 6. 14 INTERACTION THREE-DIMENSIONAL MODEL

At the cluster level, the analysis reveals that management factors exert the most substantial influence on aviation safety outcomes. Prior to the commencement of this study, we hypothesized that the employment situation—specifically the distinction between typical and atypical employment—would emerge as the most critical determinant. Contrary to this initial expectation, the results indicate a more nuanced reality. While employment situation remains embedded within the management factors cluster, which overall demonstrates the highest explanatory power for variance in safety outcomes, its individual contribution diminishes in the fully adjusted models. Specifically, it does not retain statistical significance in relation to *Safety Work Climate* and *Personal Safety Behaviour*, and it accounts for only a modest proportion of explained variance in *Ability to Make Fitness-to-Fly Decisions* and *Ability to Make Safety Decisions*. This reflects a downward trend in which the explanatory factors can no longer be primarily attributed to atypical employment arrangements. Instead, the pattern appears to be part of a broader structural decline, initially driven by the competitive cost structures of low-cost carriers but subsequently diffused across the entire European aviation sector as operators seek to maintain profitability.

The second most influential cluster comprises personal factors, with mental health emerging as the primary driver within this category. These findings underline the critical role of individual wellbeing in shaping safety-related behaviours and perceptions. Background variables—such as professional group, age, and gender—constitute the least determinative cluster overall. Nevertheless, the effect of professional group was anticipated by the research team to be more substantial than was ultimately observed, indicating that occupational distinctions between cockpit and cabin crew may be less predictive of safety outcomes than initially assumed.

In conclusion, our findings confirm the importance of looking at aviation safety through a broader, three-dimensional lens (see Figure 6.14). The results show that factors such as organizational support, mental health, and the way crew members are treated all play a decisive role. In particular, management style—whether it fosters respect and humanization or leads to dehumanization—emerges as a key driver of outcomes. This evidence makes clear that aviation safety is not only a technical matter: social justice, fair treatment, and decent working conditions for all crew types are essential to creating a safe and sustainable sector

Insights from Airline Interviews and Aircrew Focus Groups

As part of this study, interviews and focus groups were organized with representatives of both employee and employer organisations. Their views are outlined below to provide the reader with a 360° perspective.

Insights from the interviews with Airline Stakeholders: Safety

Initiatives taken by the airline companies

- Robust **safety reporting system**, including:
  - Standardized reporting processes for incidents and occurrences.
  - Options for confidential or anonymous reporting (via Confidential Reporting System) to mitigate fear of personal consequences.
  - Crew members can request adjustments to their schedule at any time in case of a problem, whether medical or mental (so called not-fit notification).

- HR programs integrated with **Flight Operations** to manage well-being and safety issues
- Comprehensive reporting system for safety-related incidents, with the option to submit reports confidentially or anonymously via the Confidential Reporting System.
- Another airline company indicates that they maintain an independent, integrated Safety & Compliance Organization that covers all safety dimensions, covering operational, occupational, environmental safety, and security. The **IT systems** of **Planning & Assignment have** fully integrated FTL and stricter CLA rules.
- **Critical Incident Response Program (CIRP)** available for crew support (combination of health, fatigue and safety).

Insight from the focus groups with aircrew: Safety

Safety Culture and Its Individual Dimension

- Crew emphasize that safety culture cannot be viewed solely in technical or operational terms; it also has an individual and social dimension. While flights may meet formal safety requirements, the cumulative impact on crew members' personal lives and families undermines their broader sense of safety and well-being.

Complacency and Systemic Risks

- A recurring concern is the industry's complacency regarding safety, sometimes referred to as the "Boeing effect." This reflects an overconfidence in current systems while ignoring accumulating vulnerabilities. Participants evoke the "Swiss cheese model": safety layers are being systematically weakened (poking extra holes) for financial reasons, leaving the final barrier to accidents dependent on chance and luck rather than robust protection.

Economic Pressures Versus Safety

- Safety is frequently subordinated to financial considerations, resulting in "cheaper safety." Examples include staff reductions, lower training standards, and cost-cutting in rest facilities (e.g., requiring crew to stay in low-cost accommodations near airports rather than proper hotels at destinations).
- Participants stress that customer satisfaction should never outweigh safety, yet operational decisions increasingly appear driven by service metrics and cost-efficiency rather than safety priorities.

Labour Conditions, Regulation, and Inequality

- There is a perceived disconnect between safety culture and employment conditions. Fair terms and conditions vary significantly across EU member states, even though all operate

under EASA's overarching rules. This inconsistency creates uneven safety cultures and undermines trust across the sector.

Reporting, Fatigue, and Training

- A culture of underreporting persists: fatigue reports and safety reports are often ignored or not acted upon, leading crew to disengage from reporting systems. This results in the loss of vital early-warning signals of latent safety risks.
- Flight Time Limitations (FTLs) are often treated by management as operational targets rather than as protective maximums, exacerbating fatigue and increasing the risk of errors.
- Declining training standards further erode safety margins, placing additional burdens on experienced crew to compensate for gaps in the skills and preparedness of newer colleagues.

Beyond safety: Biggest challenges for aviation currently

Beyond safety concerns, the focus groups identified broader structural and organizational challenges, which participants regarded as the most pressing issues for European aviation, both now and in the future

Regulatory Gaps and Uneven Playing Field

- A recurring concern is the absence of a binding **minimum social and regulatory standard across Europe**, resulting in significant disparities in working conditions. This uneven landscape has facilitated the rise of **hybrid business models**, such as ACMI operators and ultra-low-cost carriers, which increasingly shape industry practices. Even airlines with traditionally stronger reputations are making use of these models, raising the threat of **social dumping** and undermining fair competition.
- This dynamic contributes to a broader **"race to the bottom"**: airlines and states pursue the lowest regulatory thresholds, not only in terms of costs but also in the application and enforcement of rules.

Cultural and Structural Barriers to Safety

- Broader **sociocultural differences** also complicate aviation safety management. For instance, participants highlight that in some languages, such as Russian, there is no direct equivalent for the concept of "safety," reflecting different conceptual understandings that can influence organizational practices.
- On the regulatory side, authorities are perceived as being **slow to adapt to technical issues**, while companies rapidly exploit social and contractual loopholes. This creates a situation where **airlines experiment with employment models**, shifting strategies faster than regulators or courts can respond.

External Risks and Geopolitical Pressures

- Crew point to **geopolitical instability and conflict** as direct stressors on both safety and well-being. For example, aircrew refusing to operate flights to conflict zones (e.g., Tel Aviv) have faced dismissal, raising questions about the balance between operational demands, crew safety, and employer responsibility. Avoiding such regions also leads to **longer and more complex flight operations**, further compounding fatigue and workload issues.
- At the national level, states are often more inclined to **allow airlines to lower standards** than to invest resources in combating unfair competition, reinforcing downward pressure on conditions.

Emerging Industry Developments

- The proposed move toward **single-pilot operations** is viewed with alarm, especially given the current climate of fatigue, underreporting, and managerial detachment. Many stress that reducing cockpit crew would pose serious risks for both operational safety and resilience in abnormal situations.
- The disconnect between **airline management and operational realities** is also noted: many in leadership roles lack direct flying experience, leading to decisions that disregard the complex interdependence of human, technical, and organizational factors in safety.

Critical Reflection on Growth

Finally, some participants question the **assumed necessity of unlimited air travel growth** under the "open skies" principle. They argue that the sustainability of aviation—not only environmentally, but also socially and in terms of safety—requires a fundamental reconsideration of whether universal accessibility to air travel should be prioritized over stability, safety, and fair employment standards

Key take-aways of our Safety dimensions

1. **Safety (holistic, beyond the technical approach) in the workplace**: There is a difference between the rules and the application of the rules
2. **Airline type matters for safety**: Network and cargo carriers offer the most supportive safety environments. In contrast, low-fare and ACMI operators show weaker safety climates, lower adherence to safety behaviors, and reduced willingness among crew to report fatigue or other risks. These differences reflect operational pressures, cost-driven priorities, and less formalized safety structures, highlighting the impact of business model on both safety and employee well-being.
3. **Demographics shape safety perceptions:** Older crew report more positive safety outcomes than younger colleagues, while pilots perceive the safety climate more positively and report fatigue more readily than cabin crew, who nonetheless score higher on personal safety behavior. Eastern European respondents consistently show less favourable safety perceptions.
4. **Atypical contracts undermine safety culture**: Safety climate and decision-making are systematically weaker among atypically employed crew, particularly pilots, suggesting that precarious employment reduces autonomy and willingness to act on safety concerns.
5. **Total reality counts**: Aviation safety is not solely a technical matter but is deeply shaped by organizational support, mental health, dehumanization, and professional factors, underscoring that fair working conditions and social justice are essential pillars of a robust safety culture.
6. **In the interviews**, the airlines highlight the importance of a robust and integrated safety culture, combining standardized and confidential reporting systems, HR–Flight Operations collaboration, and independent Safety & Compliance structures. By embedding FTL and CLA rules in planning systems and offering targeted support programs such as CIRP, companies strengthen both operational safety and crew well-being.

CHAPTER 7 REFLECTIONS

Our Management, EASA and EU needs to listen more to the crew as we often come up with good suggestions

INTRODUCTION

In addition to the structured survey questions, respondents were invited to provide input through an open question. This offered pilots and cabin crew the opportunity to share their experiences, concerns, and perspectives in their own words, without the limitations of predefined answer categories. The responses enrich the quantitative findings with qualitative insights, highlighting not only statistical trends but also the lived realities behind them.

The open input sheds light on themes that matter deeply to aircrew, ranging from working conditions and rostering practices to wellbeing, fatigue, and safety. It also reveals personal reflections and stories that often remain hidden in standard surveys. This chapter brings together these voices, identifies recurring themes, and illustrates how individual testimonies connect to broader patterns observed in the study. We have further enriched this with reflections arising from the research itself within the various themes. The subjects are presented in alphabetical order, rather than based on the volume of input received for each topic.

REFLECTION TOPICS

ACMI

The aviation sector has witnessed a marked shift in employment practices over the last few decades, driven by liberalization, intensified competition, and evolving business models (Jorens et al., 2015). As highlighted in European studies, traditional direct and indefinite employment contracts are no longer the only option and strategically substituted or replaced by atypical arrangements—such as fixed-term contracts, self-employment, temporary agency work, pay-to-fly schemes (Subgroup on social matters related to aircrew, 2022a), and zero-hour contracts—particularly among pilots and cabin crew (Jorens et al., 2015). These forms of employment may not be inherently illegal, but they often introduce legal ambiguities, weakened social protection, and heightened vulnerability for workers (Jorens et al., 2015; European Parliament, 2016; Jara and Simon, 2024).

A prominent concern flagged by previous research is that atypical contracts, especially those disguising what should be standard employment relationships—like bogus self-employment—can detrimentally affect health, safety, pay, and working conditions (Jorens et al., 2015; Valcke, 2014). ECA, representing the voice of the European pilots, argues that "*any form of contract in aviation that restricts pilots from performing their jobs without undue dependence constitutes a safety hazard*" (ECA, 2014). These arrangements also distort fair competition by allowing certain operators to reduce costs unfairly and sidestep typical employer responsibilities (ELA, 2020; Monti, 2021; ETUI, 2022; Valcke, 2024). One

airline interviewed observed that the anticipated European pilot shortage could lead to improved terms and conditions (as witnessed in the U.S. market) and significantly reduce reliance on atypical employment arrangements, since not all carriers will be able to recruit pilots under such conditions. This projection, however, applies primarily to pilots, not cabin crew, and notably does not extend to ACMI practices.

"ACMI companies are leeches that nourishes from pilots, not paying taxes anywhere and saving 25-45% of the salaries because of it.

ACMI should be investigated deeply. We are against the law all time

ACMI is more flexible than a large corporate company. They have less overt & visual flight safety procedures BUT react better than larger companies.

ACMI is uberisation of aviation. You must regulate their practices

ACMI operation with multiple "bases" depending on seasonal contracts are hard to depict. All it matters is that we have a 20/10 schedule and that, on top of block hours, we are paid per day "on station". In this case, 20 days of pay plus block hours. It is well understood that this is not a long-term job neither it intends to be.

ACMI should be banned. xxx pits profit before safety, or people.

ACMI treats us very bad normally, poor standards and low quality of life as well as no taxes.

ACMI's needs to be better regulated by EASA"

Within this broader context of precarious employment, ACMI (Aircraft, Crew, Maintenance, and Insurance) operations emerge as a particularly vulnerable domain. While ACMI allows airlines to address demand fluctuations with agility, it often relies on fragmented contractual structures (ePlane, 2025; Williams, 2025). Crew may operate under foreign legal frameworks, face unstable home base designations, and lack social or union protections—dynamics that diminish safety culture, reporting transparency, and workforce stability (European Parliament, 2025).

The contingent nature of ACMI contracts—and the opacity around jurisdiction and labour rights—can hinder fatigue risk management, disrupt continuity of training, and weaken organizational loyalty (Valcke, 2024). Such conditions furthermore hinder coherence in safety culture, erode reporting willingness, and undermine accountability—undermining both worker well-being and aviation safety. As a result, the operational gains afforded by ACMI may come at the expense of safety and crew well-being (Krkovic & Tajik, 2025).

The risks are twofold: first, for the workforce, ACMI-related atypical employment perpetuates financial instability and reduced job security, discouraging open communication about safety and fatigue (Valcke, 2024; Addison and Surfield, 2025). Moreover, manifold workers employed in ACMI structures face legal uncertainty about the applicable social legislation; e.g. who is the employer and who is finally responsible? Second, from an organizational safety perspective, fragmented employment relationships impede the effective implementation of fatigue management, consistent training, and mutual trust (Valcke, 2024; Addisson and Surfield, 2025). These operational challenges compromise safety integrity within the industry.

Therefore, ACMI operations serve as a potent illustration of why the ongoing evolution of aviation needs regulatory responses that reconcile operational flexibility with solid social protections. We advocate for clear EU legislation to close current loopholes, establish legal certainty for aircrew, and strengthen enforcement mechanisms. More broadly, EU institutions have emphasized the need for fair working conditions and a level playing field in aviation, recognizing that social protections are integral to safety and sustainability (European Commission, 2019; European Parliament, 2016; Valcke, 2024)

AI

The integration of Artificial Intelligence (AI) into aviation operations is in its infancy but advancing rapidly, with developments ranging from automated decision-making systems in cockpits to AI-driven customer service tools and predictive maintenance technologies (Tafur et al., 2025; Ramachandran, 2025). While these innovations promise increased efficiency, reliability, and cost reduction, they also raise significant questions regarding the future role and job content of human pilots and cabin crew (Geske et al., 2025).

"In my opinion, a matter of great concern is the over-use of automation in modern aircraft. My airline recently doubled down on their take that an automation that is "recommended" by the manufacturer (Airbus, Boeing, ...) MUST be used, eliminating the opportunities to stay proficient in manual/actual flying skills. This is something that affects the whole industry and is of great concern to myself"

Recent industry forecasts and strategic documents suggest a trend toward increasing levels of automation, including the development of single-pilot operations (SPO) and eventually fully autonomous commercial flights (see other segment). For instance, the European Union Aviation Safety Agency (EASA) has already initiated frameworks to support the certification of SPO for commercial aircraft, citing technological maturity and safety redundancies as enablers for such a transition (EASA, 2021). Similarly, Boeing and Airbus have invested heavily in AI-driven flight systems that could significantly reduce the need for two-person crews (IATA, 2023; Airbus, 2022).

However, the human factor remains critical, particularly in managing unexpected or crisis situations—an area where AI still lacks the capacity for contextual reasoning and ethical judgment (Papagiannidis et al., 2023). Studies have demonstrated that passengers, regulators, and even airline executives express reluctance to remove the human pilot entirely from the cockpit, highlighting the importance of human presence for both safety and public trust (Adeniyi, 2025; de Visser et al., 2020; Kirwan, 2025).

For cabin crew, the threat is more indirect but still substantial. AI-powered systems are being trailed to manage in-flight services, safety announcements, and even passenger interaction, potentially reducing the required number of crew members (Jussila, 2025; Kirwan, 2025). This trend risks not only job losses but also a further deskilling and devaluation of the safety-critical roles of cabin crew, which go far beyond hospitality and customer care. On top of that, results from the study from Lee and Kim (2024) illustrate that customer loyalty is associated with the reliability, professionalism, and authenticity of cabin crew services through a positive influence on their cognitive loyalty.

The implications for employment are profound. In a sector already marked by high degrees of labour flexibilisation, subcontracting, and atypical employment, the introduction of AI without clear safeguards risks accelerating precarity. Moreover, the psychological burden of technological substitution may contribute to increased job insecurity and deteriorating mental health, as noted in several sectors undergoing automation (Rizkina et al., 2025).

"I fear what artificial intelligence may do to my job. And I think we are working too much, getting old too fast. I think pilots should be considered a fast aging job"

Therefore, while the technological trajectory toward AI-enabled aviation is likely irreversible, it demands robust social dialogue, regulatory oversight, and proactive employment policy to mitigate the risks for current and future generations of flight crew. As the sector evolves, preserving the dignity, safety, and expertise of aviation workers must remain a central concern.

Brain drain and retention

The COVID-19 crisis significantly disrupted the European aviation sector, causing mass furloughs, redundancies, and early retirements, particularly among senior pilots. Airlines, under immense financial strain, often offered early retirement packages or did not renew contracts for older or more expensive pilots (ECA, 2021). This led to a noticeable shift in the age profile of the pilot workforce. As the industry began to recover in 2022–2023, many airlines prioritized rehiring lower-cost, often younger, pilots or cadets from airline-sponsored training programs, especially in the low-cost segment, where cost efficiency dominates HR strategies (Hossain et al., 2025).

"After more than 20 years of profession, working for a supposed flagship company, I can relate that the company is not concerned about people developing a life career with them. The company prefer a high rotation of workers, and is continuously lowering salaries and offering worse conditions on scheduling, hotels and transportation during layovers, opportunity of familiar life conciliation, etc. They also keep rising work load on board, reducing on board rest opportunities to the minimum required by FTL. Nowadays, being a cabin attendant is not a profession but a temporary job for young people"

Furthermore, recent hiring trends, especially by low-cost carriers and fast-growing ACMI airlines, favour pilots with fewer flight hours and greater scheduling flexibility. Younger pilots, on temporary, self-employment or subcontracted contracts, are more likely to accept such conditions, contributing to a trend toward precarious entry-level flying jobs (EASA, 2022). Our data still validate this determination of greater vulnerability within the segment of younger pilots.

However, this shift also reflects broader structural changes rather than just post-pandemic recovery. The decline of traditional "career path" models, the expansion of pay-to-fly schemes, and the rise of the use of wet leasing (see 2025 dashboard ECA) have all contributed to the erosion of seniority-based progression (Jorens et al., 2015; ECA, 2019; Subgroup on social matters related to aircrew, 2022a; Valcke, 2024; ECA, 2025).

In conclusion, while the pandemic accelerated the trend, the shift toward a younger, more flexible, and precariously employed pilot workforce in Europe is part of a longer-term evolution in the sector—raising critical concerns about experience levels, job security, and safety culture. While our data continue to

confirm the stronger position of older respondents, the open input suggests that many of these pilots perceive the profession as increasingly becoming a younger pilot's game. Although cabin crew did not express this particular reflection, they did indicate that they no longer regard aviation as a sustainable long-term career option.

However, European air traffic has rebounded strongly and is forecast to keep growing through this decade, putting sustained pressure on airlines' staffing needs. Eurocontrol reports traffic growth of ~5% in 2024 and continued increases into summer 2025, alongside network saturation and worsening delay metrics—conditions that heighten demand for skilled personnel across flight decks, cabins, and operations (Eurocontrol, 2025; Eurocontrol, 2024).

At the same time, wider EU labour shortages and global talent competition amplify outflows ("brain drain") towards regions offering higher pay and more predictable conditions. EU policy briefs explicitly flag persistent skills shortages and the need for stronger attraction/retention mechanisms in key sectors (European Parliament, 2019; EC, 2023). One of them is the aviation sector due to shifts in the air transport sector's demand for specific skills, combined with deteriorating employment practices and working conditions. With the latter they risk creating long-term labour shortages and skills gaps if left unaddressed (EURES, 2025). With this reflection in mind we present a set of known drivers for brain drain, that could in thus be prevented, and some motivators for retention.

"A career in aviation has a steep path in the beginning, but then flattens out"

"I wouldn't advise my son to become an airline pilot, it's just not worth the sacrifices anymore"

Drivers of outflow (brain drain) are:

1. Atypical employment and contractual fragmentation. The expansion of atypical models (e.g., self-employment via agencies, temporary work, zero-hour or pay-to-fly arrangements) can erode job security, depress earnings, and complicate access to social protection—weakening attachment to European employers and encouraging mobility to regions worldwide with clearer, higher-value contracts. Sectoral analyses link these arrangements to degraded working conditions and potential safety risks (Jorens et al., 2015; ECA, 2022; Institute of transport economics, 2022; Valcke, 2024).
2. Fatigue and rostering pressures. Large, cross-European surveys find pervasive fatigue: around three-quarters of pilots, and a significant segment of cabin crew, reported at least one in-duty micro sleep in the prior month; many cite insufficient rest and pressure not to report fatigue. Fatigue undermines wellbeing and professional commitment, and is repeatedly named by aircrew groups as a push factor (ECA, 2022; Valcke, 2024; ETSC, 2025; European Labour Authority, 2025).
3. Operational strain and working environment. Network congestion and chronic delay problems add volatility to duties and rest opportunities. Eurocontrol's performance reviews show ATM-related delays at multi-decade highs, compounding stress for flight and ground staff and making stable rosters harder to sustain (Eurocontrol, 2025). Evidence from the focus groups indicates that this issue constitutes a current and substantial challenge for many participating aircrew, with some reporting that they routinely carry extra clothing for two days due to uncertainty

about their return schedule. Such unpredictability has a profound impact on their social reality and serves as a significant driver for considering employment outside the sector

4. Training pipeline and career progression. Studies on European pilot recruitment/retention highlight bottlenecks in training capacity, financing burdens for initial licenses, and uneven early-career pathways—all of which make rival markets with subsidized training or clearer promotion tracks comparatively attractive (Efthymiou et al., 2021).

Retention correlates (what helps people stay)

1. Standard employment and collective frameworks. Evidence across EU transport points to better retention where employment is standardized, predictable, and covered by collective agreements—improving perceived organisational support, due process, and social benefits. Sector-specific positions argue that stabilizing contracts and reducing legal/administrative fragmentation support both safety and retention. (Jorens et al., 2015; European Parliament, 2019; ECA, 2022; Valcke, 2024, EURES, 2025)
2. Fatigue risk management and wellbeing. Peer-reviewed and industry reports connect robust FRMS, humane rostering (predictability, rest protection), and confidential reporting cultures with improved safety climate and lower turnover intention (Valcke, 2024). Post-pandemic studies of European crews associate worsened scheduling and health indicators with lower engagement, implying a retention dividend from systematic fatigue mitigation and wellbeing programs (EASA, 2024; da Silva et al., 2024; Folke and Melin, 2024).
3. Career development and internal mobility. Clear pathways (type ratings, command progression, cross-fleet/group mobility) and employer-funded upskilling help counter external pull factors by raising long-term value-in-place (OECD, 2024; Investors in People, 2025). EU skills studies recommend aligning incentives (e.g., training support tied to service commitments) to improve retention without locking workers into precarious arrangements (European Parliament, 2019).
4. Regulatory coherence across borders. Cross-jurisdictional inconsistencies in applicable labour and social-security law for mobile aircrew remain a retention risk; clarifying employer responsibility and aligning protections across the internal market would reduce friction and perceived unfairness that fuel exits (Institute of Transport economics, 2022).
5. Network performance and staffing. Addressing ATM capacity and staffing shortfalls (while accelerating Single European Sky reforms) would stabilize operations and rosters—indirectly improving retention by reducing fatigue and unpredictability (Eurocontrol, 2025)
6. EU-level talent measures. Proposed EU talent-pool instruments and broader labour-market policies can be targeted to aviation to balance inflows (e.g., skilled migration, mutual recognition) with retention (e.g., upskilling support, portability of social rights) (European Parliament, 2019)
7. Internal customer (i.e. employee) satisfaction as a goal. Yoon and Yoon (2000) developed a model explaining the antecedents of employee service quality through employee satisfaction. The model identifies perceived organizational support, supervisor support, and customer involvement as key factors influencing employee performance and job satisfaction, which in turn affect service quality (Bulgarella, 2005). Bulgarella further suggests managerial practices to strengthen employee relations and enhance satisfaction. Employee Relations Management (ERM) is described as a strategic process aimed at continuously improving manager–employee relationships to foster motivation (Wargborn, 2008). Core dimensions of ERM include building trust, commitment, and cooperation; enhancing job satisfaction; enabling employee influence

and participation in decision-making; and ultimately improving organizational productivity, profitability, and efficiency (Gennard & Judge, 2005). In short, a happy employee goes for happy customer.

Evidence-based takeaways

- **Retention is structurally linked** to contract quality (home base, fixed roster, competitive salary and job security), fatigue/rostering, and career progression (financially stable and predictable carrier); improving these reduces the chance of loss of skill capacity or increase retention (ECA, 2022; Efthymiou et al., 2021; Valcke, 2024)
- **Operational stability matters:** fixing network delays and capacity issues helps crews keep rest and life routines, thereby improving attachment to employers (Eurocontrol, 2025)
- **Coherent, enforceable social protections** across borders are a retention tool—reducing churn induced by legal uncertainty and precarious intermediated contracting. (Institute of Transport economics, 2022).
- **Targeted EU skills initiatives** should complement airline-level measures (training finance, internal mobility, FRMS, wellbeing support) to keep European talent in European jobs.

Focus on sales

The growing emphasis on in-flight sales as part of cabin crew duties—particularly in low-fare airlines—has sparked considerable concern regarding its impact on occupational identity, work satisfaction, and passenger safety (Chen & Chen, 2014) Traditionally, the core responsibility of cabin crew has been framed around safety and security (Kolander, 2019), including emergency preparedness, first aid, and conflict management (CAA, 2022). However, as airlines increasingly pursue ancillary revenue streams, cabin crew are often required to act simultaneously as sales personnel, promoting and selling food, beverages, and duty-free goods during flights (Law, 2019; Tsaur, 2020). This commercialisation of the cabin crew role has been shown to undermine professional identity, leading to what Hochschild (1983) termed "emotional dissonance"—the tension between expected professional behaviour and personal values.

"Biggest issue about XXX is the extreme focus on sales for any sort of career safety and/or progression. For example, base transfers and career progression (e.g. becoming a N1) are all made based on sales performance. Cabin crew becomes super competitive between each other due to this. Also, the sales bonus that is paid is never accurate and is super random, my sales bonus for example have never been paid correctly with the justification that there is stock discrepancy, when it's clearly not correct because stock is not counted every day and therefore the values removed from our bonus are from other days, other flights, and other crew. Which makes the incentive to sell (to get promotions, etc) be pretty much not existent. Also the safety of crew and the flight is often neglected to compensate for short turnaround times and to focus on sales. Supervisors often apply tons of pressure for inflight sales service, while neglecting their own and the other crew's responsibilities"

Empirical research indicates that many cabin crew members perceive the sales component as a distraction from their safety-related functions, particularly during short-haul operations with high

workload intensity and limited turnaround time (Martins et al., 2020; Tsaur, 2020). Studies have also pointed out that the sales push contributes to job stress and fatigue, especially when tied to performance-based incentives, surveillance, or customer feedback ratings (Kusluvan et al., 2010; Martey et al., 2020). Furthermore, the blurred line between safety and commercial tasks may reduce passenger perception of cabin crew authority in emergency situations, potentially compromising compliance and safety culture on board (Seriwatana, 2018; CAA, 2022).

"European Base Manger shouted, "you're here to fucking sell"

"They said specifically "30% attendance 70% sales"

From a labour law perspective, the increasing commercialisation of cabin crew duties raises questions about fair compensation and the recognition of professional qualifications (Brannigan et al., 2019). In some cases, time spent preparing for or executing sales tasks may not be recognised as part of the working time calculation, leading to discrepancies in pay and benefits—particularly in subcontracted or atypical employment arrangements (Jorens et al., 2015; Valcke, 2024).

In sum, the shift toward in-flight sales responsibilities risks diluting the safety-centric nature of cabin crew work, creating role conflict, psychosocial strain, and legal ambiguities. While commercial pressures may make such practices attractive for airlines, they come at a cost to worker well-being, safety standards, and professional integrity.

JUST CULTURE

The concept of Just Culture has become a cornerstone of modern aviation safety management, bridging the tension between accountability and learning within highly safety-critical environments. Rooted in the broader Safety-II paradigm, Just Culture acknowledges that human error is inevitable and often a symptom of systemic issues rather than individual failings (Dekker, 2007; Maraffi, 2025). It promotes an environment in which professionals, including pilots and cabin crew, feel psychologically safe to report incidents, near-misses, or rule deviations without fear of automatic punishment, provided there is no gross negligence or wilful misconduct (Cahill, 2020; EASA, 2021; Reason, 1997). By fostering transparency and trust, Just Culture enables organizations to detect underlying risks early and to continuously improve operational safety. However, the implementation of Just Culture remains uneven across the aviation sector. Research indicates that frontline workers may still fear retribution, especially in hierarchically structured or commercially

"There is an active and effective safety culture that is understood and respected in the company. The Company works with the union to address issues the union raise. The training department is well resourced and works closely with the flight safety department"

"… Second of all, do not judge us – safety is ALWAYS our biggest priority, no compromise on that – BUT "Just culture" in this company is only a fiction – they fire or degrade the CPTs to the FO role who had a minor incident and reported it – because they should, for the good of general safety and they admitted their mistake and learnt from it. When you hear such stories, of course you will be reluctant to report anything, because you know you are going to be punished for that – after all, with prices continuously increasing, everyone wants to live in decent conditions, especially when you do such a stressful and responsible work…"
"

pressured environments (McMurtrie & Molesworth, 2022). Effective integration of Just Culture therefore requires not only procedural safeguards but also leadership commitment and active involvement of all stakeholders, including unions, in order to align safety goals with fair treatment practices (Tjindrawati & Djazuly, 2023)

Empirical research underscores that Just Culture directly influences both **reporting behavior** and **safety outcomes** (EASA, 2021; Kumah, 2025). Studies show that flight crew members are more likely to disclose safety incidents when they perceive organizational processes as fair and non-punitive, thereby contributing to more robust safety management systems (Muir & Harris, 2017). Conversely, environments characterized by blame or punitive responses discourage reporting, leading to underreporting, unresolved hazards, and elevated operational risk (Probst et al., 2019: Kube, 2025).

Moreover, Just Culture is intertwined with employment structures and organizational support (Hong et al., 2023; Korhonen, 2023; Valcke, 2024). Atypical or precariously employed crew, such as those on ACMI or self-employed contracts (Subgroup on social matters related to aircrew, 2021), often experience reduced access to organizational support and fear reporting incidents due to job insecurity, illustrating that employment type can modulate the effectiveness of a Just Culture framework (Koranyi et al., 2018; Valcke, 2024). Similarly, younger or less experienced crew may perceive safety reporting as risky if supervisory and managerial support is perceived as inconsistent, highlighting the importance of embedding Just Culture across all demographic and contractual groups within aviation operations (McMurtrie, 2023; Skybrary, 2023; Adjekum et al., 2023).

From a policy perspective, fostering Just Culture requires **multi-level interventions**: transparent reporting systems, comprehensive training on error management, strong union and professional support structures, and alignment of safety incentives with organizational accountability mechanisms (Valcke, 2024; EASA, 2022; ICAO, 2020). Furthermore, ongoing monitoring and independent audits can help ensure that safety culture is maintained, particularly in complex, multi-jurisdictional operations (Skybrary, 2023).

In conclusion, Just Culture is not solely a technical or procedural concept; it is a **socially embedded framework** that depends on trust, fairness, and stability within the workforce. Its successful implementation is essential not only for reducing accidents and incidents but also for promoting employee well-being, professional integrity, and sustainable operational excellence in European aviation.

Safety, Fatigue and FTL

"… The gap between theory and practice is too great. All kind of departments come with safety instructions that satisfy THEIR needs. The line-pilot has to execute them all. That keeps him/her so busy that he has less time to ACTUALLY guard the safety of his/her acft and its passengers. On paper A-plus, in reality a distractor."

Fatigue remains a critical safety concern in aviation, directly affecting cognitive performance, decision-making, and situational awareness of both cockpit and cabin crew (Engin & Umit, 2021; Wingelaar- Jagt et al., 2021; ICAO, 2025). Empirical studies indicate that fatigue contributes significantly to human error in commercial aviation, increasing the likelihood of operational incidents and accidents (da Silva et al., 2024; Olaganathan et al., 2021; Caldwell, 2005; Goode, 2003). In response, regulatory frameworks such

as the European Union Aviation Safety Agency (EASA) Flight Time Limitations (FTL) regulations have been developed to mitigate fatigue risks by prescribing maximum duty periods, minimum rest times, and cumulative duty limits for aircrew (EASA, 2023).

"I am wondering how it is possible that there is no difference in regulations between short haul and long-haul. We are flying for 11hour a day, 6 flights which means 6 takeoff and landings often in bad weather conditions with a turboprop ATR 72 600. We are often in clouds, icing conditions and turbulence because lack of aircraft performance. I have previously being flying long-haul and in my point of view it is not comparable at all. I am much much more tired after an 11 hour day, 6 flights in a turboprop STR 600 than flying one leg for 11 hours in a wide body aircraft, far above all bad weather. It is really hazardous to operate a shorthaul turboprob with the same flight time limitations as for a long haul aircraft.""

FTL regulations are designed to balance operational demands with physiological limits, accounting for circadian rhythms, time-zone crossings, and consecutive duty periods (EASA, 2023). Compliance with these regulations is associated with improved alertness, reduced error rates, and enhanced overall safety performance (EASA, 2023; Alomar et al., 2024; Tuncel, 2025). However, research and industry reports suggest that **variability in operational implementation**, particularly in atypical employment contexts such as ACMI or self-employed arrangements, may compromise the intended protective effect of FTL (Subgroup on social matters related to aircrew, 2021; Valcke, 2024). Crew in these arrangements often face irregular schedules, limited access to organizational oversight, and uncertainty regarding legal protections, which increases fatigue-related risks (Jorens et al., 2015; Brannigan et al., 2019). On top of that, although EASA Flight Time Limitations (FTL) are clearly defined, and some Collective Labour Agreements (CLAs) include even higher standards, empirical evidence indicates that current FTL regulations may be insufficient to prevent crew fatigue and associated sleep disturbances (Johansson & Melin, 2018; Demerouti et al., 2018; Venus et al., 2021). High levels of inappropriate presenteeism are reported, with around 65% of pilots flying despite significant fatigue or personal challenges, around 55% operating while sick, and over 80% of cabin and cockpit crew experiencing fatigue during duty (Valcke, 2024; Efthymiou et al., 2021; Johansson & Melin, 2018). Only a minority of crew feel comfortable reporting fatigue, and fatigue support structures are often absent, reflecting a broader issue of underreporting and insufficient organizational emphasis on fatigue management (Efthymiou et al., 2021). Research further suggests that FTL are frequently used by airlines as crewing targets rather than true safety maxima, a phenomenon referred to as "pilot pushing" (ALPA, 2023; FPU, 2022). The efficiency of the FTL regulation is further challenged by the misuse and systematic pressure regarding commander's discretion: Pilots feel reluctant to exercise discretion due to fear of managerial repercussions (Although EASA explicitly clarifies that no reporting or justification is required when Commander's Discretion is not exercise), perceived disruption to schedules, or informal cultural norms that prioritize on-time performance over rest. Such practices undermine the protective intent of

"Unfortunately, most of not all of my safety related reports have been shut down by the company. I was threatened with a demotion because I decided to offload a fellow cabin crew. I am a linechecker in my company and I haven't done any training flights in over 8 months as I keep on failing the cabin crew I am testing for lack of knowledge. They call us to push sales in different departments event if we might reach some of our targets. "

Commanders Discretion, potentially increasing fatigue-related risks and compromising both crew well-being and safety outcomes (Efthymiou et al., 2021; Valcke, 2024).

Consequently, FTL have not consistently achieved their full potential in safeguarding alertness, safety, and well-being (Aljurf et al., 2018; Bendak & Rashid, 2020; Bourgeois-Bougrine, 2020; Reis et al., 2016a+b; Venus & Grosse Holtforth, 2021). Effective fatigue management therefore depends not only on regulatory frameworks but also on the cultivation of a just and positive safety culture (see topic Just Culture), supported by responsible operators and harmonized, scientifically informed EU standards (Efthymiou et al., 2021; ECA, 2023). Establishing clear responsibility for implementing FTL, particularly in complex operational arrangements such as wet-leasing, represents a critical first step toward a robust and equitable safety management system. Additionally, responses to the survey's open question highlight a recurring view among participants that separate FTL regulations should be established for short-haul and long-haul operations.

Beyond regulatory compliance, safety culture and organizational practices play a pivotal role in mitigating fatigue (Macgregor-Curtin et al., 2022). Airlines that integrate fatigue risk management systems (FRMS) alongside FTL regulations demonstrate higher reporting rates for fatigue-related issues, greater crew engagement in safety processes, and lower incidence of fatigue-related operational events (Steiner et al., 2018; EASA, 2023; Alomar et al., 2024; Martin, 2025). These systems emphasize proactive monitoring, scientific assessment of fatigue, and adaptive rostering practices, and fatigue reporting rather than relying solely on prescriptive legal limits (Martin, 2025, ICAO, 2025). Fatigue reporting is a critical component of aviation safety, providing both early warning signals of operational risk and actionable data to improve rostering and safety management. Effective reporting systems rely on a **Just Culture (see other topic)**, where crew members feel safe to report fatigue-related issues without fear of punitive consequences (McMurtrie, 2023; Skybrary, 2023; Adjekum et al., 2023). Empirical research demonstrates that airlines with robust fatigue reporting mechanisms experience higher incident detection rates, improved fatigue mitigation strategies, and enhanced overall safety outcomes (Tuncel, 2025; Jin et al., 2024).

Recent studies in European aviation highlight persistent challenges in harmonizing operational efficiency with fatigue management (Simmons, 2023). Flight planning often clashes with operational reality: delays build up, duty hours lengthen, fatigue rises, and pilots and cabin crew bear the brunt of the system's pressures.

"Airline business has changed a lot during last 35 years and Flight safety has definitely improved a lot but treatment of employees are worst as ever before, flight hours to maximum and human factors not considered. We are only numbers and should function like robots, we are asked to perform only at highest standards with lowest salary"

Network carriers and cargo operators generally maintain more favorable safety and fatigue outcomes due to predictable scheduling and direct employment structures, whereas low-cost carriers and ACMI operators report higher fatigue levels, partly linked to atypical contracts, compressed schedules, and cross-border operational variability (Eurocontrol, 2023; Valcke, 2024). These findings underscore that **FTL regulations are necessary but not sufficient**: achieving optimal safety outcomes requires integration of organizational support, workforce well-being, and robust safety culture.

In conclusion, managing fatigue in European aviation requires a multi-layered approach: enforceable FTL regulations, scientifically grounded fatigue risk management, and organizational practices that prioritize crew well-being. Aligning operational efficiency with these protective measures is essential for maintaining both flight safety and the sustainable engagement of a skilled workforce.

Extra information about the regulation

EASA Occurrence Reporting Regulation:

- **Regulation (EU) 376/2014** requires mandatory reporting of occurrences that may affect flight safety, including those related to crew fatigue.
- **EASA Part-ORO (Organisation Requirements for Air Operations)** and **CAT.GEN.MPA.100** further require operators to have a **Fatigue Risk Management System (FRMS)** or, at minimum, procedures to monitor and report fatigue as part of their Safety Management System (SMS).
- **AMC1 ORO.FTL.110(j) – Fatigue reporting** explicitly states that operators must have a system through which crew can **report fatigue** (both actual fatigue occurrences and fatigue hazards).
- Flight and cabin crew are required to report when they are unfit due to fatigue.
- Operators must collect and analyse this information to manage fatigue risks.
- Reports are **non-punitive** by principle and protected under Regulation (EU) 376/2014.

Single pilot

"My biggest concern is the fact that on long haul flights the amount of pilots are reduced. Normally we flew with 3 pilots on long haul rotations but sometimes this is reduced to 2 pilots. During a day flight I don't care but during a night flight it's a huge risk! We all know that we as humans don't perform well during the night. Flying with 2 pilots without any rest opportunity is inhumane and irresponsible"

The proposal to transition from traditional two-pilot cockpits to Single-Pilot Operations (SPO) in commercial aviation has gained traction among certain regulators and airline stakeholders, primarily driven by technological advancements, cost-efficiency goals, and perceived pilot shortages (EASA, 2021; Airbus, 2022). While the integration of advanced avionics, artificial intelligence (AI), and automated decision-support systems may technically facilitate SPO under specific conditions, the concept raises significant concerns from a human, legal, and safety-critical standpoint.

From an operational safety perspective, the presence of two qualified pilots on the flight deck provides cognitive diversity and mutual cross-checking, both of which are essential during high-stress or abnormal situations (Gao, et al. 2025). Accidents such as Air France 447 and the 737 MAX crashes illustrate the complexity of in-flight emergencies and the crucial role of pilot teamwork and error detection (BEA, 2012; NTSB, 2020). In a SPO setting, the sole pilot may become overwhelmed, particularly under conditions of fatigue, unexpected system failure, or emotional distress—factors frequently cited in aviation safety literature (CAA, 2023; Neis et al., 2018; Schmid and Stanton, 2020; Reason, 1990).

Moreover, SPO amplifies risks related to pilot incapacitation (ALPA, 2019). Current dual-pilot configurations allow immediate substitution in such cases, a safeguard that is lost when only one pilot is present (ALPA, 2019). Proposed mitigations—such as remote pilot assistance or cabin crew intervention—lack empirical validation and raise additional regulatory, technical, and ethical questions

(de Visser et al., 2020; ICAO, 2022). The reliance on AI or ground-based support further complicates responsibility and accountability frameworks in aviation law (EASA, 2023).

From a psychological standpoint, SPO introduces heightened stress and isolation for the pilot, with increased cognitive workload and limited opportunities for task sharing or debriefing. It may also deteriorate job satisfaction and contribute to mental fatigue (Cahill et al., 2019; Li et al., 2024)—an already growing concern in the aviation industry, particularly post-COVID-19 (Valcke, L., 2024). The social aspect of flying, including mutual support and peer interaction (Kolander, 2019; Emmanouil, et al. 2025), is also diminished in single-pilot configurations.

The broader socio-economic implications cannot be ignored. SPO risks undermining the professional status and employment conditions of pilots, especially in a sector already under stress, and with a growing automation anxiety (Rizkina et al., 2025; Valcke, 2024). Reducing the cockpit crew under the guise of efficiency may further alienate flight personnel, damage trust, and provoke union resistance, as reflected in several recent position papers by pilot associations (ECA, 2023).

"Reduction in pilots on the cabin is a measure that will be proven fatal to safety if it ever becomes a reality"

Critically, the public perception of SPO remains sceptical. Surveys consistently show that passengers feel less safe flying with a single pilot, even if reassured by technological compensations (Adeniyi, 2025; Boeing, 2023: Airline Ratings, 2014). The commercial viability of SPO is thus not only a matter of technical readiness but of societal legitimacy, passenger confidence, and ethical responsibility.

In sum, while SPO may offer theoretical and financial appeal in controlled environments, it poses substantial risks to operational safety, mental workload, legal accountability, and workforce stability. Any move toward SPO should be approached with extreme caution, underpinned by transparent scientific validation, inclusive stakeholder dialogue, and an unwavering commitment to safety as the cornerstone of aviation.

In line with this analysis EASA, very recently, halted its research on single-pilot operations, claiming that there is currently not enough evidence that it is equally as safe as flying with two pilots. The main reasons given for the decision are: fatigue and drowsiness, sleep inertia, cross-checks, pilot incapacitation monitoring and physiological needs (ECA, June 2025). Missing in this list is the necessary attention for Occupational Health and Safety Risks.

TRAINING

European regulation (EASA) establishes minimum requirements for initial and recurrent training (Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council and Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency) —such as Crew Resource Management (CRM), Threat and Error Management (TEM), and emergency or abnormal procedures—but in practice, some operators treat training primarily as a compliance exercise rather than as a capability-building system aligned with their actual risk profile (Dahlstrom et al., 2008; EASA, 2021; Manor, 2025). Evidence-Based and Competency-Based Training and Assessment (EBT/CBTA) were developed to shift the emphasis

from merely completing a syllabus to demonstrating competence under realistic conditions (Ziakkas et al., 2023; Ziakkas et al., 2024; Malmquist et al., 2025), yet the quality of implementation varies considerably, particularly in how operational data inform scenario design and how assessor standardization is maintained (ICAO Doc 9995; ICAO Doc 9868; IATA EBT Guide). Operators using EBT programs should fulfil a set of strict requirements in terms of qualification and training in EBT principles and application as well as a clear understanding of what EBT may bring to their organisations. We do wish to highlight a good practice that illustrates this shift from strict syllabus-based learning to training under realistic conditions: the pilot project launched by Brussels Airlines, in which Virtual Reality (VR) is used as an integral part of the A320 'type rating training' for pilots, prior to the SIM phase (Cardone, 2025).

"Being a cabin crew for me is a great job. I enjoy my personal time and also time during work. For me, working is not a heavy burden and I really enjoy it. What I don't like about it, and perhaps general situation in Spanish labour conditions is that, sometimes work is not well paid or even unpaid. For example, I personally experienced different training courses unpaid because the company doesn't consider it as something to be paid although the Spanish legislation do considers it. And through this "open question" site I would like to pinpoint this because it's a reallity and it happens in all Spanish airlines. Cabin crews aren't paid for their first training with the company. And this is ILLEGAL in Spain. I don't know why it still works like this. However, pilots are paid during this training. So why aren't cabin crews the same? …"

Training quality also depends on psychological safety: where crews fear punitive consequences, they may "train to the check," disclose less during debriefs, and under-report errors, thereby blunting the learning cycle (Patil et al., 2023). A robust Just Culture supports candid self-assessment, early help-seeking, and high-fidelity reporting that feeds directly into training scenarios (Reason, 1997; Dekker, 2007; Eurocontrol, 2019; ICAO Doc 9859; Kolbe et al., 2020).

Modern flight decks reduce manual flying and raw-data exposure, which heightens the risk of skill decay and over-reliance on automation (Haslbeck & Hoermann, 2025). Training therefore requires deliberate practice of manual handling, surprise elements, and the management of rare events—such as automation mode confusion or unreliable airspeed—to sustain judgment and resilience when automation degrades (Maurino et al., 1995; Martinussen & Hunter, 2017; Hanush, 2017). Non-technical skills (NTS), including decision-making under uncertainty, workload management, and cross-crew coordination, can be crowded out under commercial pressure from turnaround targets and cost constraints, despite meta-analytic evidence that CRM improves safety performance (Salas et al., 2006; Helmreich & Foushee, 2010: Le Bris et al., 2019; Tusher et al., 2022). Cabin crew training is particularly vulnerable when inflight sales or service KPIs displace safety-critical scenario practice.

Fatigue, wellbeing, and training effectiveness are closely linked (Behrens et al., 2023). Training scheduled during circadian lows or after intense rosters reduces learning and performance in simulators and checks (Buysse et al., 2003); fatigue, stress, and sleep debt impair retention and decision-making, potentially misrepresenting true capability and hindering reflective debriefs (Caldwell et al., 2009; Wingelaar-Jagt, 2021). Integrating fatigue science into training timetables and ensuring protected preparation and recovery periods can improve outcomes (EASA, 2024). Assessment validity and standardization also remain concerns: binary pass/fail checks and rote Line-Oriented Flight Training (LOFT) profiles can inflate pass rates without confirming robust competence under uncertainty (Möltner et al., 2015). (ICAO Doc 9868; ICAO Doc 9995).

Evidence Based Training and Competency-Based Training and Assessment depend on rich inputs from safety-management systems such as Flight Operations Quality Assurance/Flight Data Monitoring (FOQA/FDM), Line Operations Safety Audits (LOSA), Air Safety Reports (ASR), and Fatigue Risk Management Systems (FRMS) (IATA, 2014; Renier, 2022). Thin or distorted reporting—whether due to stigma or punitive cultures—produces less relevant scenarios, weakening the alignment between training and actual operational risks (DBO, 2025). Strengthening confidential reporting and analytics is therefore not merely a safety-management requirement but a training imperative (ICAO Doc 9859; Eurocontrol, 2019).

"... The training given to new inexperienced pilots is the very bare minimum to fly safely (tick some boxes) rather than actual on-the-job training (LFUS). We are evaluated on how well we follow procedures rather than on our common sense and airmanship which are keys to the job..."

Post-COVID, the sector faces experience gaps resulting from attrition and rapid rehiring (Kalic et al., 2014; Mallik, 2024), which have created performance variability, especially among newer crew members (Wang et al., 2023). Without structured line training, mentoring, and time for consolidation, these gaps can widen; targeted coaching and supervised consolidation phases help mitigate this risk.

Flight deck–cabin integration in training remains inconsistent across operators (Rigner & Dekker, 2024), despite its critical importance for time-critical events such as evacuations, smoke or fire incidents, incapacitation, security threats, and abnormal operations (European Labour Authority, 2025). Role-realistic, integrated scenarios improve shared mental models and shorten decision latencies during such events (Helmreich & Foushee, 2010). Finally, equity of access to high-quality training is a persistent issue: contracting and atypical employment arrangements can limit access to high-fidelity simulators, remedial training, and coaching, shifting costs and risks onto workers and undermining organizational oversight (Jorens et al., 2015). Compliance with minimum regulatory requirements is insufficient if access to training and developmental support is uneven across the workforce.

Practical implications

1. Treat EBT/CBTA as a **risk-based system**, not a paper exercise; invest in assessor calibration and behavioural markers.
2. Protect **NTS/CRM time** and integrate surprise/rare-event practice to counter automation skill decay.
3. Embed **Just Culture** in training and debriefs; decouple formative coaching from high-stakes checking where feasible.
4. Align training schedules with **fatigue science**; provide protected prep and recovery time.
5. Strengthen the **data to scenario** pipeline (FOQA/LOSA/ASR/FRMS) through confidential, non-punitive reporting.
6. Expand **joint flight deck–cabin** scenarios; formalize mentoring and consolidation for less-experienced crews (European Labour Authority, 2025).
7. Ensure **equitable access** to high-quality training across all employment arrangements.

TURNAROUND TIME AND QUALITY OF MATERIAL

"It is all about time for PDIs and turn around. Most of the time we are working 11-12 hours without having a break to eat. So by the end of the duty we are tired to act appropriately in an emergency situation"

Turnaround time—the interval required to prepare an aircraft for its next flight—has become an increasingly critical parameter in the operational and economic performance of European aviation. Airlines are under strong competitive pressure to minimize ground time in order to maximize aircraft utilization. While shorter turnaround times can enhance efficiency, and reduce costs, research indicates that they also carry significant implications for safety, workload, and service quality (Eurocontrol, 2024 January; EASA, 2022). Rapid turnarounds often intensify time pressure on ground staff, cabin crew, and maintenance personnel, increasing the risk of errors, fatigue, and incomplete safety checks (Jiyoung et al., 2022). This trade-off underscores the need for balanced policies that consider both economic competitiveness and operational safety. Open responses from cabin crew in the survey primarily highlight concerns about unrealistic standards for turnaround times, limited preparation, and insufficient recovery periods between flights, compounded by an increasing emphasis on in-flight sales (see related section).

"Bad working material on Board, Trolley and insert is stuck"

Next topic, and closely linked to this issue is the **quality of material and equipment** available to aviation personnel. The durability, reliability, and ergonomic design of cabin and cockpit equipment, as well as ground-handling tools, play a direct role in ensuring efficiency and reducing strain on workers. Inadequate or outdated materials can extend turnaround time, compromise safety-critical procedures, and contribute to occupational stress (Shanmugam & Robert, 2015; European Parliament, 2020; Durmaz et al., 2021).). Moreover, uneven standards across Europe—partly due to regulatory and financial disparities between airlines and regions—result in variable levels of material quality and maintenance practices.

A sustainable approach to aviation competitiveness in Europe therefore requires **integrating efficiency targets with investment in high-quality materials and (evidence-based) feasible** turnaround **times**. Ensuring that safety checks and crew recovery are not sacrificed for speed is essential to safeguarding both employee well-being and passenger safety and satisfaction. Policy recommendations should focus on uniformisation of standards across the EU, fostering investment in durable equipment, and setting realistic operational benchmarks for turnaround processes that align safety, efficiency, and fair working conditions.

KEY TAKE-AWAYS FROM THE ANALYSIS OF THEMES EMERGING FROM THE OPEN INPUT

- ACMI operations: highlight the tension between operational flexibility and social protection in aviation. Ensuring legal certainty, fair working conditions, and enforceable EU regulations is essential not only for workforce stability but also for maintaining safety and long-term sustainability in the sector
- AI and automation: The shift toward AI-enabled aviation is inevitable, but it must be guided by transparent scientific validation, robust social dialogue, and proactive regulation to ensure that dignity, expertise, and safety of aviation workers remain central.
- Commercial pressures on cabin crew: Expanding in-flight sales responsibilities risks diluting the safety-first mandate of cabin crew. Policymakers and regulators should safeguard role clarity, professional integrity, and well-being when balancing commercial imperatives with safety culture.
- Just culture: extends beyond technical procedures—it relies on trust, fairness, and workforce stability. Implementing it effectively enhances safety, supports employee well-being, and strengthens professional integrity and operational excellence in European aviation.
- Single-Pilot Operations (SPO): While financially attractive on paper, SPO poses significant risks to safety, workload management, and workforce stability. Any policy or industry initiative in this direction should proceed with extreme caution, prioritizing safety over cost-saving in line with the conclusion from EASA.
- Retention and workforce stability: Long-term retention is structurally linked to high-quality contracts (secure home base, predictable rosters, competitive remuneration), fatigue management, and clear career progression. Operational stability (e.g., managing delays, reducing network strain) and coherent, enforceable social protections across borders are equally crucial to reducing churn and brain drain. EU-level skills initiatives should complement airline-level measures to keep European talent in European jobs.
- Operational sustainability: A sustainable approach to aviation competitiveness in Europe therefore requires integrating efficiency targets with investment in durable materials, evidence-based and feasible turnaround times, and harmonized EU standards for safety checks and recovery time are vital to safeguarding safety, employee well-being, and passenger trust.
- Safety, fatigue and FTL: Effective fatigue management in European aviation demands enforceable and science-based FTL regulations (adapted to short-long haul), robust fatigue risk management, and organizational practices that place crew well-being at the center—ensuring both operational safety and long-term workforce sustainability.

CHAPTER 8 CONCLUSION: WHERE ARE WE FLYING TO?

"I joined a common sense airline, and will retire from a shit show"

"Something must happen now!"

Labour costs represent a significant component of the overall cost structure in the aviation sector, making employment conditions a central factor in shaping both operational performance and long-term sustainability. This study demonstrates that employment structures, labour relations, and organizational practices in the European aviation sector are critical determinants of well-being, safety culture, and workforce retention. Transitions between airline companies are frequent and are primarily motivated by work-life balance and overall labour conditions rather than remuneration alone, echoing prior findings on mobility in high-skill transport sectors (Eurocontrol, 2024; ETF, 2019). The instability of home base arrangements—where official designations often differ from the operational reality and unilateral employer decisions prevail, placing home bases easily inside and outside the EU—highlights structural precarity that can undermine professional security and organizational loyalty (European Parliament, 2019). Further concerns can be raised in social security law, where this concept of home base was introduced looking at the aviation law for a connecting factor. This was with primarily stability in mind for the workers. Experiences show that this objective is not completely achieved.

Remuneration structures further influence workforce behavior and well-being. While cabin crew may undertake secondary employment for financial reasons, pilots often pursue intellectual or personal fulfilment. Issues surrounding compensation during medical absence or flight gaps contribute to stress and perceived insecurity, aligning with prior evidence that compensation clarity is linked to both retention and operational safety (ILO, 2021). Part-time work shows modest benefits for well-being, suggesting that flexible scheduling can mitigate some of the negative effects of occupational stress, consistent with studies on fatigue and work-life balance (EASA, 2023).

Flight time limitations (FTL's) that were introduced aiming to exclude that crew fatigue would have an impact on safety, is of growing concern for aircrew personnel. Because of the way, it is implemented and executed, the fact that is often seen as being not a maximum but rather a target and known pilot pushing regarding commander's discretion. This leads to a plea for more clarity and a revision of the actual rules.

The dependency of the aircrew member vis-à-vis the airline one is flying for raises several issues.

Aviation personnel is per definition international, causing a complex interplay of labour and social security legislation. The result is legal uncertainty, which becomes more problematic from the moment this interplay is based on reasons of reducing labour costs and enhance competitiveness. Social engineering, in particular when connected to (chains of) bogus-subcontracting constructions, lead to

deterioration of workers' rights. The study demonstrates that such risks are existent regardless the aviation-models, but are very prevalent in low-cost carriers and the upmost in ACMI situations.

Regional and business-model disparities also drive systemic differences. Atypical employment is more prevalent among pilots, ACMI, low-fare, and charter operations, particularly in Eastern Europe, reflecting local labour market conditions and regulatory frameworks. These structural patterns reinforce inequalities in job security, fatigue, and mental health outcomes, emphasizing the intersection between employment arrangements and safety culture (Folke & Melin, 2025; Eurofound, 2020). Network and cargo airlines consistently report more favourable well-being and safety climates, highlighting the protective role of stable employment, supportive management, and predictable schedules.

Union membership remains unevenly distributed, with the lowest levels observed in ACMI and business aviation operations, and among atypical workers who are often reticent to join unions (Eurofound, 2020). Atypical employment—particularly self-employment via agencies—is closely associated with weaker union presence, reduced access to organizational support, and lower willingness to report safety concerns, confirming the critical role of employment type in shaping safety culture and psychosocial outcomes (Folke & Melin, 2025; European Cockpit Association [ECA], 2022).

The data underscore that aviation safety extends beyond technical proficiency: organizational support, psychosocial well-being, and fair employment conditions are foundational to effective safety culture (Valcke, 2024; EASA, 2022; EASA, 2023). Younger crew members and cabin staff are particularly vulnerable, facing greater psychosocial risks and lower access to organizational support, suggesting a need for targeted interventions.

On top of that when we compare the 2024 results with those of the 2014 survey, it becomes clear that the key challenges can no longer be attributed primarily to contrasts between legacy and other airline companies, nor to the distinction between typical and atypical employment. Instead, the findings point in the direction of a more general trend across the sector, suggesting a danger for a levelling down convergence of outcomes (with notable (worse) exceptions among ACMI workers and respondents based in Eastern Europe). We support this statement with several observations stooled on the comparison of the results from 2014 and 2024:

- Widespread trends across business models: While atypical employment and ACMI arrangements continue to show higher risks regarding well-being, fatigue, and legal uncertainty, even legacy carriers and directly employed crew now report more stressors related to scheduling, fatigue, and mental health (results have not improved after recovery beyond COVID-19). This indicates that vulnerabilities and concerns can be found all over airline companies beyond traditional "at-risk" groups.
- Well-being outcomes converge: Younger crew members and cabin staff remain relatively more vulnerable, but overall differences between airline types and employment categories are less pronounced than in 2014. Part-time arrangements and flexible schedules now show modest positive effects across the sector, suggesting systemic improvements but also a levelling of outcomes.
- Safety culture and reporting patterns: Safety perceptions and willingness to report fatigue or incidents are no longer strictly associated with airline type or employment status. Instead, we

note lower willingness for both subjects and systemic factors—such as management style, organizational support, and clarity of operational instructions—emerge as more consistent predictors of both safety and well-being.

- Growing concern within the aircrew about the working atmosphere (based on open input and survey)

Moreover, several conclusions and analysis of trends from the current report support the conclusion that the main challenges can no longer be explained solely by contrasts between legacy versus other airlines or by employment type (typical versus a-typical employment).

So, while flexibility is an important instrument also for the aviation sector, a balance more than ever must be found with workers' rights. Certainly, when we notice that labour conditions have an important impact on well-being of the personnel and on global safety-issues.

Policy Recommendations

Based on these findings, we propose the following evidence-based policy measures to be developed in close collaboration between all stakeholders:

1. Strengthen Employment Protection

    - Promote more stable and clear employment situations (Eurofound, 2020), and to control the unregulated use of ACMI (European Labour Authority, 2025).
    - Clarify and enforce home base (and operational base) definitions to prevent discretionary employer decisions and enhance more stability and legal certainty. Reflect about the situations where home base is situated outside of Europe.
    - Based on input from the airline companies themselves, it is clear that European carriers operate under significantly stricter rules and legislation compared to many global competitors, which places them at a competitive disadvantage. Any regulatory adjustments should therefore carefully balance safety and social standards with the need to safeguard the sector's competitive position.

2. Converge Remuneration and Social Protection

    - Ensure consistent protections for medical absence, duty gaps, and minimum social benefits (particularly for atypically employed crew) (ILO, 2021). Airlines can enhance their strategic positioning in the competition for talent by prioritizing these issues, while ensuring sustained attention to work–life balance. Such an approach is likely to contribute to higher retention rates and to mitigating brain drain within the European aviation sector

    - Encourage greater influence on scheduling/arrangements for aircrew, including part-time arrangements, as a tool for enhancing well-being and mitigating fatigue (in line with the good practice presented in one of the interview with the airline companies)

    - Strengthen the fight against bogus-subcontracting constructions by strengthening multi-disciplinary cross-border cooperation and coordination between national inspection services also with the help of the European Labour Authority (ELA)

- Urge the European legislators to reflect about a European framework offering more clarity and certainty about the social framework applicable to the aircrew sector fully taking into account the specificities of the aviation sector.

3. Address Regional and Structural Disparities

    - Target regulatory enforcement and labour-market support in Eastern European bases and ACMI operations to reduce systemic precarity.

    - Monitor compliance with collective agreements and labour law across business models.

4. Enhance Collective Representation

    - Ensure the systematic involvement of flight personnel in every stage of policy development and adjustment (through unions and independent pilot/crew representation), thereby moving away from top-down decision-making towards more participatory and practice-informed processes.

    - Strengthen union access and membership opportunities for atypically employed crew (Valcke, 2024).

    - Facilitate social dialogue (and union representation) at European and airline levels to converge protections and reduce structural inequities.

5. Well-being and Safety Management

    - Require systematic incorporation of psychosocial risk, fatigue management, and employment conditions into safety management systems (EASA, 2023).

    - Expand independent, easy accessible and confidential reporting systems, peer support programs, and mental health resources trusted by the workers.

    - Airline companies are encouraged to foster a management style (transformational leadership) that balances operational efficiency with a proactive commitment to employee well-being. Transparent communication, fair and consistent application of rules, and genuine opportunities for crew involvement in decision-making contribute not only to healthier workplaces but also to stronger organizational trust and safety culture. By adopting a supportive and participatory management approach, companies can strengthen retention, reduce psychosocial risks, and ensure sustainable workforce engagement.

    - Be open to a clarification (see block hours, duty time,…) and revision of the FTL, based on an evidence –based approach, combined with input from members of the aircrew themselves (call is specifically to EASA and the European commission) and to safeguard the application on the ground. This to keep aviation careers feasible and sustainable.

    - Initiatives targeting well-being, fatigue, or job insecurity should be systematically followed by robust post-hoc evaluations to verify their effectiveness, ensure alignment with the needs of aircrew, and provide evidence for further policy refinement. Embedding such evaluation mechanisms enhances accountability, supports evidence-

based decision making, and ensures that resources generate measurable and sustainable improvements.

6. Target Vulnerable Groups

    - Develop programs specifically for younger crew and cabin staff to enhance resilience, mental health, and professional development. We refer to good practices from our interviews such as Sherlock, Voice, Gain program, …

    - Provide structured mentoring, training, and progression pathways to counter the pull of external labour markets (in line with good practices put forward in the interviews: integration of these topics in the training) (European Labour Authority, 2025).

In conclusion, these findings reinforce that fair employment conditions, legal certainty, collective representation, and well-integrated well-being programs are not only matters of social justice but essential components of a resilient, safe, and sustainable European aviation sector. Addressing the structural inequalities and vulnerabilities revealed in this study is critical for retaining skilled personnel, maintaining operational safety, and ensuring the long-term sustainability of European aviation. We believe that such focus could strengthen the dream-job for aircrew personnel.

RECOMMENDATIONS FOR FURTHER RESEARCH

In chapter 1 we presented some limitations for the study, in line with normal research protocols. Where we presented a robust research model there are always interesting approaches for future research to be put forward:

- Including other professional groups: Safety-sensitive roles in aviation extend well beyond cockpit and cabin crew. Ground handling staff, air traffic controllers, and other professional groups face comparable safety challenges. While their situation might not always be similar, certain challenges (e.g. flexibility) are common. A holistic approach to aviation safety therefore requires integrating the perspectives of these groups into guidelines and regulations, fostering alignment and coherence across the sector.
- Longitudinal research: To advance beyond correlational/association findings and address questions of causality, longitudinal research with a large and stratified sample is needed. Such efforts should be grounded in a clear understanding of the actual composition of the aviation workforce, including demographic and employment background variables.
- Integration of safety dimensions: While this study deliberately excluded the technical perspective of safety, future research could profit from combining different safety dimensions—technical, organizational, and psychosocial—in order to assess how diverse stakeholders, interact within an integrated safety culture.
- Towards a legal framework: Building on the evidence presented, future work could explore the construction of a legal framework that better regulates sub-contracting chains and abuse of social engineering and that addresses the intersection of safety and wellbeing. This could involve either adapting existing regulations and directives or developing new instruments. An additional challenge lies in determining which organizational actors, and at what level of the aviation system, would bear responsibility for monitoring and enforcement. We propose a strongly evidence-based approach, complemented with input from the crew themselves.

REFERENCES

Adeniyi, D. (2025). The Role of Trust in Human-Robot Interaction: A Perspective on Factors Influencing Trust Development. I*nternational Research Journal of Innovations in Engineering and Technology* 09(06), 112-118. DOI:10.47001/IRJIET/2025.906013

Adjekum, D., Afari, D., Owusu-Amponsah, N., Waller, Z., Rasouli, V., Ullrich, G., Snyder, P. & Corbin, N. (2023). Development of a generative voluntary safety reporting culture (GVSRC) model for the Gulf of Mexico (GOM) oil and gas (O & G) sector using attributes of the aviation safety action program (ASAP). *Safety Science* 161, 106073, https://doi.org/10.1016/j.ssci.2023.106073.

Airbus. (2022). *The Future of Flight Operations*. https://www.airbus.com. Consulted on July 31, 2025.

Airline Ratings (2024). *Would You Fly On A Plane With Only One Pilot*? https://www.airlineratings.com/articles/would-you-fly-on-a-plane-with-only-one-pilot. Consulted on August 5, 2025.

Aljurf, T.M., Olaish, A.H., & BaHammam, A.S. (2018). Assessment of sleepiness, fatigue, and depression among Gulf Cooperation Council commercial airline pilots. *Sleep and Breathing*, 22 (2), 411-419, 10.1007/s11325- 017-1565-7.

Alomar, I., Alomar, S. & Stecenko, I. (2024). Improvement of fatigue management methodology related to flight crew. *Aviation* 28. 148-162. 10.3846/aviation.2024.22146

ALPA. (2019). The dangers of single-pilot operations. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.alpa.org/-/media/ALPA/Files/pdfs/news-events/white-papers/white-paper-single-pilot-operations.pdf&ved=2ahUKEwjXlNmGoPaOAxW6KvsDHYLrAnMQFnoECCAQAQ&usg=AOvVaw2mNRpR0EZdn_euLomhO7MI. Consulted on August 6,2025.

ALPA. (2023). Factsheet Pilot Pushing. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKE wj_kIv-kM2BAxVV4gIHHT-HAfsQFnoECBkQAQ&url=http%3A%2F%2Fpublic.alpa.org%2Fportals%2Falpa%2Fpressroom%2Finthecoc kpit%2FFactSheet-TiredPilotPushing.pdf&usg=AOvVaw3RvPH_8oIga6lnexoTNNf_&opi=89978449. Consulted on September 28, 2023.

Babbie, E. (2020). *The Practice of Social Research* (15th ed.). Cengage Learning.

BEA. (2012). *Final Report on the accident on 1st June 2009 to the Airbus A330-203*. Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile.

Behrens, M., Gube, M., Chaabene, H., Prieske O., Zenon, A., Broscheid, KC., Schega, L., Husmann, F. & Weippert M. (2023). Fatigue and Human Performance: An Updated Framework. *Sports Med.* 53(1), 7-31. doi: 10.1007/s40279-022-01748-2.

Bendak, S., & Rashid, H.S. (2020). Fatigue in aviation: A systematic review of the literature. *International Journal of Industrial Ergonomics* 76, 102928. https://doi.org/10.1016/j.ergon.2020.102928

Boeing. (2023). *Commercial Market Outlook*. https://www.boeing.com. Consulted on August 3, 2015.

Bor, R., du Plessis, A., Russell, M., & Rosenthal, J. (2010). *Clinical Aviation Psychology*. Ashgate.

Bourgeois-Bougrine, S. (2020). The illusion of aircrews' fatigue risk control. *Transportation Research Interdisciplinary Perspectives* 4, 100104. https://doi.org/10.1016/j.trip.2020.100104

British Psychological Society (BPS). (2021). *Ethical guidelines for internet-mediated research (2021 edition)*. The British Psychological Society. https://www.bps.org.uk/news-and-policy/ethical-guidelines-internet-mediated-research-2021. Consulted on August 1, 2025.

Brooks, S. K., Webster, R. K., Smith, L. E., et al. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, 395(10227), 912–920.

Bryman, A. (2016). *Social Research Methods* (5th ed.). Oxford University Press.

Buysse, D. J., Barzansky, B., Dinges, D., Hogan, E., Hunt, C. E., Owens, J., ... & Wiest, F. (2003). Sleep, fatigue, and medical training: setting an agenda for optimal learning and patient care. *Sleep* 26, 218-225.

CAA. (2023). *Human Factors in Aviation Safety: Annual Report 2022*. Civil Aviation Authority.

Cahill, J., Cullen, P., Anwer, S., Gaynor, K., & Wilson, S. (2020). The requirements for new tools for use by pilots and the aviation industry to manage risks pertaining to work-related stress (WRS) and wellbeing, and the ensuing impact on performance and safety. *Technologies*, *8*(3), 40. https://doi.org/10.3390/technologies8030040

Cahill, Joan & Cullen, Paul & Gaynor, Keith. (2019). Estimating the Impact of Work Related Stress on Pilot Wellbeing and Flight Safety. Conference: The 2nd International Symposium on Human Mental Workload: Models and Applications (H-WORKLOAD 2018), Amsterdam (September 20-21, 2018). At: Amsterdam, The Netherlands.

Caldwell, J. A., Mallis, M. M., Caldwell, J. L., Paul, M. A., Miller, J. C., & Neri, D. F. (2009). Fatigue countermeasures in aviation. *Aviation, Space, and Environmental Medicine*, 80(1), 29–59.

Cardone, N. (2025). Brussels Airlines lanceert nieuwe Virtual Reality pilotenopleiding als eerste binnen Lufthansa Group. Consulted on August 14 2025. https://press.brusselsairlines.com/brussels-airlines-lanceert-nieuwe-virtual-reality-pilotenopleiding-als-eerste-binnen-lufthansa-group

Civil Aviation Authority (CAA). (2022). *Cabin Crew Safety Responsibilities and Role Evolution*. London: CAA Publications.

Clays, E., De Bacquer, D., Delanghe, J., Kittel, F., Van Renterghem, L., & De Backer, G. (2007). Associations between dimensions of job stress and biomarkers of inflammation and infection. *Journal of*

Occupational and Environmental Medicine, 49(7), 748–757. https://doi.org/10.1097/JOM.0b013e3180954efd

Cremers, J. and Houwerzijl, M. (2021). *Subcontracting and social liability*, ETUC, 37 p.

Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and Conducting Mixed Methods Research* (3rd ed.). SAGE Publications.

da Silva, J., Barqueira, A., Magalhães, L., Santos, L. (2024). Human fatigue in the aircraft maintenance environment. *Safety Science* 180. 106634. https://doi.org/10.1016/j.ssci.2024.106634.

Dahlstrom, N., Laursen, J., & Bergström, J. (2008). Crew Resource Management, Threat and Error Management, and Assessment of CRM Skills. https://www.google.be/url?sa=t&source=web&rct=j&opi=89978449&url=https://portal.research.lu.se/files/5545527/1981944.pdf&ved=2ahUKEwji9_TSqc6PAxViUaQEHeSmOFgQFnoECBkQAQ&usg=AOvVaw0M64btaAisfM5KsKykpJVP

DBO. (2025). *Overcoming the barriers of operational risk reporting*. https://www.bdo.be/en-gb/insights/articles/successful-operational-risk-reporting. Consulted on August 14, 2025.

De Boeck, E., Jacxsens, L., Bollaerts, M., & Vlerick, P. (2015). Food safety climate in food processing organizations: Development and validation of a self-assessment tool. Trends in Food Science & Technology, 46(2). https://doi.org/10.1016/j.tifs.2015.09.006

de Visser, E. J., Pak, R., & Shaw, T. H. (2020). From 'automation' to 'autonomy': The importance of trust repair in human–machine interaction. *Ergonomics*, 63(5), 623–635. https://doi.org/10.1080/00140139.2020.1724790.

De Witte, H., Pienaar, J., & De Cuyper, N. (2016). Review of 30 Years of Longitudinal Studies on the Association Between Job Insecurity and Health and Well-being: Is there Causal Evidence? *Australian Psychologist*, 51(1), 18–31.

Dekker, S. (2012). *Just Culture: Balancing Safety and Accountability*. CRC Press. https://doi.org/10.4324/9781315251271

Demerouti, E., Veldhuis, W., & Coombes, C., et al. (2018). Burnout among pilots: psychosocial factors related to happiness and performance at simulator training. Ergonomics, 62(2), 233–245. https://doi.org/10.1080/00140139.2018.1464667

Díaz I., & Cabrera, D. (1997). Safety climate and attitude as evaluation measures of organizational safety. Accid Anal Prev. 29(5), 643-50. doi: 10.1016/s0001-4575(97)00015-8.

Durmaz, V., Yazgan, E., Yilmaz, A. (2021). Ergonomic Risk Factors in Ground Handling Operations to Improve Corporate Performance. *International Journal of Aviation Science and Technology* 2 (2). 82-90. DOI: 10.23890/IJAST.vm02is02.0205

EASA. (2021). Safety Issue Report – Skills and Knowledge Degradation due to Lack of Recent Practice. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.easa.europa.eu/community/system/files/2021-08/Safety%2520Issue%2520Report%2520-%2520%2520Skills%2520and%2520Knowledge%2520Degradation_REV2%2520Clean_0.pdf&ved=2ah

UKEwjDjMaeuIqPAxUlVqQEHbDSIrMQFnoECBgQAQ&usg=AOvVaw0uxZuSOoFCluU1PQEqR-dN. Consulted on August 14, 2025.

EASA. (2022). *Annual Safety Review 2022*. European Union Aviation Safety Agency.

EASA. (2023). *Artificial Intelligence Roadmap. A human-centric approach to AI in aviation*. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.easa.europa.eu/en/light/topics/artificial-intelligence-and-aviation-0&ved=2ahUKEwjbtb7moPaOAxXzU6QEHYB0GPcQFnoECCEQAQ&usg=AOvVaw2qyBs7MFJIY5ko2015p9Ps. Consulted on August 6,2025

EASA. (2023). Effectiveness of Flight Time Limitations (FTL 2.0). https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.easa.europa.eu/en/downloads/138572/en&ved=2ahUKEwjOvvvsjL-PAxXSNvsDHeBnMl0QFnoECBgQAQ&usg=AOvVaw0TJIZAMmiMQQWBPWHeEknY. Consulted on August 24, 2025.

EASA. (2024). EASA ATCO Fatigue Research Study, Final Report, D-4.C.1. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.easa.europa.eu/sites/default/files/dfu/ATCO_Fatigue_Study_Final_report_D4C1_-_V4.1_final_21_May_2024.pdf&ved=2ahUKEwj53uWDwIqPAxW5TqQEHYLtPK8QFnoECCUQAQ&usg=AOvVaw1ZZu9jGvBOZV6A8Lrrzy74. Consulted on August 14, 2025.

EC. (2023). Commission report finds labour and skills shortages persist and looks at possible ways to tackle them. https://ec.europa.eu/commission/presscorner/detail/ro/ip_23_3704. Consulted on September 3, 2025.

ECA. (2023). *Position Paper on Single-Pilot Operations*. https://www.master.eurocockpit.be/news/single-pilot-operations-will-never-happen. Consulted on September 4, 2025.

ECA. (2024). *Position Paper on Atypical employment*. https://www.eurocockpit.eu/positions-publications/atypical-employment. Consulted on September 4, 2025.

ECA. (2025). 2025 Wetleasing trends: Growth, gaps, and abuses. https://www.eurocockpit.eu/news/2025-wet-lease-trends-growth-gaps-and-abuses and https://public.tableau.com/app/profile/europeanpilots/viz/shared/GNXSHT7PZ. Consulted on September 3, 2025.

Efthymiou, M., Usher, D., O'Connell, J., Warnock-Smith, D., Conyngham,G. (2021). The factors influencing entry level airline pilot retention: An empirical study of Ryanair. *Journal of Air Transport Management* 99, 101997. https://doi.org/10.1016/j.jairtraman.2020.101997.

Efthymiou, M., Whiston, S., O'Connell, J., & Brown, G. (2021), Flight crew evaluation of the flight time limitations regulation. Case Studies on Transport Policy, 9(1), 280–290. https://doi.org/10.1016/j.cstp.2021.01.002

ELA. (2020). Working group on fair competition in aviation Denmark Summary. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.ela.europa.e

u/sites/default/files/2021-09/DK-Working%2520group%2520on%2520Fair%2520Competition.pdf&ved=2ahUKEwin5vKO676PAxWdRKQEHR0pAnAQFnoECCIQAQ&usg=AOvVaw3hSGF-KkoYUiDGZldxuhOD. Consulted on September 3, 2025.

Elliott, R., Crowe, L., Pollock, W., & Hammond, NE. (2023). The impact of the COVID-19 pandemic on critical care healthcare professionals' work practices and wellbeing: A qualitative study. *Aust Crit Care* 36(1):44-51. doi: 10.1016/j.aucc.2022.10.001.

Engin, O. & Umit, H. (2021). A critical approach to fatigue risk factors in cockpit and cabin crew for the flight safety in aviation industry. *Bussecon Review of Social Sciences* 3. 01-19. 10.36096/brss.v3i1.251.

ePlane. (2025). Europe aircraft ACMI Leasing market: Trends and Forecasts 2025-2032. https://www.eplaneai.com/news/europe-aircraft-acmi-leasing-market-trends-and-forecasts-20252032. Consulted on September 3, 2025.

ETSC. (2025). Summer pilot fatigue campaign raises alarm over safety risks. https://etsc.eu/summer-pilot-fatigue-campaign-raises-alarm-over-safety-risks/?utm_source=chatgpt.com. Consulted on August 27, 2025.

ETUI. (2022). While aviation takes off again, labour standards remain low. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.etui.org/sites/default/files/2022-05/HM25_While%2520aviation%2520takes%2520off%2520again%252C%2520labour%2520standards%2520remain%2520low_2022.pdf&ved=2ahUKEwin5vKO676PAxWdRKQEHR0pAnAQFnoECCUQAQ&usg=AOvVaw2mMbsOba2rtCD6b9EkVtGt. Consulted on September 2, 2025.

Eurocontrol. (2019). *Just Culture Guidance Material*. https://www.eurocontrol.int/initiative/just-culture

Eurocontrol. (2024, january). *Network Operations Report: December 2023*. https://www.eurocontrol.int/sites/default/files/2024-01/eurocontrol_network_operations_report_-_december_2023_0.pdf. Consulted on September 2, 2025.

Eurocontrol. (2024). *First Network Operations Plan 2024–2028: Forecasting traffic, delays and capacity*. Consulted on August 27, 2025https://www.eurocontrol.int

Eurocontrol. (2025). *European network operations report: July 2025*. https://www.eurocontrol.int, Consulted on August 27, 2025.

Eurofound. (2020). *Atypical work: Prevalence and impact on working conditions in the EU*. Luxembourg: Publications Office of the European Union. https://doi.org/10.2806/145233, Consulted on August 27, 2025.

European Aviation Safety Agency (EASA). Article 89 report 2021. https://www.easa.europa.eu/en/document-library/general-publications/art-89-report-2021. Consulted on September 29, 2025.

European Aviation Safety Agency (EASA). (2022). *Review of fatigue risk management systems in European aviation*. Cologne: EASA.

https://www.google.be/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.easa.europa.eu/sites/default/files/dfu/ATCO_Fatigue_Study_Final_report_D4C1_-_V4.1_final_21_May_2024.pdf&ved=2ahUKEwiNw8X0qs6PAxWEVKQEHStTIyQQFnoECBsQAQ&usg=AOvVaw1ZZu9jGvBOZV6A8Lrrzy74

European Cockpit Association (ECA). (2022). *Pilot fatigue in Europe: Results of the 2022 ECA survey*. Brussels: ECA.

European Commission. (2015). *Ethics for researchers: Facilitating research excellence in FP7*. Directorate-General for Research and Innovation. https://ec.europa.eu/research/participants/data/ref/fp7/89888/ethics-for-researchers_en.pdf. Consulted on August 27, 2025.

European Commission. (2023). *Mobility of workers in the European Union: Labour mobility report 2023*. Luxembourg: Publications Office of the European Union. https://doi.org/10.2767/12345. Consulted on August 27, 2025.

European Commission. (2024a, May 13). *Labour and skills shortages in the EU: Developments and policy responses*. Directorate-General for Employment, Social Affairs and Inclusion. Consulted on August 27, 2025, https://ec.europa.eu

European Commission. (2024b, November 25). *European Year of Skills – Final report*. Directorate-General for Employment, Social Affairs and Inclusion. Consulted on August 27, 2025, https://ec.europa.eu

European Labour Authority (2025), EURES Report on labour shortages and surpluses 2024: Sector analysis on air transport, Publications Office of the European Union, Luxembourg. https://eures.europa.eu/living-and-working/labour-shortages-and-surpluses-europe_en

European Parliament. (2019, March). *Atypical employment in aviation*. Policy Department for Structural and Cohesion Policies. Consulted on August 27, 2025, https://www.europarl.europa.eu

European Parliament. (2025). The systematic use of wet leasing by airlines and its impact on labour rights**.** https://www.europarl.europa.eu/doceo/document/P-10-2025-002816_EN.html, Consulted on August 28, 2025.

European Union Aviation Safety Agency (EASA). (2022**). Annual Safety Review 2022**. https://www.easa.europa.eu/sites/default/files/dfu/annual_safety_review_2022_0.pdf. Consulted on September 2, 2025.

Evans, B. Glendon, I., & Creed. P. (2007). Development and initial validation of an Aviation Safety Climate Scale. *Journal of Safety Research*, 38 (6), 675-682.https://doi.org/10.1016/j.jsr.2007.09.005.

Folke, F., Melin, M. (2024). Ramp-up in the air: Impairing or repairing aviation crews' working conditions? A mixed-methods survey study on working conditions, health, and safety among cabin crew and pilots in Europe. *Journal of Air Transport Management* 119. 102642. https://doi.org/10.1016/j.jairtraman.2024.102642.

Folke, F., Melin, M. (2025). Is it safe to be safe? Examining underreporting and presenteeism among European pilots: The role of employment type. *Safety Science* 181, 106696, https://doi.org/10.1016/j.ssci.2024.106696.

FPU. (2022). Commanders' Discretion: probably the most abused rule in today's aviation industry. https://fpu- romania.dk/commanders-discretion-probably-the-most-abused-rule-in-todays-aviation-industry/. Consulted on September 29, 2023.

Galesic, M., & Bosnjak, M. (2009). Effects of questionnaire length on participation and indicators of response quality in a web survey. *Public Opinion Quarterly, 73*(2), 349–360. https://doi.org/10.1093/poq/nfp031

Gao, S., Bai, Y., Hong, R., & Wang, L. (2025). Behavioral and psychophysiological responses of initial pilots in collaboration with an experienced but risky captain: A flight-simulation study based on the social facilitation. *Safety Science*, 187,106858. https://doi.org/10.1016/j.ssci.2025.106858.

Goode, J. (2003). Are pilots at risk of accidents due to fatigue?. *Journal of safety research* 34. 309-13. 10.1016/S0022-4375(03)00033-1

Grimmond J, Brown SD, Hawkins GE. (2025). A solution to the pervasive problem of response bias in self-reports. *Proc Natl Acad Sci U S A*. 122(3). doi: 10.1073/pnas.2412807122

Hanusch, Moritz. (2017). Manual Flying Skills - Airline Procedures and their Effect on Pilot Proficiency. 10.13140/RG.2.2.17886.23362.

Haslbeck, A., & Hoermann, H. (2016). Flying the Needles: Flight Deck Automation Erodes Fine-Motor Flying Skills Among Airline Pilots. *Human Factors The Journal of the Human Factors and Ergonomics Society* 58. 10.1177/0018720816640394.

Helmreich, R. L., & Foushee, H. C. (2010). Why CRM? Empirical and theoretical bases of human factors training. In *Crew Resource Management* (2nd ed.). Academic Press. https://doi.org/10.1016/B978-0-12-374946-8.10001-9

HindSight 35, 35-38. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://skybrary.aero/sites/default/files/bookshelf/34346.pdf&ved=2ahUKEwjexpzxhL-PAxWlWKQEHYg7GnoQFnoECCIQAQ&usg=AOvVaw1L9EAZ5yjCFJgHzeWS8xp4. Consulted on September 1, 2025.

Hochschild, A. R. (1983). *The Managed Heart: Commercialization of Human Feeling*. Berkeley: University of California Press.

Hong, Y., Kim, M.-J., & Sohn, Y. W. (2023). The Relationship between Job Insecurity and Safety Behavior: The Buffering Role of Leadership Ethics. *Sustainability 15*(18), 13910. https://doi.org/10.3390/su151813910

IATA. (2014). *Data Report for Evidence-Based Training.* https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.iata.org/contentassets/c0f61fc821dc4f62bb6441d7abedb076/data-report-for-evidence-basted-training-

ed20one.pdf&ved=2ahUKEwjIjv2uxoqPAxVsVaQEHSiLOawQFnoECCsQAQ&usg=AOvVaw3rT3HSbksir9g28qocMO57. Consulted on August 14, 2025.

IATA. (2023). *AI and Digital Transformation in Aviation*. Geneva: International Air Transport Association. Retrieved from https://www.iata.org/en/pressroom

IATA. *EBT Implementation Guide*.

ICAO. (2020). *Safety Management Manual (Doc 9859)*. International Civil Aviation Organization.

ICAO. (2022). *Manual on Remotely Piloted Aircraft Systems (RPAS)*. International Civil Aviation Organization.

ICAO. (2025). Cognitive fatigue and information overload in the digital cockpit: Mitigating emerging human performance risks. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.icao.int/sites/default/files/Meetings/a42/Documents/WP/wp_083_en.pdf&ved=2ahUKEwjlyb-zir-PAxVaVKQEHTc2CqcQFnoECCcQAQ&usg=AOvVaw0E3qQ2QnB7C8aYSA45_Kba. Consulted on August 24, 2025.

ICAO. *Manual of Evidence-Based Training (Doc 9995)*.

ICAO. *Procedures for Air Navigation Services—Training (Doc 9868)*.

ICAO. *Safety Management Manual (Doc 9859)*.

Institute of Transport economics. (2022). The organisation of the Norwegian aviation sector in a European context. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.toi.no/getfile.php%3Fmmfileid%3D73817&ved=2ahUKEwjb9Ivxsc6PAxX5VqQEHcNQNYIQFnoECBcQAQ&usg=AOvVaw38zgSa0l6o_yCJiGreMSaw. Consulted on August 27, 2025.

International Labour Organization (ILO). (2021). *The future of work in air transport*. Geneva: ILO.

Investors in People. (2025). The benefits of employee upskilling in today's workplace. https://www.investorsinpeople.com/knowledge/the-benefits-of-employee-upskilling-in-todays-workplace/. Consulted on September 3, 2025.

Jackson, C. A., & Earl, L. (2006). Prevalence of fatigue among commercial pilots. *Occupational Medicine*, 56(4), 263–268.

Jara, H., Simon, A. (2024). European Unemployment Benefit to Protect Atypical Workers? *Soc Indic Res* 171, 967–986. https://doi.org/10.1007/s11205-023-03276-6.

Jin, W., Lui, H. & Shen, F. (2024). Artificial Intelligence in Flight Safety: Fatigue Monitoring and Risk Mitigation Technologies.*Preprints*. 1-11. doi:10.20944/preprints202409.2208.v

Jiyoung, K., Myoungjin, Y. & Sunghyup, H. (2022). Study on Factors That Influence Human Errors: Focused on Cabin Crew. *International Journal of Environmental Research and Public Health* 19. 5696. 10.3390/ijerph19095696.

Johansson, F. & Melin, M. (2018). Fit for Flight? Inappropriate Presenteeism Among Swedish Commercial Airline Pilots and Its Threats to Flight Safety. *The International Journal of Aerospace Psychology* 28(3–4), 84–97. https://doi.org/10.1080/24721840.2018.1553567

Jorens, Y., Gillis, D., Valcke, L., & De Coninck, J. (2015). *Atypical Employment in Aviation*. European Commission.

Jussila, E. (2025). The future of cabin crew training: The role of artificial intelligence in the evolving aviation industry. Master thesis Haaga-Helia University of Applied Sciences.

Kalic, M., Babic, D., Dožić, S., Kuljanin, J. & Mijovic, N. (2022). Impact of Covid-19 on the Aviation Industry: An Overview of Global and Some Local Effects. *Anali Pravnog fakulteta u Beogradu* 70, 1079-1127. 10.51204/Anali_PFBU_22405A.

Karaçelebi, F. G. (2024). Employee Relations Management in Aviation. In S. Kurnaz, A. Rodrigues, & A. Padhra (Eds.), *Strategic Management and Policy in the Global Aviation Industry* (pp. 16-30). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-0908-7.ch002

Kirwan, B. (2025). Human Factors Requirements for Human-AI Teaming in Aviation. *Future Transportation*, *5*(2), 42. https://doi.org/10.3390/futuretransp5020042

Kolander, C. K. (2019). Flight and cabin crew teamwork: improving safety in aviation. In *Crew resource management*, 407-420. Academic Press. https://doi.org/10.1016/B978-0-12-812995-1.00014-2.

Kolbe M, Eppich W, Rudolph J, Meguerdichian M, Catena H, Cripps A, Grant V, & Cheng A. (2020). Managing psychological safety in debriefings: a dynamic balancing act. *BMJ Simul Technol Enhanc Learn* 20;6(3), 164-171. doi: 10.1136/bmjstel-2019-000470.

Kole, U., Roland, M., Ishaya, I & Okere, Daniel. (2024). A Systematic Review of Literature Relating to the Relationship Between Physical Fatigue, Work Related Stress, Wellbeing and Safety Perception Amongst Maintenance Repair Organization Personnel In the Aviation Industry. 10.22624/AIMS/ACCRABESPOKE2024P18.

Koranyi, I., Jonsson, J., Rönnblad, T., Stockfelt, L. & Bodin, Theo. (2018). Precarious employment and occupational accidents and injuries – A systematic review. *Scandinavian Journal of Work, Environment & Health* 44. 10.5271/sjweh.3720.

Korhonen, J. (2023). Fatigue Reporting Behaviour Within a Regional Airline. Bachelor of Business Administration, Aviation Business

Krkovic, V. & Tajik, A. (2025). Safety performance in modern aviation wet-leasing operations. Bachelor thesis Bachelor programme in Aviation

Kube, D. (2025). Ditch the Blame Game: How Just Culture and Human Performance Unlock Real Safety. https://www.linkedin.com/pulse/ditch-blame-game-how-just-culture-human-performance-kube-ep-chsc-xrkpc/. Consulted on September 1, 2025.

Kumah, A. (2025). Adverse event reporting and patient safety: the role of a just culture. *Front. Health Serv*. 5, 581516. doi: 10.3389/frhs.2025.1581516

Kusluvan, S., Kusluvan, Z., Ilhan, I., & Buyruk, L. (2010). The human dimension: A review of human resources management issues in the tourism and hospitality industry. *Cornell Hospitality Quarterly*, 51(2), 171–214. https://doi.org/10.1177/1938965510362871

Kvale, S., & Brinkmann, S. (2009). *InterViews: Learning the Craft of Qualitative Research Interviewing* (2nd ed.). SAGE Publications.

Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*. Thousand Oaks, CA: Sage Publications.

Law, C. (2019). *A flight attendant's essential guide: From passenger relations to challenging situations*. BrownWalker Press.

Le Bris, S., Madrid-Guijarro, A. & Philippe Martin, D. (2019). Decision-Making in Complex Environments Under Time Pressure and Risk of Critical Irreversibility: The Role of Meta Rules. *Management,* 22(1), 1-29. https://doi.org/10.3917/mana.221.0001.

Leary, M. R. (2004). *Introduction to behavioral research methods* (4th ed.). Boston: Pearson.

Lee, C., & Kim, T. (2024). The Effect of Cabin Crew Service Quality on Customer Loyalty. *The Journal of Industrial Distribution & Business*, *15*(9), 11–19. https://doi.org/10.13106/JIDB.2024.VOL15.NO9.11

LI, Q., Chen, C., Kam K.H. NG, YUAN, C., & **Yui, C.** (2024). Single-pilot operations in commercial flight: Effects on neural activity and visual behaviour under abnormalities and emergencies. *Chinese Journal of Aeronautics*, 37(8), 277-292. https://doi.org/10.1016/j.cja.2024.04.007

Macgregor-Curtin, I., Balfe, N. & Leva, M. (2022). Fatigue Risk Management; Current Practices and Challenges, Further Learning. 2087-2096. 10.3850/978-981-18-5183-4_S06-06-122.

Mallik, A. (2024). Transforming recruitment in the post-covid era: the role of social media and digital solutions. *Journal of Management and Enterpreneurship* 10, 2231-3710.

Malmquist, S., Vincenzi, D. A., Lemos, K., & Pruchnicki, S. (Eds.). (2025). Chapter 9 A pilot story (true story) in *Training and simulation: Processes, challenges and solutions*. CRC Press. Doi 10.1201/9781032710297

Manor, K. (2025). Is a Compliance Training Program Effective? A Comparison Analysis of Compliance Officers' Perceptions and Recommended Practices in Multinational Corporations Regarding Compliance eTraining Program Effectiveness. 10.13140/RG.2.2.35961.38245.

Maraffi, R., & Pupulidy, I. (2025). From Errors to Excellence: A New Paradigm for Safety in Construction. Phd.

Martey, E.M. & Brew, Y. & Frempong, J. (2020). Sales force targets and its psychological effect on job satisfaction of supply chain employees through pressure and stress in Indonesian automobile industry. *International Journal of Supply Chain Management* 9, 1052-1063.

Martin, S. (2025). Integrating Fatigue Risk Management Systems Into Aviation Safety Management Systems. https://aviationsafetyblog.asms-pro.com/blog/integrating-fatigue-risk-management-systems-into-aviation-safety-management-systems. Consulted on August 24, 2025.

Martins, A., Riordan, T. & Dolnicar, S. (2020). A post-COVID-19 model of tourism and hospitality workforce resilience. 10.31235/osf.io/4quga.

Martinussen, M., & Hunter, D. R. (2017). *Aviation Psychology and Human Factors* (2nd ed.). CRC Press.

Maurino, D., Reason, J., Johnston, N., & Lee, R. (1995). *Beyond Aviation Human Factors: Safety in High Technology Systems*. Ashgate.

McMurtrie, K. (2021). Influences on flight crew reporting behaviour: trust and fear of reprisal. Thesis ofr Doctor in Philosophy. 10.13140/RG.2.2.36540.77446.

McMurtrie, K., Molesworth, B. (2022). Confidence and Trust in the 'Just Culture' Construct. *Transportation Research Procedia* 66, 214-225. https://doi.org/10.1016/j.trpro.2022.12.022.

Möltner A, Tımbıl S, Jünger J. (2015). The reliability of the pass/fail decision for assessments comprised of multiple components. *GMS Z Med Ausbild* 32(4). doi: 10.3205/zma000984.

Monti, G. (2021). Collective labour agreements and EU competition law: five reconfigurations. *European Competition Journal 17*(3), 714–744. https://doi.org/10.1080/17441056.2021.1930452

Muir, H. & Harris, D. (2017). *Human Factors and Aviation Safety*. Routledge.

Neis, S. M., Klingauf, U., & Schiefele, J. (2018). Classification and review of conceptual frameworks for commercial single pilot operations. In *2018 IEEE/AIAA 37th Digital Avionics Systems Conference (DASC)* (pp. 1-8). IEEE.

NTSB. (2020). *Safety Recommendation Report: Boeing 737 MAX*. National Transportation Safety Board.

OECD. (2024). Promoting Better Career Mobility for Longer Working Lives in the United Kingdom. https://www.oecd.org/en/publications/promoting-better-career-mobility-for-longer-working-lives-in-the-united-kingdom_2b41ab8e-en/full-report/supporting-career-progression-in-the-longevity-era_14258a54.html. Consulted on September 3,2024.

Olaganathan, R., Holt, T. B., Luedtke, J., & Bowen, B. D. (2021). Fatigue and Its Management in the Aviation Industry, with Special Reference to Pilots. *Journal of A viation T echnology and Engineering* 10 (1). https://doi.org/10.7771/2159-6670.1208

Papagiannidis, E., Mikalef, P., Conboy, K., Van de Wetering, R. (2023). Uncovering the dark side of AI-based decision-making: A case study in a B2B context. *Industrial Marketing Management* 115, 253-265. https://doi.org/10.1016/j.indmarman.2023.10.003.

Papavasileiou, E., Papatheodorou, A., & Edmunds, J. (2025) Human operators in air transport: A decade of systematic reviews. *Journal of the Air Transport Research Society* 4, 100059. https://doi.org/10.1016/j.jatrs.2025.100059

Patil, R., Deepali, R., Lakshmi, N., Amruta, D., & Mittal, A. (2023). The Power of Psychological Safety: Investigating its Impact on Team Learning, Team Efficacy, and Team Productivity. *The Open Psychology Journal* 16, 1-12. **DOI: 10.2174/18743501-v16-230727-2023-36**

Probst, T., Bettac, E & Austin, C. (2019). Accident underreporting in the workplace. In R. Burke & A. Richardsen (Eds.), Increasing Occupational Health and Safety in Workplaces (pp. 30-47). Cheltenham, UK: Edward Elgar.

Ramachandran, A. (2025). Artificial Intelligence in Air Traffic Control Advancing Safety, Efficiency, and Automation with Next-Generation AI Technologies. https://www.researchgate.net/profile/Anand-Ramachandran-7/publication/388960570_Artificial_Intelligence_in_Air_Traffic_Control_Advancing_Safety_Efficiency_and_Automation_with_Next-Generation_AI_Technologies/links/67ae881d461fb56424d91f1e/Artificial-Intelligence-in-Air-Traffic-Control-Advancing-Safety-Efficiency-and-Automation-with-Next-Generation-AI-Technologies?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InB1YmxpY2F0aW9uIiwicGFnZSI6InB1YmxpY2F0aW9uIn19

Reason, J. (1990). *Human Error*. Cambridge University Press.

Reason, J. (1997). *Managing the Risks of Organizational Accidents*. Ashgate.

Reis, C., Mestre, C., Canhão, H., Gradwell, D., & Paiva, T. (2016a) Sleep and fatigue differences in the two most common types of commercial flight operations, *Aerospace Medicine and Human Performance* 87(9), 811- 815, 10.3357/AMHP.4629.2016.

Reis, C., Mestre, C., Canhão, H., Gradwell, D., & Paiva, T. (2016b). Sleep complaints and fatigue of airline pilots, *Sleep Science* 9 (2), 73-77, 10.1016/j.slsci.2016.05.003

Renier, Y. (2022). Competency-Based Training and Assessment (CBTA). https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www2023.icao.int/MID/Documents/2022/CRM/2022.06.20%2520YREN%2520MEA.pdf&ved=2ahUKEwjIjv2uxoqPAxVsVaQEHSiLOawQFnoECCkQAQ&usg=AOvVaw1ddVV9R_d-aQ2bO6gazkBe. Consulted on August 14, 2025.

Rigas D. (2019). *Flying off course: Airline Economics and Marketing*, London, Routledge, 5th Edition, 2019, 341p.

Rigner, J. & Dekker, S. (2000). Sharing the Burden of Flight Deck Automation Training. *International Journal of Aviation Psychology* 10, 317-326. 10.1207/S15327108IJAP1004_1

Rizkina, A., Hidajat, H. & Farida, I. (2025). Job-Related Anxiety in the Age of Artificial Intelligence: A Systematic Review of Workplace Dynamics. *Formosa Journal of Multidisciplinary Research*. 4. 3965-3976. 10.55927/fjmr.v4i8.416

Salas, E., Wilson, K., Burke, C. S., & Wightman, D. (2006). Does CRM training work? *Human Factors*, 48(2), 392–412. DOI:10.1518/001872006777724444

Schmid, D., & Stanton, N. A. (2020). Progressing toward airliners' reduced-crew operations: A systematic literature review. *The International Journal of Aerospace Psychology*, *30*(1-2), 1-24.

Seriwatana, P. (2018). Effect of passenger perception of in-flight safety and security procedures on their satisfaction: The moderating role of safety knowledge. *ABAC Journal*, 38. 42-55.

Shanmugam, A. & Robert, T. (2015). Human factors engineering in aircraft maintenance: A review. *Journal of Quality in Maintenance Engineering* 21. 478-505. 10.1108/JQME-05-2013-0030.

Shi, H., Aamir, N., Ji, L. & Xiaobo, Y. (2024). The effects of psychological safety and employee voice behavior on flight attendants' mindful safety practices adoption. *Frontiers in Public Healt*h 12. DOI=10.3389/fpubh.2024.1398815.

Simmons, B. (2023). A fatigue survey of European Pilots. https://www.master.eurocockpit.be/sites/default/files/2023-08/A%20report%20on%20a%20fatigue%20survey%20of%20European%20Pilots_2023_FINAL.pdf. Consulted on August 27, 2025.

Skybrary. (2023). Whether report? Understanding just culture through safety reporting.

Steiner, S., Bartulovic, D. & Fakleš, D. (2018). Integration of Fatigue Risk Management in Aviation Safety Management System. Conference: 18th International Conference on Transport Science ICTS 2018. At: Portorož, Slovenia

Stewart, N & Harris, D. (2019). Passenger Attitudes to Flying on a Single-Pilot. Commercial Aircraft. *Aviation Psychology and Applied Human Factors*, 9(2), 77-85. https://dx.doi.org/10.1027/2192-0923/a000164

Subgroup on social matters related to aircrew. (2021). *Paper on self-employment.* https://ec.europa.eu/transparency/expert-groups-register/screen/meetings/consult?lang=en&meetingId=28675&fromExpertGroups=100420. Consulted on September 29, 2025.

Subgroup on social matters related to aircrew. (2022a). *Final paper on pay-to-fly.* https://ec.europa.eu/transparency/expert-groups-register/screen/meetings/consult?lang=en&meetingId=45041&fromExpertGroups=100420. Consulted on September 29, 2025.

Subgroup on social matters related to aircrew. (2022b). *Final paper on work through intermediaries.* https://ec.europa.eu/transparency/expert-groups-register/screen/meetings/consult?lang=en&meetingId=45041&fromExpertGroups=100420. Consulted on September 29, 2025.

Subgroup on social matters related to aircrew. (2023). *Final paper on Posting of workers commercial air transport within the European Union.* https://ec.europa.eu/transparency/expert-groups-register/screen/meetings/consult?lang=en&meetingId=48376&fromExpertGroups=100420. Consulted on September 29, 2025.

Tafur, C., Camero, R., Rodríguez, D., Rincón, JC., Saenz, E. (2025). Applications of artificial intelligence in air operations: A systematic review. *Results in Engineering* 25, 10374. https://doi.org/10.1016/j.rineng.2024.103742.

Tashakkori, A., & Teddlie, C. (2010). *SAGE Handbook of Mixed Methods in Social & Behavioral Research* (2nd ed.). SAGE Publications.

Tjindrawati, O., & Djazuly, C (2023). Fostering path to a just culture in healthcare organizations: Influential factors and challenges. *Jurnal Aisyah* : *Jurnal Ilmu Kesehatan* 8. 10.30604/jika.v8i4.2413.

Tourangeau, R., & Yan, T. (2007). Sensitive questions in surveys. *Psychological Bulletin*, **133**(5), 859–883. https://doi.org/10.1037/0033-2909.133.5.859

Tsaur, S., Hsu, F., & Kung, L. (2020). Hassles of cabin crew: An exploratory study. *Journal of Air Transport Management*, 85,101812. https://doi.org/10.1016/j.jairtraman.2020.101812.

Tuncel, O. (2025). Evaluating Crew Fatigue Management Strategies in Aviation: A Fuzzy DEMATEL Approach. *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi* 24. 111-145. 10.46928/iticusbe.1579872.

Tusher, H., Nazir, S., Mallam, S., Rusli, R. & Botnmark, A. (2022). Learning from accidents: Nontechnical skills deficiency in the European process industry. *Special Issue: International Conference & Exhibition Prevention Asia* 41, S4-S9. https://doi.org/10.1002/prs.12344

Valcke, L. (2024). *Happiness in the sky? (Atypical) employment, job- related wellbeing in European cockpit and cabin crew, and the relationship with safety (behaviour).* Wolters Kluwer. https://shop.wolterskluwer.be/nl_be/Happiness-in-the-sky-sBPDOCHITS/#pdp-description

Van Hoecke, M. (Ed.). (2011). *Methodologies of Legal Research: Which Kind of Method for What Kind of Discipline?* Hart Publishing.

Venus, M., & grosse Holtforth, M. (2021). How Duty Rosters and Stress Relate to Sleep Problems and Fatigue of International Pilots. International Journal of Aviation, Aeronautics, and Aerospace, 8(3). DOI: https://doi.org/10.58940/2374-6793.1579

Venus, M., Greder, D., & grosse Holtforth, M. (2022). How professional pilots perceive interactions of working conditions, rosters, stress, sleep problems, fatigue and mental health. A qualitative content analysis. Revue Européenne De Psychologie Appliquée, 72(3), 100762. https://doi.org/10.1016/j.erap.2022.100762

Virtanen, M., Kivimäki, M., Elovainio, M., & Vahtera, J. (2005). From insecure to secure employment: Changes in work, health, and work ability. *Scandinavian Journal of Work, Environment & Health*, 31(6), 465–472.

Wang, P., Chen, S., Cuifang, A.& Xiuxi, S. (2023). The post-pandemic workplace: issues and insights for future research and action. *Elgar companion to managing people across the Asia-Pacific,* 19-46. 10.4337/9781802202250.00008.

Williams, D. (2025). 2025 ACMI market insight and the evolving role of intermediaries in ACMI leasing. https://accaviation.com/2025-acmi-market-insight-and-the-evolving-role-of-intermediaries-in-acmi-leasing/. Consulted on September 4, 2025.

Williams, L. J., & Brown, B. K. (1994). Method variance in organizational behavior and human resources research: Effects on correlations, path coefficients, and hypothesis testing. *Organizational Behavior and Human Decision Processes*, 57(2), 185–209. https://doi.org/10.1006/obhd.1994.1017

Wingelaar-Jagt, YQ., Wingelaar, TT., Riedel, WJ., Ramaekers, JG.(2021). Fatigue in Aviation: Safety Risks, Preventive Strategies and Pharmacological Interventions. *Front Physiol.* 12,712628. doi: 10.3389/fphys.2021.712628.

Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services*. Journal of Computer-Mediated Communication,* 10(3), 1034. https://doi.org/10.1111/j.1083-6101.2005.tb00259.x

Wu, AC., Donnelly-McLay, D., Weisskopf, MG., McNeely, E., Betancourt, TS., Allen, JG. (2016). Airplane pilot mental health and suicidal thoughts: a cross-sectional descriptive study via anonymous web-based survey. *Environ Health* 15(1):1–12. doi:10.1186/s12940-016-0200-6' in 'Mental Health in Commercial Aviation', Pasha and Stokes.

Ziakkas, D., Sarikaya, I., & Natakusuma, H. C. (2023, July). EBT-CBTA in Aviation Training: The Turkish Airlines Case Study. In *International Conference on Human-Computer Interaction* (pp. 188-199). Cham: Springer Nature Switzerland.

Ziakkas, D., Waterman, N., & Flores, A. (2024). Emerging Technologies in Aviation: The Simulated Air Traffic Control Environment (SATCE) application in Competency Based Training and Assessment. *Intelligent Human Systems Integration (IHSI 2024): Integrating People and Intelligent Systems*, *119*(119), 627-635.

FACT SHEET

FACULTEIT RECHTSGELEERDHEID

ECA Piloting Safety European Cockpit Association ETF ENAA European National Airlines Association

IRIS UGENT – DEPARTMENT CRIMINAL LAW, CRIMINOLOGY AND SOCIAL LAW

FACTSHEET

EMPLOYMENT IN THE EUROPEAN AVIATION INDUSTRY 2024

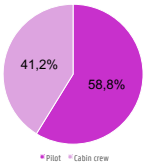
Fall of 2024 Qualtrics

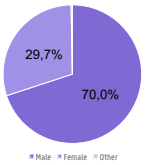
COCKPIT AND CABIN CREW

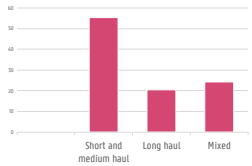
Respondents

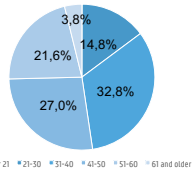
More than 100 (European) airline companies

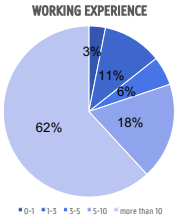
46% has changed airlines more than ones







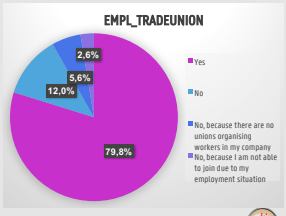




49,7% works for a network airline, 25,7% for a low-fare airline, 4% for ACMI

More than 70 nationalities

10,3% is atypically employed, 5,8% is self-employed.



13, 5% of the respondents does not enjoy the benefits of a collective agreement

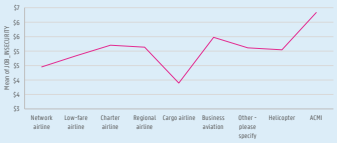
Kind of airline

An impact on the employment reality?

ACMI

65% atypically employed

ACMI Higher job insecurity



Low fare

lower results for safety

Lower fatigue reporting

Lower organizational humanization

Higher dehumanization

18% has other activities of which 56,6% are conducted outside of the aviation industry → 60% for financial reasons

Eastern Europe

50/50 Typical and atypical

37→ 35 Mental health lower

Fatigue less reported

55→ 60 Organisational dehumanization higher

10,2→ 8,2 Organizational humanization is less

Wage

Only 47,3% is compensated for maternity leave

59,8% is compensated for their work medical

79,2% is compensated for their uniform

62,8% is compensated for crew ID card

74% is paid in 'Block hours'

56,3% says they do not have enough time for pre- and post flight duties

32,9% does not feel able to negotiate about working hours

20,7% of respondents works parttime

Well-being

Organizational Dehumanization

Positive

A positive attitude of the company towards their employees is experienced by a LOW number of respondents, 58% reports levels below the neutral statements. (M= 10,11 out of a maximum of 21, SD= 5,08)

Negative

Experience with organizational dehumanization in study sample is HIGH (M=55,36 out of a maximum of 77) with a large standard deviation (SD= 14,78).

Mental Health

is MODERATE as shown by a mean sum score on the scale of 34,17 out of maximum of 56 (SD=7,41).

Job Insecurity

is MEDIUM (M=4,7 out of a maximum of 10), with little variety among participants (SD=2,23).

Medication Use

is LOW (M= 7,69 out of 30), with little variety among participants (SD= 1,9).

Only more alarming results for ALCOHOL

Physical Health

is MEDIUM – 57,9% Good or Very Good (less than in 2021 and 2022)

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FACTSHEET

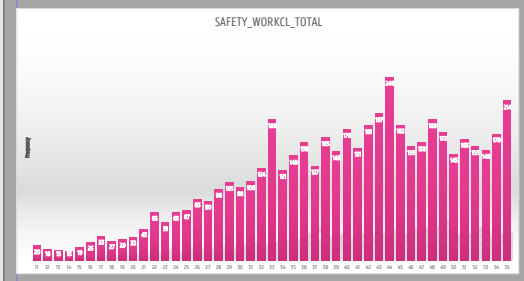
EMPLOYMENT IN THE EUROPEAN AVIATION INDUSTRY 2024

COCKPIT AND CABIN CREW

SAFETY

Safety work climate

Is LOW (M= 39,73 out of a max of 55), with a big standard deviation (SD= 10,25). 58,6% of respondents reports levels below the dangerous level of 43 out of 55, which illustrates that these respondents always report neutral or negative answers.



MOST REMARKABLE RESULTS

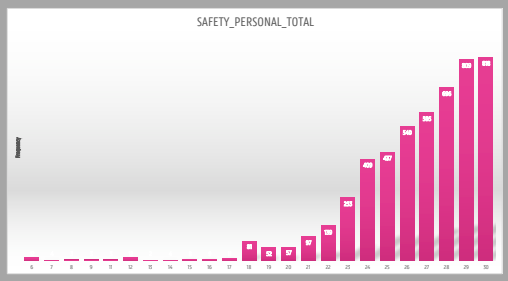
49,6% of respondents question the ability of their superiors (managers, supervisors, etc.) to motivate their employees to work with the highest attention to safety regulations and address safety-related issues in a constructive and respectful way.

47,8% of respondents that their superiors (management, supervisors, etc.) do not have a realistic picture of the potential problems and risks related to (flight) safety.

47,6% of respondents indicate that when safety issues are reported, management does not act quickly to correct these problems/issues.

Personal Aviation Safety Behaviour

Is BETTER (M= 26,45, out of a max of 30), with a small standard deviation (SD= 3,34). Only 14,8% of respondents report levels below the threshold of 24 (always reporting neutral of negative answers).



MOST REMARKABLE RESULTS

31,9% of respondents indicate that they do not put in extra effort to improve (flight) safety

12,2% of respondents say that they do not know where to go and what to do in case of an incident.

More than **10%** admits to not report an error, near miss or problem occurs regarding (flight) safety, as soon as possible via the appropriate channels (e.g. incident report, supervisor).

THE TRUST OF RESPONDENST IN SUPERIORS AND MANAGEMENT CONCERNING MATTERS OF SAFETY IS SIGNIFICANTLY LOWER THAN THE TRUST IN THE ABILITIES OF COLLEAGUES AND THEMSELVES – results are less favourable than in 2021!

Are you sometimes reluctant to take such safety decisions out of fear for possible negative consequences for your professional career?

35% YES

Are your colleagues sometimes reluctant to take such safety decisions our of fear for possible negative consequences for their professional career?

51% YES

Are you sometimes reluctant to take such decisions about your fitness to fly out of fear for possible negative consequences for your professional career?

44,8% YES

Are your colleagues sometimes reluctant to take such decisions about their fitness to fly out of fear for possible negative consequences for their professional career?

59,6% YES

DECISION MAKING and EMPLOYMENT STATUS

Do you think that your employment status may affect your ability to take such decisions (safety)?

40,3% YES

Do you think that your colleagues' employment status may affect their ability to take such decisions (safety)?

59,5% YES

Do you think that your employment status may affect your ability to take such decisions (fitness to fly)?

42,1% YES

Do you think that your colleagues' employment status may affect their ability to take such decisions (fitness to fly)?

52,4% YES

33,9% does not feel able to modify the instructions of the airline based on e.g. objections regarding flight safety, liability, or regarding health and safety. On top of that, 17,8% takes a neutral position.

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SURVEY QUESTIONNAIRE

We provide the version for pilots, the survey is adjusted for the group of cabin crew but those adjustments are limited to the referred group ('pilot' changed to 'member of the cabin crew').

P- ATYPICAL EMPLOYMENT IN THE AVIATION SECTOR - 2024

Start of Block: Informed consent

Q1 Dear participant,

You have been invited to take part in this industry-wide study on the employment and well-being of pilots and cabin crew organised by **ECA, ETF, ENAA and Ghent University** (Belgium), with the financial support of the **European Commission.** The aim of this study is to present a clear overview of the employment landscape in the aviation industry, 10 years after the pilot **UGent- study** on 'Atypical forms of employment in the aviation sector', as to be able to motivate and steer further legislative changes if needed. The questionnaire is **completely anonymous** and your participation is wholly voluntary. The answering of the questions will take *no longer than **15 minutes***, depending on your employment status. When in doubt, please do indicate so by using the option 'I don't know' or staying as close to your truth as possible. You will be able to give your general vision, anecdotes, and input in an open question at the end of the questionnaire. It is possible to save the survey and complete it later on, within the given timeframe of the study. We realize that the completion of this questionnaire is a commitment and we **thank you** for your cooperation. You can always obtain additional information from Prof. Jorens (yves.jorens@ugent.be) and Mrs. Valcke (doctoral researcher - lien.valcke@ugent.be). It is also possible to receive a concise version of the report and consult the publications that arise from it. *I hereby declare that I, as a participant in this study of the research group IRIS and under the direction of Ghent University, in cooperation with ECA, ETF and ENAA, (1) have read and understood the study information. I am aware that I can request further information from yves.jorens@ugent.be and lien.valcke@ugent.be if I have any questions; (2) consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason. I understand that taking part in the study involves answering the online survey questionnaire but that I may refuse to answer when not willing; (3) give permission to the researchers to save, process, and report my results anonymously. I understand that information collected about me, will not be shared beyond the study team and that the study is completely anonymous; (4) know that not participating or stopping my participation in the study in no way has negative consequences for me; (5) know that on request I can get a summary of the research findings after the study has been completed and the results are known; (6) allow my data to be used for further analysis by other researchers after complete anonymization; (7) know that Ghent University is the responsible unit with regard to personal data collected during the investigation. I know that the data protection officer can provide me more information about the protection of my personal information. Contact: Hanne Elsen (privacy@ugent.be).*

- ○ I consent.
- ○ I do not consent.

Skip To: End of Survey If Dear participant, You have been invited to take part in this industry-wide study on the employm... = I do not consent.

End of Block: Informed consent

Start of Block: Structure survey

Q204

The survey is made up of the following consecutive blocks: Demographic and employment data - time estimation: **1 minute** Current work characteristics - time estimation: depending on your employment situation **around 5 minutes** (Mental) well-being - time estimation: between **2 and 5 minutes** Safety, and some generic questions - time estimation between **3 and 5 minutes** Open question - time estimation: **to answer voluntarily**

With this structure in mind, you can monitor your progress. Thank you in advance!

End of Block: Structure survey

Start of Block: Demographics and basic employment

Q195

1. Demographics and employment situation

Q3 What is your gender?

- ○ Male
- ○ Female
- ○ Other/ prefer not to say _____

Q5 How old are you?

- ○ Under 21
- ○ 21-30
- ○ 31-40
- ○ 41-50
- ○ 51-60
- ○ 61 or older

Q13 Select your country of nationality.

▼Afghanistan ... Other

Q15 How many years of work experience do you have as a pilot? (for e.g.: From 3 years and 1 day on -> 3-5)

- ○ 0-1
- ○ 1-3
- ○ 3-5
- ○ 5-10
- ○ more than 10

Q209 I fly

- ○ Short and medium haul
- ○ Long haul
- ○ Mixed

Display this question:

If I fly = Long haul

Q210 How many layovers do you have on average per month ?

0
1
2
3
4
5
6
7
8
9
10

Display this question:

If I fly = Short and medium haul

Q211 How many legs do you do in a day on average per month?

0
1
2
3
4
5
6
7
8
9
10

End of Block: Demographics and basic employment

Start of Block: General employment

Q200

2. Current work characteristics

Q37 What kind of airline do you work for?

- Network airline
- Low-fare airline
- Charter airline
- Regional airline
- Cargo airline
- Business aviation
- Helicopter
- ACMI
- Other - please specify _____

Q39 Which airline do you work for?

_____

Q40 Is the airline you currently work for the first airline you worked for?

- ○ Yes
- ○ No

Display this question:

If Is the airline you currently work for the first airline you worked for? = No

Q41 How many other airlines have you worked for?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ 8
- ○ 9
- ○ 10

Display this question:

If Is the airline you currently work for the first airline you worked for? = No

Q42 What were your motivations for changing airline companies? *[Multiple options possible]*

- ☐ To get closer to your home and family
- ☐ Better wages
- ☐ Better general working conditions
- ☐ More flight hours
- ☐ Type of airplane
- ☐ Regional / continental / intercontinental flights
- ☐ Public image of the company
- ☐ Other reasons – please specify _____

Q26 Which airport do you work at (*main, please give the 3-letter-IATA-Code*)?

_____

Q28 In which country is your official home base?

▼Afghanistan ... Other

X→

Q30 Do you consider this to be your real home base?

- ○ Yes
- ○ No

Display this question:

If Do you consider this to be your real home base? = No

Q32 Which country do you consider your real home base?

▼Afghanistan ... Other

X→

Q34 Do you live in the country where your home base is located?

- ○ Yes
- ○ No

Q32 Where do you usually start your shift?

- ○ Homebase
- ○ Operational base
- ○ Other _____

Q212 Where do you usually end your shift?

- ○ Homebase
- ○ Operational base
- ○ Other _____

Q33 Who decides where your home base is?

- ○ Registered/main office of the airline
- ○ Regional/local office of the airline
- ○ Temporary work agency
- ○ Intermediary
- ○ You yourself
- ○ Other – please specify _____

Q34 Do you have any say in this matter (determining home base)?

- ○ Yes
- ○ No

Q35 Within what term can your home base be changed?

- ○ No notice
- ○ A few days
- ○ A few weeks
- ○ A few months
- ○ Change by negotiation
- ○ Other – please specify _____

Q216 You have completed approximately 30% of the survey, thank you in advance for your continued participation!

End of Block: General employment

Start of Block: Employment situation

X→

Q51 What is your relationship with the airline you work for?

- ○ I have an employment contract with the airline directly.
- ○ I work for the airline via a temporary work agency with whom have an employment contract.
- ○ I work for the airline as a self-employed worker via a cooperation agreement concluded with the airline directly.
- ○ I work for the airline as a self-employed worker via a cooperation/service agreement concluded with an agency/brooker.
- ○ I work for the airline via an enterprise or firm.
- ○ It is a different relationship - Please explain.

_____

Display this question:

If What is your relationship with the airline you work for? = I have an employment contract with the airline directly.

Or What is your relationship with the airline you work for? = I work for the airline via a temporary work agency with whom have an employment contract.

Q53 What kind of employment contract?

- ○ an open-ended/permanent employment contract
- ○ a fixed-term employment contract
- ○ a stand-by / on-call contract

Display this question:

If What is your relationship with the airline you work for? = I work for the airline via an enterprise or firm.

X→

Q55 Are you a shareholder in this enterprise?

- ○ No
- ○ Yes, I am the only shareholder in this company
- ○ Yes, together with another pilot
- ○ Yes, together with another partner

Q66 From whom do you get your instructions (directions)? *[Multiple options possible]*

- ☐ Registered office of the airline/airlines headquarters
- ☐ Regional office of the airline
- ☐ Temporary work agency
- ☐ Intermediary
- ☐ You yourself
- ☐ Other – please specify _____

Q67 What do these instructions involve? *[Multiple options possible*]

- ☐ Schedules
- ☐ Flight routes / flight plan
- ☐ Maximum daily / monthly flight hours
- ☐ Safety and operational aspects
- ☐ Working hours
- ☐ Training requirements
- ☐ Crew composition
- ☐ Other – please specify _____

Q68 Evaluate the following statement: "I can modify the instructions of the airline based on e.g. objections regarding flight safety, liability, or regarding health and safety."

- ○ Strongly agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Strongly disagree

Q69
Who decides which safety objections are valid to modify the instructions of the airline? (*Multiple options possible)*

- ☐ Registered office of the airline/airline headquarters
- ☐ Regional office of the airline
- ☐ Temporary work agency
- ☐ Intermediary
- ☐ You yourself
- ☐ Other – please specify _____

Page Break

Q70
Are you sometimes reluctant to take such safety decisions out of fear for possible negative consequences for your professional career?

- ○ Yes
- ○ No

Q71
Are your colleagues sometimes reluctant to take such safety decisions our of fear for possible negative consequences for their professional career?

- ○ Yes
- ○ No

Q72
Do you think that your employment status may affect your ability to take such decisions?

- ○ Yes
- ○ No

Q73
Do you think that your colleagues' employment status may affect their ability to take such decisions?

- ○ Yes
- ○ No

Q74 Evaluate the following statement: "I can decide not to fly for legitimate reasons of illness, fatigue, etc."

- ○ Strongly agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Strongly disagree

Q75
Are you sometimes reluctant to take such decisions about your fitness to fly out of fear for possible negative consequences for your professional career?

- ○ Yes
- ○ No

Q103
Are your colleagues sometimes reluctant to take such decisions about their fitness to fly out of fear for possible negative consequences for their professional career?

- ○ Yes
- ○ No

Q104
Do you think that your employment status may affect your ability to take such decisions?

- ○ Yes
- ○ No

Q105
Do you think that your colleagues' employment status may affect their ability to take such decisions?

- ○ Yes
- ○ No

Q215 Are you sometimes reluctant to take safety or health decisions for fear of possible negative consequences for your income?

- ○ Yes
- ○ No

End of Block: Employment situation

Start of Block: Other occupational activities

Q208
You have completed approximately 50% of the survey, thank you in advance for your continued participation!

Q43 Do you have other jobs/remunerated activities?

- ○ Yes. Because of e.g. financial reasons, intellectual stimulation, ... _____
- ○ No

Display this question:

If Do you have other jobs/remunerated activities? = Yes. Because of e.g. financial reasons, intellectual stimulation, ...

Q48 These other jobs/remunerated activities are

- ○ In the aviation industry as ... _____
- ○ Outside of the aviation industry as ... _____

End of Block: Other occupational activities

Start of Block: Legislation

Q201

2. Current work characteristics

Q110 Which country's legislation is applicable to your cooperation/contract with the airline?

▼Afghanistan ... Other/ I don't know

Q186 Which country's labour law is applicable to you?

▼Afghanistan ... Other/ I don't know

Q113 This country is...

- ○ the country of your official home base.
- ○ the country of the registered office of the airline you fly for. [Choose this option if different from the official home base.]
- ○ the country of the registered office of your own company. [Choose this option if different from the official home base.]
- ○ the country where you live. [Choose this option if different from the official home base.]
- ○ a different country. - please specify _____

Q188 Where do you pay your social security contributions?

▼Afghanistan ... Other/I don't know

Q190 This country is...

- ○ the country of your official home base.
- ○ the country of the registered office of the airline you fly for. [Choose this option if different from the official home base.]
- ○ the country of the registered office of your own company. [Choose this option if different from the official home base.]
- ○ the country where you live. [Choose this option if different from the official home base.]
- ○ a different country. - please specify _____

Q114 Are you yourself responsible for the payment of your social security contributions?

- ○ Yes
- ○ No

Q116 In which country did you sign your contract?

▼Afghanistan ... Other

Q217 Are you a member of a trade union?

- ○ Yes
- ○ No
- ○ No, because there are no unions organising workers in my company
- ○ No, because I am not able to join due to my employment situation

Q218 Is there a Collective Labour Agreement at company or group level?

- ○ Yes
- ○ No
- ○ I don't know

End of Block: Legislation

Start of Block: Income

Q213 I work

- ◯ Fulltime
- ◯ Part time
- ◯ Flexible/depends on the month

X→

Q83
Are your wages/remunerations paid directly by the airline you mainly fly for?

- ◯ Yes
- ◯ No
- ◯ I don't know

Display this question:

If Are your wages/remunerations paid directly by the airline you mainly fly for? = Yes

X→

Q84 Are they paid by the registered office of this airline (i.e. not by a subsidiary of this airline)?

- ◯ Yes
- ◯ No

Display this question:

If Are your wages/remunerations paid directly by the airline you mainly fly for? = No

Q85 By whom are they paid?

- ○ Temporary work agency
- ○ Intermediary (e.g. payroll services company)
- ○ Other – Please specify _____

Display this question:

If What is your relationship with the airline you work for? = I work for the airline via a temporary work agency with whom have an employment contract.

Q214 Is the paying organisation registered in the same country as the intermediary?

- ○ Yes
- ○ No
- ○ I don't know

X→

Q86
Is your income variable?

- ○ Yes, I have a minimum fixed income and a part of my income is variable.
- ○ Yes, the totality of my income is variable.
- ○ No, I have a fixed income.

Q115 How are you paid?

- ○ Lump sum (fixed amount every month)
- ○ Lump sum + extras. Following extras are paid...
  _____
- ○ Per hour with a minimum number of flight hours guaranteed. The amount of hours garanteed is _____
- ○ Per hour without a minimum number of flight hours guaranteed

Q116 Which activities are you being paid or compensated for? *[Multiple options possible]*

- ☐ Flight hours
- ☐ Positioning ('dead-heading')
- ☐ Time during layovers
- ☐ Hotel
- ☐ Meals between flights
- ☐ Meals during flights
- ☐ Uniforms
- ☐ Crew ID cards
- ☐ Inflight sales
- ☐ Sick leave
- ☐ Maternity leave
- ☐ Visas
- ☐ Work-related medical charges
- ☐ Non-work-related medical charges
- ☐ Costs of retaining licenses/attestations/flying allowances

☐ Other – Please specify _____

☐ Q117 How many hours do you work, on average, per month and how many of them are actual flight hours?

_____

Q118
To what extent are you able to refuse or negotiate your working hours?

○ I feel generally free to do so

○ I can refuse or negotiate in exceptional cases

○ I can't refuse or negotiate

Display this question:

If To what extent are you able to refuse or negotiate your working hours? = I can't refuse or negotiate

Q119 Who decides this?

○ Registered/main office of the airline

○ Regional/local office of the airline

○ Temporary work agency

○ Intermediary

○ Other – Please specify _____

Q120 How are your hours counted?

- ○ Per hour worked
- ○ Per actual flying hour ('block hours')

Q121
Are flight preparations and checks considered and remunerated as hours worked?

- ○ Yes
- ○ No
- ○ One is, the other one is not

Q122
Do you consider you have enough time for pre-/post-flight duties, including turnaround?

- ○ Yes
- ○ No

Q206
You have completed approximately 70% of the survey, thank you in advance for your continued participation!

End of Block: Working hours

Start of Block: Wellbeing

Q196

3. (Mental and physical) wellbeing

Q125 How would you generally assess your physical health in the **past four weeks**?

	Very bad	Bad	Moderate	Good	Very good
	1	2	3	4	5
My general physical health was ...					

Q219 When fatigued...

- ○ I always report
- ○ I sometimes report
- ○ I never report
- ○ Other _____

Q127 How often did you use the following types of medication in the **past four weeks**?

	Never	Once a week	2-3 times a week	4-6 times a week	Daily
Sleep medication	○	○	○	○	○
Pain killers	○	○	○	○	○
Antidepressants	○	○	○	○	○
Anti-anxiety medication	○	○	○	○	○
Amphetamines	○	○	○	○	○
Alcohol	○	○	○	○	○

Q129 The following expressions gauge your vision of the attitude of the airline towards you,as their worker. To what extent do you agree with the following statements regarding your experience in the **past four weeks?**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My airline values my contribution to its well-being	○	○	○	○	○	○	○
My airline strongly considers my goals and values.	○	○	○	○	○	○	○
My organization really cares about my well-being	○	○	○	○	○	○	○
My airline makes me feel that one worker is easily as good as any other	○	○	○	○	○	○	○
My airline would not hesitate to replace me if it enabled the company to make more profit	○	○	○	○	○	○	○
If my job could be done by a machine or a robot, my airline would not hesitate to replace me by this new technology	○	○	○	○	○	○	○

My airline considers me as a tool to use for its own ends	○	○	○	○	○	○	○
My airline considers me as a tool devoted to its own success	○	○	○	○	○	○	○
My airline makes me feel that my only importance is my performance at work	○	○	○	○	○	○	○
My airline is only interested in me when they need me	○	○	○	○	○	○	○
The only thing that counts for my airline is what I can contribute to it	○	○	○	○	○	○	○
My airline treats me as if I were a robot	○	○	○	○	○	○	○
My airline considers me as a number	○	○	○	○	○	○	○
My airline treats me as if I were an object	○	○	○	○	○	○	○

Q131 Below are some statements about feelings and thoughts , please tick the box that describes your experience **over the last four weeks**

	Much less than usual	Not as often as usual	As often as usual	More than usual
I have been feeling optimistic about the future	○	○	○	○
I have been feeling useful	○	○	○	○
I have been feeling relaxed	○	○	○	○
I have been feeling interested in other people	○	○	○	○
I have had energy to spare	○	○	○	○
I have been dealing with problems well	○	○	○	○
I have been thinking clearly	○	○	○	○
I have been feeling good about myself	○	○	○	○
I have been feeling close to other people	○	○	○	○
I have been feeling confident	○	○	○	○
I have been able to make up my mind about things	○	○	○	○
I have been feeling loved	○	○	○	○
I have been feeling interested in new things	○	○	○	○
I have been feeling cheerful	○	○	○	○

Q133 Regarding my psychological health and safety, for example during the COVID-19 pandemic, I know where or whom to go to within the structure of the airline if needed

- ○ Yes, I know where to go to, and I would address these matters internally (at work, with the person within organisation or appointed by the employer)
- ○ Yes, I know where to go to but I would never address these matters internally (at work, with the responsible person within organisation or appointed by the employer)
- ○ No, I don't know
- ○ No, because there is no organs/person/… appointed by the employer
- ○ Other: _____

Q136 Please indicate to what degree you can agree with the following statements

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Chances are, I will soon lose my job.	○	○	○	○	○
I feel insecure about the future of my job.	○	○	○	○	○

End of Block: Wellbeing

Start of Block: Safety

Q197

4. Safety and General information

Q134 Please read each of the following safety statements and indicate if you: strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), or strongly agree (5) within the context of your (previous) employment situation. Be honest in your answers. There are no right or wrong answers. Please mark only one number per statement. We see *safety* as a broad term. It is about avoiding adverse outcomes (accidents and incidents) through a set of methods, principles and practices that have

been developed to identify and eliminate (or attenuate) dangers at all levels: technical, personal (e.g. mental health), sociological, for passengers and personnel, etc.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The superiors (managers, supervisors, etc.) I work with set clear objectives concerning (flight) safety and are clear about their safety-related expectations.	○	○	○	○	○
The superiors (managers, supervisors, etc.) I work with are able to motivate their employees to work with the highest attention to safety regulations and address safety-related issues in a constructive and respectful way.	○	○	○	○	○
The importance of (flight) safety is permanently visible by means of, for example, written communication from leaders, posters, signs and/or icons, etc.	○	○	○	○	○
Pilots are able to openly discuss safety problems with their superiors and/or colleagues.	○	○	○	○	○

At my work, superiors (management, supervisors, etc.) consider safety to be of great importance. For example, they consider safety more important than keeping to the schedule.	○	○	○	○	○
The superiors (management, supervisors, etc.) involve employees actively in safety-related matters.	○	○	○	○	○
When safety issues are reported, management acts quickly to correct these problems/issues.	○	○	○	○	○
At my work, training is given at regular intervals to refresh and update knowledge, especially when new procedures or equipment are introduced.	○	○	○	○	○

Management allocates sufficient resources to safety, for example sufficient time, staff, funds, protection materials and infrastructure.	○	○	○	○	○
At my work, superiors (management, supervisors, etc.) have a realistic picture of the potential problems and risks related to (flight) safety.	○	○	○	○	○
My colleagues at work are alert and attentive to potential problems and risks related to (flight) safety.	○	○	○	○	○
At my work, I put in extra effort to improve (flight) safety (e.g. voluntary tasks or activities which promote (flight) safety).	○	○	○	○	○
I possess the necessary knowledge to maintain or improve (flight) safety.	○	○	○	○	○
In case of a safety issue at my work, I know where to go and what to do.	○	○	○	○	○

I believe that it is important to maintain (flight) safety at all times to prevent safety problems, events and incidents.	○	○	○	○	○
I follow the highest standards of (flight) safety when I am at work (e.g. wearing all required protective equipment, applying the correct safety regulations).	○	○	○	○	○
When an error, near miss or problem occurs regarding (flight) safety, I report this as soon as possible via the appropriate channels (e.g. incident report, supervisor).	○	○	○	○	○

Q135 When an error, near miss or problem occurs regarding (flight) safety, I report this to…

- [ ] My direct supervisor
- [ ] The management of the (airline) company
- [ ] The management of the airport
- [ ] The civil aviation authority
- [ ] I don't know
- [ ] Other _____

End of Block: Safety

Start of Block: Open question

Q198
5. Open Question

Q139 Here you can give your personal input, make side notes, clarify your answers, give your view on the future of the aviation sector, testify about good practices, etc.

_____

End of Block: Open question

INTERVIEW GUIDELINE

Introduction

Section 1: Background Information

1. Can you briefly describe your role and responsibilities as an HR manager in this airline company, particularly in relation to cockpit and cabin crew?

2. Approximately how many employees work in the cockpit and cabin crew roles in your company, and in which employment model (typical or atypical e.g. temporary, agency work, on call, self-employed, …))?

Section 2: Atypical Employment Arrangements

3. What are the main reasons why you have/had relied/rely on a particular model of employment? How has the employment model evolved over the past five years (E.g. wet leasing, posting (eg. Subgroup on social matters related to aircrew, 2023), home base outside Europe, …)?

    a. How do you recruit? Do any issues arise if you work with subcontracted personnel (e.g. wet-leasing...)? For example: engagement and retention, legislation not adjusted, equal access to professional development and career progression …

4. How do you determine the applicable labour laws of your personnel? Do you strive for as much uniformity as possible?

Section 5: Flight Time Limitations (FTL)

5. How is compliance with FTL monitored and enforced within the company?

6. Do you collect feedback from crew members regarding the practicality and impact of FTL regulations, are adjustments made based on this feedback?

Section 3: Mental and Physical Health Initiatives

7. What initiatives does your company have in place to support the mental and physical health of cockpit and cabin crew, what resources do you provide? How does your company assess the effectiveness of mental health and well-being programs?

8. How do you encourage crew members to seek help for mental health concerns?

9. How does your company assess staff satisfaction and mental health/well-being?

Section 4: Link Between Health, Employment, and Safety

10. Are there specific safety protocols or training programs designed to address the possible impact of well-being on safety? How do HR and safety departments collaborate to address issues related to employee health and safety?

Section 6: Future Directions

11. In your opinion, what are the biggest challenges in aviation? How does your company plan to adapt to these changes?

12. What changes do you think would be required /necessary in aviation regulations more in particular concerning employment issues?

13. Are there any innovative practices or programs you are considering implementing in the domain of employment issues and well-being?

Conclusion