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MESAFE [EASA.2022.C07]

[D4.1 REPORT ON THE RISK OF INCAPACITATION AND LIMITATION OF LICENCE PRIVILEGES]

MESAFE – MEntal health for aviation SAFEty

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SUMMARY

Problem area

Mental disorders can influence pilot and air traffic controllers' performance in many detrimental ways. Their effects can bring about incapacitation, which erodes safety margins and might disrupt normal operations. On a more critical level, they can lead to errors, violations, inappropriate automatic hurried actions or biased decision making.

Currently, there are no specific, standard, validated mental health assessment methods for aeromedical use, incorporating the specific operational needs, to address the incapacitation risk due to mental disorders in the framework of the fitness for duty certification process.

MESAFE stands for "MEntal health for aviation SAFEty". It is a research project, funded by EASA under the framework of the European Union's Horizon Europe research and innovation programme. Started in May 2022 and lasting 2 years, the project aims at overcoming challenges preventing the effective implementation of the Aeromedical certification process for pilots and air traffic controllers (ATCOs) with regards to the incapacitation risk associated with mental health conditions. The project will provide evidence-based recommendations for new medical developments for the early diagnosis as well as treatment of mental health conditions which could pose a safety risk for aviation and would consequently lead to pilot and ATCO unfitness or the limitation of their licence privileges for safety purposes.

Two questions are prominent in this light. The first question is: "Can the safety impact of mental disorders be assessed, both in qualitative as well as quantitative terms, given the proposed solutions and mitigations?". It is important to be aware that the total impact may be relatively small, but even then, it may be so that some aspects of the certification process will become less efficient, whereas others will become more efficient. A second question is "what will the impact on regulations be?". To answer this question, it is important to understand, given the proposed changes to aeromedical certification operations, what part of the regulation will be influenced by these changes, so as to be aware of the amount and type of adjustments to regulations that might be expected.

Description of work

The present document is the D-4.1 REPORT ON THE RISK OF INCAPACITATION AND LIMITATION OF LICENCE PRIVILEGES of the MESAFE project and implements all the previous project's work (see the MESAFE deliverables D-1.1, D-1.2, D-2.1 and D-3.1) into a pilots' and air traffic controllers' mental incapacitation risk management process.

In line with this, and following the EASA technical requirements, this document provides the following information:

- an overview of the risk of incapacitation of applicants and an assessment of which mental health conditions are eligible for aeromedical certification based on their severity and the class of aeromedical certification;
- an overview of mitigation measures that will take into account the appropriateness of imposing limitations to further reduce the safety risks related to the risk of incapacitation for each class of aeromedical certification for applicants who do not fully meet the applicable fitness requirements.
- a consolidated mental fitness assessment process that includes tools, approach, professionals involved, the risk of incapacitation and the potential application of limitations to mitigate certain risks.

At the end of Task 4 (planned at T0+15) the Milestone 3 of the project "*Validation of the acceptable risk of incapacitation considering the evolution of medical sciences*" is achieved. The output of T4 is then used as input for T 5 "Reviewing existing pilot and ATCO aeromedical examination standards for applicants for a medical certificate" and T6 "Define conclusions and recommendations", which run in parallel from T0+16 to T0+22.

Results and Application

This document implements all the take-home messages of previous MESAFE deliverables into a revised process to assess the risk that mental incapacitation poses to aviation safety, that MESAFE intends to propose to update the current EU aeromedical procedures for assessing the risk of mental incapacitation of pilots and ATCOs.

We call this process MIRAP, which stands for Mental Incapacitation Risk Assessment Process.

The MIRAP follows 7 subsequent steps, that are listed below:

- Step 1: identify any real or potential mental incapacitation events
- Step 2: determine the severity of the MIE identified
- Step 3: determine the probability of occurrence of the MIE identified
- Step 4: apply the matrix to detect the risk level
- Step 5: apply risk mitigation measures
- Step 6: re-apply the matrix to identify the new risk level
- Step 7: decision and follow-up

The process has been developed on the basis of the state of the art and up to date scientific evidence about mental disorders and psychodiagnostic procedures, which MESAFE has extensively described in deliverables D1.1 Report on the review of diagnostic measures, D1.2 - Report on the review of treatment options, D2.1 Report on the analysis of the availability of diagnostic tests and D3.1 Report on the analysis of the suitability of screening and confirmation tests for misuse of alcohol and drugs. All this information has been analysed with respect to its usability, acceptability and suitability to the aeromedical environment and customized within MIRAP on the basis of what the AMEs, pilots and ATCOs told us in the 3 surveys and its analysis: in line with this, the MIRAP addresses the suggestions and principles to improve the users' (AMEs as well as applicants) acceptability of the aeromedical mental health assessment.

Using the MIRAP requires knowledge of operational effects of mental incapacitation events. Such an approach can be used for aeromedical risk assessment by the AME assisted by a qualified aviation mental health professional and in consultation with operational competence. As implicit in it, MESAFE aims to propose a network of connections between medical professionals, operational experts and mental health specialists, to support aeromedical decision-making.

To assess the usability, suitability and acceptability of the proposed application of the matrix in the MIRAP, in its next tasks (namely task 5 and 6), MESAFE will engage in:

- A detailed description of the profiles and competency framework for the MHS
- A MIRAP proof of concept study (PoC).

National Chief Medical Officers will be requested to provide cases in which risk assessment of (a) mental incapacitation event(s) has been complex or difficult irrespective of the outcome (fit, fit with limitation(s), unfit). Cases should be completely anonymised and should preferably be provided in a format where the medical history (anamnesis) is separated from the argumentation and outcome of the case in order to create the possibility of blinding the outcome for the MESAFE Research team. The MESAFE research team will evaluate relevance of the cases and perform the POC evaluation. The MESAFE research team is aware of the

risk that insufficient cases will timely (i.e. before the deadline of Tasks 5 and 6) be provided by the National Chief Medical Officers. In that case the MESAFE team will try and retrieve example cases from a clinical psychiatric practice and use these cases to explore the feasibility and possible problems of the concept.

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ABBREVIATIONS

ACRONYM	DESCRIPTION
ABES	Abnormal and Emergency Situation
AeMC	Aero-medical centre
AME	Aviation Medical Examiner
AMC	Acceptable Means of Compliance
AMOB	Aeromedical-Operational Board
ATC	Air Traffic Control
ATCEUC	Air Traffic Controllers European Union Coordination
ATCO	Air Traffic Controller Operator
ATCS	Air Traffic Control Service
ATPL	Airline Transport Pilot Licence
CAA	Civil Aviation Authority
CANSO	Civil Air Navigation Services Organization
CDT	Carbohydrate Deficient Transferrin
CMO	Certificate Management Office
CPL	Commercial Pilot Licence
CRM	Crew resource management
EAMR	European Aero-Medical Repository
EASA	European Union Aviation Safety Agency
ECA	European Cockpit Association
EPPSI	European Pilot Peer Support Initiative
EtG	Ethyl glucuronide
EU	European Union
FAA	Federal Aviation Administration
GDPR	General Data Protection Regulation
GGT	Gamma Glutamyl Transferase
GMP	General medical practitioner
GP	General practitioner
HF	Human Factors
HR	Human Resources
ICAO	International Civil Aviation Organization
IFATCA	International Federation of Air Traffic Controllers' Associations
ID	Identification
MAO inhibitors	Monoamine oxidase inhibitors
MEG	Medical Expert Group
MH	Mental Health
MHP	Mental Health Professional
MHS	Mental Health Specialist
MIE	Mental Incapacitation Event
MIR	Mental Incapacitation Risk

MIRAP	Mental Incapacitation Risk Assessment
MMPI-2	Minnesota Multiphasic Personality Inventory - 2
NASA	National Aeronautics and Space Administration
OCL	Valid only as a qualified co-pilot
OML	Operational Multi-crew Limitation
OSA	Obstructive sleep apnoea
POC	Proof of Concept
PPL	Private Pilot Licence
PSG	Peer Support Group
PSP	Peer Support Programmes
RPAS	Remotely Piloted Aircraft Systems
rTMS	Repetitive Transcranial Magnetic Stimulation
SCG	Stakeholder Consultation Group
SFCL	Sailplane Flight Crew Licensing
SIC	Specific regular medic examination(s)
SSL	Special restrictions as specified
SSRI	Selective Serotonin Reuptake Inhibitor
TML	Time Limitation
TRM	Team Resource Management
US	United States

1. Introduction

The present document is the D-4.1 REPORT ON THE RISK OF INCAPACITATION AND LIMITATION OF LICENCE PRIVILEGES of the MESAFE project. The document provides up to date methods and procedures to assess and mitigate the mental incapacitation risk of pilots and ATCOs.

MESAFE stands for "MEntal health for aviation SAFEty". It is a research project, funded by EASA under the framework of the European Union's Horizon Europe research and innovation programme. Started in May 2022 and lasting 2 years, the project aims at overcoming challenges preventing the effective implementation of the Aeromedical certification process for pilots and air traffic controllers (ATCOs) with regards to the incapacitation risk associated with mental health conditions.

Detailed background information about MESAFE and expected results by the project can be found in the MESAFE deliverable D1.1 Report on the review of diagnostic measures, which is available at https://www.easa.europa.eu/en/research-projects/mesafe-mental-health#group-downloads.

1.1 Scope of the document

The present document is the deliverable of the Task 4 of the project and includes the output of subtasks 4.1 and 4.2.

Task 4 "*Validation of the acceptable risk of incapacitation considering the evolution of medical science*" aims at developing a consolidated mental fitness certification process targeted to AMEs. As expected, this task has produced a mental incapacitation risk assessment process to identify the applicants' mental incapacitation risk, as well as mitigation measures to reduce the risk when this overcomes the acceptable level. A proof of concept of the process complements the proposed process.

Subtask 4.1, *"Analyse the risk of incapacitation for each class of aeromedical certification, taking into account the acceptable risk level"*, aims at determining the risk of incapacitation of applicants and assessing which mental health conditions are eligible for aeromedical certification based on their severity and the class of aeromedical certification. Besides the applicant's mental health status and her/his personal and medical history, the incapacitation risk factors also include organisational stressors and operational scenarios that might affect the mental fitness.

Subtask 4.2, "*where the risk level is not acceptable, analyse whether certain limitations imposed to the aeromedical certificate may mitigate the higher-to-acceptable risk taking into account the class of aeromedical certification",* has reviewed the existing limitations imposed to the aeromedical certificate and their effects. In this light, it is crucial to determine the effects of temporary / permanent loss of licence and associated financial risks for applicants, as these issues may affect the level of trust and confidentiality between the applicant and the AMEs. To mitigate this hazard, the task has engaged in the development of a process in which it is clear what happens if the pilot has been grounded (sick leave for temporary, licence payment by insurance, advice/welfare for permanent) and recommendations to keep peer support for ATCOs and pilots who have lost licence to help them reorientate. The Just Culture principles are integrated in this process.

Task 4 takes input from Task 1 "*Review and critique of the state-of-the-art in the diagnosis and care of mental health conditions*", Task 2 *"Identify mental health diagnostic tests suitable for use in aeromedical fitness assessments"* and Task 3 "*Identify screening and confirmation tests for psychoactive substances suitable for use in aeromedical fitness assessment*". Tables 1, 2, and 3 provide a list of the take-home messages from D1.1, D1.2 and D3.1 that are followed-up in this document.

D1.1 REPORT ON THE REVIEW OF DIAGNOSTIC MEASURES					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
3.6	Many mental disorders impede the ability to concentrate and cause sleeping difficulties, which is much more frequent than suicidal behaviour, and also an important risk for flight safety.	list of mental incapacitation events and definition of acceptable risk levels	overview of the mental health conditions that are eligible for aeromedical certification according to their severity and the class of aeromedical certification	OPEN	Guidance material (task 5)
3.7	The safety assumption according to which an applicant suffering from a mental health disorder will seek help and self-declare her/his condition might fail. Indeed, for many mental disorders denial in a relatively frequent symptom leading to a reduced rate of self-declaration. Feelings of shame and guilt can also reduce the rate of self-declaration.	Proposed history taking, access to previous AMEs records, access to medical records, access to psychological/ psychiatric records, access to other relevant documentation	MIRAP step 1	OPEN	Rules and procedures enabling the access to previous records and relevant documentation (Task 5) Training modules on interviewing skills and history taking targeted to AMEs (Task 6)
3.8	The cultural and organizational environment which individuals belong to have an impact on their possibility and willingness to self-declare mental health issues. A supportive and just-culture oriented environment towards mental health and psychological discomfort might help self-declaration of possible mental issues before they escalate into negative effects for safety and for the health of people suffering from them.	Focus on symptoms rather than disorders Highlight of the importance of getting the consent by pilots/ATCOs to access relevant documentation Highlight of the importance of interviewing skills of AMEs Need of open discussion about the final aeromedical decision on mental fitness and mitigation measures for loss of licence	How to improve the acceptability of the aeromedical mental health assessment The MIRAP	OPEN	Safety promotion material (task 6) Training modules on interviewing skills targeted to AMEs (Task 6)

D1.1 REPORT ON THE REVIEW OF DIAGNOSTIC MEASURES					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
4.1	Psychodiagnostic tests taken as standalone assessment measures do not enable a psychological diagnosis. Still tests and questionnaires might be useful to support the part of the interview addressing mental complaints.	Aeromedical interview checklist	MIRAP step 1 Role of the MHS	OPEN	Standardized Procedures for mental health assessment (task 5) Training modules on clinical interview targeted to AMEs (Task 6)
4.2	Very few dedicated and validated tests and questionnaires for pilots, ATCO's and other aviation professionals exist. Valid pilot and ATCS norms are available for the MMPI-2.	Aeromedical interview checklist	MIRAP step 1 Role of the MHS	OPEN	Training modules on psychodiagnostic options targeted to AMEs (Task 6)
4.5	Assessing the risk of suicide and other risky behaviours is generally assumed to be based on two major principles: the clinical impression and quality of the contact with the patient, and epidemiological risk factors.	MIEs severity and probability assessment	The MIRAP	CLOSED	
4.7	To detect possible neurocognitive shortcomings the recommended aeromedical examination should be based on the two most important pillars: 1) the AME interview (history taking), and 2) Operational information: occupational history and functioning of the pilot or ATCO in the event of incidents and accidents and during simulator sessions, proficiency checks and training courses.	MIEs severity and probability assessment	The MIRAP	OPEN	Training modules on cognitive decline assessment targeted to AMEs (Task 6)
	The key challenges reported by AMEs with respect to the current procedures for the aeromedical mental fitness assessment, both for initial applicants and revalidation/renewal, are summarized as follows: • Applicants' opposing attitudes to disclose information • Difficulties in identifying symptoms	Measures to improve the acceptability of the aeromedical mental health assessment	How to improve the acceptability of the aeromedical mental health assessment The MIRAP MIRAP cooperation processes and professionals involved	OPEN	Task 5 guidelines Task 6 training

D1.1 REPORT ON THE REVIEW OF DIAGNOSTIC MEASURES					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
	• Insufficient training on mental health • Lack of legal definition or basis of implementation Mental Health Assessment in the different CAA • Absence of clear, robust, and validated questionnaires and interviews • Impossibility to access the applicant psychosocial and medical history; no access to earlier AME's record • Insufficient cooperation among AMEs and mental health specialists • Too little time allocated to assess mental fitness of applicants				
5.3	Suggested recommendations to improve the mental fitness assessment process, both for initial applicants and revalidation/renewal, by AMEs: • Multidisciplinary collaboration with mental health specialists and peer support groups • Standardized questionnaires and interviews • Possibility to access the applicant psychosocial and medical history • Shared procedures among Member States • Especially through EASA guidelines on how to perform the assessment	Measures to improve the acceptability of the aeromedical mental health assessment	How to improve the acceptability of the aeromedical mental health assessment The MIRAP MIRAP cooperation processes and professionals involved	OPEN	Task 5 guidelines Task 6 training

D1.1 REPORT ON THE REVIEW OF DIAGNOSTIC MEASURES					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
	• Periodical evaluation performed by mental health specialists • Trainings and educational material both for AMEs and mental health specialists on their collaboration				

Table 1 - D1.1 take-home messages and follow-up

D1.2 REPORT ON THE REVIEW OF TREATMENT OPTIONS					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
2.1	There are several effective biological and psychotherapeutic treatment options for mental disorders.	Risk mitigation strategies	MIRAP Step 5	OPEN	Recommendation to refer to psychotherapists and psychiatrists (task 5) Training modules for AMEs and PSGs on psychosocial interventions and biological treatment for mental disorders (task 6)
2.3	The presence of psychotherapeutic treatment in between two aeromedical examinations and/or in a given current timeframe should be evaluated carefully before being considered as disqualifying, as it works as a safety net to prevent relapses. It would be beneficial if the AME could consult the psychotherapist and obtain information regarding the evolution of the applicant	Highlights on the protective value of treatment options for mental disorders	MIRAP step 5	OPEN	Recommendation to involve psychotherapists (task 5) Information for AMEs and PSGs on effectiveness of psychosocial interventions (task 6)
3.2	The compatibility of biological treatment	Review of biological treatment options	Eligible biological treatment	OPEN	Recommendation to involve

D1.2 REPORT ON THE REVIEW OF TREATMENT OPTIONS					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
	options for mental Health with aviation duties depends on the duties, the disorder, the effects of the treatment, and the side-effects of the treatment. As a general rule, such evaluation must be made on an individual basis by a psychiatrist.	Definition of cooperation processes between the psychiatrist and the AMEs within the mental health risk assessment process	Role of MHS		psychiatrists (task 5) Information for AMEs and PSGs on effectiveness and side-effects of biological treatment (task 6)
4.3	AMEs should work closely with mental health specialists and peer support groups.	Definition of cooperation processes among PSGs, AMEs and MHSs in the framework of the mental health risk assessment process (task 4)	MIRAP cooperation processes and professionals involved	OPEN	Task 5 guidance material Task 6 training

Table 2 - D1.2 Take home messages and follow-up

D3.1 Report on the analysis of the suitability of screening and confirmation tests for misuse of alcohol and drugs					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
3.1	EASA guidelines specifically mention alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents as psychoactive substances of concern because all these substances have acute, prolonged, or residual effects, and/or withdrawal symptoms that are incompatible with flying or ATC duties. The use of so-called 'party drugs' is presently widespread among the general population, and is not limited to specific sub-cultures anymore. Simultaneous use of different substances,	Assessment of the Mental Incapacitation Risk related to substance abuse	The MIRAP	OPEN	List of psychoactive substances (task 5) Training modules for AMEs and PSGs (task 6)

D3.1 Report on the analysis of the suitability of screening and confirmation tests for misuse of alcohol and drugs					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
	including alcohol, is popular. The acute and hangover effects of alcohol are detrimental to flight safety. Residual or hangover effects represent a major threat to flight safety, as the consequent degradation of performance may be insidious and may not be recognised by the other crewmembers.				
3.2	All aeromedical licence examinations of pilots and ATCOs should include physical examination and extensive history taking by the AME in which several dedicated questions concerning psychoactive substance use should be included in the interview. In addition, screening test methods for identification of psychoactive substance (mis)use are considered important additional tools to support AMEs/AeMCs in their considerations about an applicant's fitness to function in a safety-sensitive aviation job.	Interview checklist Role of the MHS	The MIRAP MIRAP cooperation processes and professionals involved	OPEN	Training modules for AMEs and PSGs (task 6)
3.3	Hair analysis appears best suited for initial Class 1 /Class 3 psychoactive substance testing because it can provide a 30-90 days alcohol/ drugs/ medication history of the applicant.			OPEN	Task 5 guidelines
3.4	For renewal of Class 1, Class 3, and all Class 2 examinations a Urine Drugs Screen (if positive, followed by a confirmation analysis) is suitable to demonstrate the use of			OPEN	Task 5 guidelines

D3.1 Report on the analysis of the suitability of screening and confirmation tests for misuse of alcohol and drugs					
TAKE HOME MESSAGE		FOLLOW-UP IN THIS DOCUMENT		STATUS	FOLLOW-UP IN NEXT TASKS
ID	Description	Output	Section		
	opioids, cannabinoids, amphetamines, cocaine, hallucinogens, and sedative hypnotics over a time period covering at approximately 2 to 4 days (for most drugs) before the test is taken.				
3.5	When evidence has to be found for chronic excessive alcohol use, the combination of serum levels of Gamma Glutamyl Transferase (GGT) and Carbohydrate Deficient Transferrin (CDT) appears the most suitable method to be used for screening. This combination covers excessive alcohol use in the 2-3 weeks prior to the examination. For recent excessive use of alcohol, Ethyl glucuronide (EtG) in urine is suitable to demonstrate excessive alcohol use at least within 24 hours prior to the examination.			OPEN	Task 5 guidelines

Table 3 - D3.1 Take home messages and follow-up

In line with these and following the EASA technical requirements, this document provides the following information:

- based on task 1 results, overview of the mental health conditions that are eligible for aeromedical certification according to their severity and the class of aeromedical certification;
- based on task 2 and 3 results, analysis of the risk of incapacitation for each class of aeromedical certification, taking into account the acceptable risk level;
- overview of mitigation measures that will take into account the appropriateness of imposing limitations to further reduce the safety risks related to incapacitation for each class of aeromedical certification for applicants who do not fully meet the applicable fitness requirements.

At the end of Task 4 (planned at T0+15) the Milestone 3 of the project "*Validation of the acceptable risk of incapacitation considering the evolution of medical sciences*" is achieved. The output of T4 is then used as input for T 5 "Reviewing existing pilot and ATCO aeromedical examination standards for applicants for a medical certificate" and T6 "Define conclusions and recommendations", which run in parallel from T0+16 to T0+22.

1.2 Structure of the document

This deliverable is structured as follows:

- Section 1 is the present section, introducing the document in the framework of the project and its research ambition and scope.
- Section 2 addresses the issues and challenges collected through surveys on the current aeromedical mental fitness certification process from pilots' and ATCOs' perspective. Firstly, it summarises main findings from the AME point of view's survey on the current aeromedical mental fitness certification process (MESAFE D1.1), followed by the new findings from the pilots' and ATCOs' point of view. Then, a synthesis of the main findings from AMEs, Pilots, and ATCOs perspectives are respectively compared to observe common findings. Lastly, methodological limitations and strengths are reported.
- Section 3 depicts the process through which the mental fitness assessment acceptability could be improved from both the point of view of AMEs and applicants (pilots and ATCOs), i.e., measures to mitigate the impact of limitations; measures to benefit from the aeromedical assessment; just culture, Peer support programmes, and measures to improve work-related stress.
- Section 4 provides the MESAFE mental incapacitation risk assessment process (MIRAP), which is made of 7 steps. This section provides a detailed description of each step: from the identification of any actual or potential mental incapacitation event, to the determination of severity and probability of the mental incapacitation event; from the risk level identified, to the mitigation strategies that may be applied, and the re-application of the matrix to determine the risk level. Moreover, the analysis of acceptable incapacitation risk level for each class of aeromedical certification is analysed.
- Section 5 provides a detailed description of the professional profiles to be involved in the mental incapacitation risk assessment process (MIRAP). The section starts with the cooperation process among all those profiles involved in the mental incapacitation risk assessment process. Thereafter, the profiles of Mental Health Specialist (MHS) are presented, in particular those of the Aviation Psychologist and Aviation Psychiatrist with their respective competency framework. The section continues with the presentation of Peer Support groups profiles and concludes with the proposal to set up an AeroMedical-Operational Board (AMOB) composed of medical and mental health specialists that would be called by AMEs and AeMCs to make sensitive decisions on those mental health events that fall outside the competence of the AMEs and require in-depth consultation by specialists.
- Section 6 describes the next steps, namely the proof of concept performed by the MESAFE team on the use of the MIRAP.
- Section 7 provides the list of references.
- Section 8 provides the annex with the two survey templates.

1.3 How to read this document

Three highlights are important to achieve understanding of this document:

- Three acronyms are of special relevance in this document: MIRAP (Mental Incapacitation Risk Assessment), MIR (Mental Incapacitation Risk), MIE (Mental Incapacitation Events) and AMOB (AeroMedical-Operational Board). These have been generated by MESAFE and, although they are available in the acronyms' list, they are reminded here because they reflect the key MESAFE expected outcomes.
- Mental Health Specialist (MHS) and Mental Health Professional (MHP) used as synonyms.

- No take-home messages. All the sections of the previous MESAFE documents ended with a list of take-home messages, based on scientific evidence, which summarized the main findings that would be followed-up in the next tasks of the MESAFE project. This deliverable does not include any take-home messages, as it rather implements all the take-home messages of previous deliverables into the proposed MIRAP.
- In line with this, the reader will find a lot of cross-references to the previous MESAFE deliverables.

2. Issues and challenges on current aeromedical mental fitness certification process

Fit for duty means physically and mentally prepared and capable of performing assigned duties at the highest degree of safety. Mental fitness indicates the ability to think clearly and make effective and efficient decisions, which depends on a mix of factors including those pertaining to mental health, such as control on behaviour, emotional regulation, cognitive ability and stress coping.

Mental fitness is a specific requirement set by EASA and national regulators for the periodical aeromedical assessments of safety-sensitive personnel, including pilots and ATCOs, aimed at detecting and/or excluding specific conditions that might make the applicant unable to safely exercise the privileges of the licence.

The aeromedical certification process is the process by which Aeromedical Examiners evaluate if safety-sensitive personnel meet the medical standards required by aviation authorities to perform their duties safely. It consists of several steps, including a medical history review, a physical and mental examination, and laboratory tests.

The process needs to be repeated periodically, to ensure that the applicants continue to meet the requirements.

The AME is the medical professional who, having completed specialised training, performs medical exams on pilots, ATCOs and other aviation professionals to assess their risk of incapacitation. Certified by the national competent authorities, the AMEs play an essential role in reducing the incapacitation risk by ensuring that safety-sensitive personnel are physically and mentally fit to perform their duties safely for the duration of the next validity period of their medical certificate. Indeed one of the biggest challenges of this assessment is its forecasting scope: in fact, it does not look only at the day of the examination, but at the period spanning throughout the entire duration of the validity period of the medical certificate.

For the description of the concepts of incapacitation, the reader is referred to section 2.4 of the MESAFE deliverable D1.1 Report on the review of diagnostic measures.

Incapacitation caused by non-mental health events

On-the-job (ATCOs) or in-flight (pilots) medical incapacitation caused by cardiovascular, metabolic, gastro-intestinal, respiratory, vision, otorhinolaryngological, or neurological events will in most cases be clearly apparent to the remaining team or flight crew members, or will be indicated by the affected ATCO or pilot who is aware of her/his own significant discomfort or pain and who will immediately advise the other team or flight crew members of their condition. Cases of subtle incapacitation will not always be timely apparent to other team members or may not be indicated by the affected ATCO or pilot. Therefore, ATCOs and pilots need to be trained to recognise signs of subtle incapacitation of their colleagues and of themselves in order to achieve a timely replacement of the ATCO position or taking over control of the aircraft.

Incapacitation caused by mental health events

Cases of incapacitations caused by a mental incapacitation event (MIE) may be more difficult to identify and/or to manage. In such cases there is a substantial risk that the affected pilots or ATCOs will not report their mental condition to their colleagues or that the mental condition is not clearly apparent to the colleagues. Also, replacement of the affected ATCO or taking the affected pilot off the controls might be less likely to be accepted by the affected person in cases of mental incapacitation events than in cases of incapacitation caused by other medical events. Current risk assessment methods concerning non-mental causes of incapacitation, such as the 1 % rule (ICAO, 2012), only allow a prediction of the risk of complete incapacitation during the take-off and landing phase of flight. However, mental incapacitation events may lead to the full range of incapacitation levels and may threaten flight safety throughout the entire flight. Because of these specific considerations related to mental incapacitation events it is recommended to pay specific attention to the identification and management of on-the-job or in-flight mental incapacitation events in the incapacitation training of ATCOs and pilots.

What follows provides information on the opinions and experiences of both AMEs and applicants (pilots and controllers) with respect to the current aeromedical certification process, with particular reference to the mental health assessment.

Those opinions and experiences have been collected by means of 3 surveys, respectively targeted to AMEs, pilots and ATCOs. This is in line with the MESAFE approach, which puts at the centre of the research not only the aeromedical examiners and medical assessors but also the applicants (pilots and ATCOs). In line with this, MESAFE has assessed and evaluated how the mental fitness certification process affects them and how they perceive it. This user-centred approach facilitated the MESAFE team in attaining a more comprehensive understanding of the current status of the aeromedical mental health assessment, encompassing the perspectives of both medical professionals and applicants, thus providing the team with insights, suggestions, and indications pertaining to the challenges encountered in the process by both sides of the coin.

The following Figure 1 provides the timeline of the three surveys.

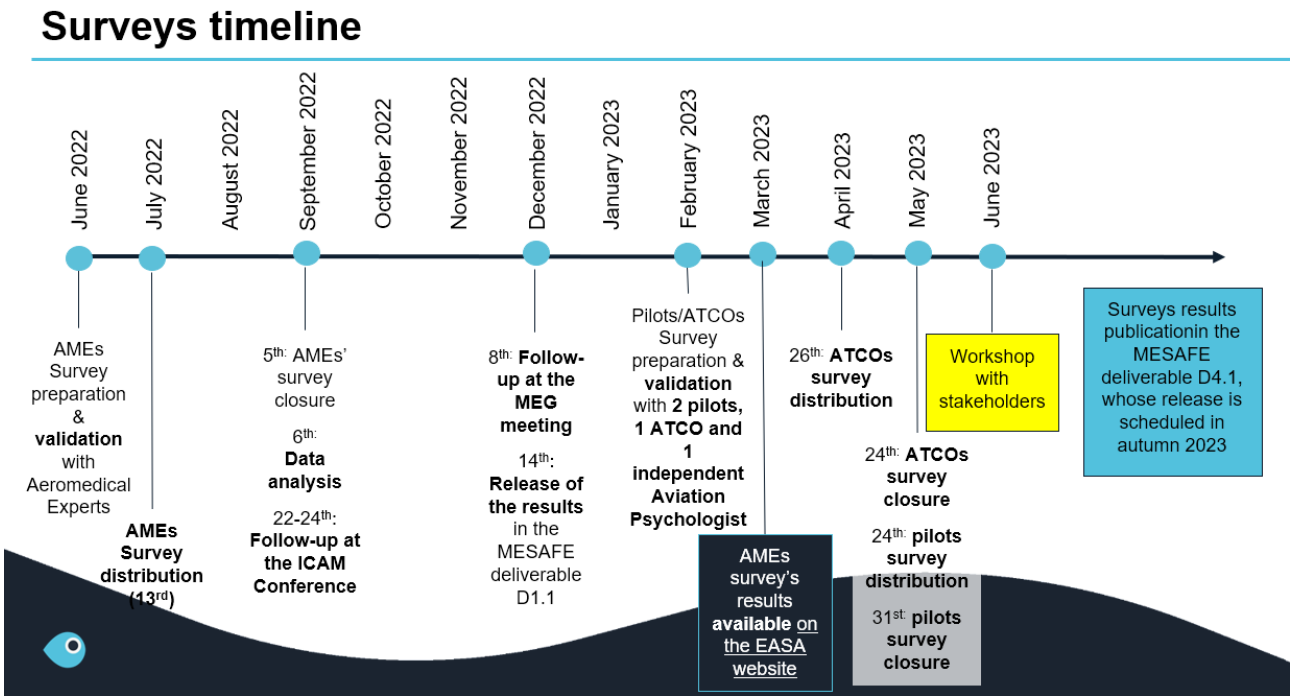


Figure 1 - The MESAFE surveys timeline

As it is possible to see in the picture, the survey targeted to the AMEs was distributed in July 2022 and closed in September 2022, while the pilots' and ATCOs' surveys were open from April to May 2023.

The survey targeted to AMEs served a twofold aim: on the one hand it was the occasion to officially launch the project to the AMEs community, which is one of the key end-users of MESAFE, and on the other hand AMEs were invited to report gaps and challenges in the current aeromedical mental health assessment of safety-critical aviation personnel. In coordination with EASA, this survey replaced the first MESAFE workshop as originally planned in the project proposal: the survey format proved in fact to be more suitable than a meeting format to engage more participants and get their feedback properly. The detailed results of this survey:

- fed into the MESAFE deliverable D1.1 Report on the review of diagnostic measures, where they were combined with state-of-the-art scientific knowledge on mental health assessment, and
- are feeding into this deliverable too, where they are regarded as the basis for MESAFE to propose a suitable, usable and acceptable Mental Incapacitation Risk Assessment Process (MIRAP). That's why a wrap-up of such results is provided in the next section.

The surveys targeted to pilots and ATCOs aimed at getting their feedback about the current mental health assessment process in order to take opinions and experiences of possible issues and problems that they detected/encountered into account while defining the risk assessment methodology and process proposed in MESAFE. In coordination with EASA, these surveys replaced the second and third MESAFE workshops as originally planned in the project proposal: again, the survey format proved in fact to be more suitable than a meeting format to engage more participants and get their feedback properly. The detailed results of these surveys are presented in this deliverable, where they are regarded as the basis for MESAFE to propose a Mental Incapacitation Risk Assessment Process (MIRAP) which proves to be sustainable for all interested parties, namely protecting the mental health of applicants as well as the passengers' safety, whilst facilitating the mental health assessment activities carried out by AMEs.

All the three surveys underwent a review process, which respectively involved two AMEs, one ATCO and one pilot, in order to make sure they were clear and acceptable, and were then updated based on the feedback received. As for the data collection, management and analysis, all the three surveys were designed in a way to collect anonymous answers; similarly, the answers analysed anonymously and the results presented aggregated.

Rather than openly advertised on social media, the survey targeted to AMEs was distributed to the Medical Expert Group by EASA. Similarly, the surveys targeted to ATCOs and pilots were distributed through the MESAFE Stakeholder Consultation Group (SCG). In particular, support for sharing the survey was requested to IFATCA, ATCEUC and CANSO. A workshop was held in June 2023 with the purpose of presenting and discussing the results of the survey in a preliminary way with the members of the SCG in order to be able to consider further feedback that could emerge from the discussion.

2.1 AMEs point of view

Figure 2 depicts the main findings of the survey named "Mental Health assessment: a survey to collect the AMEs and aeromedical assessors' point of view" administered to the European Medical Expert Group (MEG) to understand current gaps and needs with respect to the aeromedical mental health assessment from the point of view of AMEs and aeromedical assessors.

As it is possible to see in the picture:

- 102 AMEs replied.
- The most used procedure by the respondents to assess mental health is to:
    - assess mental fitness independently.
    - make use of the MHS's advice for mental health evaluation only if specific needs arise
- The respondents' experience about the usability of the current aeromedical mental health assessment is that:
    - half of the respondents find it difficult to assess the mental incapacitation risk level without experts' advice.
    - there is a high heterogeneity in the assessment techniques used both for the initial and revalidation/renewal assessments.
    - less than the 30% of the respondents find it easy to collect information about mental health during the aeromedical examination.
    - Almost all the respondents agree that AMEs should work closely with the MHS and Peer support groups.
- The most mentioned recommendations to improve the process are:
    - Standardized questionnaires and interviews.

- Periodical evaluation performed by mental health specialists.
- Multidisciplinary collaboration with mental health specialists and peer support groups.
- Trainings and educational material both for AMEs and mental health specialists on their collaboration.
- Possibility to access the applicant psychosocial and medical history.
- More time for the assessment
- Shared procedures among Member States.
- EASA guidelines on how to perform the assessment.

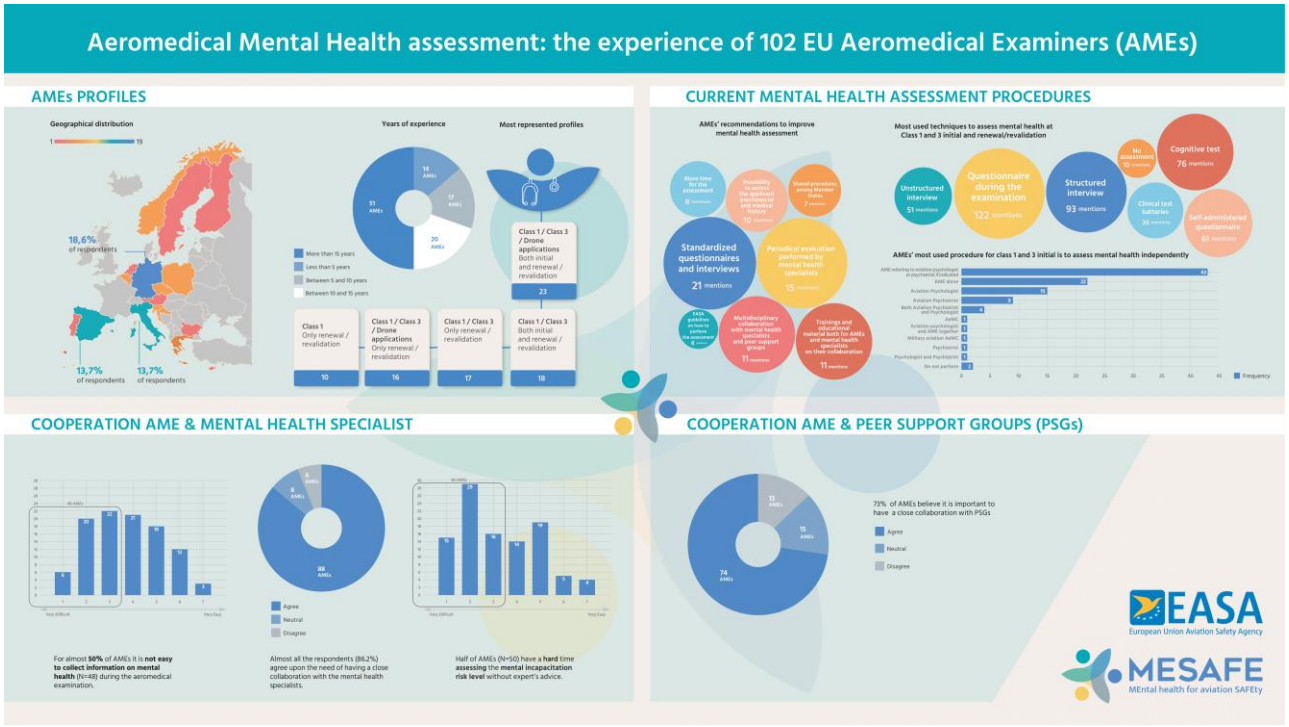


Figure 2 - Wrap-up of the MESAFE survey targeted to AMEs

The complete booklet of results is available on the EASA website at https://www.easa.europa.eu/en/research-projects/mesafe-mental-health#group-downloads. Detailed information on the survey design and administration, as well as the extensive analysis of results, can be found in the MESAFE deliverable D1.1 Report on the review of diagnostic measures. That deliverable also reports the main challenges that the respondents encounter during the aeromedical mental health assessment activities, which are pasted in the table below for the purposes of this document:

- **Applicants' opposing attitudes to disclose information**
- **Difficulties in identifying symptoms**
- **Lack of training on mental health**
- **Lack of legal definition or basis of implementation Mental Health Assessment in the different CAA**
- **Absence of clear, robust, and validated questionnaires and interviews**
- **Impossibility to access the applicant psychosocial and medical history; no access to earlier AME's record**
- **Lack of cooperation among AMEs and mental health specialists**

  Too little time allocated to assess mental fitness of applicants

Placeholder including information copied and pasted from the MESAFE deliverable D1.1 Report on the review of diagnostic measures, page 111

Table 4 - information from the MESAFE deliverable D1.1 Report on the review of diagnostic measures, page 111

The following section will present the opinions and experiences about the aeromedical mental health assessment from the point of view of pilots and ATCOs.

2.2 Pilot and ATCOs point of view

Two online surveys, respectively named "Mental Health assessment: a survey to collect the EU pilots' point of view" and "Mental Health assessment: a survey to collect the EU ATCOs' point of view" have been developed and distributed to identify current gaps and needs with respect to the mental fitness assessment process from the point of view of pilots and ATCOs. As anticipated, these two surveys complement the survey targeted to AMEs (see section 2.1).

Figure 3- The surveys targeted to European pilots and air traffic controllers

The surveys were designed to collect the point of view of European pilots and ATCOs about current gaps and needs with respect to the aeromedical mental health assessment process, reflecting the following objectives:

- To identify misalignments between the available resources and the resources required for the mental health assessment and support.
- To determine the factors that have an impact on the pilots/ATCOs' acceptability of the mental health aeromedical assessment.

Pilots and ATCOs were contacted through the support of the Stakeholder Consultation Group (SCG) constituted in the project. In particular, IFATCA, ECA and CANSO supported the distribution of the two surveys.

The surveys were administered using google form, to ensure the widest and most usable distribution. The surveys contained a total of 33 questions (22 mandatory and 11 optional). The surveys consisted mostly of 7-point Likert scale rating questions and closed ended questions. However, open-ended questions were also asked to deepen some concepts and, where necessary, the option "other" was available. Thus, the surveys produced both quantitative and qualitative data. The participation to the study was fully voluntary and, as anticipated, the collected data were anonymized from the beginning and treated confidentially.

The questions were divided into 6 sections:

1. General information: where participants were asked to indicate their nationality; years of experience as ATCOs/flight hours as pilots; and the class of medical certificate they own;
2. Mental incapacitation risk management at operational level: in terms of the perceived impact of mental health issues on the safety of operations; the ability to detect signs and symptoms of mental discomfort in themselves and colleagues; the ability to detect signs and symptoms of alcohol, drugs and other psychoactive substances' use in colleagues; actions taken when a colleague shows signs and symptoms of stress or psychological discomfort; training received about mental health issues' signs and symptoms as well as the safety impact of alcohol, drugs and other psychoactive substances; training received about the safety impact of psychoactive

medications; awareness and information on Peer Support Groups; perceived effectiveness of PSGs; cooperation between AMEs and PSGs;

3. Personal experience with the current aeromedical mental health assessment: in terms of presence of a mental health assessment at initial and renewal/revalidation applications; professionals involved in the assessment at initial and renewal/revalidation applications; assessment methods and tools; time allocation at initial and renewal/revalidation applications;
4. Gaps and needs: in terms of the perceived effectiveness of the current mental health assessment to detect mental health problems impacting safety, including opinions about the resources allocation and the collection of applicant's psychosocial and professional history data; the involvement of a Mental Health Specialist (MHS); the referral to the MHS; and the cooperation between AMEs and MHS;
5. Final remarks: two open-ended questions where participants were asked to identify challenges and improvements/recommendations for the aeromedical mental health assessment process.

The full surveys are available for consultation in **Annex A** and **Annex B**.

2.2.1 Main findings

A total of 166 individuals answered to the PILOT survey. The main represented nations were Norway (N=58; 34.9%), Belgium (N=27; 16.3%) and Ireland (N=14; 8.4%) (Figure 4).

A total of 165 individuals answered to the ATCO survey. The main represented nations were Sweden (N=32; 19.4%), Spain (N=30; 18.2%) and both Slovenia (N=17; 10.3%) and Norway (N=17; 10.3%) (Figure 5).

Within the PILOT sample, the majority of pilots have more than 10.000 hours of flight experience (N=59; 35.5%), followed by those with 5000-10.000 hours of flight experience (N=45; 27.1%). Within the ATCO sample, the majority of ATCOs have at least 15 years of experience (N=104; 63%), followed by those with 10-15 years of experience (N=27; 16.4%).

Almost all the respondents (the 92.2% of pilots and the 99.4% of ATCOs) agreed that mental health issues can have an impact on the safety of operations. This result shows how the pilots' and ATCOs' communities are compact in perceiving and acknowledging the importance of the topic.

Indeed, when it comes to the management of mental health issues, a considerable percentage of respondents (1 pilot out of 3 and, consistently, 1 ATCO out of 3) find difficult to detect signs and symptoms of mental discomfort in themselves. Such percentage increases when pilots are asked how easy is for them to detect signs and symptoms of mental discomfort in colleagues: more than half of them (51.8%) find it difficult. These results suggest that for pilots it's easier detecting these signs in themselves rather than in colleagues. On the other hand, for ATCOs the difficulty appears to remain constant both in colleagues (31.5%) and themselves (32.1%). Less than the 30% of pilots (27.7%) and less than a half of ATCOs (46.1%) confirm they are able to easily detect signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues. Interestingly, a lot of respondents don't express any level of neither easiness nor difficulty, ultimately remaining neutral. Although it is difficult to draw specific conclusions, this seems to suggest that more information and awareness on mental health would facilitate many respondents in providing an answer.

When asked if they have ever received any training about mental health issues' signs and symptoms, the 56.7% of pilots and the 60% of ATCOs answered positively. Slightly the same applies to the training about the safety impact of psychoactive medication (the 56.6% of pilots and the 55.2% of ATCOs confirmed they had received it). The percentage increases when the respondents are asked if they have ever received any training about the safety impact of the use/misuse of alcohol, drugs and other psychoactive substances (the 78.3% of pilots and the 72.7% of ATCOs confirm they had. Although they have received training, the findings just reported suggest that pilots and ATCOs struggle with the identification of signs and symptoms of mental health issues, including the effects of substances use/misuse.

In line with this, less than the 50% of the pilots and ATCOs usually take actions when a colleague shows signs and symptoms of stress. The most mentioned actions were “talk and support the colleague”, “assist in work tasks”, “advice to self-report the mental health issue”, “refer to specialist/support programme”. Among the reasons for not taking action, the respondents mentioned they were “uncertain how to help” or “uncertain how to determine”, they had “fear of reporting due to potential repercussions for themselves/others” and because of “missing professional support”. These findings suggest that more attention should be paid to the mental health topic, creating awareness and providing pilots and ATCOs not only with individual strategies but also with organisational initiatives to ease the detection of mental discomfort’s signs and symptoms.

Regarding the organizational initiatives, although almost all the respondents (the 90% of pilots and the 73% of ATCOs) are aware of what PSGs are, a little, but considerable, percentage of them (the 29% of pilots and the 38% of ATCOs) don’t agree that PSGs are effective to mitigate stress. On the other hand, the 60% of pilots and 63% of ATCOs agree that a close cooperation between AMEs and PSGs would help mitigate the safety risks related with mental health issues. These findings suggest that, even if PSPs are already much appreciated, target actions to improve their implementation and the cooperation among PSGs and other professionals involved in mental health management can be taken to increase effectiveness.

Slightly more than half of the respondents undergo a mental health assessment during the aeromedical examinations at initial applications. In particular, 90 pilots (54.2%) confirm that a mental health assessment is performed at initials, while a pretty more frequent response is reported by ATCOs (N=104; 63%). These results show that 1 out of 2 pilots and almost 2 out of 3 ATCOs undergo a MH assessment at initial applications, unveiling a gap in the safety barriers mitigating the hazards related to mental incapacitation. Indeed, an extensive mental health assessment was not mandated until 2019: it became mandatory again after 2019 as a result of the implementation of the post-GermanWings measures. For this reason, such results might reflect the experience of pilots and ATCOs who underwent aeromedical assessments in the last 10 or 20 years, when extensive medical was only performed at clinical indication.

For the revalidation/renewal applications, 118 pilots (71.1%) confirm that a mental health assessment is performed. This response is less frequent in the ATCOs’ sample (N=73; 44.2%). So, according to the replies obtained, pilots have less MH assessment at initials compared to ATCOs, but more MH assessment at revalidation/renewal compared to ATCOs.

At initials, the AMEs usually perform the MH assessment independently for the 42.9% of pilots and the 20.7% of ATCOs. Even more interestingly, a large proportion of pilots (36.2%) and ATCOs (27%) don’t know who performs the assessment. At renewal/revalidation applications, AMEs perform the MH assessment independently both for pilots (83%) and ATCOs (53%), confirming that only few MH assessments are performed by Mental health specialists.

There is a high heterogeneity in the procedures AMEs implement to assess mental health, ranging from a “Combination of questionnaires and interviews” to “Interview(s)”, “Questionnaire(s) administered during the examination” and “Self-administered questionnaire(s)”. This applies both to the initial and the revalidation/renewal assessments. It confirms what has been found in the AME survey, where aeromedical examiners reported to use various and different techniques to assess MH.

Less than 15 minutes are usually allocated to the mental health assessment of pilots and ATCOs, both for initials and renewals/revalidations. Moreover, a considerable percentage of pilots and ATCOs reported to be unaware of the time allocated for the MH assessment. These results show that little time is usually allocated to the mental health assessment and that there are no standardized procedures regarding the time allocation for it.

Indeed, the 70% of pilots and the 68% of ATCOs think the current aeromedical assessment process is not effective to detect MH issues impacting the safety of operations, and the 60% of pilots and the 66% of ATCOs don’t agree that enough time is allocated for the current aeromedical assessment of mental health.

More or less half of the respondents agree that the aeromedical assessment process should include the collection of the applicant’s psychosocial history data (the 42% of pilots and the 58% of ATCOs) and professional history data (the 46% of pilots and the 57% of ATCOs). Although it is not possible to draw

statistically meaningful conclusions, it seems that the concern for loss of licence due to past mental health issues plays a role in these findings. A more transparent mental health assessment process, including clear procedures on how these data would be used and what support could be given when the licence is suspended, may increase the level of agreement in sharing information on psychosocial and professional history.

Almost the 70% of the pilots and the 82% of the ATCOs perceive the MHS/AME cooperation as important and of value to improve today's procedures on aeromedical assessment of mental health. ATCOs would like to have a MHS involved in the mental health assessment process anyways for both initials and renewal/revalidation applications. Pilots would rather prefer having the MHS only when a particular need arises. However, only few responses were collected against having the MHS involved. Both pilots and ATCOs (the 77.7% of pilots and the 59.4% of ATCOs) agree that the referral to the MHS can help, especially when a particular need arises. Several respondents (the 18.7% of pilots and the 36.4% of ATCOs) would refer to the MHS all initial applications, anyways.

The following sections provide detailed information on the surveys' results. These will be presented in parallel combining pilots' and ATCOs' replies to all the questions, which have been clustered according to the surveys' sections. In this way, the reader will hopefully get a parallel overview of pilots and ATCOs opinions and experiences on the relationship between mental health and safety, the management of stress and mental discomfort at individual and organisational level and the current aeromedical procedures to assess the incapacitation risk posed by mental health issues.

2.2.2 Research sample composition

Q1 Nation.

A total of 166 individuals answered to the PILOT survey. The main represented nations were Norway (N=58; 34.9%), Belgium (N=27; 16.3%) and Ireland (N=14; 8.4%) (Figure 4).

A total of 165 individuals answered to the ATCO survey. The main represented nations were Sweden (N=32; 19.4%), Spain (N=30; 18.2%) and both Slovenia (N=17; 10.3%) and Norway (N=17; 10.3%) (Figure 5).

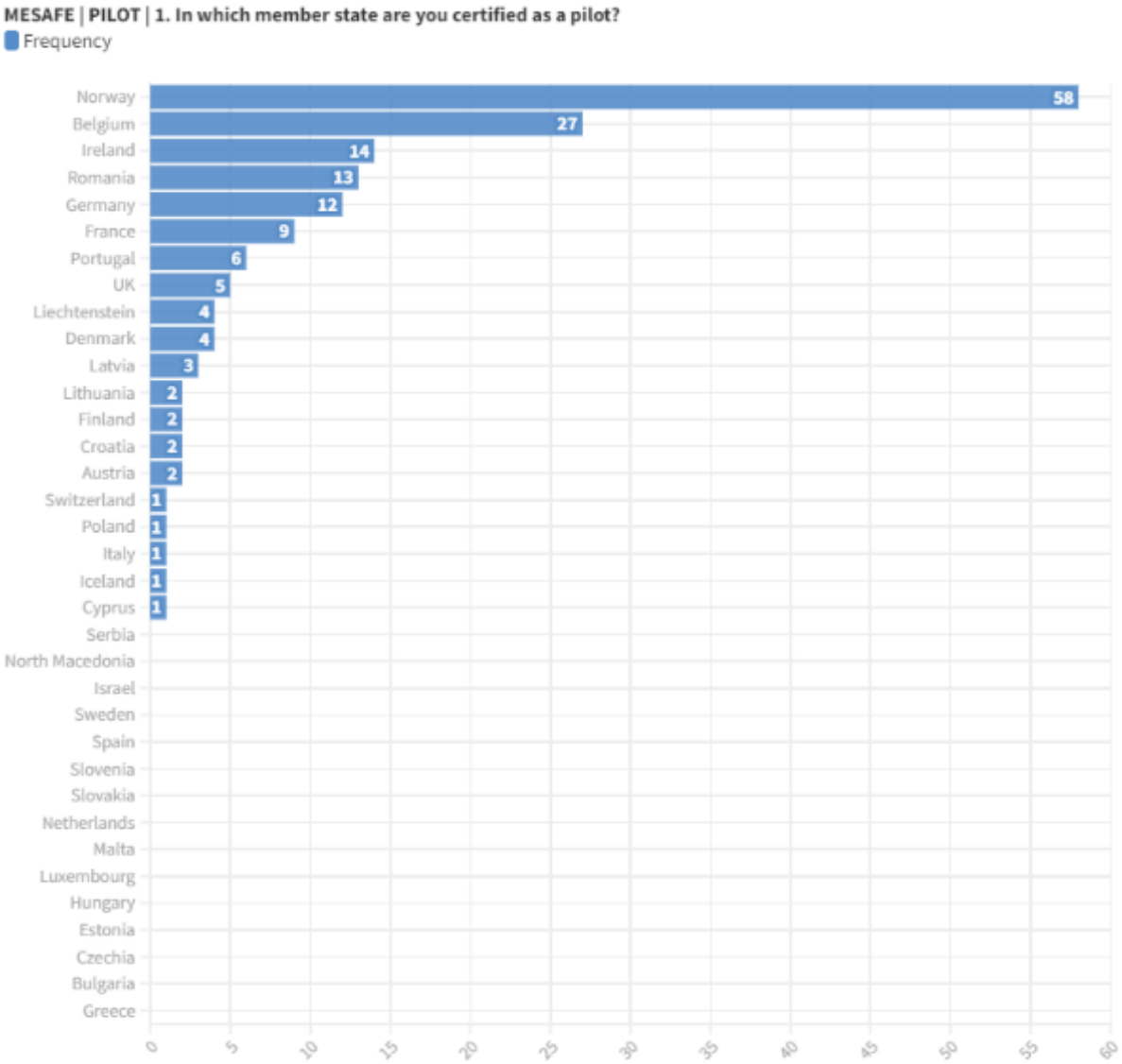


Figure 4 – Geographical distribution of pilots

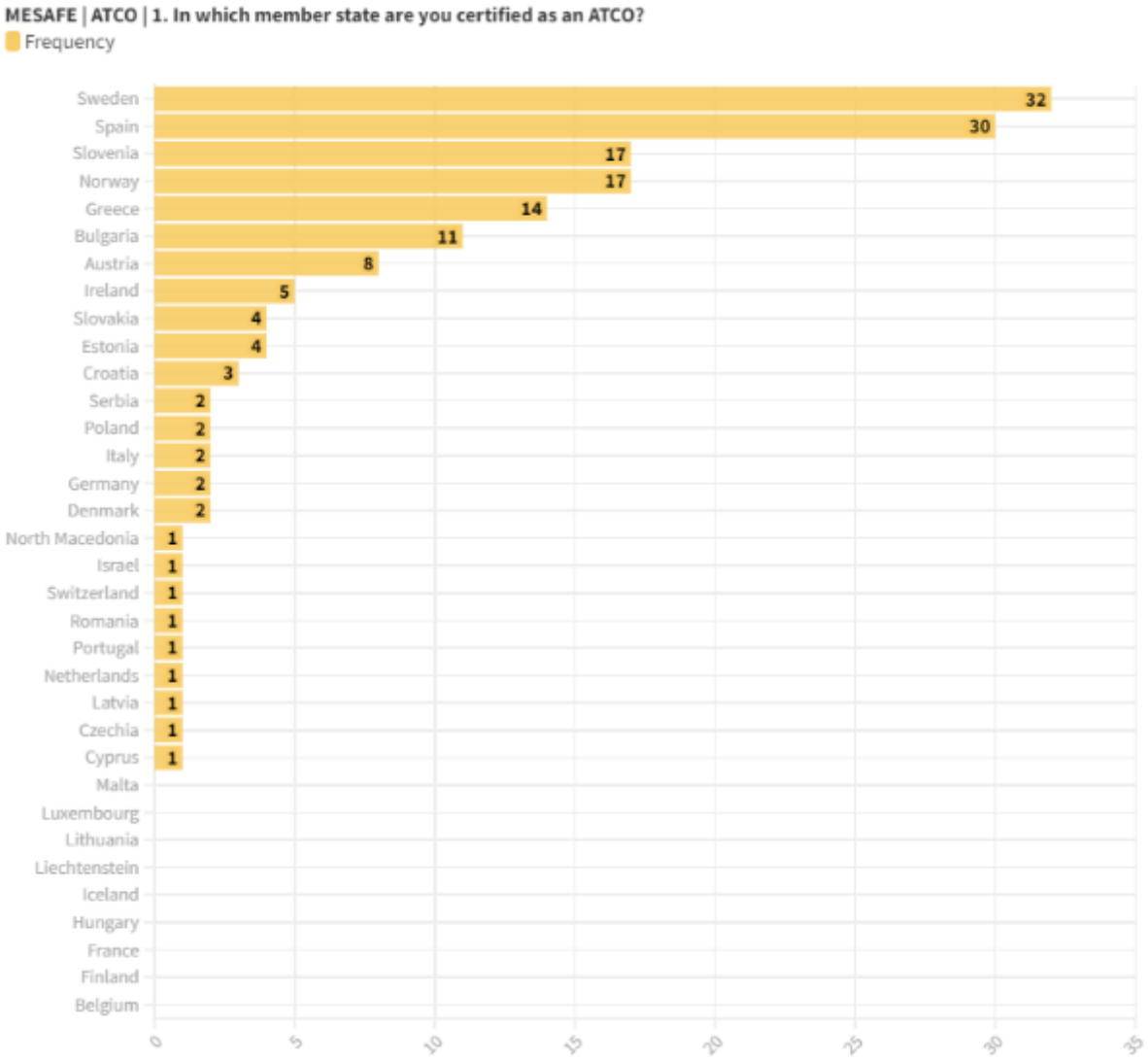


Figure 5 – Geographical distribution of ATCOs

Q2 Flight hours/Years of experience.

Within the PILOT sample, the majority of pilots have more than 10.000 hours of flight experience (N=59; 35.5%), followed by those with 5000-10.000 hours of flight experience (N=45; 27.1%), 1000-5000 hours of flight experience (N=45; 27.1%) and 1000 hours of flight experience (N=17; 10.2%).

Within the ATCO sample, the majority of ATCOs have at least 15 years of experience (N=104; 63%), followed by those with 10-15 years of experience (N=27; 16.4%). The rest of the sample equally distributes between 5 and 10 years of experience (N=17; 10.3%) and less than 5 years of experience (N=17; 10.3%).

Although pilots and ATCOs' survey participants are not representative of all the pilots and ATCOs in the EU member states, high-level and relevant insights can be derived from their answers thanks to their considerable experience.

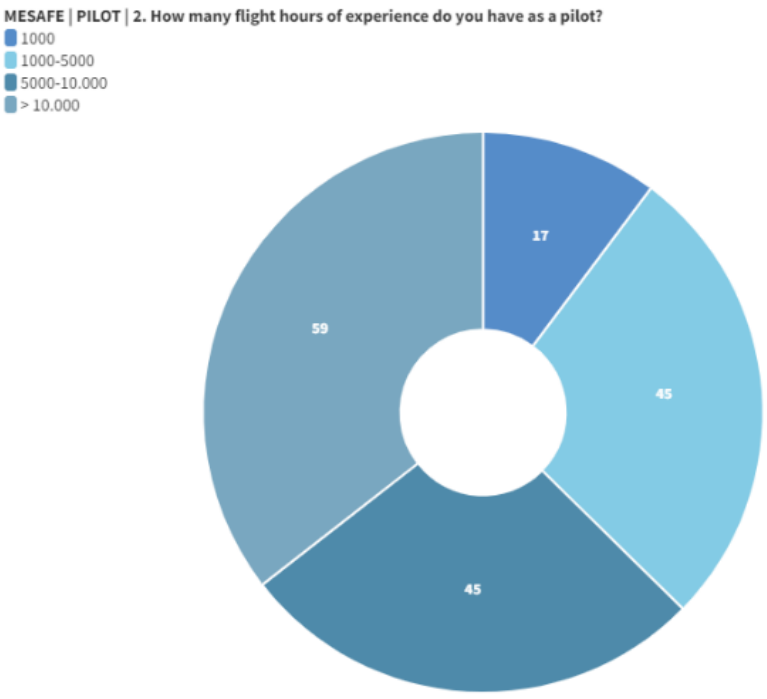


Figure 6 - Flight hours of experience of pilots

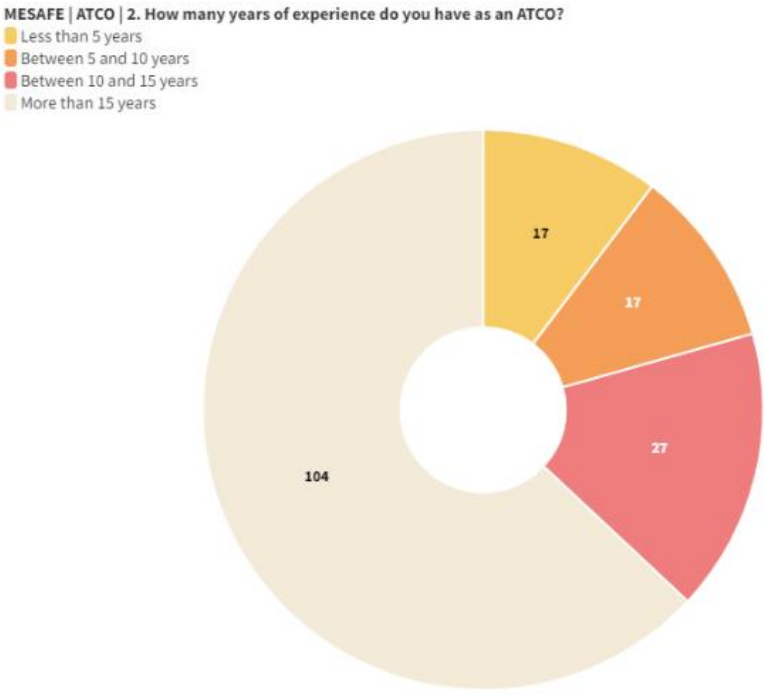


Figure 7 - Years of experience of ATCOs

Q3 Class possessed.

Of all the PILOT sample (N=166), 165 pilots (99.4%) possess Class 1 licence, while 1 pilot (0.6%) lost the licence. Within the sample, 3 pilots also possess the Drone Pilot (RPAS Operator) licence, and 1 pilot possess the ATPL(A), SFCL, national microlight licences.

Of all the ATCO sample (N=165), 164 ATCOs (99.4%) possess Class 3 licence, while 1 ATCO (0.6%) is retired. Moreover, 3 ATCOs also possess the Class 2 licence, 2 ATCOs possess the Drone Pilot (RPAS Operator) licence, 1 ATCO possess the EASA PPL licence, and 1 ATCO possess Class 1, Class 2, ATPL, CPL, and PPL licences.

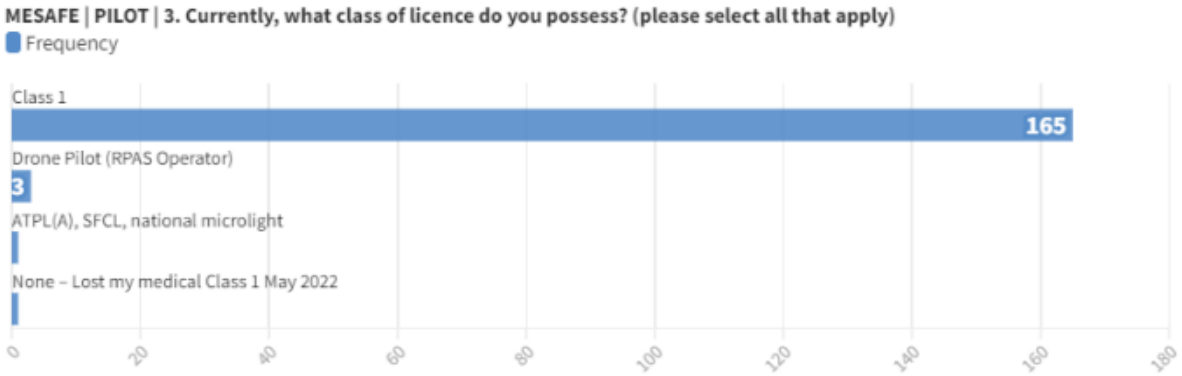


Figure 8 - Classes of licence possessed by pilots

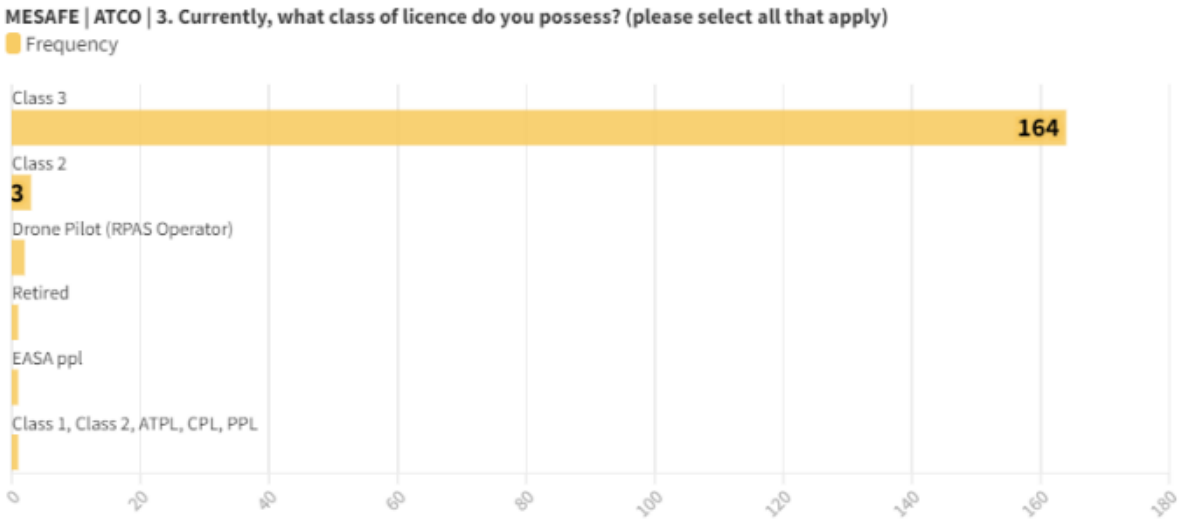


Figure 9 - Classes of licence possessed by ATCOs

2.2.3 Mental incapacitation risk management at operational level

This section includes pilots' and ATCOs' opinions, assumptions and experiences regarding the impact of mental health issues on safety. Main findings as follows:

- Almost all the respondents (the 92% of pilots and the 99% of ATCOs) agree that mental health issues may pose risks on the safety of operations;
- The 1/3 of pilots (34%) and 1/3 of ATCOs (32%) find difficult to detect signs and symptoms of mental discomfort in themselves.
- Half of the pilots (52%) and 1/3 of ATCOs (32%) find difficult to detect signs and symptoms of mental discomfort in colleagues.
- Half of the pilots (55%) and 1/3 of ATCOs (33%) find difficult to detect signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues.
- The 41% of pilots and the 42% of ATCOs take actions when a colleague shows signs and symptoms of stress potentially impacting operational safety. Mainly talking and supporting the colleague. Conversely, if they don't take actions, it is mainly because they are unsure how to determine signs and symptoms of mental discomfort or because they are unsure how to help/support the colleague.
- The 57% of pilots and the 60% of ATCOs have received training about mental health issues' signs and symptoms.

- The 78% of pilots and the 73% of ATCOs have received training about the safety impact of alcohol, drugs and other psychoactive substances.
- The 57% of pilots and the 55% of ATCOs have received training about the safety impact of psychoactive medication

What follows presents these results in detail. The reader will find many results expressed in terms of level of agreement: such level was measured by means of a 7-points Likert scale, where 1 stands for absolutely disagree and 7 for completely agree.

Q6 Mental health issues impact on the safety of operations.

Aggregating 5-6-7 responses both for pilots and ATCOs, it emerges that 153 pilots (92.2%) and 164 ATCOs (99.4%) agreed or completely agreed that mental health issues may have an impact on the safety of operations. This result shows how the pilots' and ATCOs' communities are compact in perceiving and acknowledging the importance of such issue.

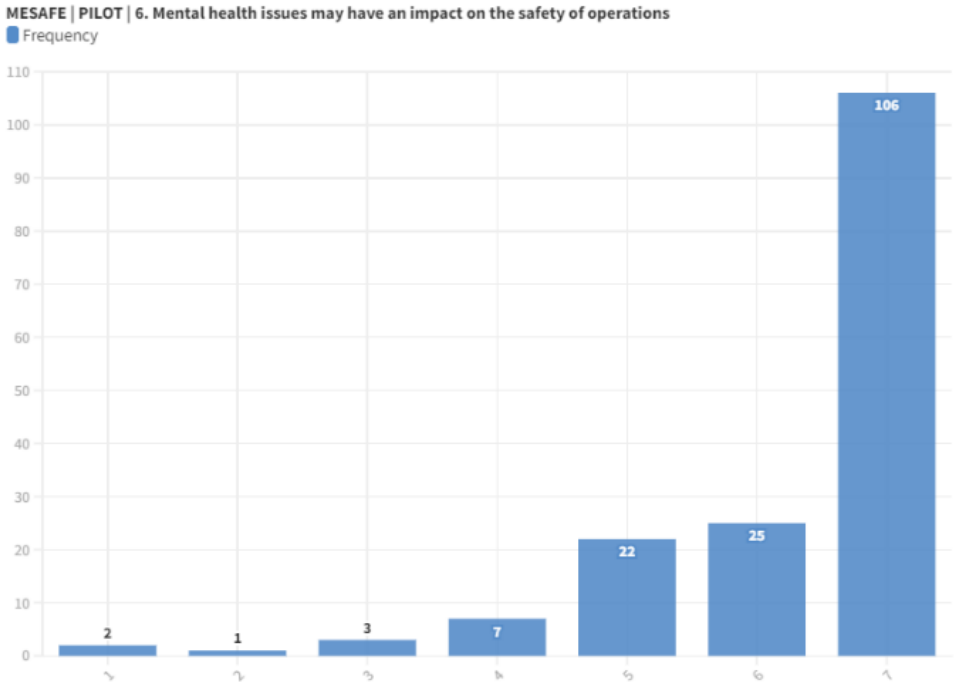


Figure 10 - Perception of pilots about the impact of MH issues on safety of operations

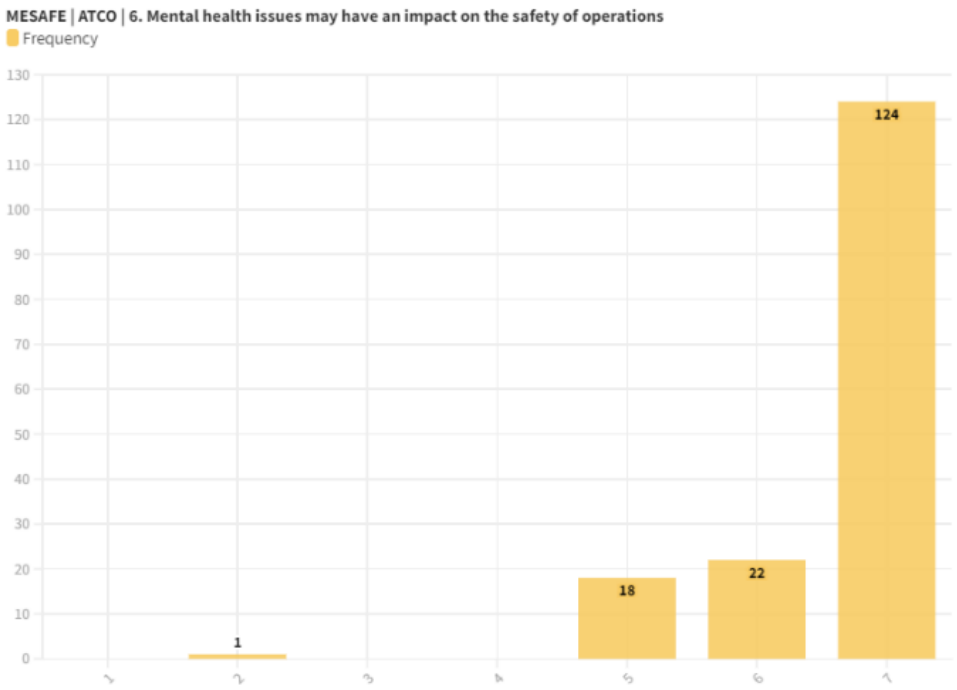


Figure 11 - Perception of ATCOs about the impact of MH issues on safety of operations

Q14 Pilots/ATCOs are able to detect signs of mental discomfort in themselves easily.

Aggregating 1-2-3 responses both for pilots and ATCOs, 57 pilots (34.3%) and 53 ATCOs (32.1%) disagree or completely disagree with the easiness of detecting signs and symptoms of mental discomfort in themselves. 34 pilots (20.5%) and 47 ATCOs (28.5%) remain neutral. Aggregating 5-6-7 responses both for pilots and ATCOs, 75 pilots (45.2%) and 65 ATCOs (39.4%) agree or completely agree with the statement, thus meaning that they are able to easily detect signs and symptoms of mental discomfort in themselves.

This finding indicates that 1 pilot out of 3 and 1 ATCO out of 3 find difficult to detect signs and symptoms of mental discomfort in themselves. Attention should be paid to the topic, creating awareness and providing pilots and ATCOs the proper instruments to ease the detection of signs and symptoms.

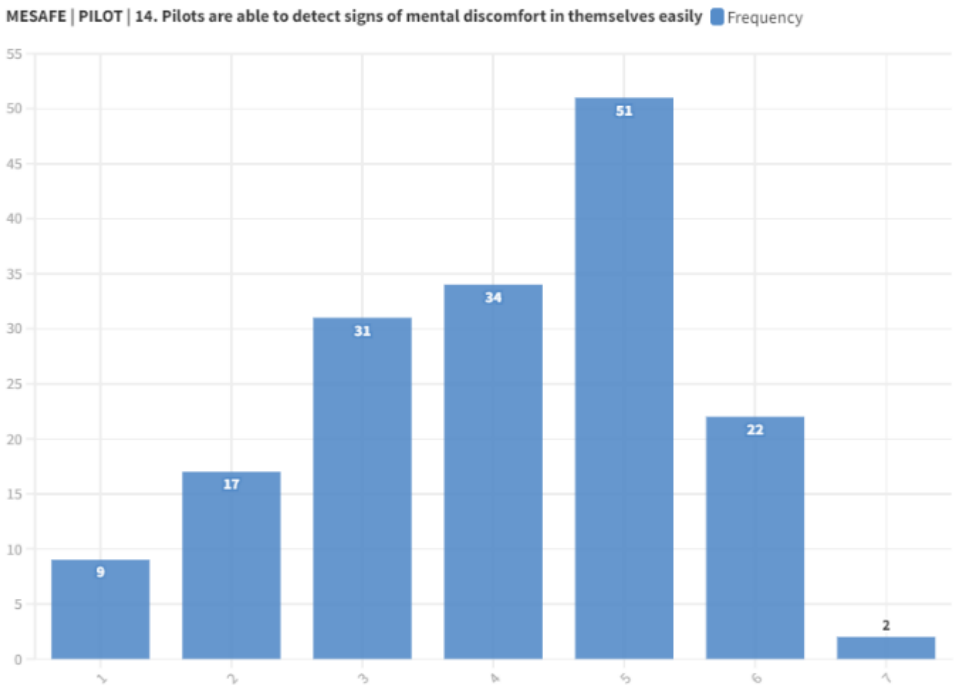


Figure 12 - Pilots' ability to detect signs of mental discomfort in themselves.

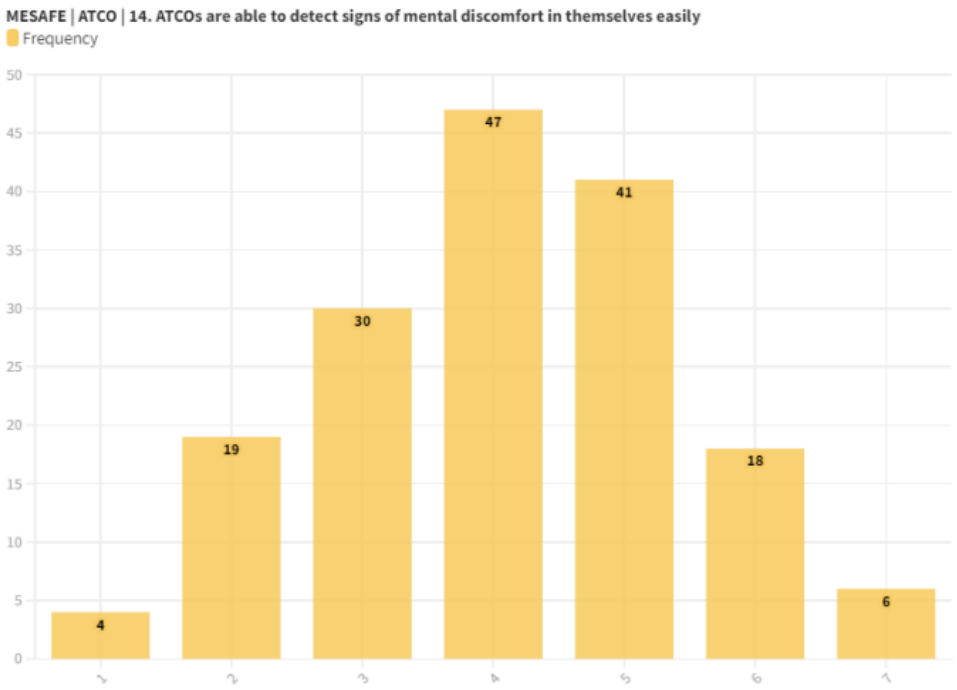


Figure 13 - ATCOs' ability to detect signs of mental discomfort in themselves.

Q15 It is easy to detect signs and symptoms of mental discomfort or stress in colleagues.

Aggregating 1-2-3 responses both for pilots and ATCOs, 86 pilots (51.8%) and 52 ATCOs (31.5%) disagree or completely disagree with the easiness of detecting signs and symptoms of mental discomfort in colleagues. 30 pilots (18.1%) and 28 ATCOs (17%) remain neutral. Aggregating 5-6-7 responses both for pilots and ATCOs, 50 pilots (30.1%) and 85 ATCOs (51.5%) agree or completely agree with the statement, thus meaning that they are able to easily detect signs and symptoms of mental discomfort in colleagues.

Differently to Q14, far more pilots find difficult to detect signs and symptoms in colleagues (51.8%) rather than themselves (34.3%). On the other hand, for ATCOs the difficulty appears to remain constant both in colleagues (31.5%) and themselves (32.1%).

Interestingly, 51.5% of ATCOs find easy to detect signs and symptoms of mental discomfort in colleagues, a number which appears to be far higher compared to pilots. In fact, only the 30.1% of pilots agree with the easiness to detect signs and symptoms in colleagues. This aspect should be investigated further to gain insight in possible variables influencing such results.

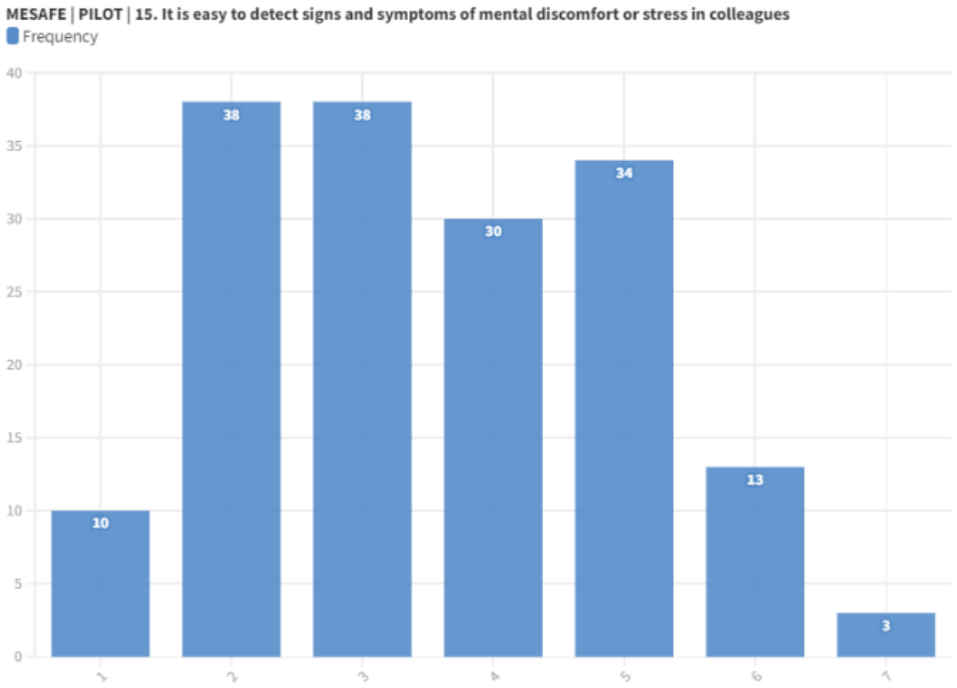


Figure 14 - Pilots' ability to detect signs of mental discomfort in colleagues.

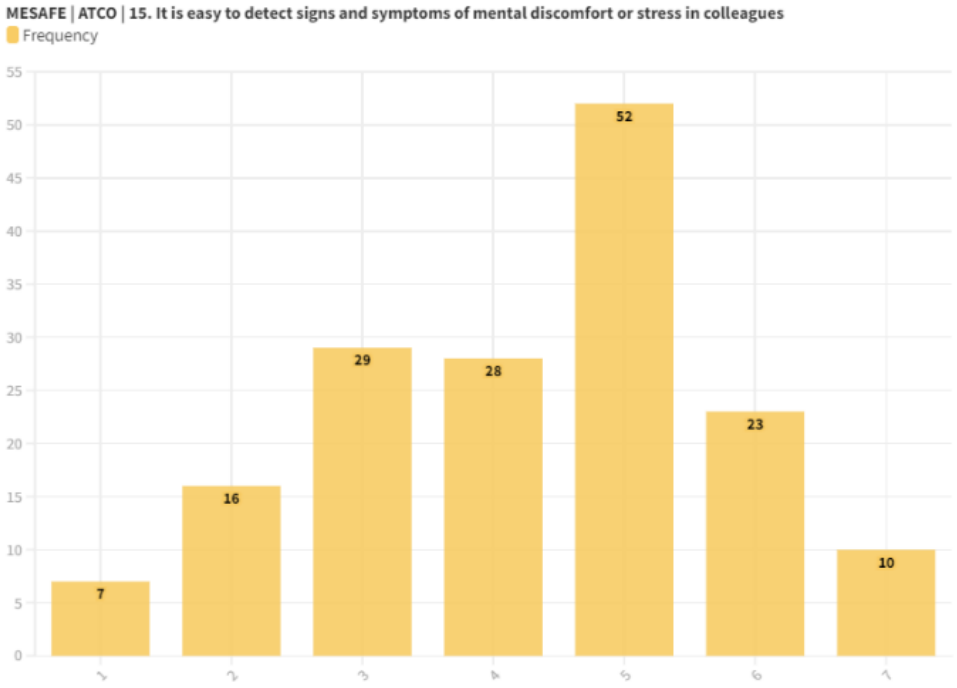


Figure 15 - ATCOs' ability to detect signs of mental discomfort in colleagues.

Q16 It is easy to detect signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues.

Aggregating 1-2-3 responses both for pilots and ATCOs, 92 pilots (55.4%) and 55 ATCOs (33.3%) disagree or completely disagree with the easiness of detecting signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues. 28 pilots (16.9%) and 34 ATCOs (20.6%) remain neutral. Aggregating 5-6-7 responses both for pilots and ATCOs, 46 pilots (27.7%) and 76 ATCOs (46.1%) agree or completely agree with the statement, thus meaning that they are able to easily detect signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues.

Similarly to Q15, slightly more than half of the pilots (55.4%) finds detecting signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues difficult. On the other hand, for ATCOs the difficulty appears to remain constant both in detecting signs and symptoms of mental discomfort in colleagues (31.5%), signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues (33.3%) and signs and symptoms of mental discomfort in themselves (32.1%). In fact, 46.1% of ATCOs perceive that the detection of signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues is easy.

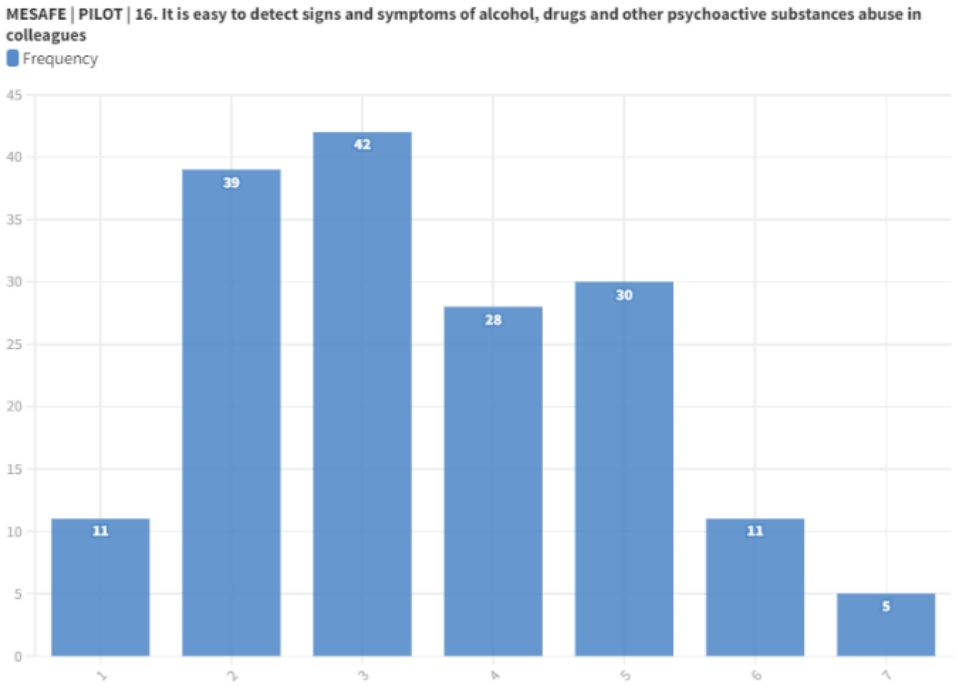


Figure 16 - Pilots' ability to detect signs of alcohol, drugs, and other psychoactive substances abuse in themselves.

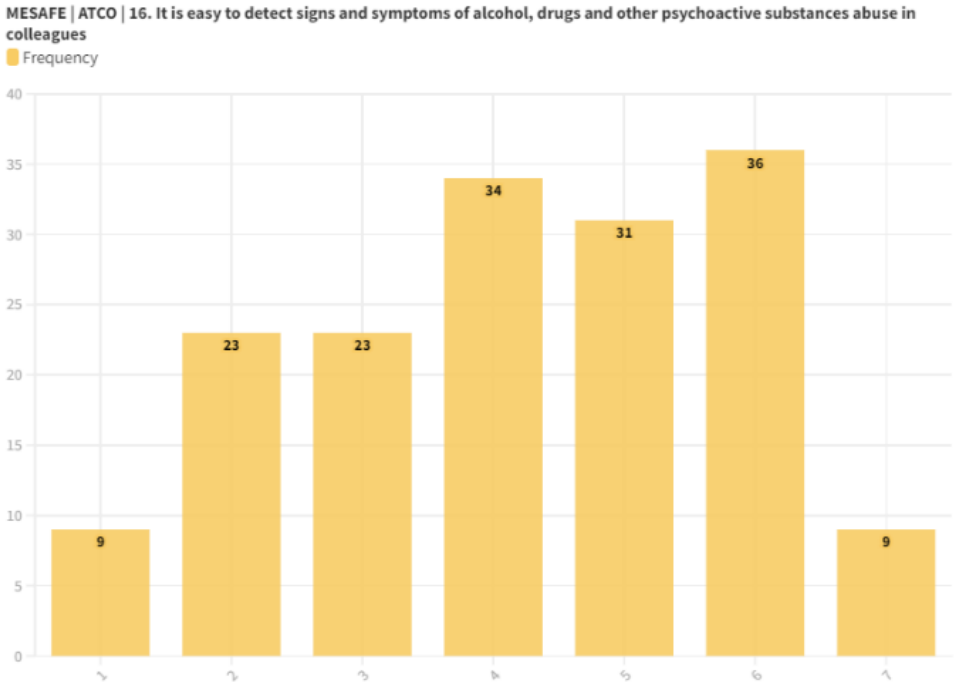


Figure 17 - ATCOs' ability to detect signs of alcohol, drugs, and other psychoactive substances abuse in themselves.

Q17 Have you ever taken any action when a colleague shows signs and symptoms of stress potentially impacting operational safety?

When it comes to take actions to ensure the safety of operations when a colleague shows signs and symptoms of stress, 68 pilots (41%) confirm that they have taken actions. A similar response is also reported by ATCOs (N=70; 42.4%). Indeed, these results mean that less than 1 out of 2 pilots and less than 1 out of 2 ATCOs took actions. The following questions Q17a and Q17b were asked to obtain more insights on this finding.

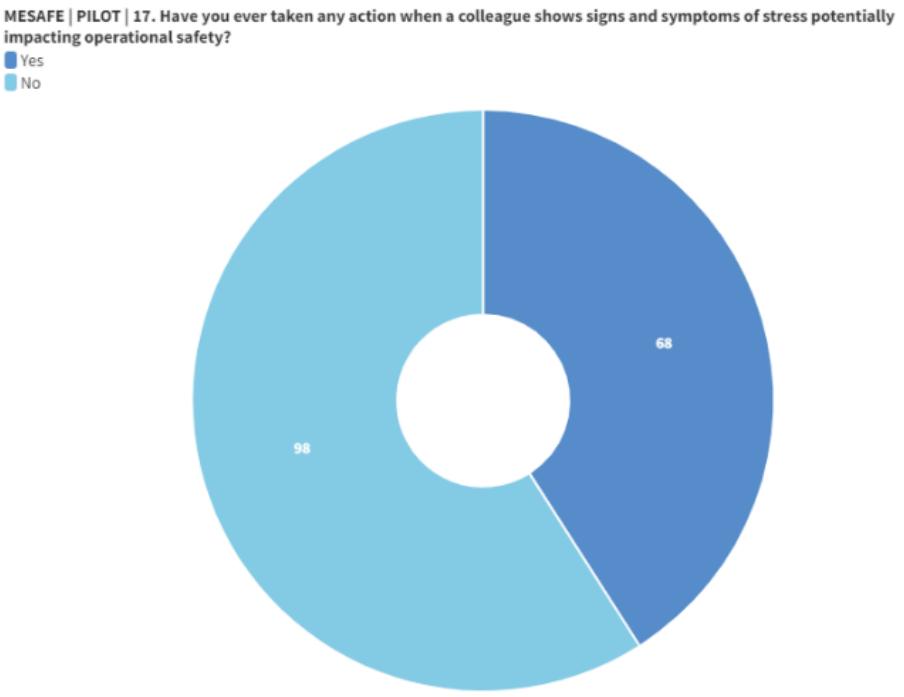


Figure 18 - Actions taken by pilots when a colleague shows signs of stress potentially impacting operational safety.

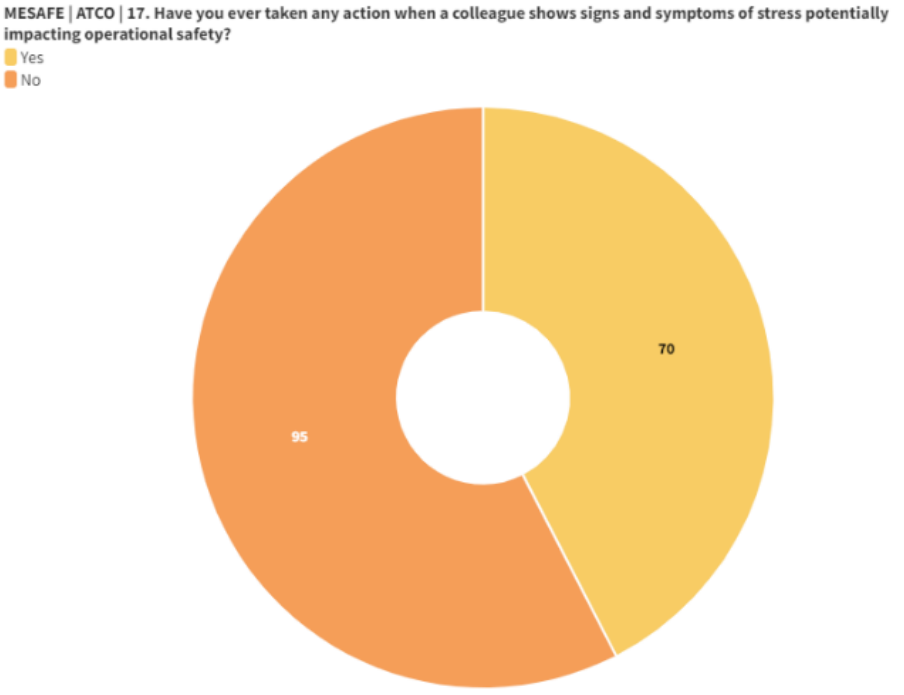


Figure 19 - Actions taken by ATCOs when a colleague shows signs of stress potentially impacting operational safety.

Q17a If yes, what actions did you take?

This question was optional, and respondents could report more than 1 action.

65 pilots answered this question obtaining a total of 72 actions clustered into 5 categories.

When able to detect signs and symptoms of stress, 39 pilots reported to “talk and support the colleague”, followed by “Refer to specialist/support programme” (N=13). 11 pilots affirmed to “Report the situation” to e.g., the chief pilot, fleet chief etc., followed by “Assist in work tasks” (N=6), and finally “advice to self-report the mental health issue” (N=3).

68 ATCOs answered this question, obtaining a total of 75 actions taken clustered into 5 categories.

When able to detect signs and symptoms of stress, 27 ATCOs reported to “talk and support the colleague”, followed by “take-over tasks/position” (N=22). 12 pilots affirmed to “Assist in work tasks”, followed by “Report the situation” (N=10), and finally “Refer to specialist/support programme” (N=4).

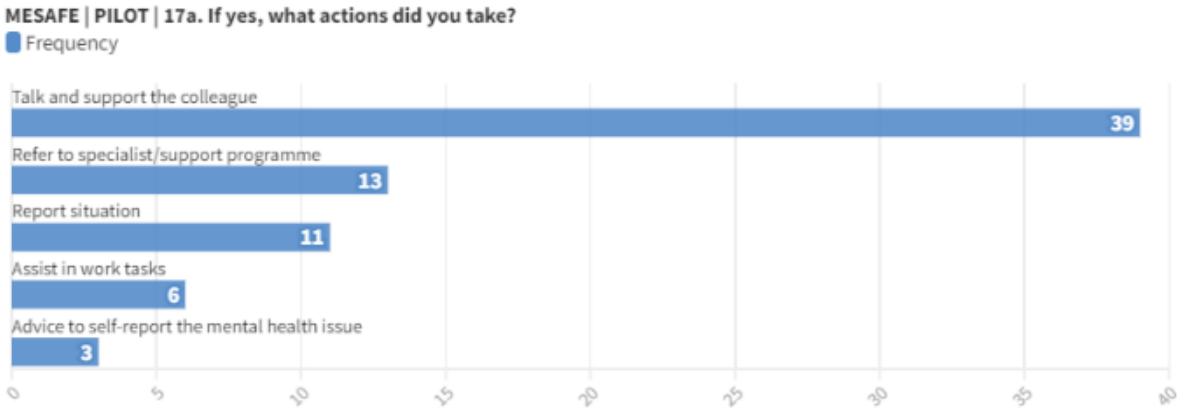


Figure 20 - Actual actions taken by pilots

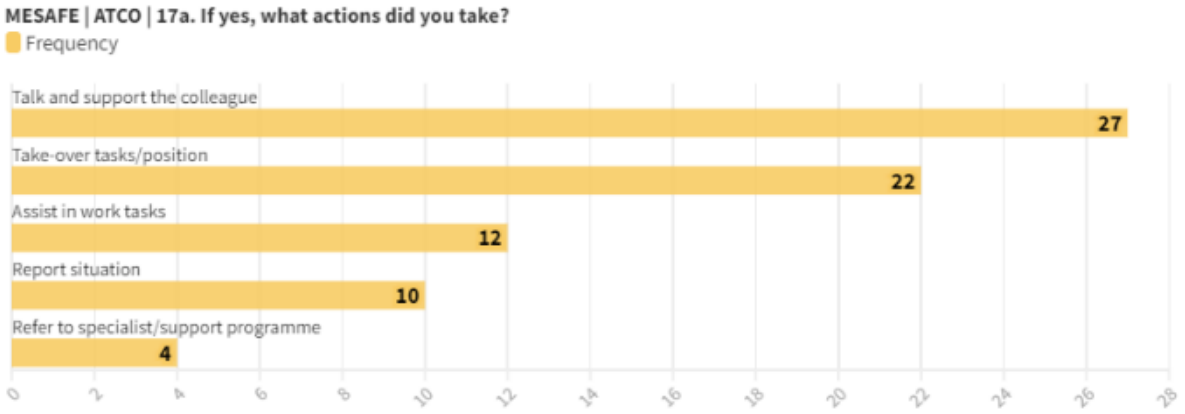


Figure 21 - Actual actions taken by ATCOs.

Q17b If no, why?

This question was optional, and respondents could report more than 1 reason.

76 pilots answered this question obtaining a total of 77 reasons clustered into 6 categories.

58 pilots reported that there were “No cases” for which actions had to be taken. When cases have manifested and when they were able to detect signs and symptoms of stress, pilots reported not to take actions because they were “uncertain how to help” (N=6) or “uncertain how to determine” (N=3). 5 pilots did not take actions because of the “fear of reporting repercussions for themselves/others” or because the “distress was detected but not impacting safety” (N=5). 1 pilot reported they didn’t take actions because of “Missing professional support”.

71 ATCOs answered this question, obtaining a total of 71 actions taken clustered into 4 categories.

40 ATCOs reported that there were “No cases” for which actions had to be taken. When cases have manifested and when they were able to detect signs and symptoms of stress, ATCOs reported not to take

actions because they were “uncertain how to help” (N=10) or “uncertain how to determine” (N=13). 8 ATCOs did not take actions because of the “fear of reporting due to potential repercussions for themselves/others”.

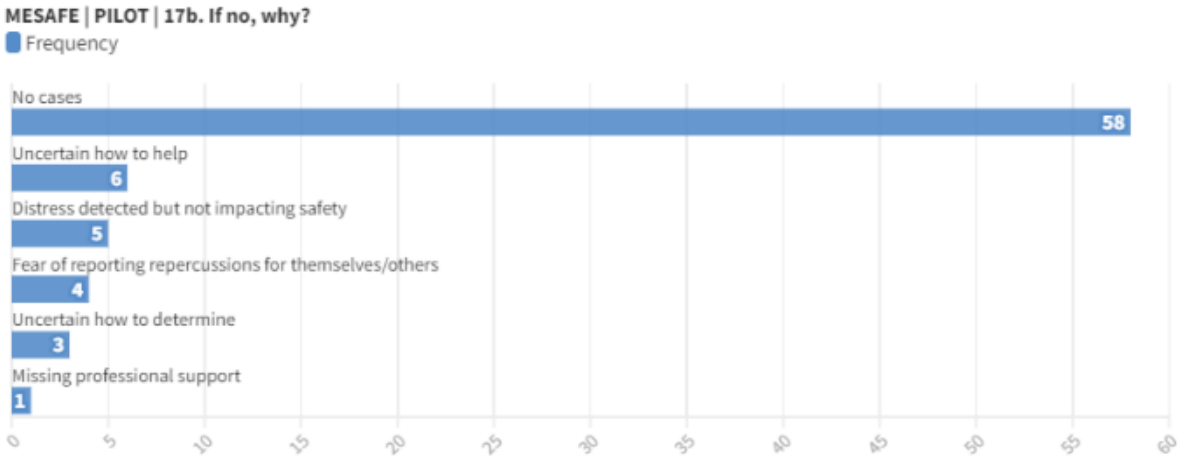


Figure 22 - Why no actions were taken by pilots

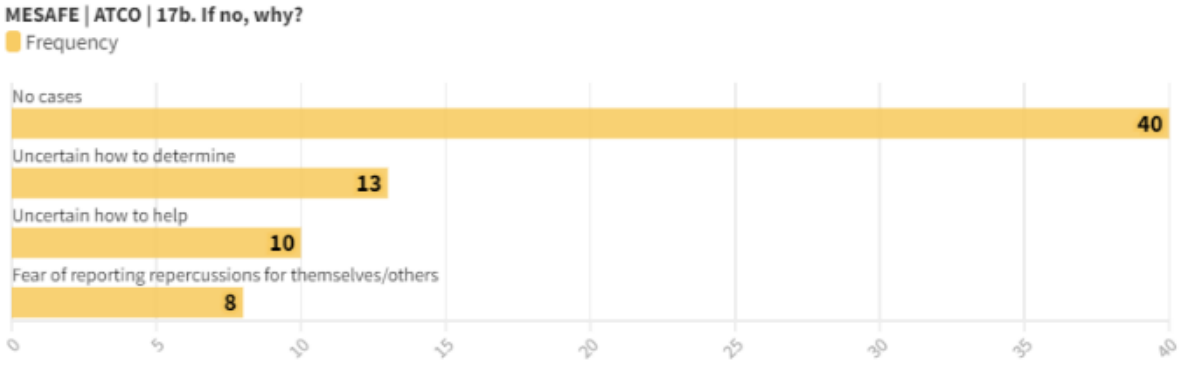


Figure 23 - Why no actions were taken by ATCOs

Q18 Have you ever received any training about mental health issues’ signs and symptoms (for example, in the framework of CRM or HF courses)?

When asked if they have ever received any training about mental health issues’ signs and symptoms, 94 pilots (56.7%) answered positively. A similar response is also reported by ATCOs (N=99; 60%). Although they have received training, from Q14-Q16 it appears that pilots and ATCOs struggle with the identification of signs and symptoms of mental health issues.

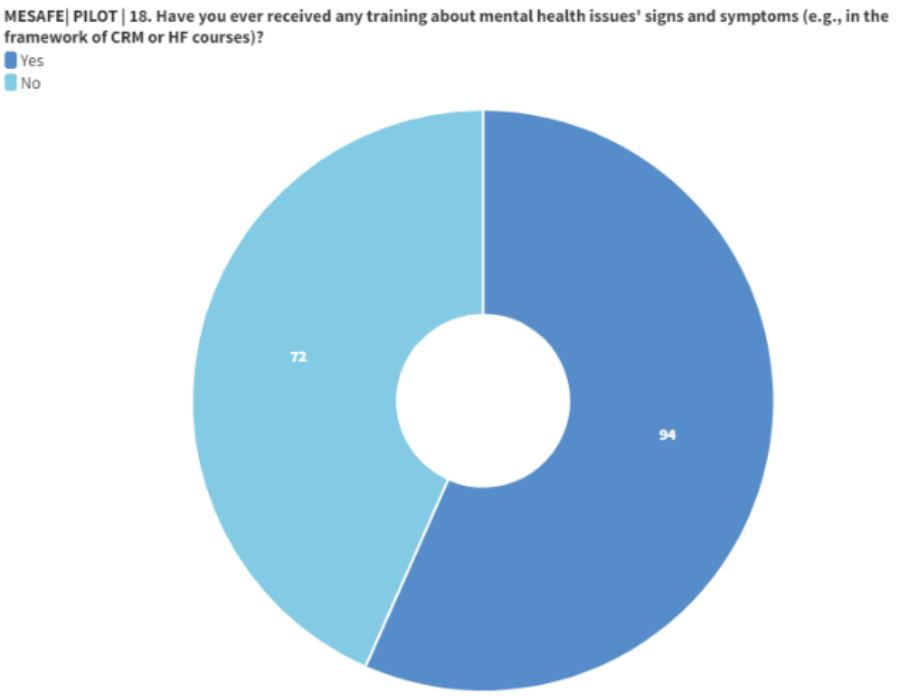


Figure 24 - Training received by pilots on mental health issues

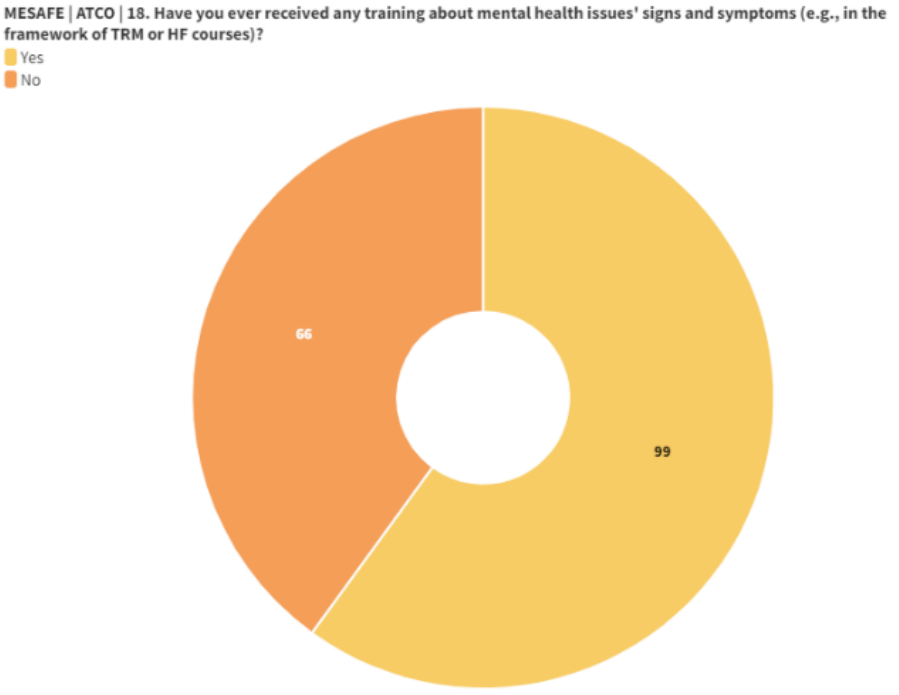


Figure 25 - Training received by ATCOs on mental health issues

Q19 Have you ever received any training about the safety impact of alcohol, drugs and other psychoactive substances?

When asked if they have ever received any training about the safety impact of alcohol, drugs and other psychoactive substances, 130 pilots (78.3%) answered positively. A similar response is also reported by ATCOs (N=120; 72.7%). From this result it appears to be more frequent to receive training on these substance-related aspects than on mental health issues, both for pilots and ATCOs.

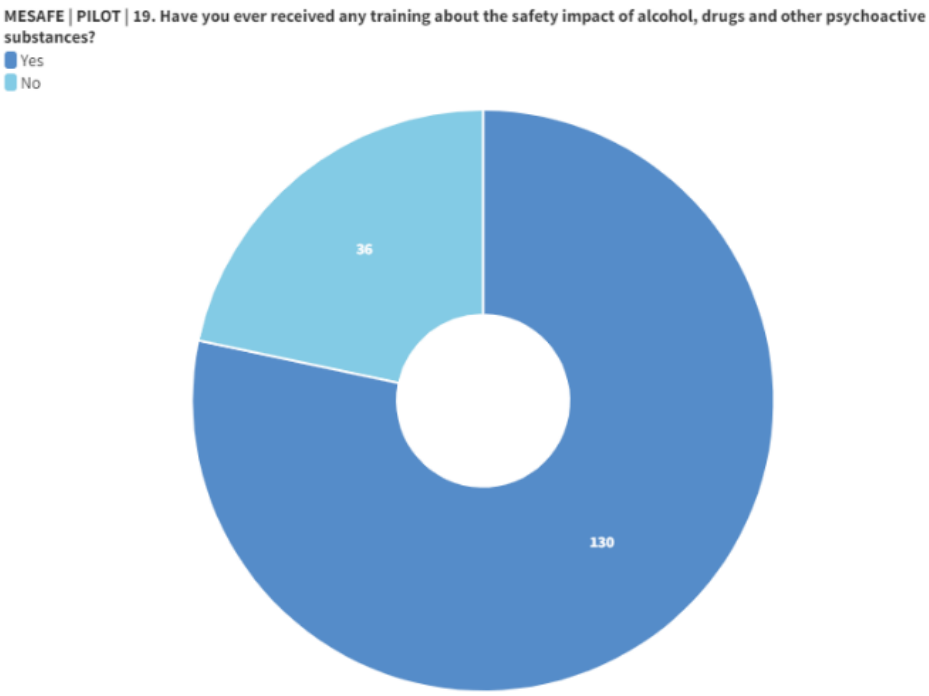


Figure 26 - Training received by pilots on the impact of alcohol, drugs, and other psychoactive substances

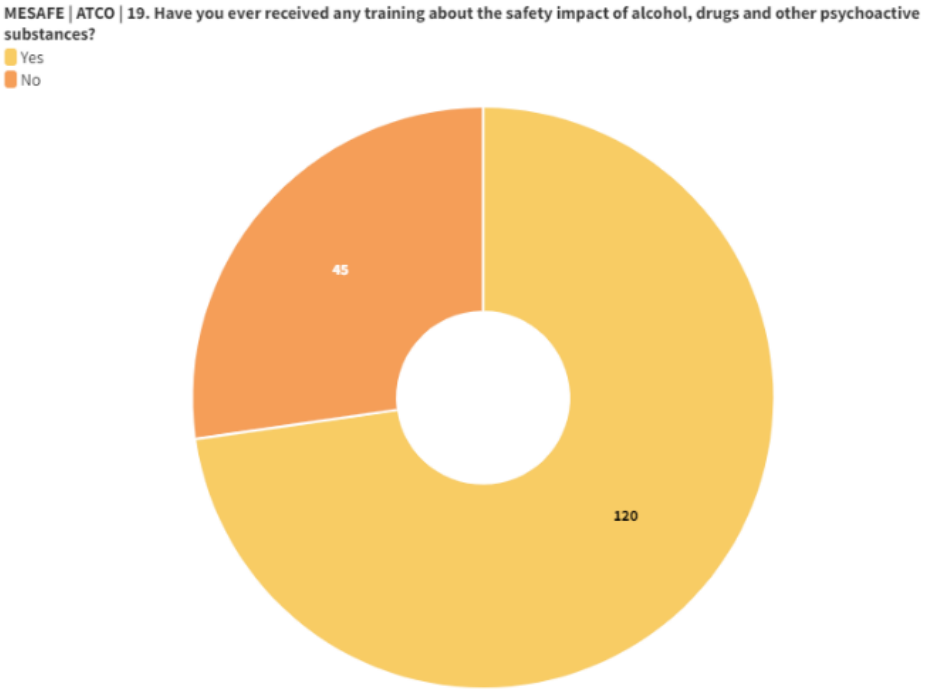


Figure 27 - Training received by ATCOs on the impact of alcohol, drugs, and other psychoactive substances

Q20 Have you ever received any training about the safety impact of psychoactive medication?

When asked if they have ever received any training about the safety impact of psychoactive medication, 94 pilots (56.6%) answered positively. A similar response is also reported by ATCOs (N=91; 55.2%). Trainings on psychoactive medication appear to have the same frequency as trainings on mental health issues.

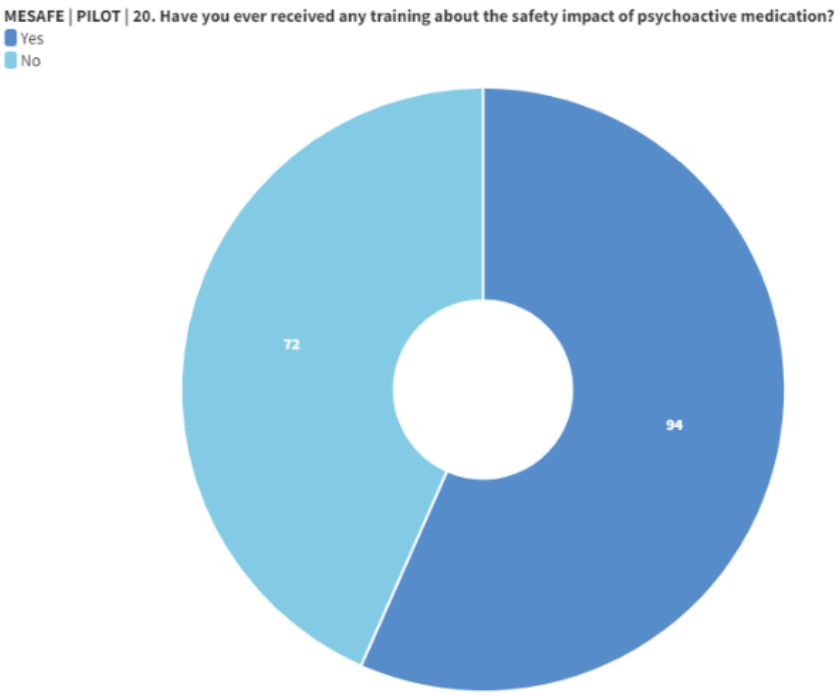


Figure 28 - Training received by pilots on the impact of psychoactive medication

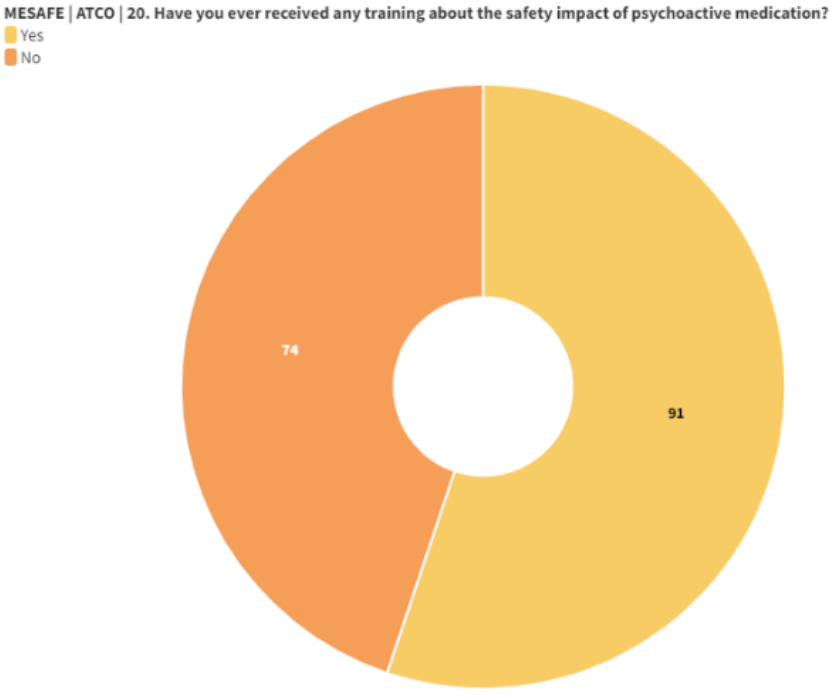


Figure 29 - Training received by ATCOs on the impact of psychoactive medication

PEER SUPPORT PROGRAMMES

This section collected pilots and ATCOs individual experiences with Peer Support Programmes. Main findings as follows:

- 90% of pilots and 73% of ATCOs are aware of what PSGs are.
- 71% of pilots and 62% of ATCOs think that PSGs are effective to mitigate stress.
- 60% of pilots and 63% of ATCOs agree that a close cooperation between AMEs and PSGs would help mitigate the safety risks related with mental health issues.

The following sections presents these results in detail.

Q21 Do you know what peer support programmes are?

When asked if they are aware of what peer support programmes are, almost the entire pilot sample responded positively (N=150, 90.4%). A slightly lower frequency can be observed among the ATCOs (N=120; 72.7%)

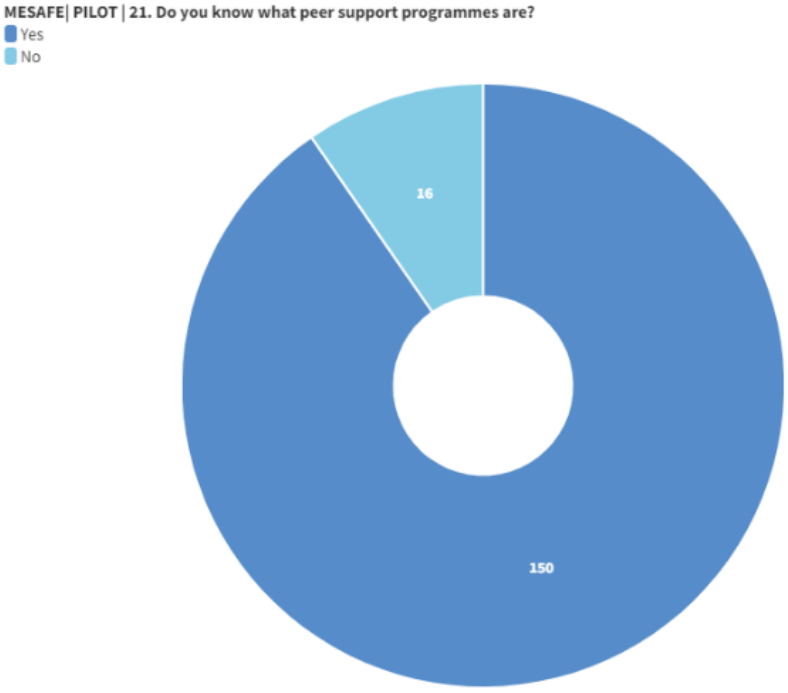


Figure 30 - Pilots' knowledge of peer support programmes

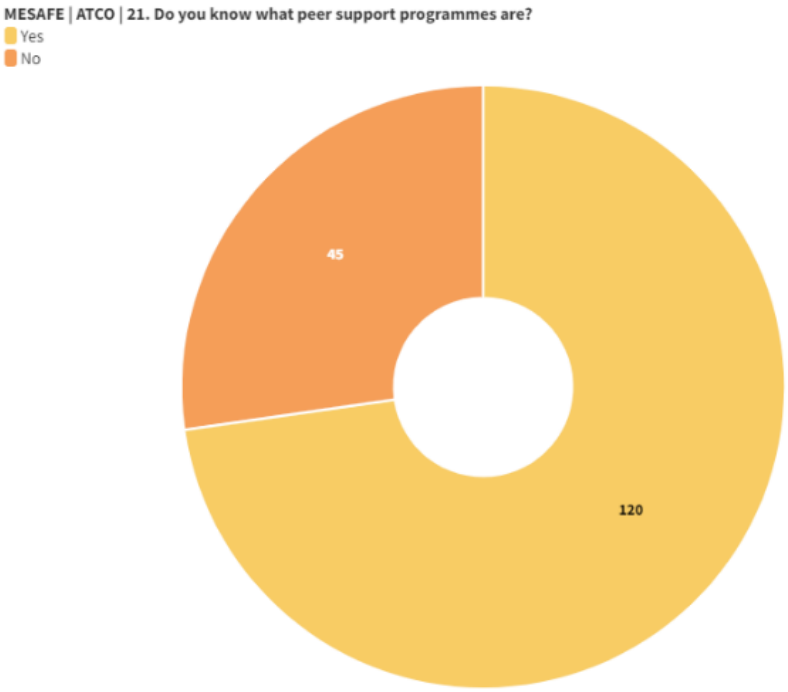


Figure 31 - ATCOs' knowledge of peer support programmes

Q21a If yes, do you think peer support programmes are effective to mitigate pilot/ATCO's stress?

This close-ended question was optional.

151 pilots answered this question. 119 ATCOs answered this question.

When asked their opinion on peer support programmes' effectiveness in mitigating pilots' and ATCOs' stress, 107 pilots responded positively (N=107, 70.9%). A lower frequency can be observed among the ATCOs (N=74; 62%).

Although it is not possible to derive statistically meaningful conclusions, these results, together with Q21, seems to suggest that PSGs are taken into greater consideration by pilots.

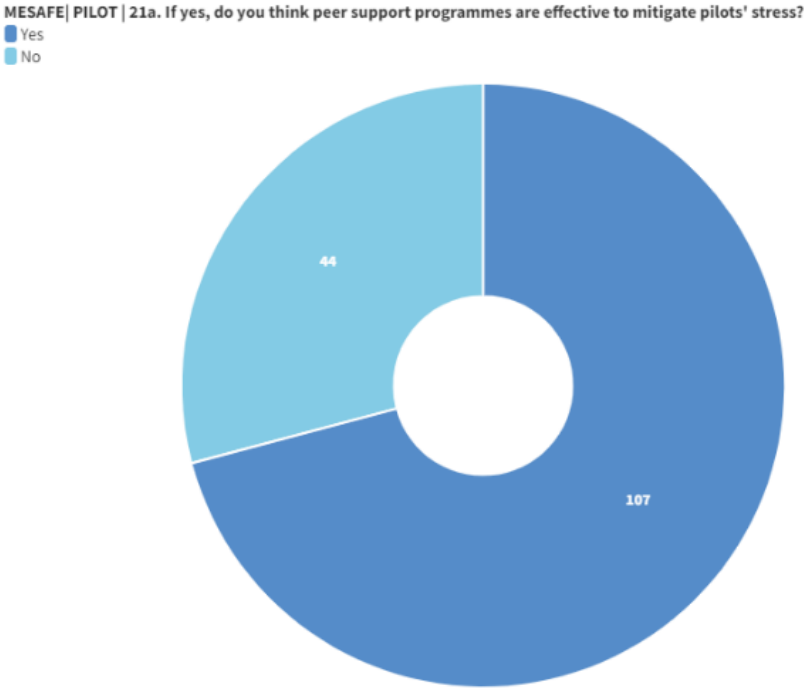


Figure 32 - Pilots' perception of PSP effectiveness in mitigating stress

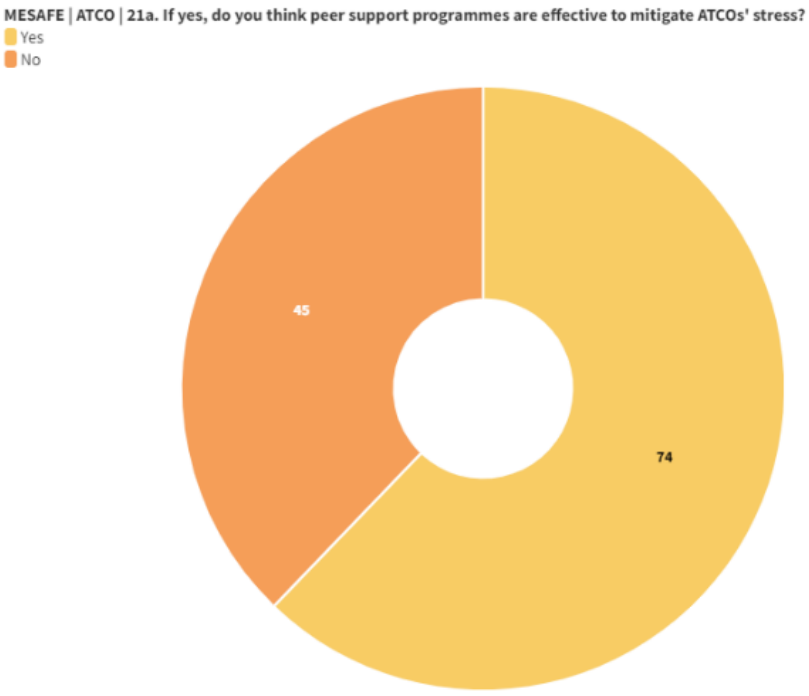


Figure 33 - ATCOs' perception of PSP effectiveness in mitigating stress

Q21b If yes, do you think that a close cooperation between AMEs and PSGs would help mitigate the safety risks related with mental health issues?

This close-ended question was optional.

123 pilots answered this question. 95 ATCOs answered this question.

Aggregating 1-2-3 responses both for pilots and ATCOs, 33 pilots (26.8%) and 17 ATCOs (17.9%) disagree or completely disagree about the close cooperation between AMEs and PSGs to help mitigate the safety risks related with mental health issues. 16 pilots (13%) and 18 ATCOs (18.9%) remain neutral. Aggregating 5-6-7 responses both for pilots and ATCOs, 74 pilots (60.2%) and 60 ATCOs (63.2%) agree or completely agree with the statement about the close cooperation between AMEs and PSGs to help mitigate the safety risks related with mental health issues.

Among the pilot and ATCO communities, it appears that almost 2 out of 3 pilots and 2 out of 3 ATCOs perceive and acknowledge the importance of a close cooperation between AMEs and PSGs.

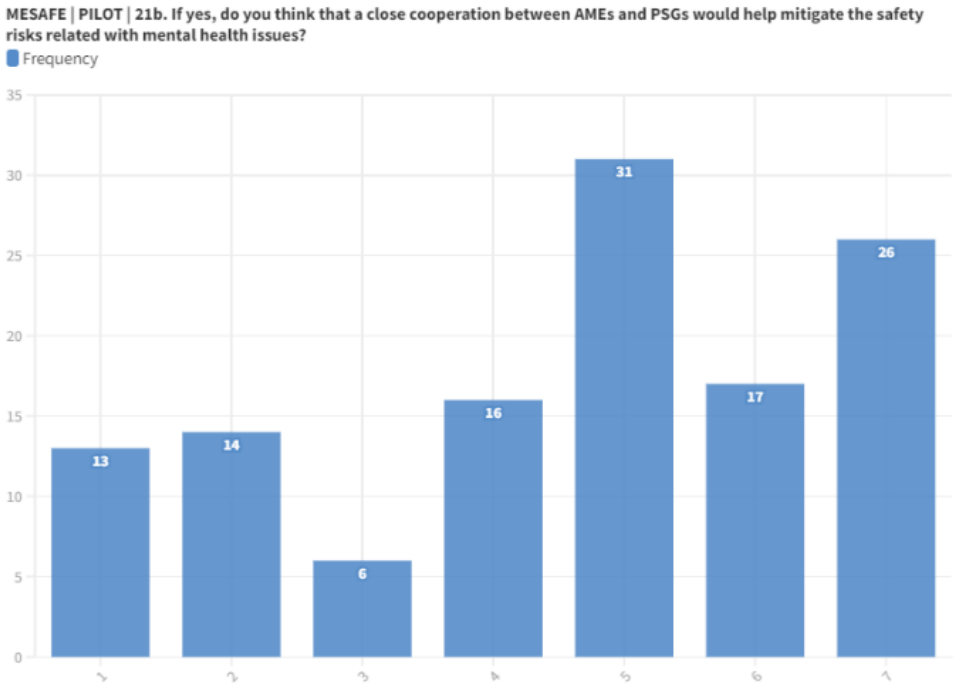


Figure 34 - Pilots' perception on a close cooperation between AMEs and PSGs to mitigate mental health safety risks

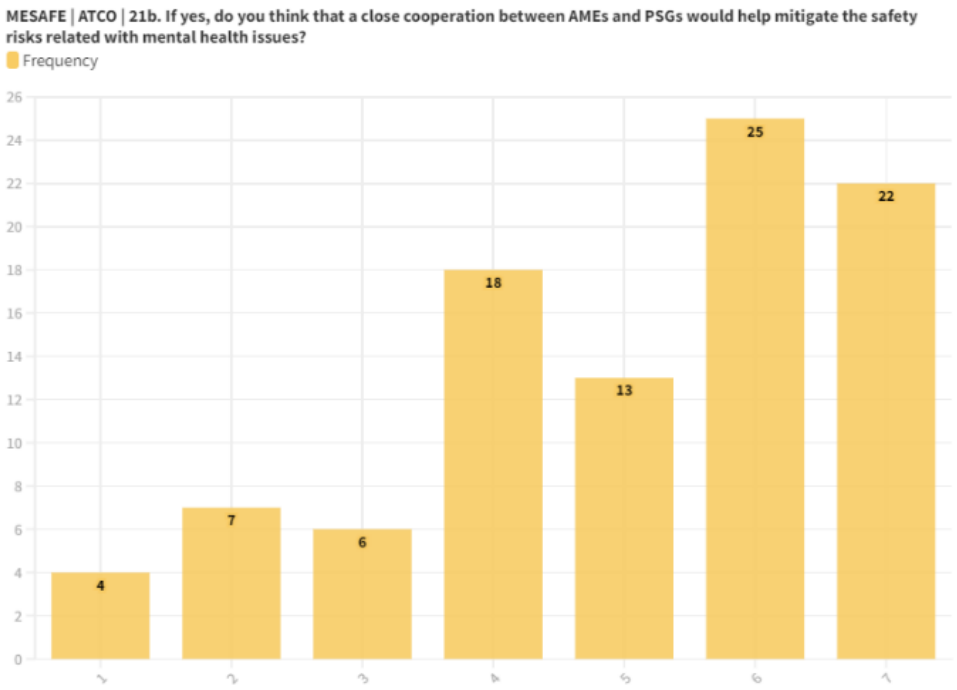


Figure 35 - ATCOs' perception on a close cooperation between AMEs and PSGs to mitigate mental health safety risks

2.2.4 Individual experience with the current aeromedical assessment of mental health for class I and III applications

This section collected pilots and ATCOs individual opinions and experiences with the aeromedical mental health assessment, both for initial and renewal/revalidation applications. Main findings as follows:

- The 54% of pilots and 63% of ATCOs underwent a mental health assessment at the initial application.
- The 71% of pilots and 44% of ATCOs undergo a mental health assessment at the renewal/revalidation application.
- AMEs' most used procedure is to assess mental fitness independently both at initial and renewal/revalidation applications.
- There is a high heterogeneity in tests used by AMEs both for the initial and revalidation/renewal assessments.
- Usually, less than 15 minutes is allocated to the mental health assessment.

The following sections presents these results in detail.

2.2.4.1 MH assessment at initial applications

Q4 Mental health assessment for class 1 and 3 initial applications.

Slightly more than half of the respondents undergo a mental health assessment during the aeromedical examinations at initial applications. In particular, 90 pilots (54.2%) confirm that a mental health assessment is performed at initials, while a pretty more frequent response is reported by ATCOs (N=104; 63%). These results show that 1 out of 2 pilots and almost 2 out of 3 ATCOs undergo a MH assessment at initial applications, unveiling a gap in the safety barriers mitigating the hazards related to mental incapacitation.

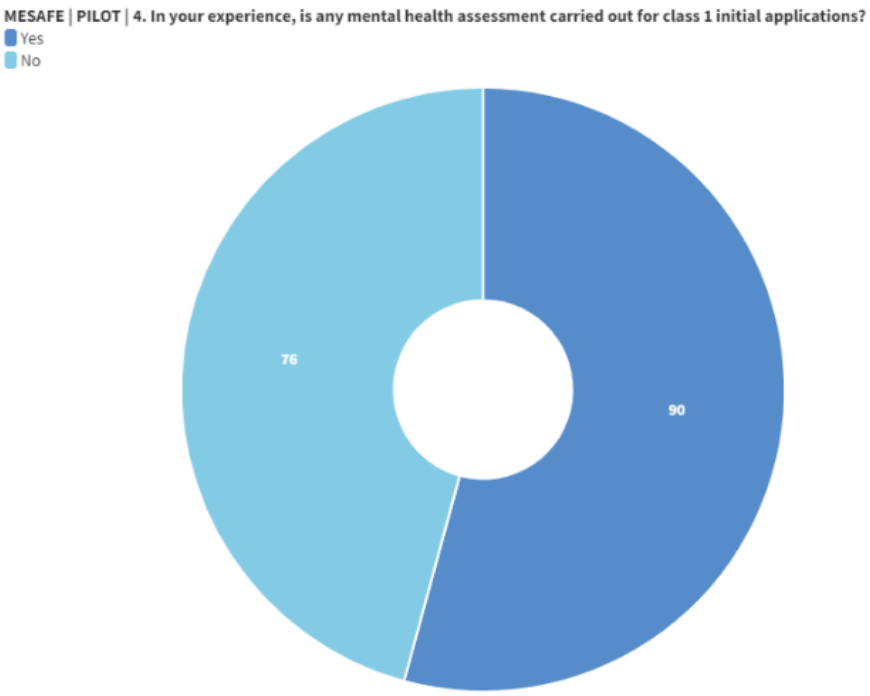


Figure 36 - Mental health assessment frequency for Class 1 initial for pilots

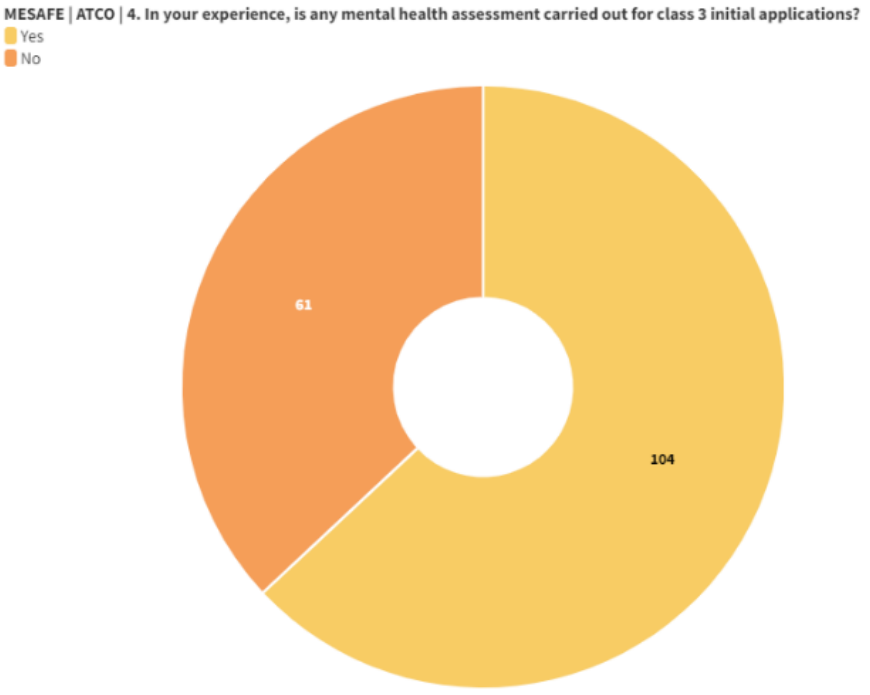


Figure 37 - Mental health assessment frequency for Class 3 initial for ATCOs

Q4a Who performs the mental health assessment for Class 1/Class 3 initial applications.

This close-ended question was optional, and respondents could report "other" options.

105 pilots answered this question.

The 42.9% of pilots reported that the AME performed the mental health assessment for Class 1 independently (N=45), while a considerable number of pilots (N=38; 36.2%) were not aware of who performs the MH assessment. On the other hand, 11 subjects (10.5%) affirmed that the MH assessment is performed by the AME referring to Aviation Psychologists and Aviation Psychiatrists if indicated; 7 subjects (6.7%) affirmed that it was performed by the Aviation Psychologist, and just 1 subject (1%) reported that it was

performed by the Aviation Psychiatrist. Interestingly, 1 subject (1%) reported that a MH assessment was performed “only during school selection and company selection”.

110 ATCOs answered this question.

The 20.7% of ATCOs reported that the AME performed the mental health assessment for Class 3 independently (N=23). Likewise, a considerable number of ATCOs (N=30; 27%) were not aware of who performs the MH assessment. 20 subjects (18%) affirmed that the MH assessment is performed by the AME referring to Aviation Psychologists and Aviation Psychiatrists if indicated. Although, a notable difference compared to the pilot survey, is that ATCOs report a higher frequency in the MH assessment performed by Aviation Psychologists (N=18; 16.2%) and Aviation Psychiatrists (N=10; 9%).

This finding shows how usually AMEs perform the MH assessment independently both for pilots (42.9%) and ATCOs (20.7%). Even more interestingly, it shows that a large proportion of pilots (36.2%) and ATCOs (27%) don’t know who performs the assessment; and that only few MH assessments are performed by Mental health specialists.

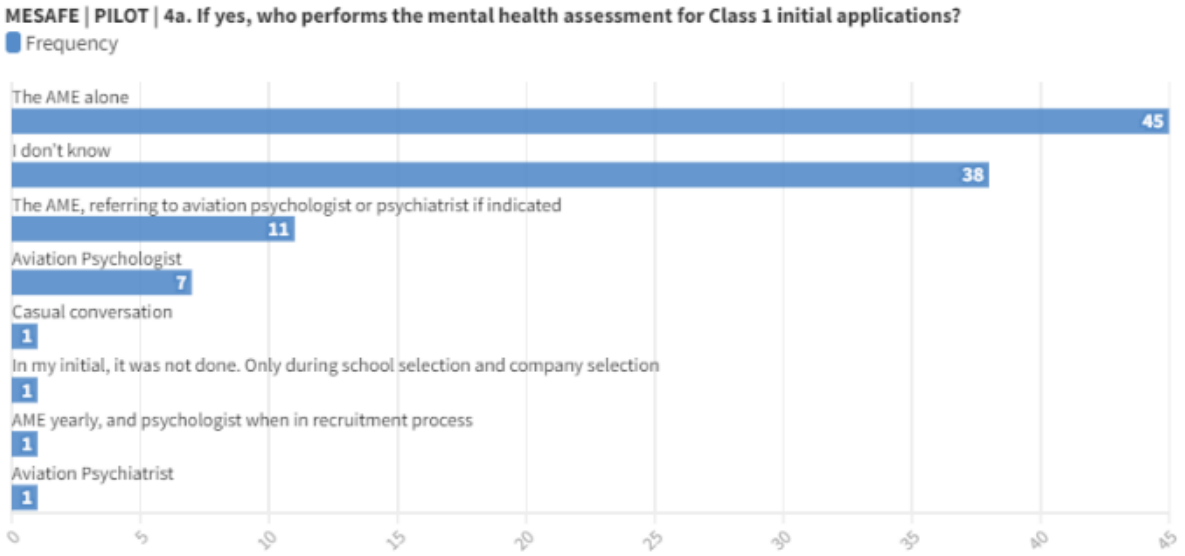


Figure 38 - Who performs Class 1 initial applications for pilots

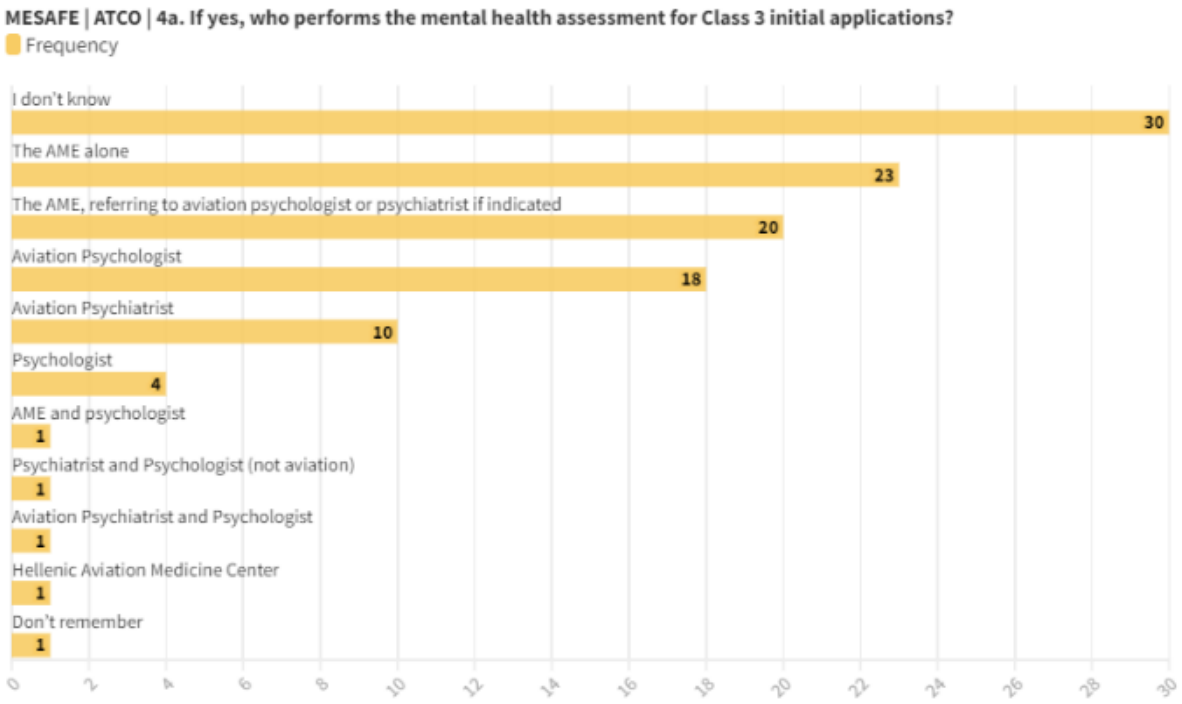


Figure 39 - Who performs Class 3 initial applications for ATCOs

Q4b How the Mental health assessment for Class 1/Class 3 initial application is performed.

This multiple-ended question was optional, and respondents could report "other" options.

88 pilots answered this question, and 103 different answers were collected.

The most used techniques by AMEs reported by pilots are a "Combination of questionnaires and interviews" (N=34; 33%), followed by "Self-administered questionnaire(s)" (N=24; 23.3%), "Questionnaire(s) administered during the examination" (N=18; 17.5%) and "Interview(s)" (N=18; 17.5%).

111 ATCOs answered this question, and 131 different answers were collected.

Similarly to pilots, ATCOs reported that the most used techniques by AMEs are a "Combination of questionnaires and interviews" (N=63; 48%), followed by "Interview(s)" (N=26; 20%), "Questionnaire(s) administered during the examination" (N=22; 16.8%) and "Self-administered questionnaire(s)" (N=13; 10%).

These results show that there is a high heterogeneity in the procedures AMEs implement to assess mental health. This result confirms what has been found in the AME survey, where aeromedical examiners reported to use various and different techniques to assess MH.

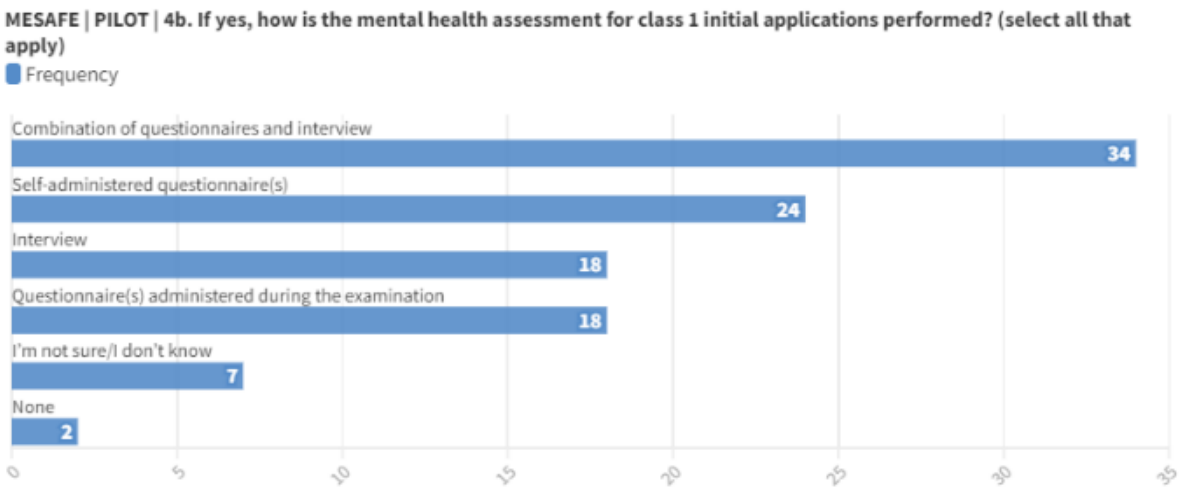


Figure 40 - How Class 1 initial applications for pilots is performed

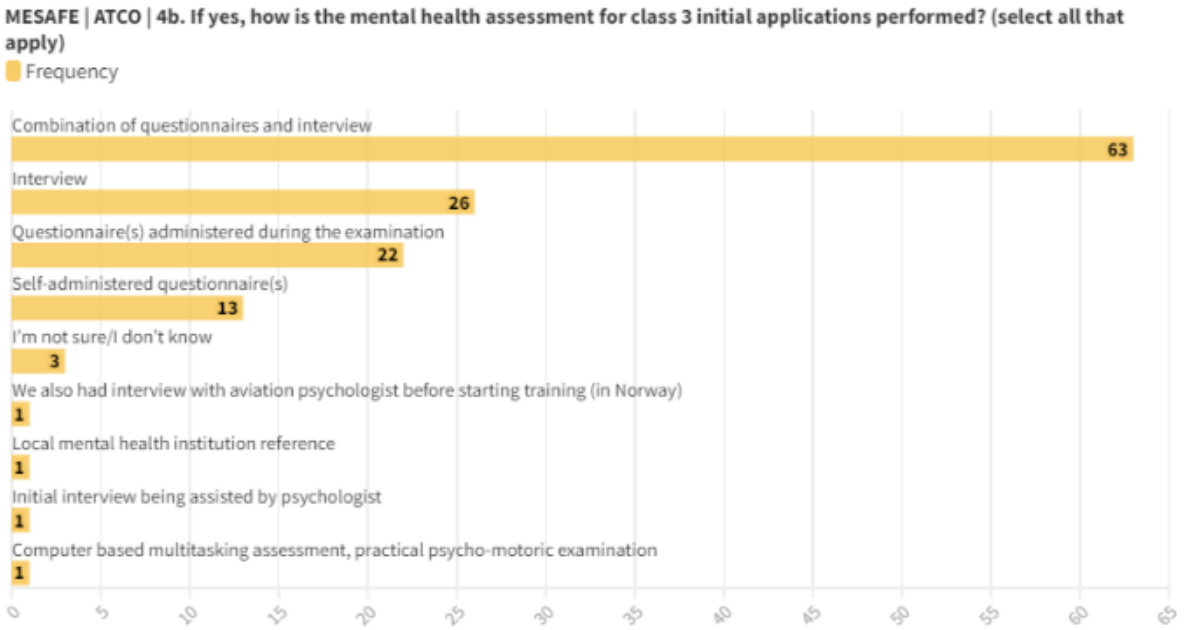


Figure 41 - How Class 3 initial applications for ATCOs is performed

Q4c Time dedicated to the mental health assessment for Class 1/Class 3 initial applications.

This close-ended question was optional, and respondents could report "other" options.

94 pilots answered this question.

The most of the pilots said that the time allocated to the MH assessment is "less than 15 minutes" (N=43; 45.7%). 36 pilots (38.3%) reported to be unaware of the time allocated, probably indicating an absence or a high variability in the time allocated to the MH assessment. 11 pilots (11.7%) reported that "half an hour" was allocated to perform di MH assessment.

106 ATCOs answered this question.

In accordance to pilots, also the majority of ATCOs reported that the most frequent time allocated to the MH assessment is "less than 15 minutes" (N=29; 27.4%). 26 ATCOs (24.5%) reported to be unaware of the time allocated for the MH assessment. In line with pilots' answers, also 22 ATCOs (20.8%) reported that "Half an hour" was allocated to perform the assessment. Although, differently from pilots, 15 ATCOs (14.1%) reported that the MH assessment lasts "More than 1 hour" and 14 ATCOs (13.2%) reported that it lasts "1 hour".

These results show that little time is usually allocated to the mental health assessment (less than 15 minutes). Moreover, this result also shows that there are no standardized procedures regarding the time allocation for MH assessment.

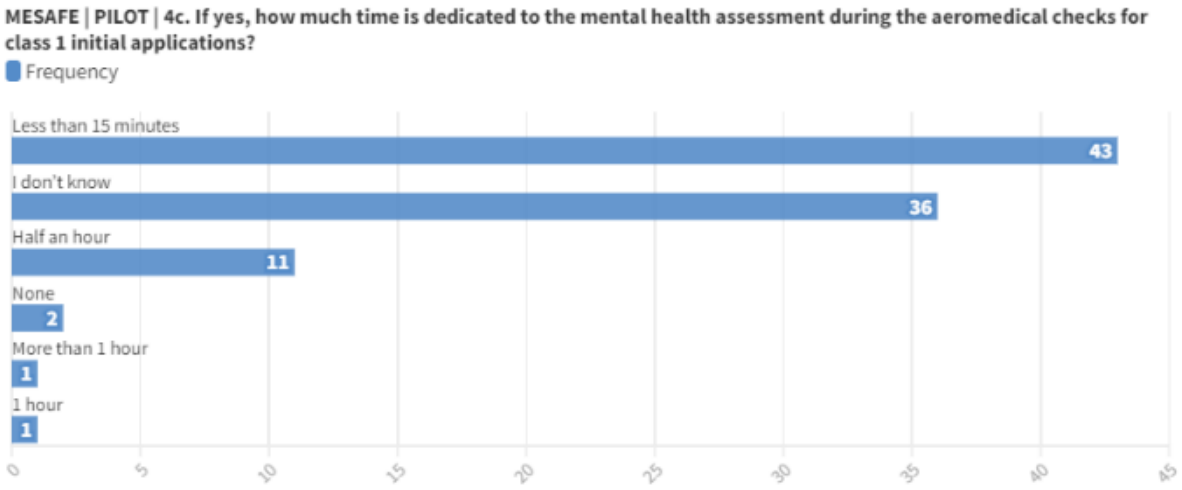


Figure 42 - How much time is dedicated to Class 1 initial applications for pilots

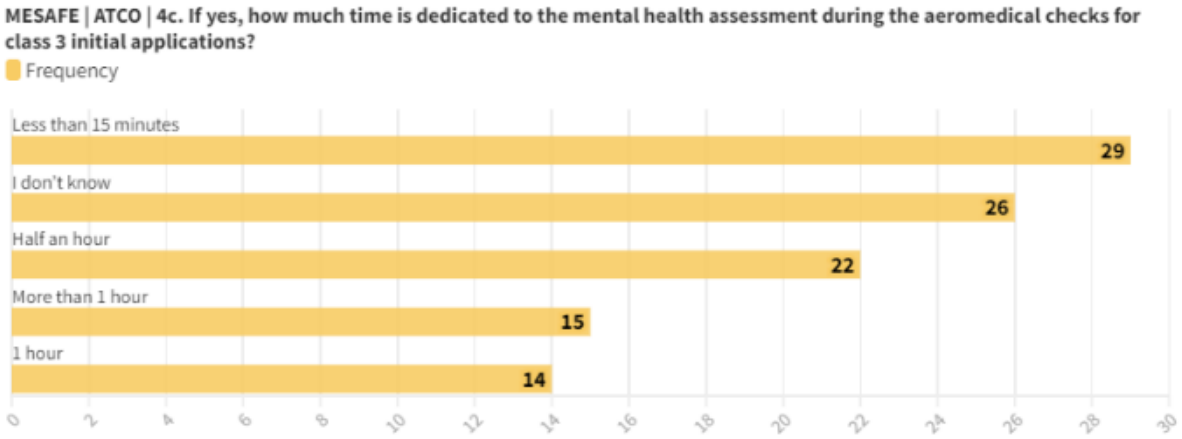


Figure 43 - How much time is dedicated to Class 3 initial applications for ATCOs

2.2.4.1 MH assessment at revalidation/renewal applications

Q5 Mental health assessment for class 1 and 3 revalidation/renewal applications.

For the revalidation/renewal applications, 118 pilots (71.1%) confirm that a mental health assessment is performed. This response is less frequent in the ATCOs' sample (N=73; 44.2%).

These findings highlight an interesting result: pilots have less MH assessment at initials compared to ATCOs, but more MH assessment at revalidation/renewal compared to ATCOs.

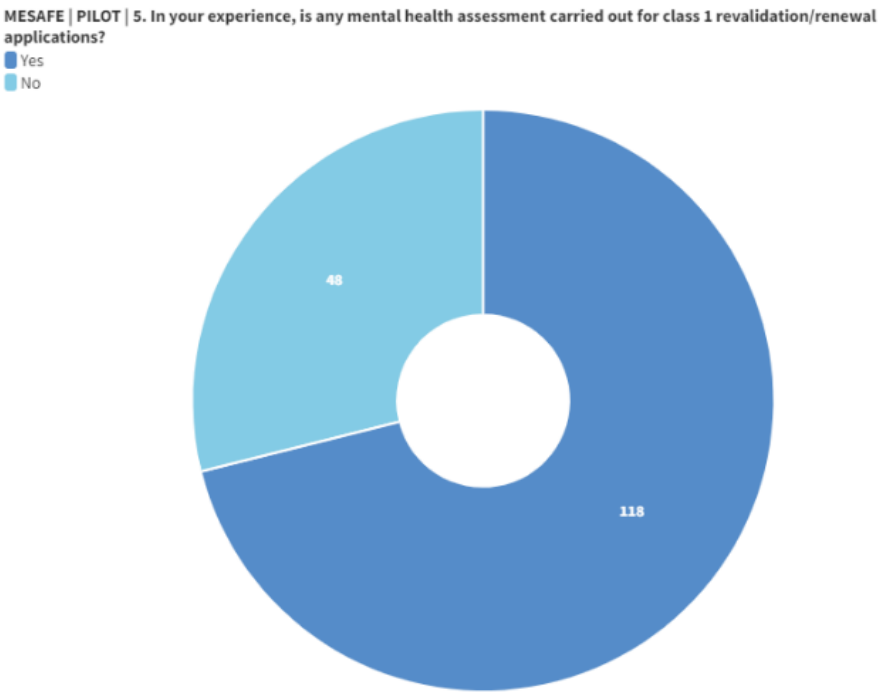


Figure 44 - Mental health assessment frequency for Class 1 renewal/revalidation for pilots

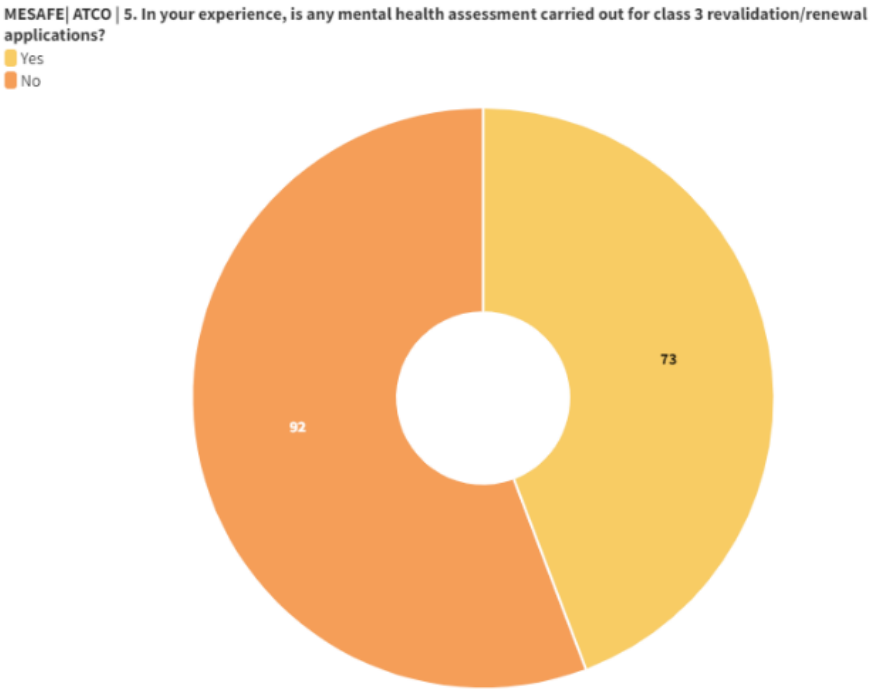


Figure 45 - Mental health assessment frequency for Class 3 renewal/revalidation for ATCOs

Q5a Who performs the mental health assessment for Class 1/Class 3 revalidation/renewal applications.

This close-ended question was optional, and respondents could report "other" options.

124 pilots answered this question.

The 83% of pilots reported that the AME performed the mental health assessment for Class 1 revalidation/renewal alone (N=103). Some pilots (N=12; 9.7%) affirmed that the MH assessment is performed by the AME referring to Aviation Psychologists and Aviation Psychiatrists if indicated; only 2 subjects (1.6%) affirmed that it was performed by the Aviation Psychologist, and no subjects reported that it was performed by the Aviation Psychiatrist.

81 ATCOs answered this question.

The 53.1% of ATCOs reported that the AME performed the mental health assessment for Class 3 revalidation/renewal alone (N=43). Likewise, a considerable number of ATCOs (N=12; 14.8%) affirmed that the MH assessment is performed by the AME referring to Aviation Psychologists and Aviation Psychiatrists if indicated. Although, a notable difference compared to the pilot survey, is that ATCOs report a higher frequency in the MH assessment performed by Aviation Psychologists (N=10; 12.3%) and Aviation Psychiatrists (N=3; 3.7%).

This finding shows how usually AMEs perform the MH assessment renewal/revalidation alone both for pilots (83%) and ATCOs (53%). Confirming what has been found in Q4a, only few MH assessments are performed by Mental health specialists.

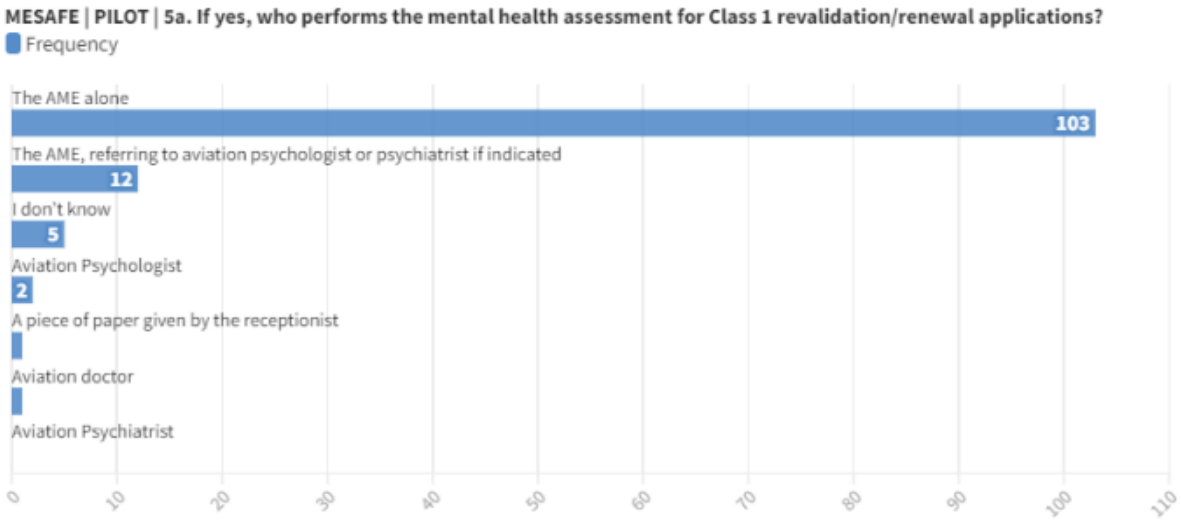


Figure 46 - Who performs Class 1 renewal/revalidation applications for pilots

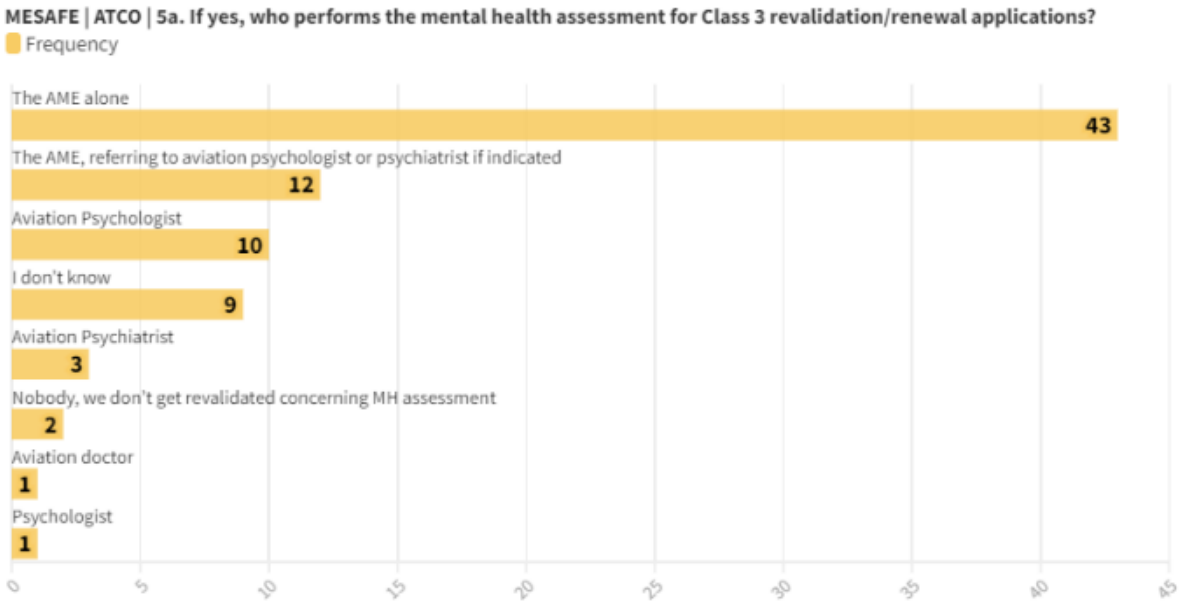


Figure 47 - Who performs Class 3 renewal/revalidation applications for ATCOs

Q5b How the Mental health assessment for Class 1/Class 3 revalidation/renewal application is performed.

This multiple-ended question was optional, and respondents could report “other” options.

121 pilots answered this question, and 142 different answers were collected.

The most used techniques reported are “Self-administered questionnaire(s)” (N=42; 29.6%), followed by “Combination of questionnaires and interviews” (N=37; 26.1%), “Interview(s)” (N=31; 21.8%) and “Questionnaire(s) administered during the examination” (N=27; 19%).

75 ATCOs answered this question, and 83 different answers were collected.

ATCOs reported that the most used techniques by AMEs are a “Combination of questionnaires and interviews” (N=28; 33.7%), followed by “Interview(s)” (N=22; 26.5%), “Questionnaire(s) administered during the examination” (N=17; 20.5 %) and “Self-administered questionnaire(s)” (N=13; 15.7%).

These results show that there is a high heterogeneity in the AMEs procedures to assess mental health also for revalidation/renewal applications.

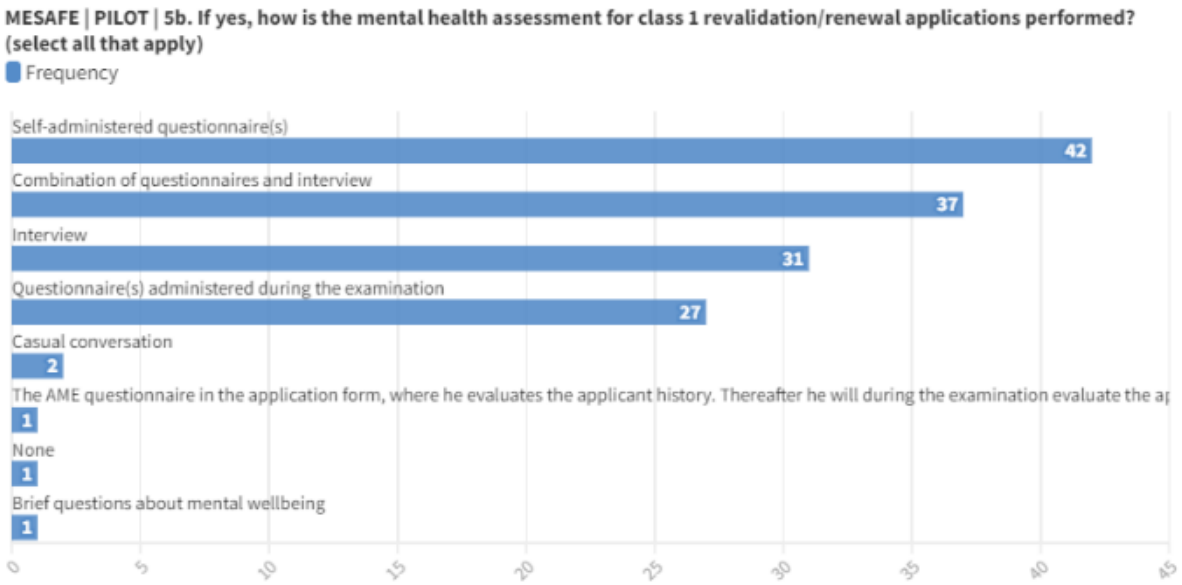


Figure 48 - How Class 1 renewal/revalidation applications for pilots is performed

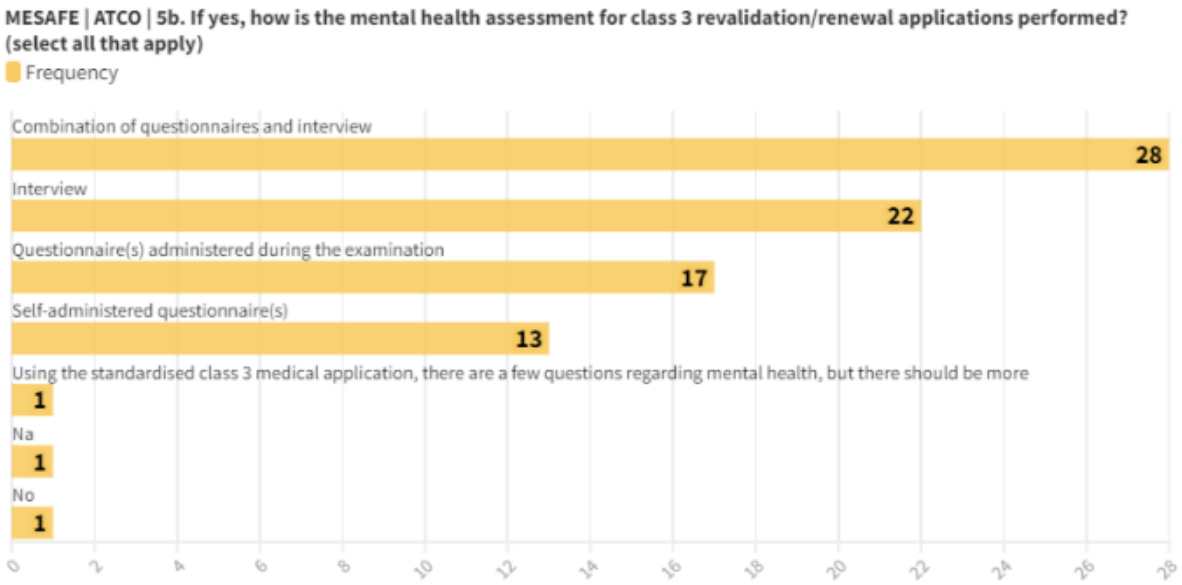


Figure 49 - How Class 3 renewal/revalidation applications for ATCOs is performed

Q5c Time dedicated to the mental health assessment for Class 1/Class 3 revalidation/renewal applications

This close-ended question was optional, and respondents could report “other” options.

125 pilots answered this question.

In pilots' experience, the most frequent time allocated to the MH assessment is "less than 15 minutes" (N=103; 82.4%). 10 pilots (8%) reported to be unaware of the time allocated, probably indicating an absence or a high variability in the time allocated to the MH assessment. 10 pilots (8%) reported that "half an hour" was allocated to perform di MH assessment. Only 1 pilot reported that "1 hour" was allocated for the revalidation/renewal MH assessment.

76 ATCOs answered this question.

In accordance to pilots, also the majority of ATCOs reported that the time allocated to the MH assessment is "less than 15 minutes" (N=52; 68.4%). In agreement with pilots' answers, also 10 ATCOs (13.2%) reported that "Half an hour" was allocated to perform the assessment. 6 ATCOs (7.9%) reported to be unaware of the time allocated for the MH assessment. 5 ATCOs (6.6%) reported that the MH assessment lasts "1 hour".

These results show that little time is allocated to the mental health assessment, confirming what has been found in Q4c.

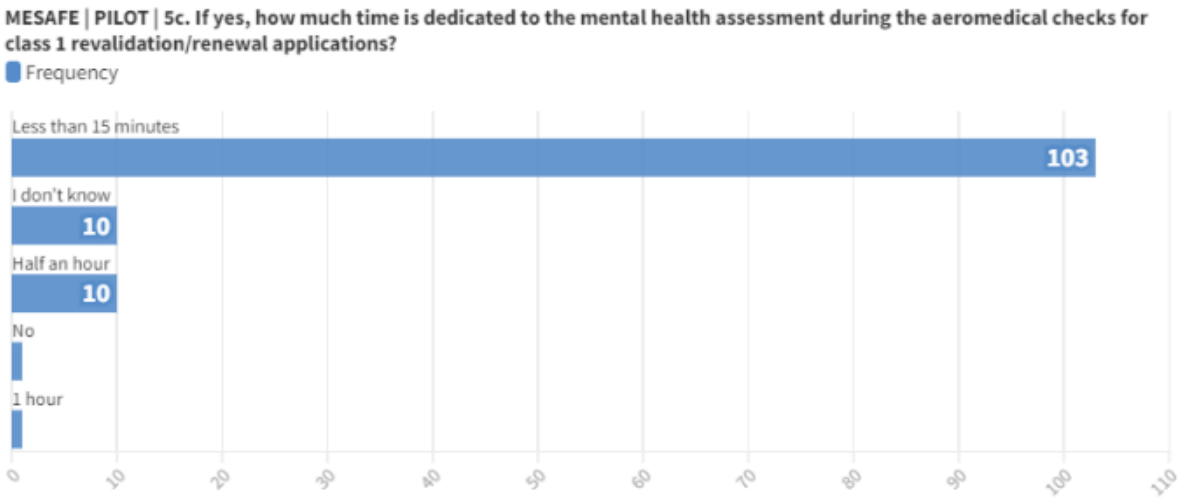


Figure 50 - How much time is dedicated to Class 1 renewal/revalidation applications for pilots

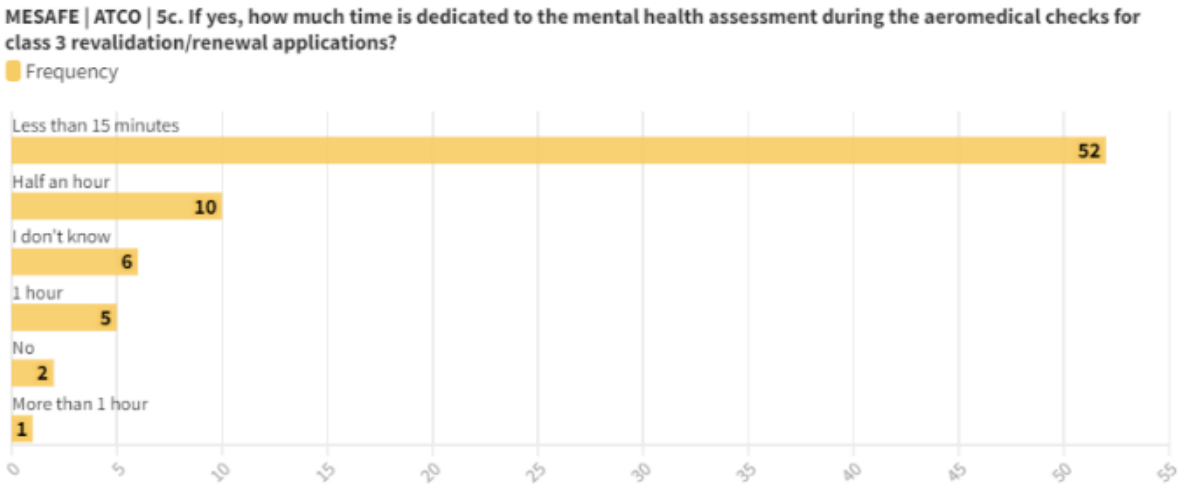


Figure 51 - How much time is dedicated to Class 3 renewal/revalidation applications for ATCOs

2.2.4.2 Gaps and needs

This section collected pilots' and ATCOs' gaps and needs with respect to current aeromedical mental health assessments. Main findings as follows:

- The 70% of pilots and the 68% of ATCOs think the current aeromedical assessment process is not effective to detect MH issues impacting the safety of operations;

- The 60% of pilots and the 66% of ATCOs think that the time allocated for the current aeromedical assessment process is not enough;
- The 42% of pilots and the 58% of ATCOs agree that the aeromedical assessment process should include the collection of the applicant's psychosocial history data;
- The 46% of pilots and the 57% of ATCOs agree that the aeromedical assessment process should include the collection of the applicant's professional history data;
- The 47% of pilots would involve a MHS only when a particular need arises; while the 47% of ATCOs would involve a MHS both for initial and for renewal/revalidation applications;
- The 78% of pilots and the 59% of ATCOs would want to be referred to a MHS only when a particular need arises.
- The 69% of pilots and the 82% of ATCOs perceive the cooperation between AMEs and MHS as important and of value to improve today's procedures.

The following sections present these results in detail. The reader will find many results expressed in terms of level of agreement: such level was measured by means of a 7-points Likert scale, where 1 stands for absolutely disagree and 7 for completely agree.

Q7 Effectiveness of the current aeromedical assessment to detect mental health issues impacting safety.

Aggregating 1-2-3 responses both for pilots and ATCOs, it emerges that 117 pilots (70.5%) and 113 ATCOs (68.4%) do not agree with the effectiveness of today's aeromedical assessment to detect mental health issues. 22 pilots (13.2%) and 26 ATCOs (15.8%) remained neutral. Aggregating 5-6-7 responses both for pilots and ATCOs, 27 pilots (16.3%) and 26 ATCOs (15.8%) agree or completely agree regarding the effectiveness of today's aeromedical assessment in detecting mental health issues.

This finding highlights the importance of rethinking the aeromedical assessment with more resources allocated to the detection of mental health issues impacting the safety of operations.

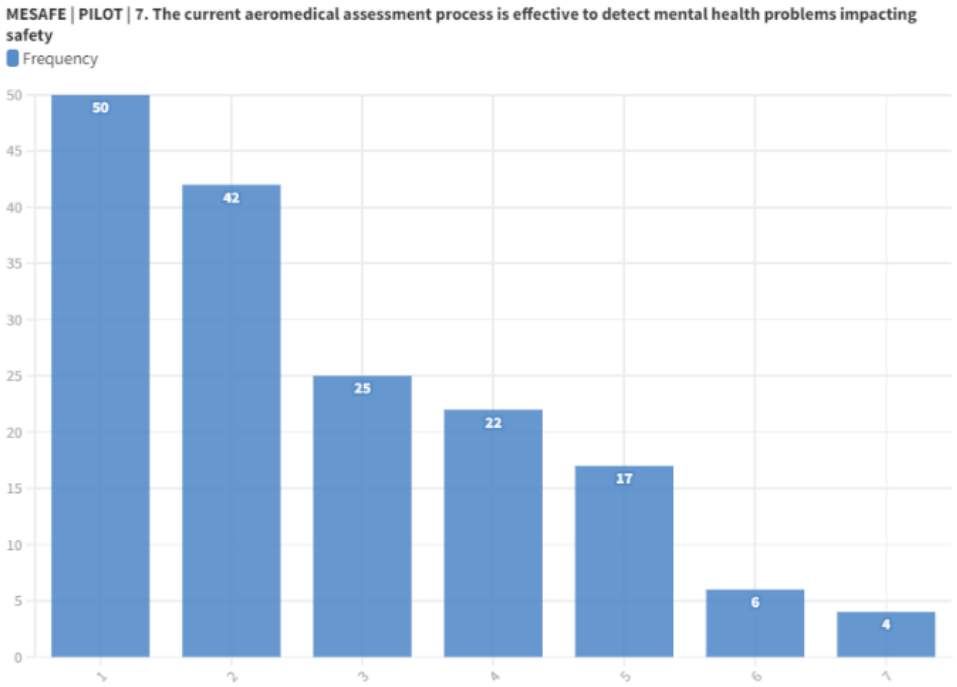


Figure 52 - Pilots' perception on the current aeromedical assessment effectiveness to detect mental health issues

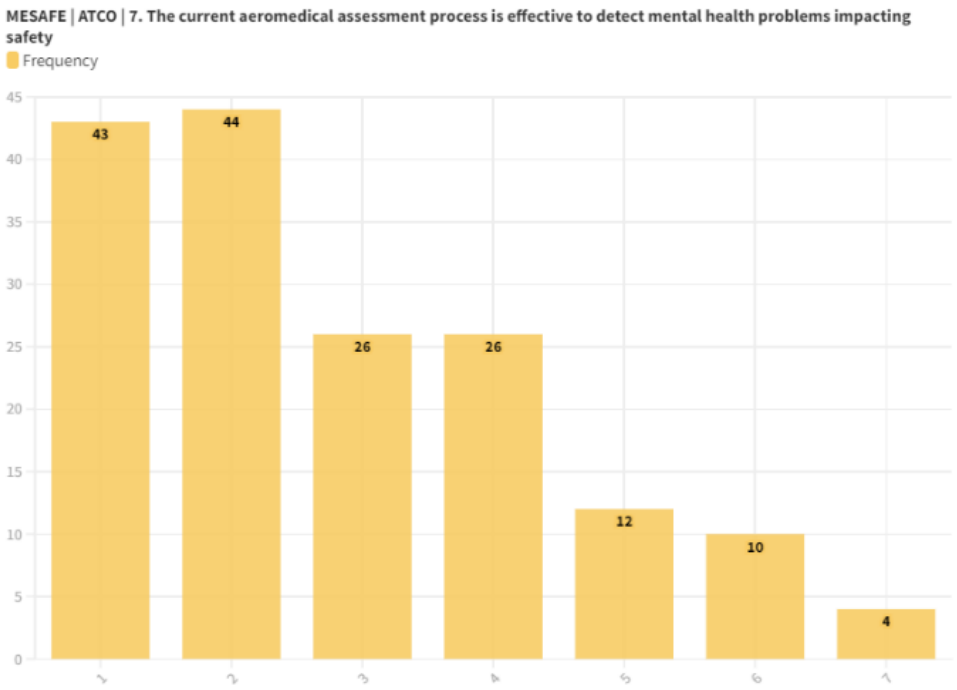


Figure 53 - ATCOs' perception on the current aeromedical assessment effectiveness to detect mental health issues

Q8 Time allocated to the mental health assessment.

Aggregating 1-2-3 responses both for pilots and ATCOs, it emerges that 100 pilots (60.2%) and 109 ATCOs (66%) do not agree that enough time is allocated in today's aeromedical mental health assessment. 25 pilots (15.1%) and 24 ATCOs (14.6%) remained neutral. Aggregating 5-6-7 responses for both pilots and ATCOs, a little percentage (41 pilots, namely the 24.7%, and 32 ATCOs, namely the 19.4%) agree or completely agree that the time allocated in today's aeromedical mental health assessment is enough.

This finding highlights the importance of rethinking the number and amount of resources, including time, allocated to the aeromedical mental health assessment.

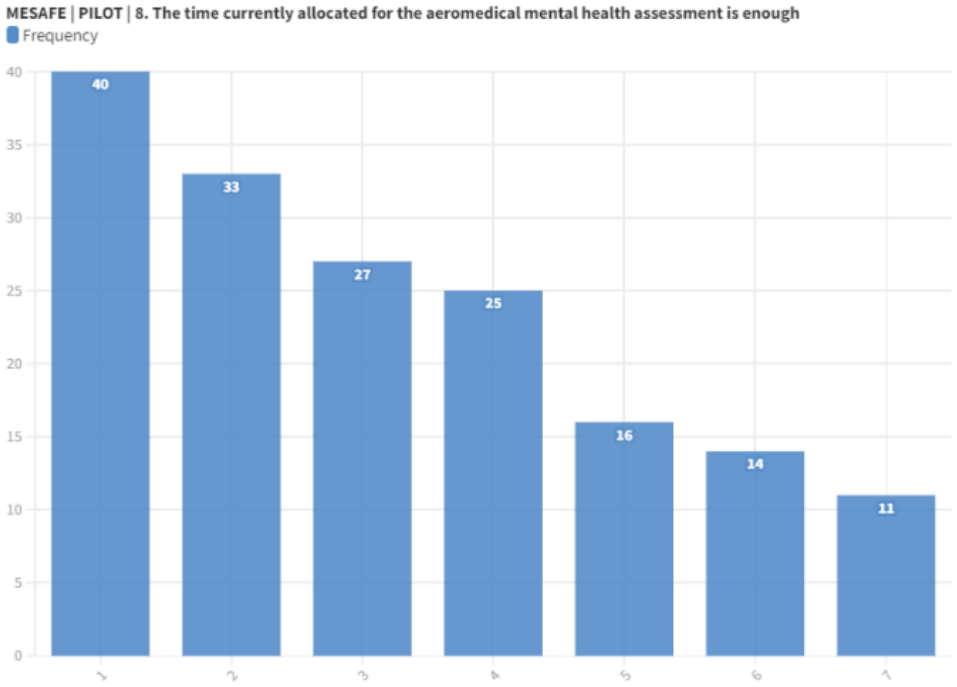


Figure 54 - Pilots' perception on the time allocated for the aeromedical mental health assessment

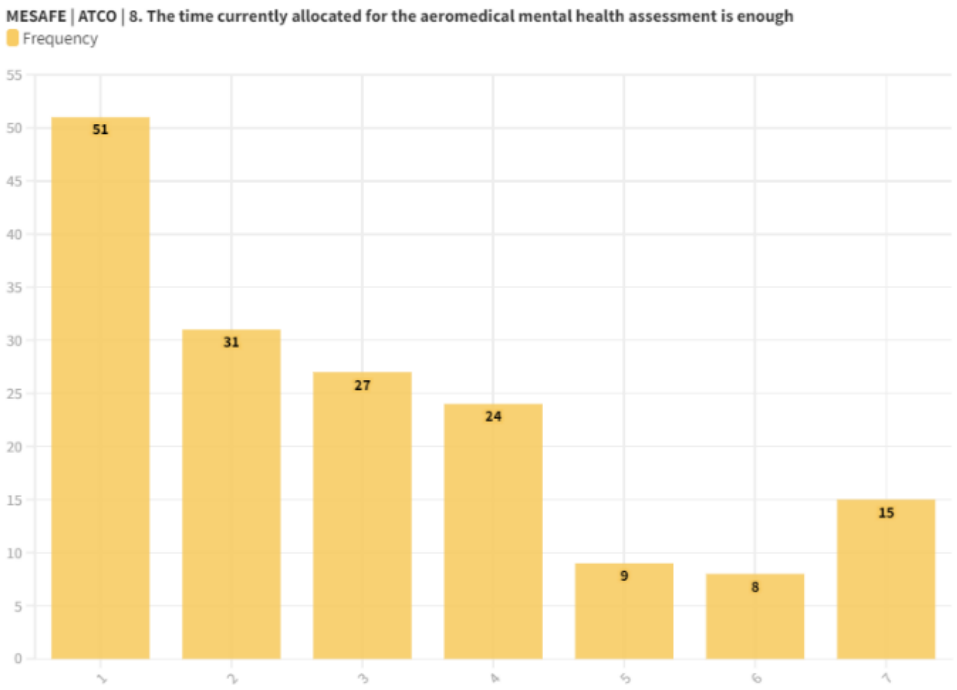


Figure 55 - ATCOs' perception on the time allocated for the aeromedical mental health assessment

Q9 Collection of applicant's psychosocial history data.

Aggregating 1-2-3 responses both for pilots and ATCOs, 70 pilots (42.2%) and 37 ATCOs (22.4%) disagree or completely disagree in collecting the applicant's psychosocial history data for the mental health assessment. 26 pilots (15.6%) and 32 ATCOs (19.4%) remain neutral. Aggregating 5-6-7 responses both for pilots and ATCOs, 70 pilots (42.2%) and 96 ATCOs (58.2%) agree or completely agree in collecting the applicant's psychosocial history data for the mental health assessment.

Interestingly, the pilot population seems to be divided on the topic. Conversely, it appears to be a slight positive preference for ATCOs in collecting psychosocial history.

Although it is not possible to draw statistically meaningful conclusions, it seems that the concern for loss of licence due to past mental health issues plays a role in these findings. A more transparent mental health assessment process, including clear procedures on how these data would be used and what support could be given when the licence is suspended, may increase the level of agreement in sharing information on psychosocial history.

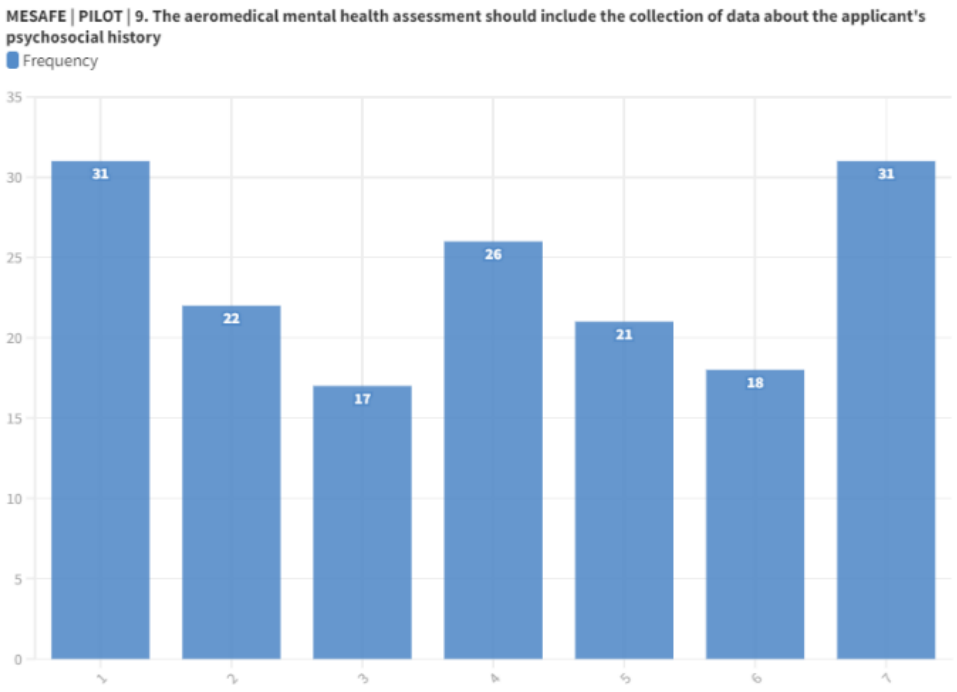


Figure 56 - Pilots' perception on psychosocial history

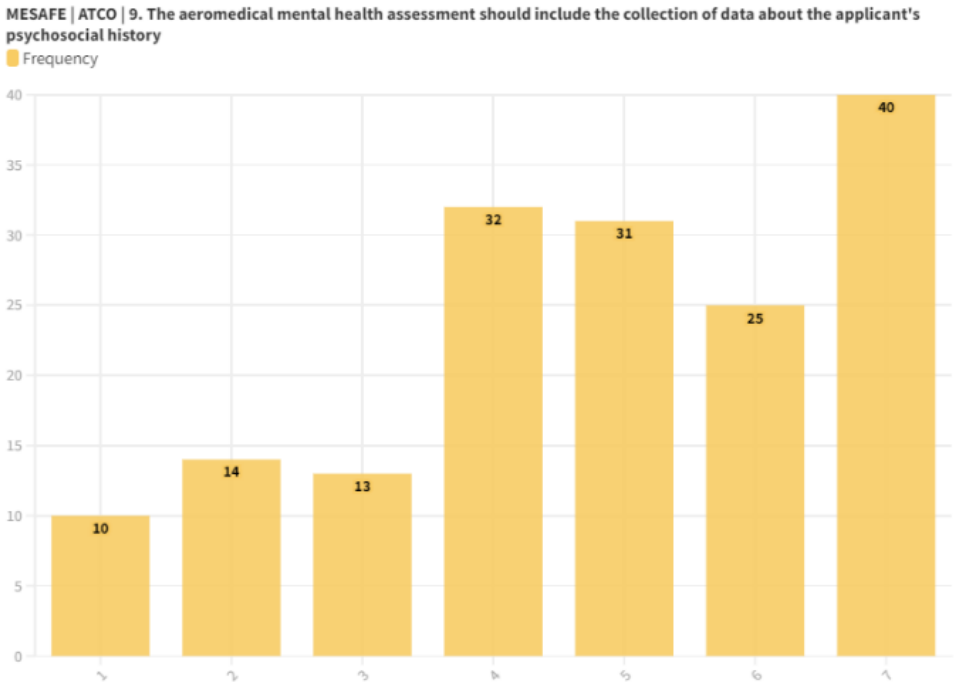


Figure 57 - ATCOs' perception on psychosocial history

Q10 Collection of applicant's professional history data.

Aggregating 1-2-3 responses both for pilots and ATCOs, 66 pilots (39.8%) and 39 ATCOs (23.6%) disagree or completely disagree in collecting the applicant's professional history data for the mental health assessment. 23 pilots (13.8%) and 31 ATCOs (18.8%) remain neutral. Aggregating 5-6-7 responses both for pilots and ATCOs, 77 pilots (46.4%) and 95 ATCOs (57.6%) agree or completely agree in collecting the applicant's professional history data for the mental health assessment.

Similarly to the previous answer (Q9), these findings highlight how the pilot population is divided on the topic, although with a greater willingness to share professional history data. ATCOs seem to be more willing

in sharing professional history data. These results could mean that sharing professional history data is perceived as less sensitive compared to psychosocial history data.

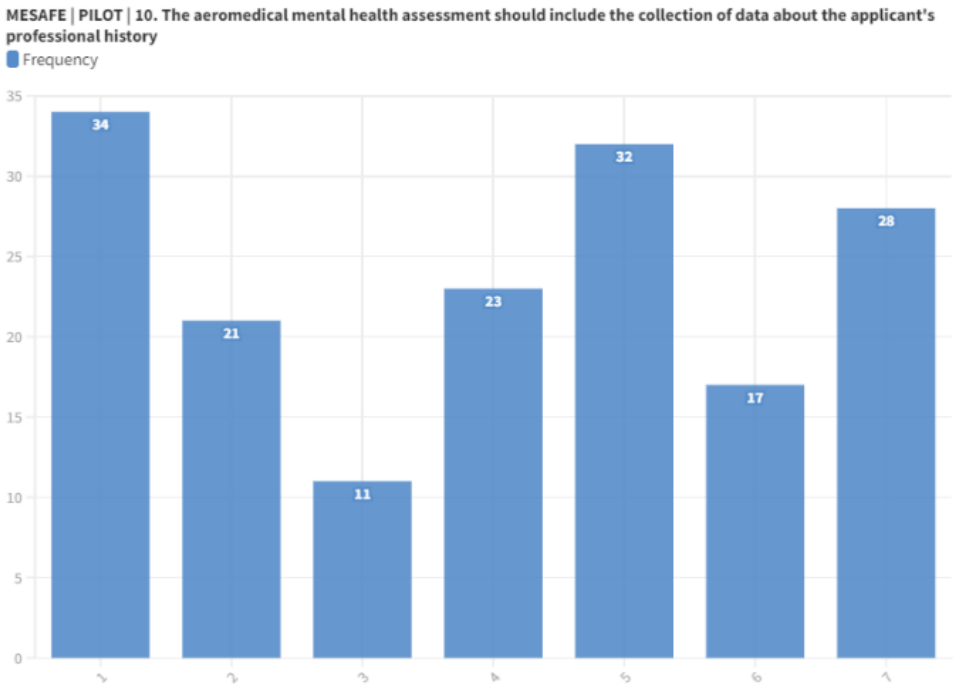


Figure 58 - Pilots' perception on psychosocial history data

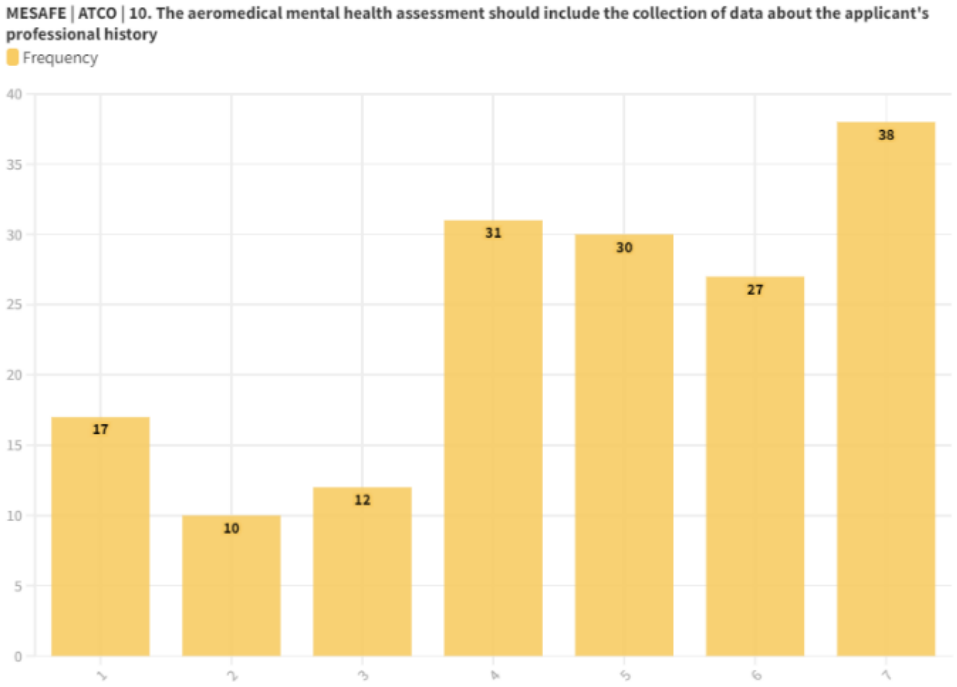


Figure 59 - ATCOs' perception on psychosocial history data

Q11 Involvement of a MHS in the mental health assessment.

In this close-ended question, respondents could report “other” options.

For the pilot population, 36 pilots (21.7%) reported that a MHS should be involved in the aeromedical assessment, especially at initials, 37 pilots (22.3%) both for initial and for renewal/revalidation, and 78 pilots (47%) agreed, but only if particular needs arise, while 11 pilots (6.6%) reported that they would not want the MHS involved in the aeromedical mental health assessment.

Since the “other” answer option was present, 4 (2.4%) specific answers were collected and are reported in the graph below.

For the ATCO population, 46 ATCOs (27.9%) reported that a MHS should be involved in the aeromedical assessment, especially at initials, 78 ATCOs (47.3%) both for initial and for renewal/revalidation, and 39 ATCOs (23.6%) agreed, but only if particular needs arise, while 1 ATCO (0.6%) reported that they would not want the MHS involved in the aeromedical mental health assessment.

Since the “other” answer option was present, 1 (0.6%) specific answer was collected and is reported in the graph below.

These results show a propension in ATCOs towards having a MHS both for initials and renewal/revalidation applications. Pilots would rather prefer having a MHS only when a particular need arises. Only few responses were collected against having the MHS involved in the MH assessment.

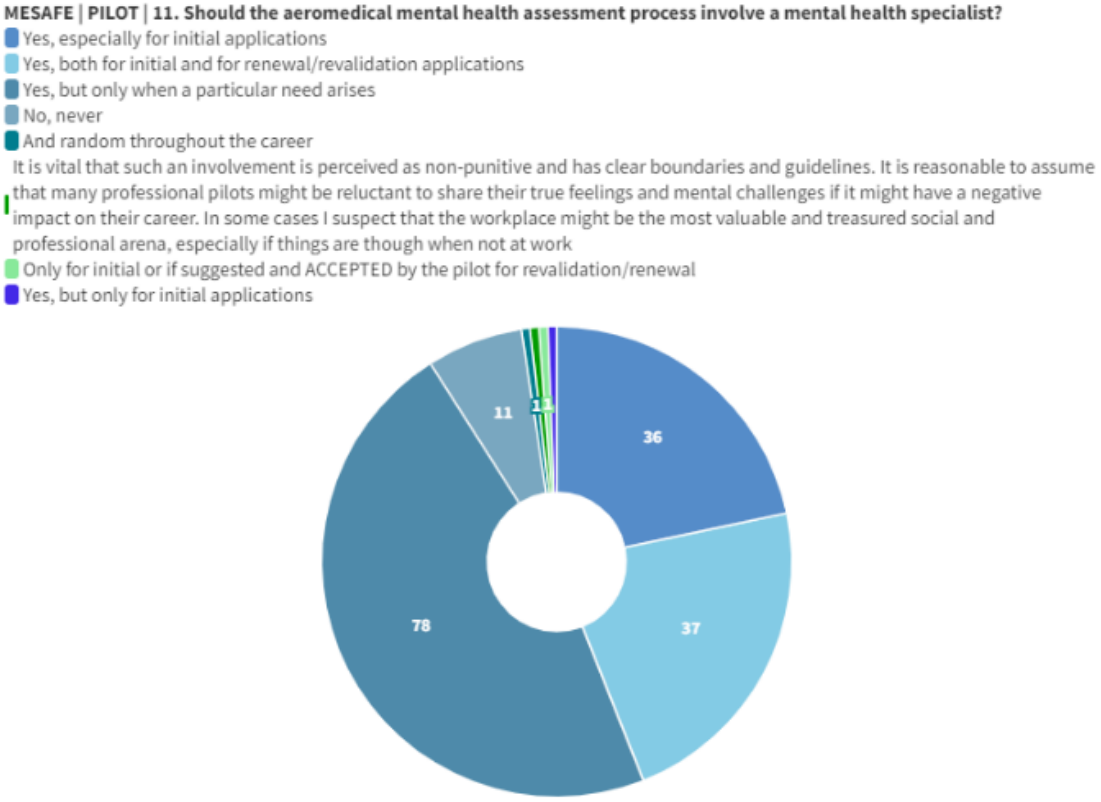


Figure 60 - Pilots' perception on the MHS involvement in the aeromedical mental health assessment

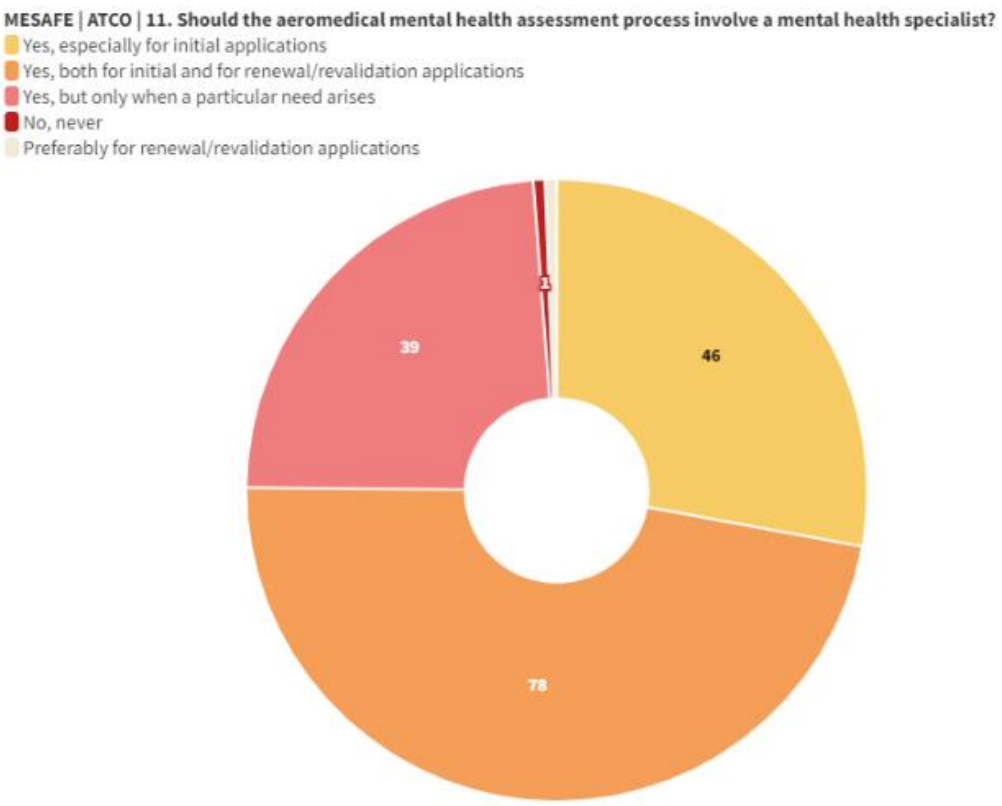


Figure 61 - ATCOs' perception on the MHS involvement in the aeromedical mental health assessment

Q12 AME referral to the MHS.

In this close-ended question, respondents could report “other” options.

For the pilot population, 31 pilots (18.7%) reported that the AME should refer the applicant to a MHS at all initials, 129 pilots (77.7%) only if particular needs arise, while 4 pilots (2.4%) answered “No, never”.

Since the “other” answer option was present, 2 (1.2%) specific answer were collected and are reported in the graph below.

For the ATCO population, 60 ATCOs (36.4%) reported that the AME should refer the applicant to a MHS at all initials, 98 ATCOs (59.4%) only if particular needs arise, while 3 ATCOs (1.8%) answered “No, never”.

Since the “other” answer option was present, 4 (2.4%) specific answer were collected and are reported in the graph below.

These results show a propension in both pilots and ATCOs populations to be referred to a MHS only when a particular need arises (77.7% for pilots and 59.4% for ATCOs). However, an important number of respondents would refer the applicant to a MHS for all initials (18.7% for pilots and 36.4% for ATCOs).

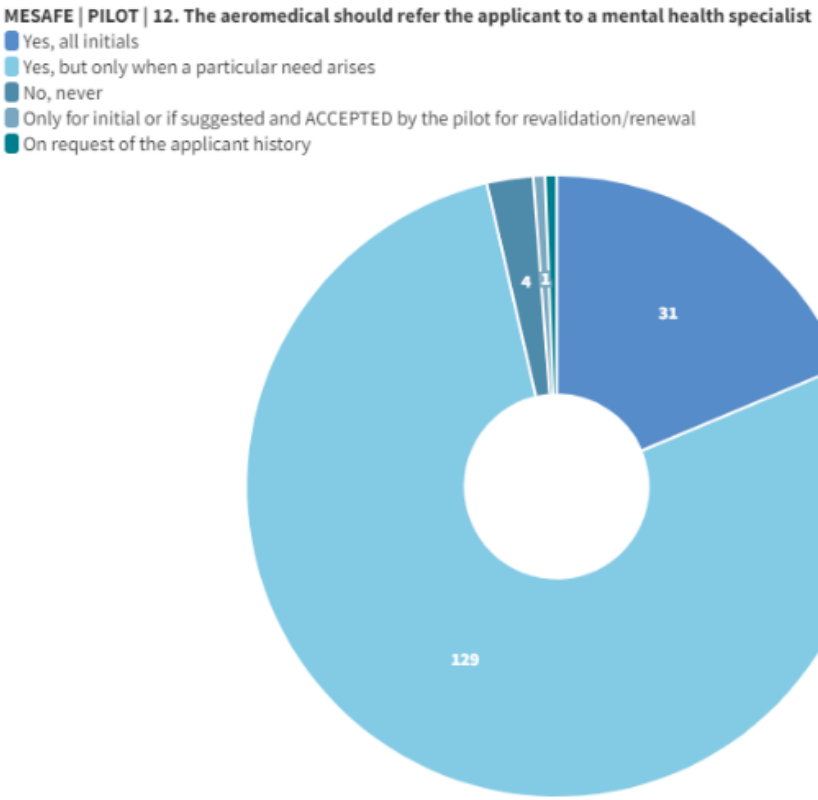


Figure 62 - Pilots' perception on the applicant referral to the MHS

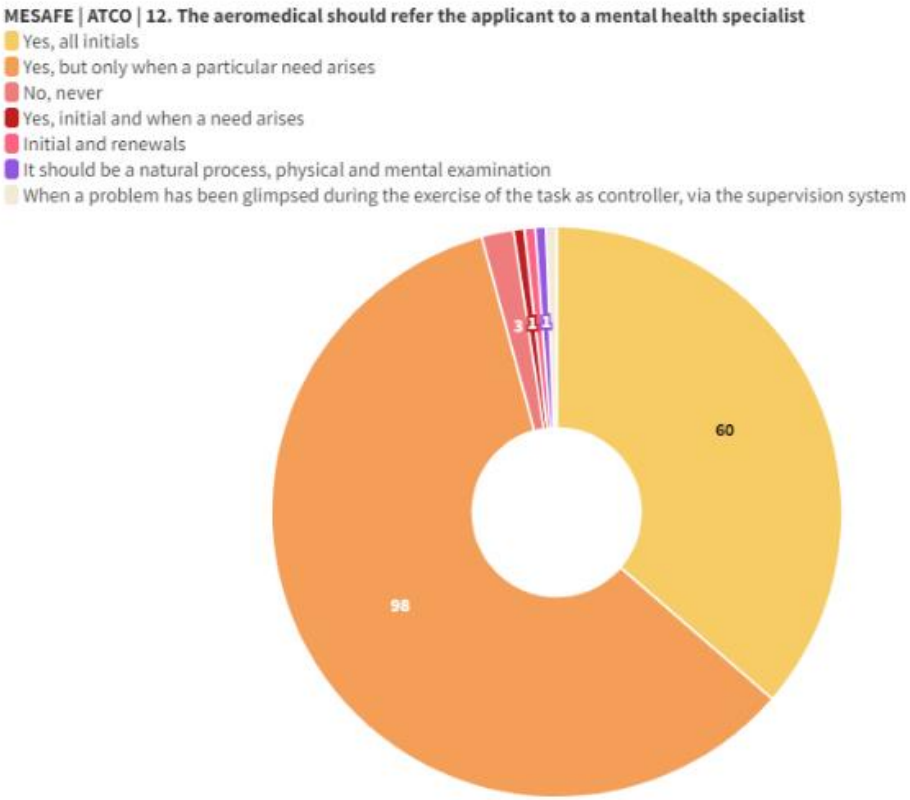


Figure 63 - ATCOs' perception on the applicant referral to the MHS

Q13 Close cooperation between AMEs and MHS to improve the effectiveness of the MH assessment.

Aggregating 1-2-3 responses both for pilots and ATCOs, 29 pilots (17.5%) and 12 ATCOs (7.3%) disagree or completely disagree with the statement “a close cooperation between AMEs and MHS would improve the

effectiveness of the aeromedical mental health assessment". 22 pilots (13.2%) and 17 ATCOs (10.3%) remain neutral. Aggregating 5-6-7 responses both for pilots and ATCOs, 115 pilots (69.3%) and 136 ATCOs (82.4%) agree or completely agree in a close cooperation between AMEs and MHS to improve the effectiveness of the MH assessment.

This result shows that almost 70% of the pilots and 82% of the ATCOs perceive this cooperation as important and of value to improve today's procedures.

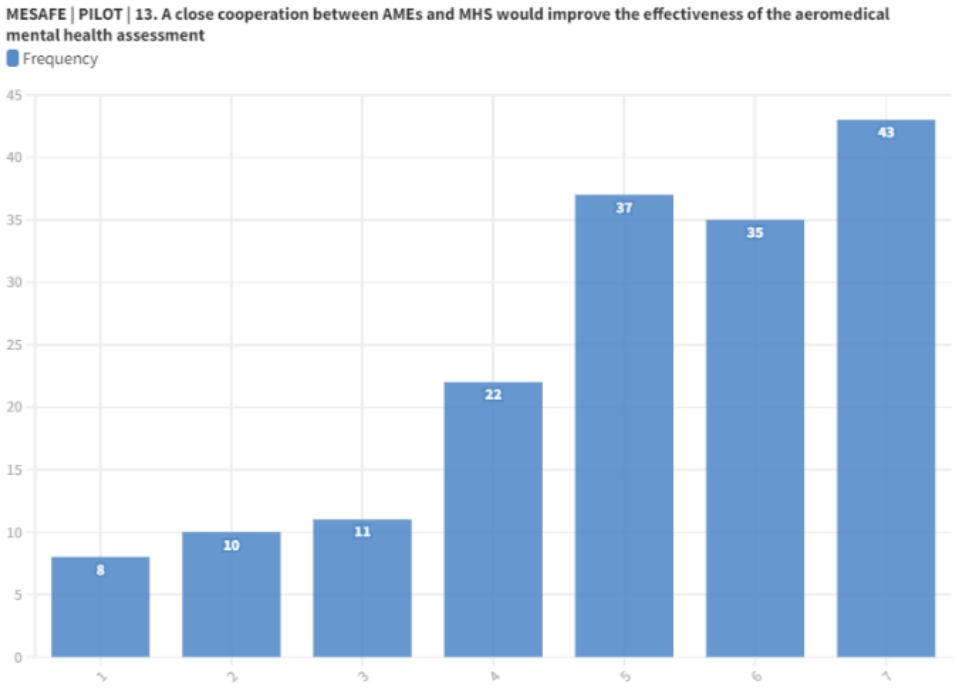


Figure 64 - Pilots' perception on a close cooperation between AMEs and MHS to improve the effectiveness of the aeromedical mental health assessment

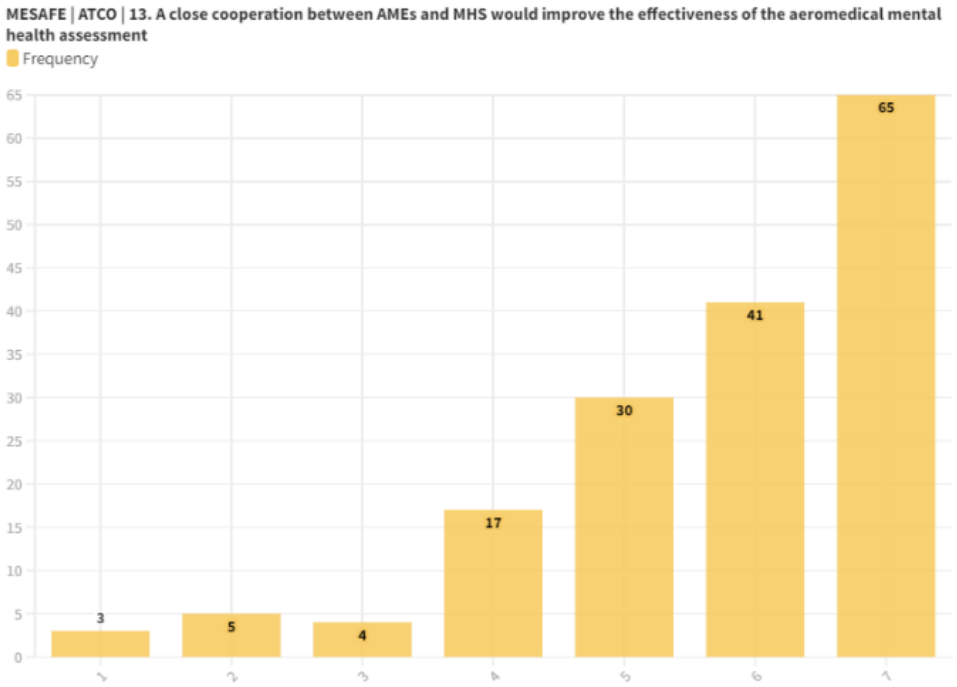


Figure 65 - ATCOs' perception on a close cooperation between AMEs and MHS to improve the effectiveness of the aeromedical mental health assessment.

2.2.4.3 Final remarks

Two open-ended questions were asked to pilots and ATCOs to provide further information on challenges and recommendations to improve the aeromedical mental health assessment and management of the mental incapacitation risk.

Q22 Currently, what are the issues preventing a good aeromedical mental health assessment?

Pilots and ATCOs were asked to identify the greatest challenges that they were facing in the aeromedical mental health assessment for both initial and revalidation/renewal applications. The feedback received (Table 5) was clustered into 11 categories, which are provided in the table below.

CHALLENGES	Mentions by ATCOs	Mentions by Pilots
Blame culture	16	14
Loss of license concerns	**19**	**42**
Shortage of MHS	11	11
Insufficient resources (doctors, time)	**33**	**22**
Low interest by the authorities and service providers in assessing and promoting workers' mental health	**23**	**22**
Absence of any assessment of MH	13	10
Lack of supporting procedures for mental health assessment and assistance	12	18
Sensitive data protection concerns	3	9
Lack of training modules about MH targeted to AMEs	17	14
Lack of training modules about mental health management targeted to ATCOS/pilots	3	5
Poor work-related stress management	9	6

Table 5 - Issues preventing a good aeromedical mental health assessment

As it is possible to see in the table, the top 3 challenges are "Loss of license concerns", "Insufficient resources" and "Low interest by the authorities and service providers in assessing and promoting workers' mental health".

The top 5 challenges reported by pilots are:

- Loss of licence concerns (N=42)
- Low interest by the authorities and service providers in assessing and promoting workers' mental health (N=22)
- Insufficient resources (doctors, time; N=22)
- Lack of supporting procedures for mental health assessment and assistance (N=18)
- Lack of training modules about MH targeted to AMEs (N=14)

The top 5 challenges reported by ATCOs are:

- Insufficient resources (doctors, time; N=33).
- Low interest by the authorities and service providers in assessing and promoting workers' mental health (N=23)
- Loss of licence concerns (N=19)

- Lack of training modules about MH targeted to AMEs (N=17)
- Blame culture (N=16)

Below are some statements made by the respondents:

Loss of licence concerns:

- *"The potential punitive side of it is also a big issue, **not knowing what is acceptable to talk about** without risking losing the medical approval or being subjected to extensive testing. All pilots will undergo though times in life, just like everyone else. **I wish there was a system where my colleagues could call or talk to someone** without fearing the consequences. After working for an airline with hundreds of pilots for many years I have heard stories about many personal tragedies (suicide, substance abuse etc), that probably **could have been avoided if it was easier to ask for help in a secure environment**".*
- *"**Mental health issues are often not covered by loss of license insurances**. As long as a pilot has any fear about the continuation of his profession, putting bread on the table for his family, this pilot will be **prone to lie** about his (mental) health".*
- *"The fact that if you seek help you may be grounded. This may cause pilots not to seek the assistance they need. The **same applies to other medical issues** as well".*

Insufficient training/resources:

- *"I have been to several aeromedical examiners that share the same frustration, which I have discussed with them. They are **neither trained** nor do they have the **time or resources to perform good assessments today.**"*

Low interest in promoting mental health:

- *"If employers were required to provide Loss of Licence/Medical insurance that included a loss of medical due to a mental health issue, with full pay until recovery or significant 6-7 figure payout for permanent loss of medical, then many would start to open up. **Until then, no chance**".*
- *"**Too much focus on grounding and diagnoses, and too little on keeping people happy and flying**".*

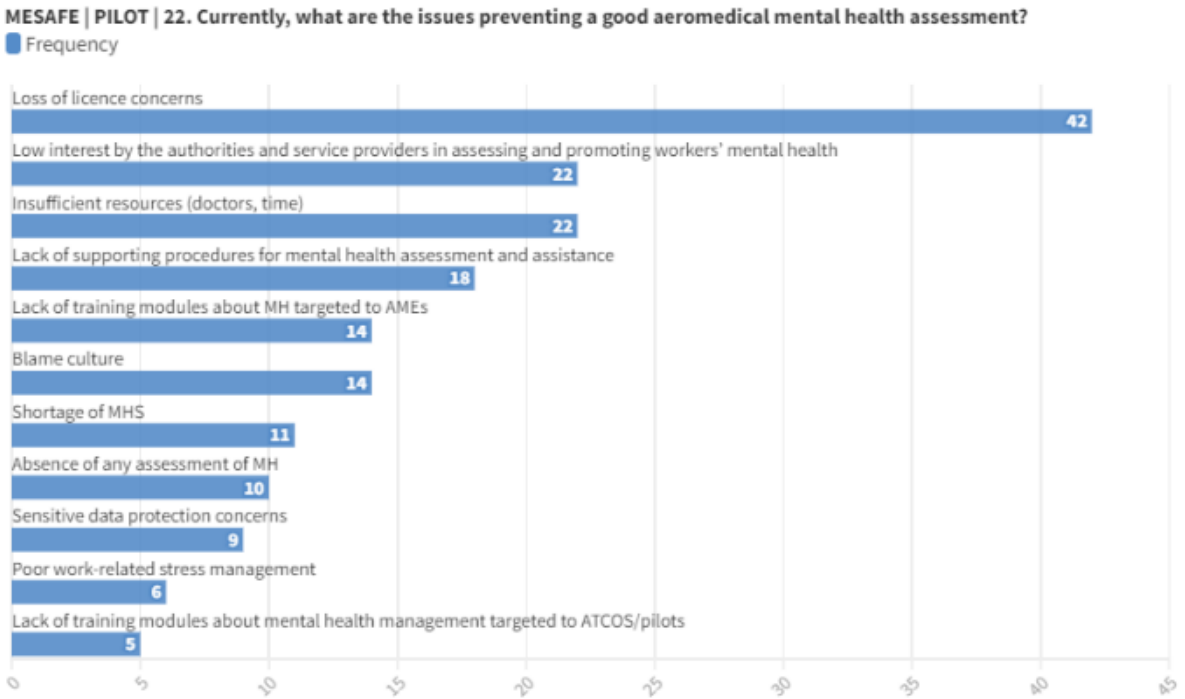


Figure 66 - Pilots' perceived issues preventing a sound aeromedical mental health assessment

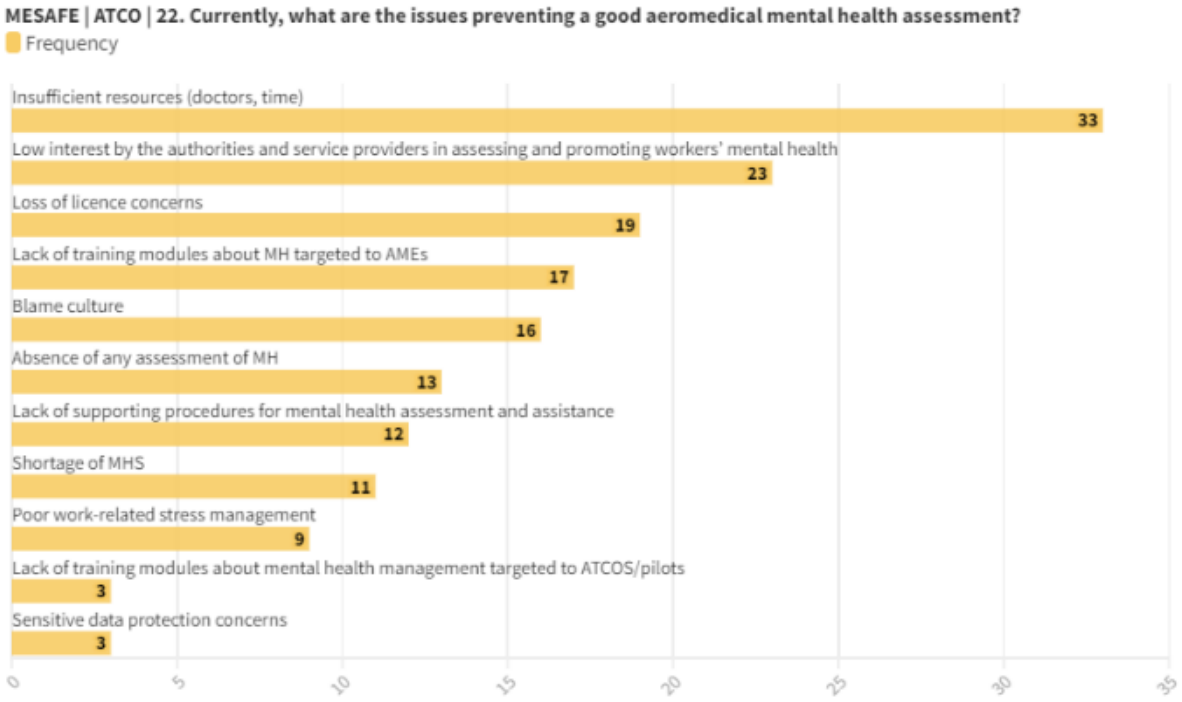


Figure 67 - ATCOs' perceived issues preventing a sound aeromedical mental health assessment

Q23 What would you recommend to improve the aeromedical mental health assessment process?

Pilots and ATCOs were also asked to suggest recommendations to improve the aeromedical mental health assessment both for initial applicants and revalidation/renewal applicants. The feedback received (Table 6) was clustered into 14 main recommendations, that are provided in the table below.

RECOMMENDATIONS	Mentions by ATCOs	Mentions by Pilots
Just culture towards mental health issues	18	**19**
Sensitive data protection	2	7
Loss of licence mitigations	3	7
Mental health assistance services provision	8	6
Involvement of MHS in the MH assessment	13	**18**
Increased time for the MH assessment	5	8
Increased support for mental health by the authorities and service providers	**24**	**24**
Thorough and periodical evaluations of mental health. Including the MH assessment for renewals/revalidations	**19**	10
Involvement of MH specialists	13	10
Improved procedures	**28**	10
Training on MH for AMEs	8	16
Mental health management training modules targeted to ATCOS/pilots	11	5
Work-related stress management	11	5

Peer Support Programmes	5	10

Table 6 - Pilots' and ATCOs' recommendations to improve the aeromedical mental health assessment process

As illustrated in the table, the top 3 recommendations are “Just culture towards mental health issues”, “Increased support for mental health by authorities and service providers” and “Involvement of Mental health specialists in the mental health assessment”.

The top 5 recommendations reported by pilots are:

- Increased support for mental health by authorities and service providers (N=24)
- Just culture towards mental health issues (N=19)
- Involvement of Mental health specialists in the mental health assessment (N=18)
- Training on mental health for AMEs (N=16)
- Peer support programmes (N=10); Improved procedures (N=10); Involvement of Mental health specialists (N=10); and Thorough and periodical evaluations of mental health. Including the MH assessment for renewals/revalidations (N=10).

The top 5 recommendations reported by ATCOs are:

- Improved procedures (N=28)
- Increased support for mental health by the authorities and service providers (N=24)
- Thorough and periodical evaluations of mental health. Including the MH assessment for renewals/revalidations (N=19)
- Just culture towards mental health issues (N=18)
- Involvement of Mental health specialists (N=13) and Involvement of Mental health specialists in the mental health assessment (N=13).

Below are some statements made by the respondents:

Mental health assistance service provision and cooperation AME/MHS.

- “*Give each ATCO the possibility to speak with a psychologist on a regular basis without the risk of losing the medical/be judged. Then if the AME is detecting something on the yearly exam, the psychologist assigned to the ATCO should be contacted and together make a strategy to get the ATCO cleared for duty if needed*”.

Increased time and Mental health specialists’ involvement.

- *“**More time** on the exam and that it is a **mental health professional** who takes the exam”.*

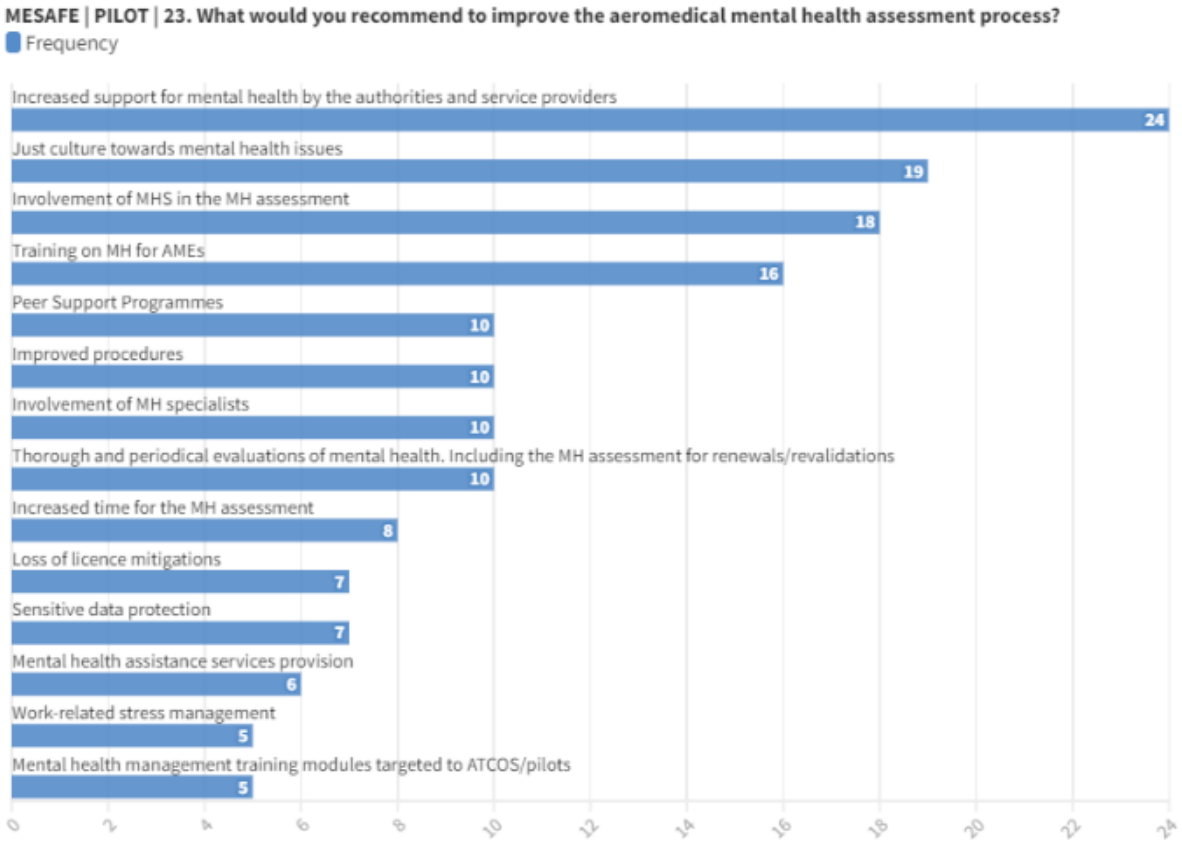


Figure 68 - Pilots' recommendations to improve the aeromedical mental health assessment

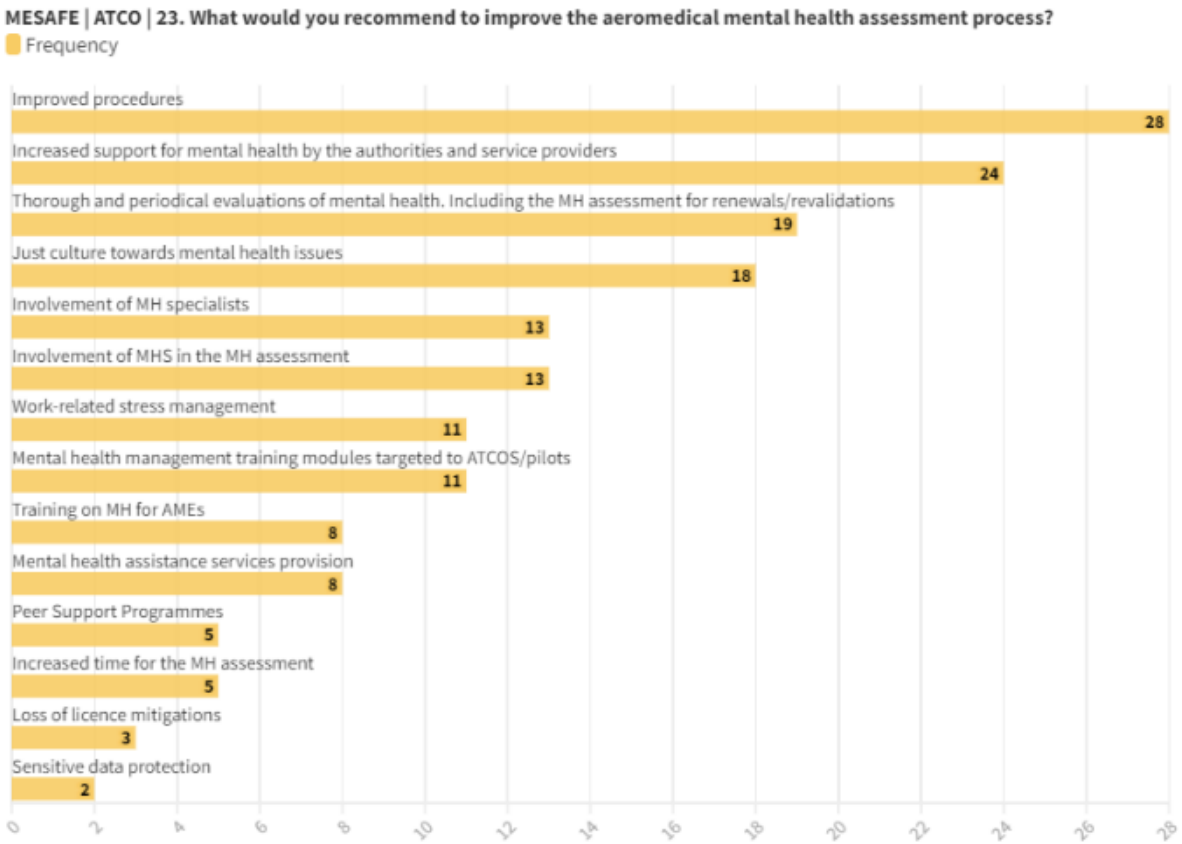


Figure 69 - ATCOs' recommendations to improve the aeromedical mental health assessment

2.3 Comparison and common findings of the three surveys

The following section aims to provide a comprehensive synthesis of the results obtained from the three surveys: AMEs, pilots, and ATCOs. This section will present the key findings, enabling a deep understanding of the overall outcomes obtained with regards to today's aeromedical mental health assessment. Table 7 reports the main findings per specific category. Similarities and differences in the findings will then be discussed.

Survey section	AMEs	Pilots	ATCOs
General information	102 AMEs. Mainly from Germany (N=19;18.6%), Italy (N=14; 13.7%), and Spain (N=14; 13.7%). With at least 15 years of experience (N=51; 50%).	166 pilots Mainly from Norway (N=58; 34.9%), Belgium (N=27; 16.3%) and Ireland (N=14; 8.4%). With more than 10.000 hours of flight experience (N=59; 35.5%)	165 ATCOs Mainly from Sweden (N=32; 19.4%), Spain (N=30; 18.2%) and both Slovenia (N=17; 10.3%) and Norway (N=17; 10.3%). With at least 15 years of experience (N=104; 63%)
Your current experience	AMEs' most used procedure is to assess mental fitness independently. There is a high heterogeneity in tests used both for the initial and revalidation/renewal assessments. Most AMEs make use of MHS for mental health evaluation only if specific needs arise. Almost no AMEs refer applicants to MHS for the treatment of any temporary or permanent psychological distress.	54% of pilots underwent a mental health assessment at the initial application. 71% of pilots undergo a mental health assessment at the renewal/revalidation application. AMEs' most used procedure is to assess mental health independently both at initial and renewal/revalidation applications. There is a high heterogeneity in tests used by AMEs both for the initial and revalidation/renewal assessments. Usually, less than 15 minutes is allocated to the mental health assessment.	63% of ATCOs underwent a mental health assessment at the initial application. 44% of ATCOs undergo a mental health assessment at the renewal/revalidation application. AMEs' most used procedure is to assess mental health independently both at initial and renewal/revalidation applications. There is a high heterogeneity in tests used by AMEs both for the initial and revalidation/renewal assessments. Usually, less than 15 minutes is allocated to the mental health assessment.
Gaps and needs	Almost half of the AMEs don't have usable and effective criteria to decide whether to refer to the mental health specialists. Almost all the respondents agree that AMEs should work closely with MHS.	70% of pilots think the current aeromedical assessment process is not effective to detect MH issues impacting the safety of operations. 60% of pilots think that the time allocated for the current aeromedical assessment process is not enough. 42% of pilots agree that the aeromedical assessment process should include the collection of the applicant's psychosocial history data. 46% of pilots agree that the aeromedical assessment	68% of ATCOs think the current aeromedical assessment process is not effective to detect MH issues impacting the safety of operations. 66% of ATCOs think that the time allocated for the current aeromedical assessment process is not enough. 58% of ATCOs agree that the aeromedical assessment process should include the collection of the applicant's psychosocial history data.

		process should include the collection of the applicant's professional history data. 47% of pilots would involve a MHS only when a particular need arises. 78% of pilots would want to be referred to a MHS only when a particular need arises. 69% of pilots perceive the cooperation between AMEs and MHS as important and of value to improve today's procedures.	57% of ATCOs agree that the aeromedical assessment process should include the collection of the applicant's professional history data. 47% of ATCOs would involve a MHS both for initial and for renewal/revalidation applications. 59% of ATCOs would want to be referred to a MHS only when a particular need arises. 82% of ATCOs perceive the cooperation between AMEs and MHS as important and of value to improve today's procedures.
Mental incapacitation risk management at operational level	More than half of the AMEs find it very difficult to assess the mental incapacitation risk level, based on medical records. Only the 20% of the AMEs find it easy to collect information about mental health during the aeromedical examination.	92% of pilots agree that Mental health issues may pose risks on the safety of operations. 1/3 of pilots (34%) find difficult to detect signs and symptoms of mental discomfort in themselves. 1/2 of pilots (52%) find difficult to detect signs and symptoms of mental discomfort in colleagues. 1/2 of pilots (55%) find difficult to detect signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues. 41% of pilots take actions when a colleague shows signs and symptoms of stress potentially impacting operational safety. 57% of pilots have received training about mental health issues' signs and symptoms. 78% of pilots have received training about the safety impact of alcohol, drugs and other psychoactive substances. 57% of pilots have received training about the safety impact of psychoactive medication	99% of ATCOs agree that Mental health issues may pose risks on the safety of operations. 1/3 of ATCOs (32%) find difficult to detect signs and symptoms of mental discomfort in themselves. 1/3 of ATCOs (32%) find difficult to detect signs and symptoms of mental discomfort in colleagues. 1/3 of ATCOs (33%) find difficult to detect signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues. 42% of ATCOs take actions when a colleague shows signs and symptoms of stress potentially impacting operational safety. 60% of ATCOs have received training about mental health issues' signs and symptoms. 73% of ATCOs have received training about the safety impact of alcohol, drugs and other psychoactive substances. 55% of ATCOs have received training about the safety impact of psychoactive medication
Peer support programmes	A considerable percentage of AMEs (36%) have never	90% of pilots are aware of what PSGs are.	73% of ATCOs are aware of what PSGs are.

	consulted peer support groups, and in general just over half of them have consulted them. Almost all the respondents agree that AMEs should work closely with Peer support groups.	71% of pilots think that PSGs are effective to mitigate stress. 60% of pilots agree that a close cooperation between AMEs and PSGs would help mitigate the safety risks related with mental health issues.	62% of ATCOs think that PSGs are effective to mitigate stress. 63% of ATCOs agree that a close cooperation between AMEs and PSGs would help mitigate the safety risks related with mental health issues.
Challenges	Applicants' opposing attitudes to disclose information. Difficulties in identifying symptoms. Lack of training on mental health. Lack of legal definition or basis of implementation Mental Health Assessment in the different CAA. Absence of clear, robust, and validated questionnaires and interviews. Impossibility to access the applicant psychosocial and medical history; no access to earlier AME's record. Lack of cooperation among AMEs and mental health specialists. Too little time allocated to assess mental fitness of applicants.	Loss of licence concerns. Low interest by the authorities and service providers in assessing and promoting workers' mental health. Insufficient resources (doctors, time). Lack of supporting procedures for mental health assessment and assistance. Lack of training modules about MH targeted to AMEs. Blame culture. Shortage of MHS. Absence of any MH assessment. Sensitive data protection concerns. Poor work-related stress management. Lack of training modules about mental health management targeted to ATCOs/pilots.	Insufficient resources (doctors, time). Low interest by the authorities and service providers in assessing and promoting workers' mental health. Loss of licence concerns. Lack of training modules about MH targeted to AMEs. Blame culture. Absence of any MH assessment. Lack of supporting procedures for mental health assessment and assistance. Shortage of MHS. Poor work-related stress management. Lack of training modules about mental health management targeted to ATCOs. Sensitive data protection.
Recommendations	Multidisciplinary collaboration with mental health specialists and peer support groups. Standardized questionnaires and interviews. Possibility to access the applicant psychosocial and medical history. Shared procedures among Member States. Especially through EASA guidelines on how to perform the assessment. Periodical evaluation performed by mental health specialists. Trainings and educational material both for AMEs and	Increased support for mental health by authorities and service providers. Just culture towards mental health issues. Involvement of Mental health specialists in the mental health assessment. Training on mental health for AMEs. Peer Support Programmes. Improved procedures. Involvement of MHS. Thorough and periodical evaluations of mental health. Including the MH assessment for renewals/revalidations.	Improved procedures. Increased support for mental health by the authorities and service providers. Thorough and periodical evaluations of mental health. Including the MH assessment for renewals/revalidations. Just culture towards mental health issues. Involvement of MHS in the mental health assessment. MH management training modules for ATCOs. Work-related stress management. Training on MH for AMEs.

	mental health specialists on their collaboration.	Increased time for the MH assessment. Loss of licence mitigations. Sensitive data protection. Mental health assistance service provision. Work-related stress management. Mental health management training modules targeted to ATCOs/pilots.	Involvement of MH specialists. MH assistance service provision. Peer Support Programmes. Increased time for the MH assessment. Loss of licence mitigations. Sensitive data protection improvement.

Table 7 - Comparison and common findings of the three surveys

As shown in the table, all the three surveys confirm that:

1. **the AMEs' most used procedure is to assess mental fitness independently both at initial and renewal/revalidation applications.** In fact, AMEs recommended to have "Shared procedures among Member States". Recommendations which are shared also with pilots and ATCOs since they recommended to have "Improved procedures" and "Thorough and periodical evaluations of mental health. Including the MH assessment for renewals/revalidations."
2. **there is a high heterogeneity in tests used both for the initial and revalidation/renewal assessments.** In fact, AMEs recommended to have "Standardized questionnaires and interviews".
3. **the time allocated to the mental health assessment should be increased.** In fact, in the challenges, AMEs report that too little time is allocated to assess mental fitness of applicants. Pilot and ATCOs reported that usually, less than 15 minutes is allocated to the mental health assessment.
4. **there is a lack of training modules about MH targeted to AMEs.** In fact, AMEs report not to have usable and effective criteria to decide whether to refer to the MHS, while pilots and ATCOs think the current aeromedical assessment process is not effective to detect MH issues impacting the safety of operations.
5. **AMEs should work closely with MHS.** In fact, AMEs find difficult to assess the mental incapacitation risk level, based on medical records. And with no other data available, only 20% of the AMEs find it easy to collect information about mental health during the aeromedical examination. AMEs, as a challenge, also report applicants' opposing attitudes to disclose information. On the other hand, both pilots and ATCOs, report concrete concerns for the loss of their licence (generally, with no insurance coverage for MH issues) and a low interest by the authorities and service providers in assessing and promoting workers' mental health. Although:
    - 42% of pilots and 58% of ATCOs agree that the aeromedical assessment process should include the collection of the applicant's psychosocial history data.
    - 46% of pilots and 57% of ATCOs agree that the aeromedical assessment process should include the collection of the applicant's professional history data.

    In fact, pilots and ATCOs recommend increasing the support for mental health by authorities and service providers and promote a just culture towards mental health issues.
6. **a close cooperation between AMEs and PSGs would help mitigate the safety risks related with mental health issues.** In fact, 71% of pilots and 62% of ATCOs think that PSGs are effective to mitigate stress.

In conclusion, the results showed that, to effectively manage the mental incapacitation risk, appropriate aeromedical assessment measures should be designed and combined with organisational initiatives. It is crucial to structure and provide shared and standardised procedures among Member States for the MH assessment, but also shared instruments and tools to assess mental health issues and mental incapacitation

acceptable risks. Moreover, the implementation of the mental health assessment and the administration of tools require an increase in time allocated for it.

In addition, training modules for AMEs on mental health and mental health signs and symptoms detection should be provided.

The aspects of sensitive data protection need to be further explored. Confidentiality is one of the most relevant hot topics today and most divisive for the survey respondents.

Finally, the collaboration between AMEs and MHS needs to be strengthened, as well as the one with PSGs.

2.4 Limitations and strengths of results

As any survey, also the MESAFE surveys present some limitations, as follows:

- selection bias of participants, because of:
    - fully voluntary participation;
    - no predefined balance between countries;
    - too little number of pilots and ATCOs who participated in the survey to be considered as representative of all the EU pilots and ATCOs population;
- response bias, because respondents might have given desirable answers;
- qualitative data analysis.

For these reasons, the results cannot be considered as statistically meaningful. Despite this, still high-level insights can be derived from the answers thanks to:

- the considerable experience of all participants;
- the considerable overlap and comparability of the outcomes of the three surveys.

Moreover, these surveys represent one of the first EU initiatives to investigate the mental health topic at institutional level, ultimately working as starting point to detect main gaps to be further investigated and consolidated.

3. How to improve the acceptability of the aeromedical mental health assessment

This section addresses some proposals to improve the acceptability of the aeromedical mental health assessment based on the results of the three surveys presented in section 2.

Following an attentive reading of the critical issues that AMEs, pilots and ATCOs have reported, in MESAFE we wondered, first of all, how the self-declaration principle could work in a context, such as that of the periodical aeromedical examination, featured by a climate of evaluation anxiety combined with the fear of losing one's job, on the hand of the applicants, and time pressure combined with high responsibility, on the other hand of the AMEs. Such a context facilitates, by its nature, self-protective and defensive behaviours to a greater extent than cooperative attitudes and unfortunately presents all the premises for not establishing an AMEs-applicants alliance. The result is therefore a natural self-protective reticence to disclose personal information, perceived very well by AMEs and recognized by applicants.

The lack of adequate time for the assessment, the lack of standardized psychodiagnostic procedures, the lack of mental health professionals to support AMEs and the lack of appropriate training targeted to AMEs about clinical interview management and mental health make the whole Mental Incapacitation Risk (MIR) management system even more vulnerable.

To address these issues, it is necessary to generate a context in which applicants are less afraid to disclose their problems and can find help and protection, rather than punishment, when disclosing. This context should be featured by specific characteristics, including:

- Focus on the risk for the applicant's health as well as the applicant's and passengers' safety, rather than on mental disorders' diagnoses
- Transparent transmission of information on the extent of this risk
- Transparent transmission, already during the aeromedical examination, of information on what happens after the license has been suspended and what support is planned for the applicant
- Financial support mechanisms for loss of license
- Peer Support Mechanisms for loss of license
- Professional Support Mechanisms for loss of license

In this perspective, the license suspension becomes a moment of discussion between the AME and the applicant on how to manage the safety risk of a mental health issue and on what steps to plan for a timely reintegration on duty, and, when this is not possible, for a sustainable reorientation and rehabilitation path.

We believe that these aspects also concern, to a certain extent, the aeromedical evaluation of physical diseases. In the case of mental disorders, however, the lack of measurable risk indicators and the stigma towards mental disorders, which even today, unlike physical diseases, are considered an individual's fault, are added to all those factors. In other words, no one would ever blame those pilots or ATCOs who have had a heart attack, while we tend to attribute a panic attack to the guilt of those pilots or ATCOs who are suffering from it, to their weakness and unwillingness to react. Socio-cultural differences with respect to mental health and psychological distress do the rest. These include:

- the imagery that each culture has with respect to mental disorders (e.g., they are all the same, all extremely disabling, all long-lasting and not recoverable -and that's not true)
- the imagery that each culture has with respect to individuals who are suffering from mental disorders (e.g., they are all not reliable, they are all abnormal, deviant, weird -and that's not true)
- the imagery that each culture has with respect to the possibility of seeking help for psychological discomfort.

- the imagery that each culture has with respect to the relationship between gender differences and the presence of mental disorders (many cultures attribute mental disorders to women more than to men)
- gender differences in expressing psychological discomfort and seeking help for it
- attitudes towards psychological discomfort and mental disorders within professional communities (it is known that stigma is stronger in professional environments where there is a male prevalence, where there is a current or inherited military culture, where people are dedicated to caring for others: with regard to the latter, it is important to underline that a considerable stigma exists towards the psychological discomfort of doctors, psychologists and psychiatrists).

MESAFE does not have the power to change the culture on mental health as this requires not only a lot of time but also additional initiatives. However, MESAFE believes that some basic principles could work as a first step towards a turnaround in thinking about mental health issues (Figure 70) and hopes its contribution would help make the aeromedical mental fitness certification process more effective.

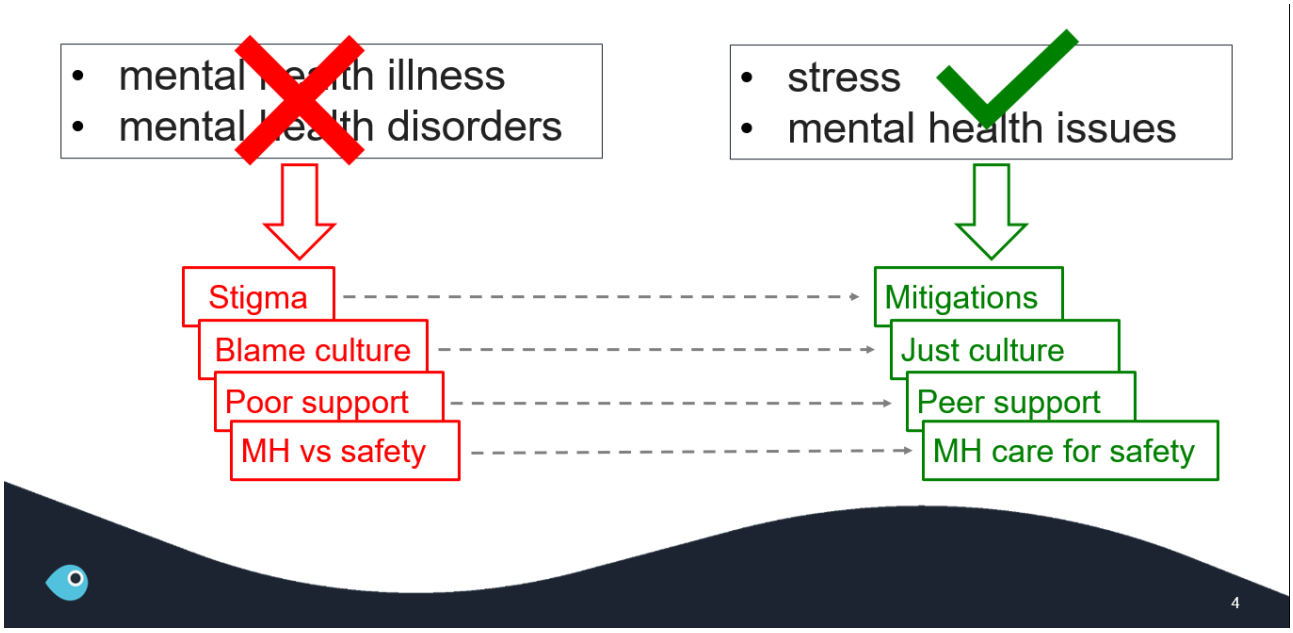


Figure 70 - the MESAFE principles for aeromedical assessments of mental health

What follows provides suggestions on how to improve the acceptability of the aeromedical mental health assessment from respectively the AMEs and the applicants' perspective, in the context of flight safety. These recommendations are based on the results of the surveys, specifically from the open-ended questions where AMEs, pilots, and ATCOs were asked recommendations to improve today's aeromedical mental health assessment.

3.1 For AMEs

What follows provides suggestions to improve the acceptability of the aeromedical mental health assessment from the AMEs point of view.

These have been clustered into measures to have complete information, measures to get advice, measures to enable skills.

3.1.1 Measures to have complete information

For an AME it may be difficult to achieve an overview of the current mental health status of applicants in the solely framework of the aeromedical interview, especially at initials and especially when non-reporting of symptoms is probable. That's why MESAFE recommends to complement the information achieved by means of the aeromedical interview with background information on the applicant's psychosocial and professional

history and also provides guidance about key aspects to address in the aeromedical interview on mental health. The following suggestions are proposed:

- **Give AMEs the access to the applicant's medical records**: to enable the AME to have a comprehensive overview of the applicant's medical history, including any previous mental health issues or treatment. This information can be helpful in assessing the applicant's current mental health status and risk of future problems.
- **Give AMEs the access to the applicant's previous visits**: to enable the AME to see what emerged from previous aeromedical evaluations, including any mental health assessments. This information can be helpful in identifying any patterns of behaviour or symptoms that may be relevant to the applicant's current mental health status.
- **Give AMEs the access to the applicant's professional history**: to enable the AME to get information about the applicant's behavioural patterns on-duty and potential mental health issues impacting the ability to perform the job.
- **Provide AMEs with a list of key aspects to address in the aeromedical interview**: to enable the AME to get appropriate information.

3.1.2 Measures to get advice

No measurable indicators are available for the most of mental disorders. That's why the cooperation with experts on mental health could be suggested as a measure to promote the usability and acceptability of the aeromedical mental health assessment process. In line with this, in MESAFE we recommend to:

- **Provide AMEs with a network with MHS and PSG**: to allow AMEs to get support from other professionals who are expert respectively in mental health issues (MHS) and operational aspects (PSG). This network can provide AMEs with consultation, education, and referrals to other resources.

3.1.3 Measures to enable skills

- **Enable interview skills**: by means of target training courses, to help AMEs ask consistent questions and do it in an appropriate way, so as to collect more reliable information about the applicant's mental health history and current status.
- **Provide AMEs with mental health knowledge**: by means of target training courses, to help AMEs to improve their skills in mental health issues and their incapacitating potential.

3.2 For applicants

What follows provides suggestions to improve the acceptability of the aeromedical mental health assessment from the pilots and ATCOs point of view.

These have been clustered into measures to mitigate the impact of limitations, measures to benefit from the aeromedical mental health assessment, PSPs to improve the communication among the applicants, the employers and the AMEs, measures to improve work-related stress coping.

3.2.1 Measures to mitigate the impact of limitations

Any limitations for a certificate holder may impact the work status of an ATCO or pilot and the operations. The degree to which this becomes a problem for the applicant and the operation in question depends on the type of limitation, the work situation and the flexibility of the operations.

Limitations which require specific medical examinations (SIC) or time limitations may often be applied without causing a problem at the workplace, but may induce extra cost for certification which may or may not be covered by the employer.

Limitations are, with some exceptions, imposed by the Medical Assessor. The AME or AeMC is, however, responsible for the investigation, for organising the clinical reports from specialists, and the aeromedical assessment to be forwarded to the medical assessor at the licensing authority. Most limitations are standardised, such as visual limitations (VDL, VML, VNL, CCL) or limitations for hearing aids (HAL) other disability (APL, AHL,). However, limitations imposed as part of a MIE (mental incapacitation event) risk mitigation might be less standardised and need a thorough understanding of the pilot´s working environment and operational schedule. For example, when imposing a TML (limited period of validity of the medical certificate), it is advisable to take into account the validity of his/her licenses or ratings and scheduled check rides or simulator training when setting the exact time limit. Often such a coordination is possible and can decrease difficulties or unnecessary extra cost for both the pilot and the operator without hampering follow-up or flight safety. Another example is when an SSL (special restriction as specified) might be applied to an ATCO (ref. AMC2 ATCO.MED.B.001); A special restriction might involve special work scheduling or avoiding certain types of operation, or a requirement for a particular supervision or backup. In order for such restrictions to be helpful in relation to operations and safety, it is necessary to have a good dialogue between the AME/AeMC and the applicant, and in some cases also management. The process for evaluation of possible limitations should be tailored to each case, sometimes involving an aeromedical operational board and sometimes involving primarily the AME or AeMC with specialist support. The medical assessor should be kept in the loop as the ultimate decision-maker.

Based on the above, the following points must be taken into consideration when a limitation may be necessary to be imposed on a license:

- **Proactively mitigating the limitations' consequences:** the pilot or ATCO whose license may be subject to a limitation must be advised of the possibility and given the chance to openly and actively discuss with the AME the possible ramifications the relevant limitation might have on her or his work situation. Both the actual safety effect of the limitation, and the possible problems it may cause to the specific flight operation in question, should be discussed so that the AME or AMOB (Aeromedical-Operational board -see section 5.3) can find with the applicant the best course of action. The AMOB is a board of experts that MESAFE recommends to institute and will be described in section 5.3 of this document.
- **Providing assistance in finding solutions at the workplace.** If a limitation must be applied to the medical certificate, the practical consequences might be difficult for the pilot or ATCO to face alone. The AME or AMOB may in such circumstances offer help and advice to the license holder including necessary dialogue with the Medical assessor (who will make the decision) and also possibly employer to find solutions for continued operations in a safe and efficient manner both for the employer or employee. In some cases, an airline or ATCO organization might have an effective occupational health service who could assist. Such advice or dialogue with an employer must in all cases be cleared by the pilot or ATCO in question as professional secrecy fully applies. Peer support may in many cases also be available to assist the Pilot or ATCO in such circumstances. If a limitation has severe consequences, including loss of the operational job, professional reorientation advice may be necessary. In such cases it is important to ensure that the pilot or ATCO is not left to himself, but is given advice of possibilities in the short or long term, and connected up to an appropriate advisory body which may provide follow-up and support.
- **Loss of license insurance**. Stakeholders should be aware of the possible financial consequences of limitations which cannot be managed by mitigation measures at the workplace. Possible financial loss or loss of employment in such circumstances should be covered in a loss of license insurance if applicable.

All of the above points should be observed as a way of finding the best possible solutions in the interest of aviation safety. Such mitigation points may in addition play an important role in improving reporting of symptoms or problems to the AME, as fear of loss of employment or financial loss may to some extent be alleviated.

3.2.2 Measures to benefit from the aeromedical mental health assessment

Any aeromedical examination carries out a potential evaluation anxiety on the side of applicants, which has to be properly addressed to generate cooperation and alliance between them and the AMEs. To achieve this, it is important that pilots and ATCOs are enabled to benefit from the examination, even if it ends up with limitations. One way to benefit from the aeromedical examination is to get non-judgmental information on any real or potential incapacitation risk due to mental health issues and advice on how to receive treatment to decrease the safety risk level and, at the same time, appropriately treat the mental health issue ultimately improving the individual's well-being. In line with this, advice on how to manage mental incapacitation risk factors, including stress coping strategies, lifestyle best practices, etc should be also provided.

Based on the above, the following points must be taken into consideration when the aeromedical mental health examination is carried out:

- **Focus on mental incapacitation events rather than mental disorders**. Classifying mental disorders enables the communication among professionals, fosters research, enables the access to treatment, protects human rights and enables the access to refunds for mental health treatment expenses. On the other side, having a classification system can lead to disadvantages, such as danger of discrimination/exclusion, spread of stereotypes and labelling (reducing the person to her/his diagnosis). That's why it is important to tune the communication about mental health issues according to the interlocutor. When communicating among medical doctors or Mental health Specialists, the focus on mental disorders' diagnoses is important to share the same language to address mental health issues' signs and symptoms so as be sure that everybody understands the same meaning. Nevertheless, things change when medical doctors or Mental health Specialists communicate with pilots and ATCOs, who do not have the same knowledge on mental health. In such situations, communicating in form of diagnoses of mental health disorders may generate applicants' concerns, worries and fears. The latter put an unnecessary burden on pilots and ATCOs and may also prove to be inconsistent with the real consequences of a mental health issue on their job. That's why in MESAFE we propose to focus on Mental Incapacitation Events (MIEs) when speaking about mental health with the applicants. The focus on MIEs helps applicants to practically understand the consequences of these events on operational safety and ultimately their mental (and physical) health, preventing blame, judgement and labelling.
- **Provide referral to mental health specialists for treatment.** Even if treatment is out of the scope of any aeromedical examination, providing guidance on how to address a mental health issue may prove to foster the alliance between the AME and the applicant, ultimately improving operational safety, when no limitations are issued, as well as the individual's well-being (in any case). In fact, if a MIE is detected, the practical consequences might be difficult for the pilot or ATCO to face alone. That's why in MESAFE we recommend the AMEs to provide guidance and referral to mental health specialists for treatment. Applicants can benefit from the latter by learning how to mitigate ineffective behavioural patterns. When limitations are not issued, this may ultimately prove to reduce the safety risk and keep pilots and ATCOs on duty as long as possible. The referral to MHS for treatment can also be beneficial when limitations are issued.
- **Generate a just culture environment**, which is addressed in the next section.

3.2.2.1 Just Culture

For a long time, most cultures ascribed accidents and disasters to supernatural or religious causes.

It was only during the Enlightenment that the importance of human reasoning was recognized in western societies. As a consequence, errors, mistakes, and catastrophes were no longer considered purely bad luck or an act of God, but potentially the result of individual wrongdoing. Since then, technological advancements have meant that often small errors can have enormous consequences. One of the best examples is the Tenerife aircraft disaster in 1977, when a relatively minor communication error led to the death of more than 500 people. In safety-critical industries, such as the aviation and oil industry, accidents were long thought to

be caused by an individual's failure or misconduct and that the best way to prevent accidents in the future would be to punish the perceived culprit, to set an example (Van Marum et al, 2022). It has become clear that this approach does not work, because most accidents are not caused by one or more people but by a series of small events that are insufficient to cause an accident on their own but, if occurring simultaneously, can cause disasters. This is referred to as the "Swiss Cheese Model" (Reason 2000). In the late 20th century, the so-called blame-free safety culture was developed. People can report, without risk of punishment, all mistakes, errors, accidents, incidents, and other things that go wrong. A downside of this culture is that people who deliberately cause damage or who are grossly negligent go free, which creates a feeling of injustice.

This weakness of the blame-free culture in turn led to the development of the "just culture" concept (Dekker & Breaky 2016). Although different definitions exist, a just culture is generally regarded as a safety culture in which people can report accidents, incidents, mistakes, errors, and other mishaps without a risk of punishment. Only in the case of gross negligence or wilful misconduct will punitive measures be taken (Mulder & De Rooy 2019). A challenge to just culture is the tendency to sharply distinguish between acceptable and unacceptable behaviour. While most scholars consider this to be a hallmark of a just culture, some, such as Dekker and Breaky opine that this is not possible and that emphasis should be put on a restorative approach in which the needs of all stakeholders are addressed (Dekker & Breaky 2016). Effort should be focused on healing measures and not on drawing lines between acceptable and unacceptable behaviour. Perhaps an even bigger challenge to just culture are legal considerations. Whereas intentions are very important in a just culture (by punishing only in case of gross negligence or wilful misconduct), the outcome is important in legal procedures. One could say that law primarily looks backward to establish liability, whereas just culture primarily looks forward to establishing future safety (Van Marum et al, 2022). The only way for just culture principles to survive legally therefore, is if dedicated regulation is made or if private parties agree on the application of just culture principles. Examples of dedicated regulation are EU 376/2014 and ICAO annex 13 on accident investigation. The European Just Culture Declaration is a good example of adoption of just culture principles by private parties (European Just Culture Declaration).

Also the European Peer Support Initiative strongly supports Just Culture Principles (EPPSI Guide on Peer Support). Just culture principles have been defined differently by lawmakers, scholars and private organisations. A generally accepted definition of just culture does not exist, let alone a generally accepted definition of just culture in relation to the mental health of aircrew and air traffic controllers. When analysing the wide range of definitions used, almost all definitions of just culture seem to try to find a balance between safety and accountability. This is logical, as just culture principles have been developed for accident and incident investigations, not in relation to mental health risks. In relation to mental health risks, it is advisable also to incorporate medical ethical values into just culture. It can be suggested to include autonomy, a medical-ethical core value, into the balance of safety, accountability and autonomy. In line with general medical ethical principles, just culture for mental health in aviation will then mean balancing the rights and duties of all involved. The pilot and ATCO-patient have a right to good care, and a right not to be punished by job- or income loss because of mental disease. At the same time the pilot or ATCO-patient has a duty to provide safe operations, which means that he or she should be cooperative with mental health examinations and seek treatment when necessary. The industry and air navigation service providers have a duty to support a pilot or ATCO with mental illness, which means that adequate insurance for disability should be provided (De Rooy 2018).

Some examples of practical implementations of just culture principles in relation to mental health in aviation are:

- The MESAFE mental incapacitation risk matrix (see deliverable D2.1) supports an assessment of the safety of operations.
- The pilot/ ATCO has on obligation to comply with a mental examination and to provide relevant information.

- The AME and mental health professional report in an objective way, making sure their assessment can be replicated by others if necessary. The mental incapacitation risk matrix also helps to achieve this, especially when the applicant is involved actively.
- Pilots and ATCO's can report mental health problems without a fear of income loss, as long as they provide sufficient information for a valid assessment. Financial and social risks as a result from seeking help are minimised.
- Pilots and ATCO's can choose at any moment NOT to comply with a mental examination any more (this is in sharp contrast to the use of just culture principles in accident investigations, but a prerequisite of medical ethics). In this case, the financial risk of a loss of license will be borne by the pilot/ATCO.

One of the biggest challenges to applying just culture principles to mental health problems in airline personnel is to create a level playing field for all airlines. As of 2023, labour contracts vary highly between various airlines and countries, and sometime even between operational bases of the same airline. Especially airlines trying to minimize the financial risks of employee's who report sick, may suffer competitional disadvantages in an already harsh industry. Another risk is misuse by employees who are for example engaged in a labour conflict.

How to deal with these challenges is largely a political decision. One way could be a mandatory loss-of license insurance for all professional pilots and ATCO's. However, there are also many class 1 certificate holders who make an (partial) income from other activities than working as a pilot, to whom such an insurance will not be applicable. Another way would be uniform employment rules for aviation personnel across Europe, but this is legally extremely difficult, and a sensitive political matter outside the scope of this project.

As shown above, applying the proposed mental risk identification matrix in combination with active involvement of the applicant is a way of adopting just culture principles in daily aeromedical practice. For the aviation industry as a whole, the most feasible option for applying just culture principles for mental health in aviation personnel would be by voluntarily cooperation of employers, unions and other stakeholders. The European Pilot Peer Support Initiative is an excellent example of cooperation of various stakeholders embracing just culture principles. A next -and feasible- step could be the development of a uniformly accepted definition of just culture with regard to mental health of aviation personnel.

A suggested definition could be:

A just culture for mental health in aviation is a safety culture in which all safety sensitive personnel can report mental health problems in a supportive atmosphere without a risk of job- or income loss. If indicated, timely treatment according to the highest standards is available. A maximum effort is made to ensure that employees can return to their job safely. Safety sensitive personnel should however provide honest information and cooperate with mental examinations and treatment to their best capabilities. Appropriate measures are taken to protect confidentiality of medical information. It is acknowledged that some mental disorders may hamper the ability to provide accurate information and that cooperation may be hampered in case of a severe mental disorders. In this situation, no punitive actions will be taken*.

*This suggested definition acknowledges the European GDPR and national medical confidentiality laws as the relevant regulatory framework that is also applicable in case of mental health problems of safety-sensitive aviation personnel. Mental disorders that may hamper cooperation can for example be bipolar disorders and psychotic disorders, as well as some neurocognitive disorders. In inability to cooperate with mental examinations and treatment because of a mental disorder will automatically be disqualifying for medical certification.

3.2.3 Peer Support Programmes to improve the communication among the applicants, the employers and the AMEs

For background information on the principles, organisational aspects, and role in aviation safety of PSPs the reader is referred to section 4.1 of MESAFE Report D-1.2 (MESAFE - D-1.2 - Report on the review of treatment options).

In the context of the usefulness of PSPs to improve flight safety, this section will discuss the benefits and challenges of a PSP for pilots and ATCOs as well as for AMEs and national authorities.

What is the benefit for pilots and ATCOs in the context of flight safety?

A PSP offers a low-threshold safe and confidential haven for pilots who have problems, including mental health, psychosocial problems, work related problems, financial worries, health concerns, bereavement issues, relationship / family difficulties, or social demands. In some cases such problems may lead to significant mental health problems when they are not appropriately taken care of or treated (e.g. Hammen, 2005; Young, 2008). In many cases of pilots and ATCOs, who have such psychological or psychosocial problems, mental health is not a binary sick/not sick status but rather a continuum of well - to less well - to illness. In this continuum there are pilots and ATCOs feeling less well for whom deterioration to illness or mental incapacitation events might be prevented by suitable support and/or treatment, while keeping them on an active job status or taking them temporary off the roster during treatment while keeping their licence.

Because pilots and ATCOs may be unaware of the effects of their problems, or may hide these problems from their AME due to lack of trust or stigmatisation of mental problems, it is important that a PSP offers them a low threshold to take the first step in actively seeking help. In many cases this first step is the start of a trajectory in which the clients learn to cope with their problems, and/or get specialised support and treatment, leading to successful and safe continuation of their career in aviation.

It can be concluded that a PSP is beneficial to flight safety by keeping clients safely performing their job or, in other cases, taking them temporary off their job roster until they have recovered up to safety standards. Moreover, PSP support is beneficial for the personal wellbeing of the pilots or ATCOs.

In this context it should be considered that in EASA's GM1 CAT.GEN.MPA.215 a support programme is described as "a proactive programme applying the principles of 'just culture' as defined in Regulation (EU) No 376/2014, whereby senior management of the operator, mental health professionals, trained peers, where available, and in many cases representative organisations of crew members work together to enable self-declaration, referral, advice, counselling and/or treatment, where necessary, in case of a decrease in medical fitness." Although it is considered that a programme with trained peers would create the most optimal easy access and trust conditions, above cited EASA's GM1 opens a possibility to develop an alternative support programme in case there is no possibility to involve trained peers, as long as the preconditions as stated in EASA's CAT.GEN.MPA.215 are met (see https://www.easa.europa.eu/sites/default/files/dfu/Consolidated%20AMC-GM_Annex%20IV%20Part-CAT_March%202019.pdf).

What is the role of AMEs and what are the challenges?

The above-mentioned conclusion also means that a well functioning PSP is important for AMEs and national authorities. AMEs and national medical assessors and pilots/ATCOs share the same aim of their work which is to safeguard flight safety. For AMEs and national medical assessors PSPs are important means of prevention of aeromedically significant mental health problems. Therefore, information should be provided about the structure, key principles, and operating procedures of a PSP during the AME training. AMEs should learn that PSPs are to prevent that pilots with mental health issues are driven 'underground', but instead come forward to seek help. They should further know that a PSP will help pilots and ATCOs retain their medical certificate where possible, and enhance flight safety.

The benefits of a PSP can be utilised by AMEs through stimulating self-referral of pilots and ATCOs to a PSP. Self-referral can be stimulated by informing all applicants about 1) the potential effects of life stresses on

professional performance and wellbeing and 2) the possibilities which PSPs can offer. AMEs can also recommend self-referral to a PSP in individual cases where an AME suspects that the applicant's circumstances and/or life-stresses might -on longer term- lead to unfavourable developments in the applicant's mental health status or professional career, although the applicant may meet the fit requirements at the time of the examination.

In a PSP the Mental Health Professional (MHP) makes her/his judgement about a pilot's fitness to fly or what constitutes a threat to flight safety in conjunction with the consulting AME or company medical person. The only bodies able to decide to remove a pilot from the roster for medical reasons are the operator's medical department, the pilot's AME, or the National Aviation Authority. Such a decision is still protected by medical confidentiality (EPPSI, 2020).

In cases in which the PSP's MHP deems it necessary to take a client from the roster for some time period or that the medical certificate has to be suspended, the AME and/or national medical assessor will have to be informed and/or asked for their agreement and cooperation. In such cases the applicant's informed consent is needed and confidentiality should be observed wherever possible. In the case where flight safety is acutely threatened and the client refuses consent, it can be necessary to breach confidentiality. The boundaries of confidentiality and procedures to be followed in such cases are laid down in the Terms of Reference of a PSP.

To achieve above-mentioned beneficial effects it is proposed to strengthen the link between peer support groups and the AMEs, the medical assessors and the MHS, thus promoting an integrated approach for mental health assessment, monitoring, and prevention of incapacitation caused by mental health events. It is important that confidentiality, roles and working relationships between PSPs and AMEs/assessors are carefully considered and discussed, in order to build and retain trust of the applicants.

3.2.4 Measures to improve work-related stress coping

Since providing stress coping strategies falls within the scope of aeromedical examinations, in MESAFE we believe that engaging applicants in reporting work-related stressors and spreading knowledge on stress signals and coping can create an additional safety barrier to prevent the MIEs' negative effects on duty.

That's why in MESAFE we recommend including training modules on stress in the incapacitation training courses. These modules could include information about mental health issues detection in self and colleagues and appropriate actions to be taken, work-related stressors reporting to employers and AMEs, stress coping strategies.

4. The MESAFE approach for the aeromedical mental incapacitation risk assessment process

This section implements the recommendations proposed in section 3 into a revised process to assess the risk that mental incapacitation poses to aviation safety, that MESAFE intends to propose to update the current EU aeromedical procedures for assessing the risk of mental incapacitation of pilots and ATCOs.

From now on, we will call this process MIRAP, which stands for Mental Incapacitation Risk Assessment Process, and MIR the Mental Incapacitation Risk. As implicit in its name, the MIRAP is a process composed of a series of subsequent activities, called steps, that MESAFE suggests AMEs to follow during the aeromedical assessment of mental health to make the decision on the certification of mental fitness. The MESAFE MIRAP is therefore a process to support the decision making of AMEs.

This process applies the risk assessment methodologies already acknowledged in aviation (see the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests) to clinical psychology and psychopathology knowledge. The process has in fact been developed on the basis of the state of the art and up to date scientific evidence about mental disorders and psychodiagnostic procedures, which MESAFE has extensively described in deliverables D1.1 Report on the review of diagnostic measures, D1.2 - Report on the review of treatment options, D2.1 Report on the analysis of the availability of diagnostic tests and D3.1 Report on the analysis of the suitability of screening and confirmation tests for misuse of alcohol and drugs. All this information has been analysed with respect to its usability, acceptability and suitability to the aeromedical environment and customized within MIRAP on the basis of what the AMEs, pilots and ATCOs told us in the 3 surveys (see section 2) and its analysis: in line with this, the MIRAP addresses the suggestions and principles to improve the users' (AMEs as well as applicants) acceptability of the aeromedical mental health assessment as described in section 3.

The MIRAP implements the MESAFE matrix as presented in the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests. What follows will provide a wrap-up of this matrix and information on how to use it in the framework of the MIRAP.

4.1 The MESAFE matrix

Figure 71 reproduces the 5x5 matrix for mental incapacitation risk assessments that was proposed in the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests.

MESAFE MATRIX Risk assessment of mental health			Catastrophic - A	Hazardous - B	Major - C	Minor - D	Negligable - E
			May cause catastrophic event	may cause flight safety critical event	May comprimise flight safety	Reduced effectiveness and capacity to adapt to operational requirements	Minimal impact on flight safety
	Frequency per year	Flight hours between each event (approx) *	Total incapacitation	Severe incapacitation	Major decrement on performance	Minor to moderate performance compromise, may continue duties	Minimal impact on performance
Frequent 5	> 1/month	100	5A	5B	5C	5D	5E
Occasional 4	1-10 times	1.000	4A	4B	4C	4D	4E
Remote 3	10-99%	10.000	3A	3B	3C	3D	3E
Improbable 2	1-10%	100.000	2A	2B	2C	2D	2E
Extremely improbable 1	<1%	>1.000.000	1A	1B	1C	1D	1E
*given random onset of event unconnected to flight. If event is connected to flying activity (e.g. Murder suicide or flight anxiety),use career frequency rather than yearly							
	Risk unacceptable					**Operational risk reduction could be co-pilot, backup crew, time window to land helicopter etc. Personal risk factors could be close follow-up by psychologist, peer-support etc. Formalised risk reduction is documented and required in the certificate.	
	Risk unacceptable, but may in some cases be acceptable after thorough review and specific mitigation. A medical board should in such cases be employed**						
	Risk may be acceptable - may require operational and/or personal risk reduction**						
	Risk acceptable						

Figure 71 - the MESAFE matrix

What follows describes how to use the matrix in the framework of the MIRAP.

4.2 The MIRAP

Figure 72 describes the steps which the MIRAP is composed of. As it is possible to see in the picture, the MIRAP follows 7 subsequent steps, that are listed below:

- Step 1: identify any real or potential mental incapacitation events
- Step 2: determine the severity of the MIE identified
- Step 3: determine the probability of occurrence of the MIE identified
- Step 4: apply the matrix to detect the risk level
- Step 5: apply risk mitigation measures
- Step 6: re-apply the matrix to identify the new risk level
- Step 7: decision and follow-up

Two gates are foreseen in this process:

- Gate 1: “No MIEs”: this gate follows step 1. If step 1 provides, as an output, the absence of real or potential MIE(s) for the applicant, the process can move to step 7, where the decision is to release the mental fitness certification. On the contrary, in case step 1 gives, as an output, the presence of real or potential MIE(s) for the applicant, the process can move forward to step 2, where the severity and probability of occurrence of the MIE(s) will be assessed.
- Gate 2: “Risk is acceptable”: this gate follows step 4. If step 4 provides, as an output, an acceptable MIR level, the process can move to step 7, where the decision is to release the mental fitness certification. On the contrary, in case step 4 gives, as an output, the presence of an unacceptable MIR, the process can move forward to step 5, where limitations and mitigations will be assessed.

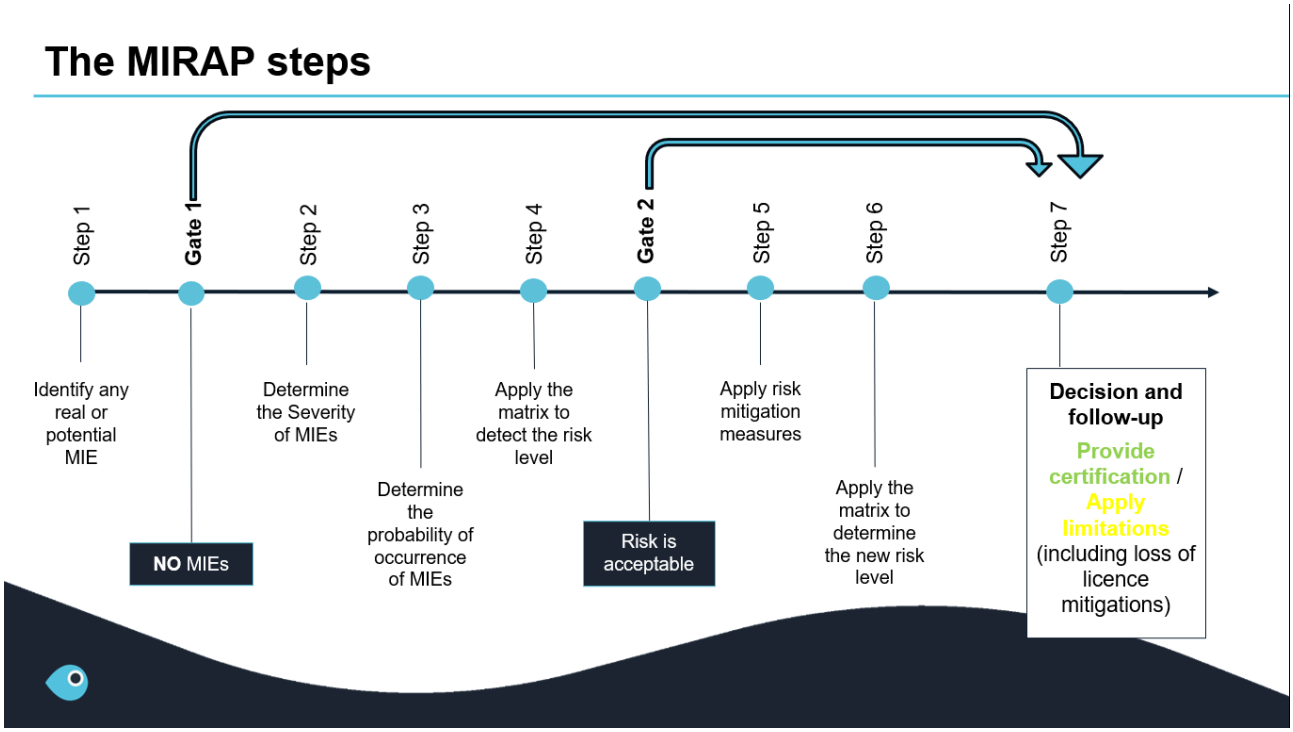


Figure 72 - the steps of the MESAFE MIRAP

4.2.1 Step 1: identify any real or potential mental incapacitation events

Figure 73 describes step 1. The purpose of step 1 is to identify any Mental Incapacitation Event(s) (MIEs) which the applicant could incur to in the near future. The expected output is a list of possible MIEs or the reasonable confirmation that no MIEs are foreseen in the near future.

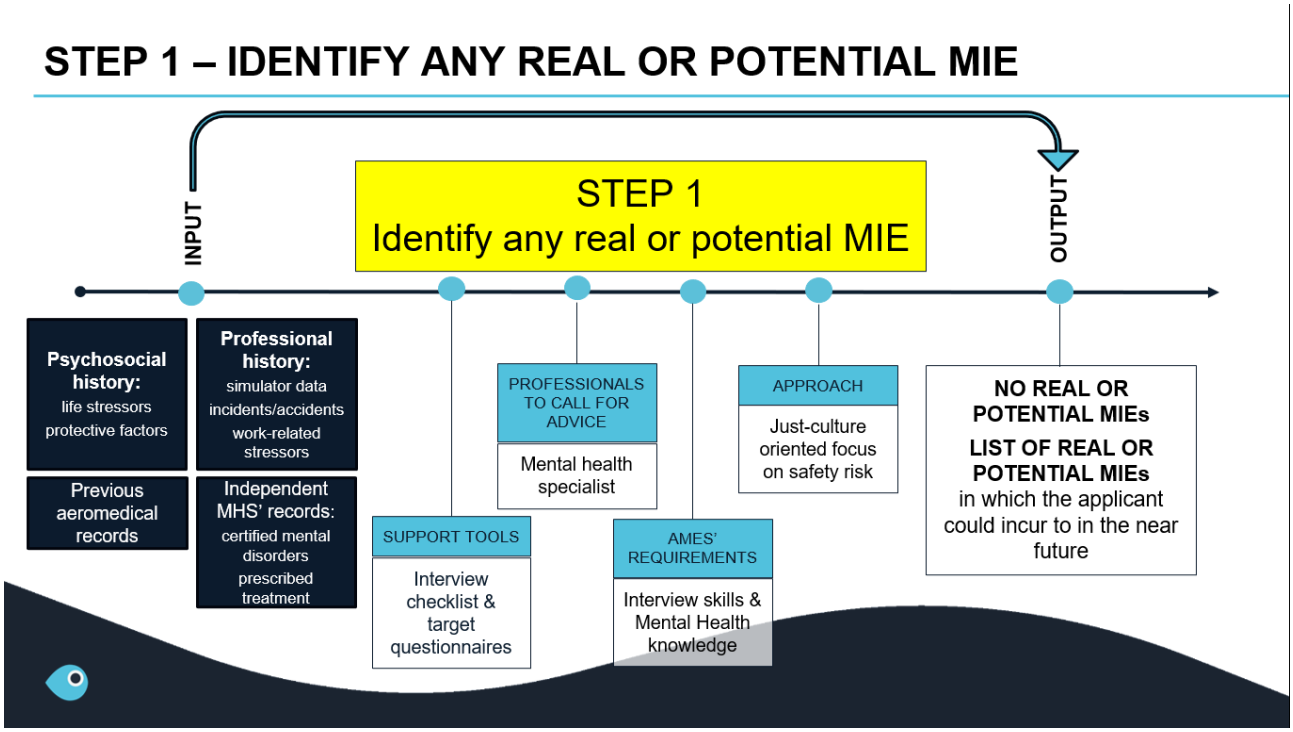


Figure 73 - Step 1: identify any real or potential mental incapacitation events

As stated in the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests, the MIEs are not diagnoses of mental disorders. Instead, MIEs are mental disorders' symptoms potentially affecting the individual's behaviour, emotional regulation, or cognitive functioning ultimately impacting the safety of flight and air traffic control operations.

MESAFE chose to focus on hazardous mental symptoms rather than mental disorders' diagnoses based on state of the art (SoA) and scientific evidence on mental disorders as reported in deliverable D1.1 Report on the review of diagnostic measures and summed up in its take home messages. According to such evidence, mental disorders are not all the same and can present different levels of subjective distress, maladaptiveness, statistical deviance, violation of society standards, social discomfort, irrationality and unpredictability, dangerousness, ultimately leading to several types of symptoms.

Not all mental disorders are hazardous for operational safety. As stated in the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests, while the certified presence of some mental disorders will almost automatically lead to the conclusion that the risk of incapacitation is high (such as in schizophrenia or bipolar type 1 disorders), for other disorders it will much more depend on the nature of the symptoms and their potential of impairing the execution of operational tasks. Indeed, from a clinical perspective, the severity of mental disorders is evaluated against their potential of disabling the individual in relevant areas of life (self-care, work, relationships), while from an operational safety perspective the severity of mental disorders is evaluated against their potential danger to passengers and aircrew. In line with this, some mental disorders may be considerably hazardous for operational safety but almost not at all severe from a psychopathological perspective (e.g., reading errors in learning disorders), and vice versa (e.g some sort of agitation due to social phobia). Furthermore, a focus on symptoms instead of disorders can help explain applicants why their symptoms may lead to an incapacitation risk, and to explain that the incapacitation risk derives from the symptoms of a disorder, and not from personal weakness or maliciousness, which is in line with what they asked in the surveys (see section 2.2).

The MIEs' list presented below augments the list proposed in the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests, by rewording somatic symptoms into "MUS" and adding the 5th bullet point about possible errors in reading/reading back instructions due to learning disorders in adults, as follows:

- Reduced alertness and executive functioning
- Depersonalization - derealisation
- Panic attack
- Medically Unexplained somatic Symptoms (MUS)
- Errors in reading/reading back instructions
- Agitation
- Intrusive thoughts
- Compulsions
- Aggressive behaviour
- Hallucinations
- Delusions
- Suicide
- Murder-suicide

The proposed list of mental incapacitation events is based on scientific evidence and SoA about specific alterations of mental functions derived from mental disorders, as reported in section 2 of the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests and wrapped up in its take-home messages. According to scientific evidence, some mental disorders can be temporary. Moreover, mental disorders can intervene at any stage of life, also based on life events and work-related stressors, as well as incidents and accidents, that can happen. Therefore, the MIRAP should be carried out at every periodic aeromedical evaluation.

The interview is suggested as main tool to address the presence of any real or potential MIE, based on SoA on psychodiagnostic techniques (see take-home messages of the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests). Target questionnaires can be combined with the interview to further investigate some aspects when red flags are raised, as for example use of psychoactive substances and cognitive decline.

Section 4.4.3 of the MESAFE deliverable reports the key points to address in the interview, and are pasted in Table 8.

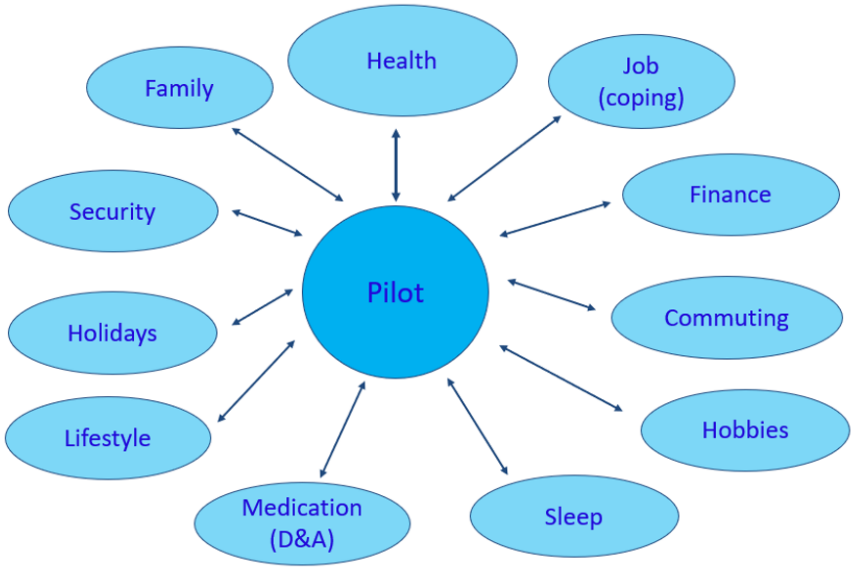
For initial aeromedical examinations:

- general attitudes to mental health, including understanding possible indications of reduced mental health in themselves and others;
- coping strategies under periods of psychological stress or pressure in the past, including seeking advice from others;
- childhood behavioural problems;
- interpersonal and relationship issues.

For all aeromedical examinations (Hudson & Herbert, 2017):

- The Job: type of flying (pilots) or ATC work; employer details; length of service in current employment; full-time/part-time; total flying hours; hours flown since last medical; roster pattern: long-, medium-, short-haul; number of sectors flown in a duty period; Also for ATCOs: are rosters reasonable?; fatigue; job satisfaction/; attitude towards job; aspirations for future career development; difficulties with operational crew resource management (CRM); any difficulties with employer and/or other colleagues and managers; company peer support?
- Commuting: distance to work; commuting time; ease of commuting; mode of travel; return journey home.
- The applicant's role and attitude in accidents or incidents, problems in training or proficiency checks, behaviour or knowledge relevant to the safe exercise of aviation tasks relevant for their class of licence.
- Coping strategies under periods of psychological stress or pressure in the past, including seeking advice from others.
- Family arrangements: married, co-habiting, or single; ages of children; childcare; family life; health issues family; partner employment.
- Interpersonal and relationship issues, including difficulties with relatives, friends, and work colleagues.
- Security: (for pilots) airport security checks; fear of terrorism, unruly passengers?
- Finance: concerns about money; debts; overtime; second job?
- Hobbies: other interests, hobbies; what do you do in your spare time? Loss of interest in hobbies, sport, or other activities may herald depression or misuse of psychoactive substances.
- Holidays: how many times/year; where do you go?; does the family join?

Asking questions regarding mood, quality of sleep, current sources of stress (such as work, fatigue, financial, home and family, bereavement), and alcohol and/or substance use is recommended. These questions should be woven into the conversation with the applicant during the aeromedical examination as part of a general health promotion discussion that addresses a variety of health issues, both mental and physical.



The components of a thorough pilot medical interview (adapted from Hudson & Herbert, 2017)

Particular attention should be given to life stressors that can be part of the "carry-on luggage" of pilots and ATCOs. Known life stressors that might have a negative impact on safe functioning in aviation are:

- work related problems
- bereavement
- financial worries
- health concerns
- relationship / family difficulties
- separation from family, loneliness
- social demands (incompatible with work demands)

The COVID-19 pandemic may have triggered mental health problems to emerge. There is evidence that above-mentioned life stresses may lead to significant mental health problems in some cases (Hammen, 2005; Young, 2008).

After this more loosely structured interview, a structured medical history taking should follow with questions on:

- Health, illness, symptoms, organ systems (functioning, complaints)
- Sleep: quality and amount (at home and on stopovers); jet lag / shift work; rest arrangements prior to duty; sleep medication? Snoring (OSA)?
- Exercise/diet: activities; diet; food during work.
- Medication: prescribed; over-the- counter; via internet

Drugs/alcohol/smoking habits: alcohol type/amount/binge drinking; suggested bottle to throttle time; social / party drugs; legal highs; driving license offences?

Placeholder including information copied and pasted from the MESAFE deliverable D2.1 Report on the analysis of availability of diagnostic tests, pages 86-87-88

Table 8 – Suggested aeromedical mental health interview checklist

The purpose of the interview is to get information on a series of aspects that have been extensively reported in section 4.2.2 of the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests and are pasted below in Table 9.

- Any mental complaints.
- Any mental complaints in the past, and any treatment by mental health professionals in the past.
- Any family history of mental disease.
- Mood during the last weeks to months.

• Things that the applicant can enjoy, that give him or her energy, that he or she looks forward to (in many mental disorders, especially in depressive disorders, this is problematic). • Sleep and feeling fit during the day (and if not, what kind of sleeping difficulties there are). • Appetite. • Concentration (this is best asked by practical questions, such as a ability to concentrate during a landing, or during a simulator session, but also when reading a book or watching a television movie or series). • Feelings of guilt, of experiencing life as worthless, feelings of sometimes thinking to be better off dead. If these are present, what kind of feelings, any suicide plans. The presence of these feelings in the past, including past suicide attempts. • Any anxiety complaints. • Any obsessive-compulsive complaints. • Any feelings of losing contact with the world or with reality. • Traumatic experiences in the past that still cause problems. • Eating problems. • Deliberate self-harm. • Any addictions. • Upon indication it is good to address memory, hallucinations, experiencing extremely fast or slow thinking, experiencing supernatural powers, being part of secret conspiracy's etc. • Coping: how does the applicant deal with painful, difficult or challenging situations? • It can be considered to ask the applicant to describe him- or herself. This may be indicative of some personality features, but in the context of an aeromedical examination it may result in a socially acceptable description of the ideal pilot with little clinical value. It may be better therefore to address this in a more subtle way during the biographical history. • A biographical history wherein the family the applicant was raised in, childhood, education and career and personal relationships are addressed. It may be considered to develop a questionnaire with some factual questions such as on how the family was composed, education, etc to make this more efficient, and to give more attention to the emotional side of life-events. It is paramount to address the social contacts and functioning from early on, and to check how important life-changes were dealt with (e.g. going to high school, leaving home to study in a different city, getting a permanent relationship, getting children, loosing relatives etc). At these life-changing moments, mental disorders are most likely to become prominent. It is also good to explicitly address any career setbacks and how the applicant dealt with them emotionally, and any problems in interpersonal relationships.
Placeholder including information copied and pasted from the MESAFE deliverable D2.1 Report on the analysis of availability of diagnostic tests, pages 70-71

Table 9 – Expected outcome from the aeromedical mental health interview

The mental health of someone can be better understood against the background of his or her personal history so it is important to investigate it. However, especially biographical questions can be perceived as intrusive, so it is important to contextualize them and avoiding asking direct questions, but rather deepen the conversation of one topic when it spontaneously emerges in the discourse. Moreover, it is important to explain why these questions are asked. Two measures can help with it: the cooperation with MHS and interview skills training courses. The access to relevant data about the applicant's medical history can be of significant help in this framework.

It is not assumed that the interview can cover all relevant aspects, especially when non-reporting is probable. For example, no previous mental disorder's certification and no mental health concerns by the applicant do not necessarily mean there are no problems. The access to relevant data about the applicant's professional history can be of significant help in this framework. It is important to underline that creating a just-culture environment can also promote self-disclosure.

If step 1 provides, as an output, the absence of real or potential MIE(s) for the applicant, the process can move to step 7, where the decision is to release the mental fitness certification. On the contrary, in case step

1 gives, as an output, the presence of real or potential MIE(s) for the applicant, the process can move forward to step 2, where the severity and probability of occurrence of the MIE(s) will be assessed (Gate 1 -see Figure 72).

Before describing step 2, some legal remarks on the exchange of sensitive data are reported.

4.2.1.1 Legal remarks on the exchange of data from health records, peer-support programs and simulator sessions

Data from previous aeromedical examinations and from previous medical and mental health treatments are protected by both medical confidentiality laws, with are a matter of national law, and by the European General Data Protection Regulation (GDPR (Regulation (EU) 2016/679)), which is applicable to all EU Member States. It is beyond the scope of this project to examine the various national medical confidentiality laws, as is discussing the GDPR in detail or examining their legal relationship. A fundamental difference between the GDPR and medical confidentiality laws is that the GDPR covers all data processing (although it contains specific stipulations with regards to medical data), whereas medical confidentiality is only applicable to medical practice. A more fundamental difference is that, at least from a conceptual point of view, the GDPR gives rules about the processing of data, whereas medical confidentiality is applicable to the information itself. (De Rooy 2018). Simulator data and data from peer support programs will generally not be covered by medical confidentiality laws (except in the situation that the simulator session was performed for a specific aeromedical purpose (see D2.1, paragraph 4.4.6), or in the rare situation that a peer supporter is also a medical professional and acting in that capacity). However, simulator data will in most cases be subject to the GDPR. Although peer-support programs generally gather little personal data, if data are being processed, this is also subject to the GDPR. From January 1, 2022, data on when an aeromedical certificate was issued or when it was rejected, but without further medical details are being stored in a European Aero-Medical Repository (EAMR) (Panait et al 2022). In this section, some general remarks specifically relevant to exchanging information with third parties for the purpose of aeromedical evaluations will be made.

Almost worldwide, medical practitioners are bound by confidentiality rules in relation to their activities. Large variations in the extent to which medical confidentiality is protected in various jurisdictions do exist, however. Of course, medical confidentiality does not apply in the case of an aeromedical examiner reporting for the purpose of obtaining an medical certificate. In some countries, physicians are requested to report all conditions in airline pilots to the civil aviation authorities (Schuite 2019). In more jurisdictions, a breach of medical confidentiality is only possible if there is a clear and imminent danger to others. In case for example a physician is being told by a patient that he is planning a terrorist attack, in most jurisdictions the physician may be under an obligation to breach medical confidentiality. In some jurisdictions, reporting may be even mandatory in such cases.

In her legal study on medical confidentiality in relation to aviation safety, by comparing the US, Canadian and Dutch medical confidentiality laws, Schuite concluded that large differences between the three countries (and within the various States of the United States), exist. She advises that, among others, a thorough evaluation on the effectiveness of a mandatory reporting obligation would be advisable, and that any reporting permission or obligation should be defined by law.

Regulation on mandatory reporting of aviation personnel with mental problems by healthcare providers is likely beyond the jurisdiction of the European Union. However, even if there would be a legal ground for such regulation, it is highly questionable if this would be helpful. Healthcare providers that are unfamiliar with aerospace medicine may be reluctant to cooperate (Pinsky et al, 2020). If people cannot disclose mental problems confidentially, this may deter them from seeking help. Especially in aviation professionals, this is likely to be the case. Little research has been done, but studies on mandatory reporting of impaired physicians or drivers suggests that this is not effective. (De Rooy 2019).

The GDPR is applicable to all processing of personal data. It is also applicable to medical data, but it cannot overrule medical confidentiality laws (except in the situations where the national medical confidentiality law gives less protection compared to the GDPR). Also on simulator data, the GDPR is applicable.

According to the GDPR, processing of personal data is only allowed if:

- The data subject has given specific, unambiguous consent to process the data.
- Processing is necessary to execute or to prepare to enter into a contract to which the data subject is a party.
- The data need to be processed to comply with a legal obligation.
- Processing data is of vital importance.
- Processing data is necessary to perform a task in the public interest or to carry out some official function.
- There is a legitimate interest to process someone's personal data.

Article 9 of the GDPR considers medical data as a special category of data. Processing is only allowed when the data subject has given explicit consent for doing so, or in case of so called substantial public interest.

Consent must be "freely given, specific, informed and unambiguous", and requests for consent must be "clearly distinguishable from the other matters" and presented in "clear and plain language." Data subjects can withdraw previously given consent whenever they want. The legal basis of processing data cannot be changed automatically from one to another justification. The consent should be documented.

Given the above, it seems logical only to share information, whether it is from medical records, peer-support programs or from simulator data, with the consent of the applicant. Furthermore, when sharing information, several measures can be advised to ensure a fair and diligent use of the data:

- Medical data are only shared between medical professionals who are bound to medical confidentiality rules and other professional requirements.
- Only relevant medical data are shared. For example, for the purpose of an aeromedical evaluation, a psychiatrist may need only to share the results of the mental status examination, the treatment and the prognosis and possible risks, but not all biographical details.
- Consent for sharing data is obtained for each situation where data are shared, especially with regards to medical data. A general consent to share all relevant data without any time limitation is legally risky and not advisable.
- It can be considered to develop standardized aeromedical consent forms for exchanging information.
- Specific regulation for sharing simulator data to support aeromedical evaluations can be considered. Then, provisions must be made ensuring that the information is dealt with diligently e.g. that data can only be shared to medical professionals that are bound to confidentiality, but never to e.g. the recruitment department of other airlines.
- Physicians and aviation psychologists, even if they have flying experience themselves, are generally not qualified as training pilots. Therefore, they should be careful when using simulator data, as these are data from a different professional domain they are not trained in. Simulator data cannot used to establish a diagnosis, but only to asses potential incapacitation as a result of a disorder (see also D2.1, paragraph 4.4.6). Physicians and aviation psychologists should only comment on possible incapacitations due to a disorder. They should refrain from any comments on the applicants flying skills or other professional abilities. In their report, physicians and aviation psychologist should describe clearly how the simulator data are interpreted and used.
- Although medical confidentiality laws are generally not applicable to peer-support programs, the GDPR is. Nevertheless, as a matter of prudence, peer-support programs are advised to adopt a high level of confidentially (similar to medical professionals) with regards to the information they obtain. Sharing information is only recommend with the consent of the individual, or when there is a clear and imminent danger to others.

Of course, an AME should do everything possible to obtain the consent of an applicant, and explain clearly why certain information is needed. In some cases, applicants may not give consent to share data. This may

be the result of a deliberate and well-informed decision by the applicant but may also be a symptom of an underlying mental disorder, for example in case of schizophrenia with paranoid delusions. In both situations, medical certification is not advisable. If there is insufficient information to make a reliable assessment, or if an independent mental health expert concludes that he or she has insufficient information to draw a reliable conclusion, the AME or medical assessor should conclude that certification is not possible due to a lack of information. This would be similar to the (slightly hypothetical) situation were an applicant comes to the medical assessment, answers questions asked by the AME, but refuses to take his shirt off to undergo a physical examination, or when an applicant refuses to share a report of a recent major surgery he or she has undergone. Of course, the AME has to be able to justify why certain information is needed, and ultimately the correctness of the procedure can be tested in court. It seems fair that the risk of a decision not to share information is borne by the applicant. In case of an obvious severe mental disorder that hampers the ability to cooperate with an aeromedical examination, this situation may be different, and the individual may be eligible for a disability payment. Conceptually, it is good to remember that flying aircraft or working as an ATCO is not a right people automatically have, but a privilege that can be awarded after an individual has proved to meet several requirements, mainly in relation to training and experience, but also in relation to medical fitness. In order to receive the privilege of flying aircraft or work as an ATCO, an individual should give up some freedom, for example by sharing medical information.

In conclusion, sharing medical or simulator data is only possible with the consent of the applicant. If an applicant refuses consent, in most cases it should be concluded that there is insufficient information to draw a conclusion with regards to his or her mental fitness, and certification should be denied. The risk of not allowing to share information should generally be borne by the applicant. Specific regulation limiting medical confidentiality for aviation professionals seems not feasible and may even deter people from seeking help. In most jurisdictions, breaching medical confidentiality when there is a clear and imminent danger to others, is possible. Specific regulation allowing the use of simulator data to support aeromedical decision making can be considered, provided that a high level of diligence is met. It is advised that, peer-support programs voluntarily apply the same level of confidentiality as medical professionals do, and that they share information in a similar way as medical professionals do. The development of standardised aeromedical consent forms for exchanging information can be considered.

4.2.2 Step 2: determine the severity of the mental incapacitation events identified

Figure 74 describes step 2. The purpose of step 2 is to determine the severity level of the MIE identified in Step 1. The expected output is the classification of these MIEs into catastrophic, hazardous, major, minor or negligible.

As illustrated in the picture, a flight instructor/examiner relevant for the type of activity (aircraft/ATC) could be involved among the professionals supporting the activity to help understand the consequences of certain actions during the duty.

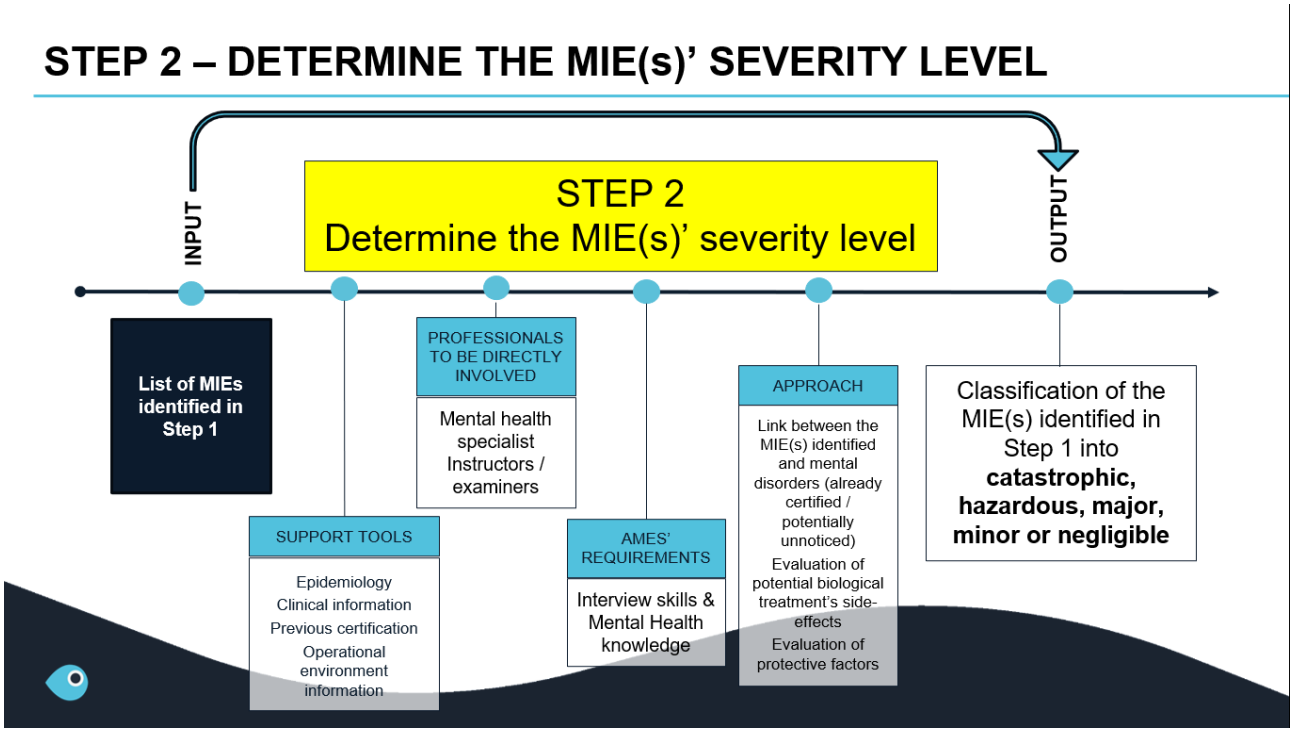


Figure 74 - Step 2: determine the severity of the mental incapacitation events identified

For the purpose of this paragraph, it should be noted that the term severity is used to indicate the severity of the operational consequences of mental incapacitation events in relation to operational safety and according to the proposed risk matrix. So, severity means if an event would be catastrophic, hazardous, major, minor or negligible.

In this section, the process of determining the severity of mental incapacitation events will be illustrated by some clinical examples, which are depicted in Italics.

For determining the severity of MIEs, it is first important to determine the exact nature of the MIE(s) identified in step 1. The most important source of information is a thorough history with details from any previous events suffered by the applicant, including any previous certification of mental disorders. This may prove to help detect also potential comorbid mental health issues that may have been unnoticed and uncertified until that moment. Epidemiological data on the symptoms and course of the disorder should be taken into account as well. However, as mental disorders may have varying symptoms in individual patients, determining previous events and performing a mental state examination is of paramount importance. The identification of protective factors (both in private life and at the workplace) might help detecting the resources available for mitigating the symptom's severity.

Practical example
An air traffic controller has been diagnosed with a mild depressive disorder but also suffers from panic attacks related to it. She has already started with some behavioural interventions advised by an occupational psychologist, and notices some improvement in mood, but she still suffers weekly panic attack and a slightly impaired concentration. Although epidemiologically, a depressed mood wood be the main feature, in this case, the most severe incapacitation events would be the panic attacks and the impaired decision making as well as ability to concentrate. These may cause a serious hazard to safe operations.

From a medical viewpoint, mental incapacitation events are symptoms of a mental disorder, so it is highly important to describe symptoms that could be possible mental incapacitation events as clearly as possible.

Practical example
A pilot who suffers from social anxiety in casual social conversations may experience anxiety during cruise flight or during informal interactions with colleagues before and after the flight, but not during the critical

phases of the flight around take-off and landing, when there is no time for social talk. In this case, a clear description of the symptoms allows to conclude that the mental incapacitation event will not be very hazardous.

In case of an obsessive-compulsive disorder, it is vital to know the exact obsessions and compulsions (and to monitor them, as they may change over time). Feeling a need to repeat washing hands three times may not be very hazardous, feeling a need to changes switches three times, or to repeat the same checklist several times leading to distraction, may be a serious hazard.

Although mainly symptoms in the individual applicant will be mental incapacitation events, during the entire evaluation process it is good to be watchful if other symptoms that may occur in the course of the disorder have sufficiently been taken into consideration. Possible side-effects of treatment should be considered as a possible incapacitation event as well. The extensive presentation of biological treatment for mental disorders and side-effects is provided in the MESAFE deliverable D1.2 - Report on the review of treatment options.

Practical example

If an air traffic controller suffering a depression is re-diagnosed with a bipolar disorder after specialist evaluation, the most hazardous incapacitation event may not be caused by depressive symptoms any more, but by a hypomanic or manic episode instead.

Determining the severity of mental incapacitation events means assessing what symptoms may influence the ability to safely perform their duties as a commercial pilot or air traffic controller. The mental status examination (see paragraph 2.1 of the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests) may provide a useful tool to evaluate the mental functions systematically. Most important areas to assess are attention, concentration, perception, thinking and emotion-regulation, as well as the presence of signs of any suicidal feelings, feelings of aggression towards others or signs of psychosis. In modern aviation, the ability to communicate and to work together with others is often more important than basic flying skills, and also this should be evaluated.

Practical example

A pilot with excellent flying skills develops adjustment problems after a divorce, leading to aggressive verbal outbursts. In general clinical practice, this will not be considered a severe mental condition, but effects on flight safety can be serious if outbursts also occur to other crew members and during critical flight stages.

In some cases, the effect of an incapacitation event may be obvious (e.g. it is clear that imperative acoustic hallucinations are a severe incapacitation event). However, in many cases this may be less clear, especially for MHS unfamiliar to aviation.

Practical example

A patient suffering a panic attack with hyperventilation and severe nausea lasting for one hour three times a year during severe stress, and functioning well the rest of the time, will not be considered to suffer a severe mental disease by most clinicians. However, the impact on flight operations of such a panic attack could be substantial. Therefore, such a panic attack may be considered a relatively severe event.

In order to avoid miscommunication and because many MHS (even with aviation mental health experience) may be hesitant to advise on purely operational issues, as this is outside their formal area of expertise, it is important for AME's to ask clear questions on symptoms, and to doublecheck in cases of doubt. Ideally, the AME determines the severity of a mental incapacitation event based on the information provided by the MHS, or, even better, and especially in complicated cases, this is done during a meeting where the applicant is also present. In some cases, if there is no clear picture of the exact operational environment the pilot or ATCO is working in, it may be necessary to ask advice from another independent pilot or ATCO on this (of course, with permission from the applicant). A flight instructor/examiner relevant for the type of activity (aircraft/ATC) may also help understand the consequences of certain actions during their duty.

The most challenging mental incapacitation event from a severity point of view, may be a diminished concentration, especially if this is present for a prolonged time, which is often the case with concentration problems caused by mental disorders. Although the level of incapacitation may be limited, and the individual may be able to perform many daily activities without major problems, in relation to flying even minor concentration problems could have serious consequences, and in combination with its continuous presence (and therefore, high probability), may lead to a substantial risk.

Of course, the actual risk caused by MIEs cannot be determined without knowing their probability of occurrence (see paragraph 4.2.3). Often there will be overlap between the clinical processes of identifying MIEs and determining their severity and probability. During a consultation, the AME's and MHS may consider all these three issues simultaneously. However, for good reproducibility and in order to achieve a maximum level of acceptability for the applicant and other stakeholders, it is important to describe incapacitation events, their severity and their probability, separately.

In summary, the process of determining the severity of the mental incapacitation events takes the following steps:

1. Based on the MIE(s) identified in step 1, identifying one or more mental disorders (by the AME & MHS);
2. Extensive history taking of symptoms that may be MIEs (by the MHS);
3. Mental status examination determining symptoms that may be or cause MIEs (by the MHS);
4. Determining side-effects of treatment, and considering side-effects as possible MIEs (by the MHS);
5. Comparing findings with relevant epidemiological data (if available) (by the MHS or AME);
6. Evaluating protective factors and their impact on the intensity of symptoms;
7. Evaluating the operational environment the applicant is working in (by the AME, the MHS, and, if necessary, the operational expert);
8. Combining symptoms that may be MIEs with information on the operational environment and determine severity level (catastrophic, hazardous, major, minor or negligible) (by the AME, the MHS, the applicant).

4.2.2.1 Overview of the mental health conditions that are eligible for aeromedical certification according to their severity and the class of aeromedical certification

From a conceptual viewpoint, psychotic, neurocognitive, bipolar, depressive and cluster B personality disorders are related to the highest MIR. For anxiety disorders, obsessive-compulsive, post-traumatic stress, somatic-symptom and eating disorders, the incapacitation risk much more depends on the actual symptoms and features. For personality disorders, as already said, especially the cluster B personality disorders are related to a high incapacitation risk, but also in case of cluster A and C disorders, it is important to perform a thorough evaluation.

In case of addiction, the risk mainly comes from the substance that is used, although comorbid behavioural problems or comorbid mental disorders may pose a risk by themselves. For an extensive review of the safety effects of psychoactive substances the reader can refer to the MESAFE deliverable D3.1 Report on the analysis of the suitability of screening and confirmation tests for misuse of alcohol and drugs and the section 2.5 of the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests.

Although an adjustment disorder is often considered benign from a clinician's point of view, its symptoms may still be incapacitating (e.g., when distracted due to sleep problems).

Although the behavioural and communication problems resulting from an autism spectrum disorder will often yield some risk of incapacitation, it is important to make an individual assessment to determine the

actual incapacitation risk. Many pilots with a very mild autism spectrum disorder can make a successful and rewarding flying career.

In conclusion, is advisable to determine the incapacitation risk individually on a case-by-case basis with an emphasis on the mental functions that have actually been impaired rather than on diagnoses.

4.2.2.2 Biological treatment unlikely to be compatible with certification

For a discussion of the most commonly used psychotropic drugs and their possible side-effects in relation to aviation safety, the reader is referred to section 2 of the MESAFE deliverable D1.2 - Report on the review of treatment options and section 2.6 of the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests. Again, it is emphasized that the risks of a biological treatment cannot be evaluated without knowing the risks of the underlying disorder. Biological treatment can mitigate risks, but also cause risks by itself. Side-effects of biological treatment should always be considered as a possible mental incapacitation event.

If, for example, a pilot with a depressive disorder is in a stable remission using a tricyclic antidepressant but suffers severe orthostatic hypotension as a side-effect of treatment, dizziness due to orthostatic hypotension may have become the most important incapacitation event.

The decision on the compatibility with certification can only be made on a case-by-case base combining all relevant clinical parameters. Nevertheless, treatment with the following classes of medication will likely NOT be compatible with class 1 or 3 certification, as these drugs have a too large risk of causing side-effects that may cause mental incapacitation events.

- Mirtazapine
- MAO inhibitors
- All antipsychotic drugs
- All mood stabilizers
- Benzodiazepines
- Stimulants
- Receiving Repetitive Transcranial Magnetic Stimulation (rTMS) treatment
- A state after brain-surgery or when receiving deep-brain stimulation

Furthermore, all off-label treatments for mental disorders, as well as treatments that are still in a research phase will almost always need to be considered incompatible, as the associated risks, side-effects and long-term effects cannot be determined reliably enough.

4.2.3 Step 3: determine the probability of the mental incapacitation events identified

Figure 75 describes step 3. The purpose of step 3 is to determine the probability level of the MIE identified in Step 1. The expected output is the classification of these MIEs into frequent, occasional, remote, improbable, extremely improbable.

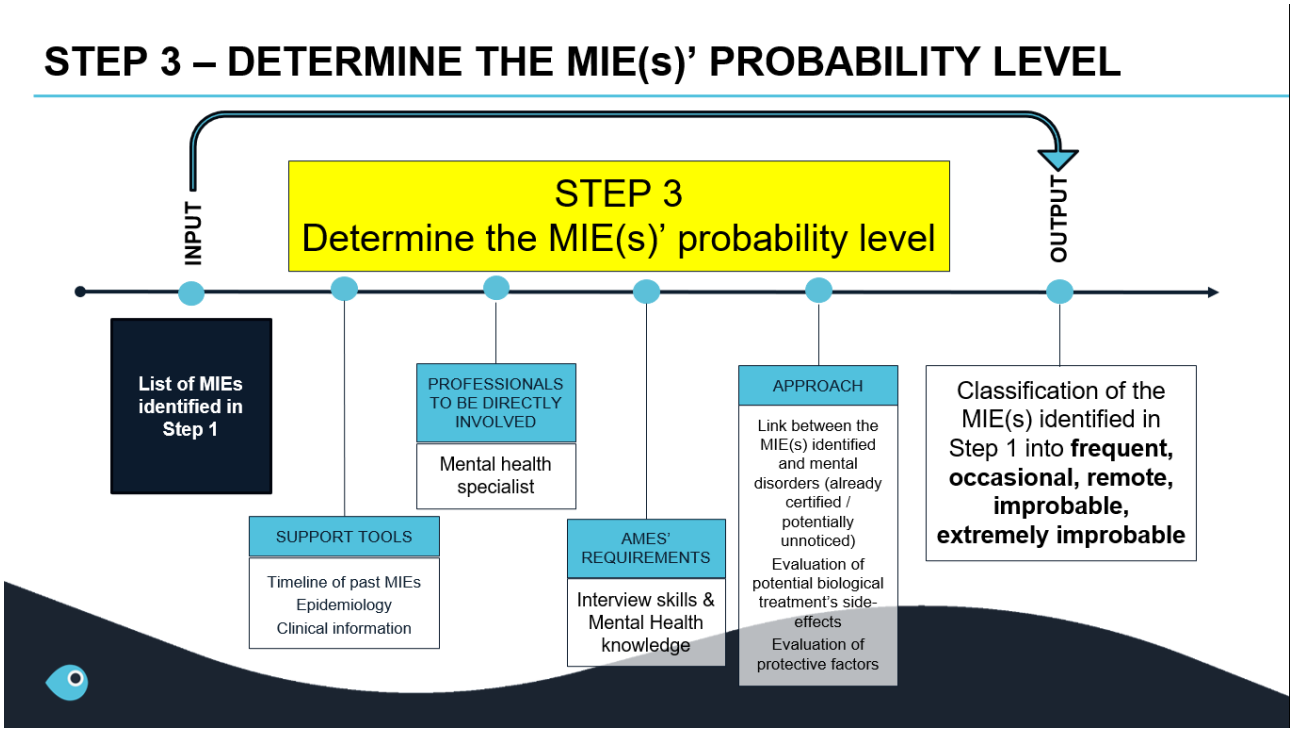


Figure 75 - Step 3: determine the probability of the mental incapacitation events identified

Although described here as a separate step, in clinical practice the processes of identifying mental incapacitation events, determining their severity and determining their probability, will be overlapping. The probability of mental incapacitation events can best be determined by the MHS, although the applicant should be actively involved in this process. An AME or occupational physician may provide valuable information on previous MIE(s) that have occurred during operations. They should also be considered to be specialist in determining the applicability of epidemiological data with respect to the operational situation of the individual applicant.

Determining the probability of MIEs means predicting whether or not, and by what frequency, MIEs will occur in the future. This determination is based both on clinical information and on epidemiological factors.

The clinical information is largely the same as the clinical information needed to determine the severity of MIEs: a thorough history with details from any previous events suffered by the applicant is a good point to start at. It is important to assess symptoms and the frequency that symptoms occur with, in detail. A hetero-anamnesis may provide valuable additional information. It can be considered to draw a timeline depicting incapacitation events during the last years, if applicable. Evaluating protective factors might help detecting all the resources available for reducing the frequency of occurrence of symptoms.

Practical example
An airline pilot is suffering from recurrent depressive episodes, leading to a depressed mood, sleeping difficulties and a lack of concentration. When drawing a timeline, it is noted that all episodes occurred when he started flying on a different aircraft type or when he made a promotion from first officer to captain.

If there are comorbidities (both physical and mental), the likelihood of mental incapacitation events may be higher. Good coping mechanisms can be protective. It is also important to identify if there are underlying personality traits that increase the likelihood of future incapacitation events.

Practical example
A relatively inexperienced first officer suffers from anxiety attacks in social situations after a highly embarrassing social experience. At some point, he notices that the social interactions with colleagues, especially during flights, are quite predictable and not too personal, and that he can therefore handle them

well. These interactions do not cause the discomfort some other social situations do. Here, taking the professional role of an airline pilot is helpful and protective. Years later this first officer has become captain. After a passenger with a heart attack died while he could not divert timely due to bad weather, he develops panic attacks. The comorbid social anxiety may cause a higher likelihood of panic attacks as a mental incapacitation event.

The clinical information should be supplemented by epidemiological data where possible. For some mental incapacitation events, extensive epidemiological data are available. Unfortunately, for many events epidemiological data are not unambiguously clear. A special problem is that epidemiological data are usually obtained in either patient groups or in the general population, but that research populations are seldomly comparable to the population of airline pilots and air traffic controllers, most of whom have been subject to a psychological selection process, and who have all had to meet higher educational demands. It is important to describe how the data are valued and to what extent epidemiological data are relevant in case of the individual applicant.

Practical example

A senior first officer suffers rare episodes of loss of muscle tone of the right leg. The episodes seem to be caused by stress. No neurological diagnosis can be made, and she is diagnosed with a functional neurological disorder. After a treatment with cognitive behavioural therapy, she has been free of episodes for three months. Although several studies suggest that the prognosis is good, the mental health expert and the AME consider the quality of the studies and the limited number of patients that has been studied too small to rely on for certification. Combined with the fact that recovery has only been present for three months, and the severity of a possible incapacitation with regards to flying duties, this condition is considered not to be eligible for certification. During a combined appointment with the AME and the mental health expert, this is discussed with the applicant, and the difficulty of interpreting inconclusive scientific data is explained, which she understands. The proposal to repeat the examination after a year is acceptable for all.

Ideally, treatment lowers the likelihood of future mental incapacitation events. However, treatments for mental disorders are (just as most treatments in medicine) not equally effective in all patients. Success rates of 50% are not uncommon, and for many disorders even considered quite good. Therefore, the likelihood of a mental incapacitation event cannot be determined by incorporating the likelihood of success of a treatment that has just been started in the assessment. Rather, there should be a stable situation with (at least substantial) recovery and a stable treatment phase.

Practical example

An air traffic controller with no history of mental complaints is diagnosed with a depressive disorder two months after the death of his wife. He has started with psychotherapy and has now had two sessions with his psychotherapist. He is also being treated by a psychiatrist, who started with sertraline, and is planning to increase the dosage from 50mg to 100mg next week. He feels that the activity of working and seeing colleagues may be good for him, and applies for a new medical certificate. Although from an epidemiological viewpoint the prognosis is quite good, the AME and mental health expert explain to him that first, a stable situation should be achieved. They advise a new assessment in three to six months. In the meantime, the occupational physicians arranges that the applicant will temporarily work in the training department, for which no medical certificate is needed.

In most cases, epidemiological data cannot *'overrule'* the clinical judgement. This is especially the case if the quality of the contact is poor, or if the examiner doubts whether the applicant provides honest answers.

Practical example

An airline captain is on sick leave because of a firs depressive disorder and reports that he has made a full recovery for six months, which is confirmed by the treating psychologist and questionnaires. However, from information by the GP it turns out that he is using disulphiram. When asked, he denies any alcohol

problems, and says he uses it just to be sure he will never drink too much. The AME considers this information to be too unreliable for certification, notwithstanding the good prognosis from an epidemiological viewpoint. Later, the applicant admits that he also suffered drinking problems, for which he has secretly sought treatment in a clinic abroad.

In some situations however, especially if mental incapacitation events are severe, epidemiological data may 'overrule' the clinical impression.

Practical example

A 55 years old senior airline caption is under high stress because of a divorce and a pending reorganization in the airline. The aircraft type he is flying on will be phased out. After he failed a profcheck, he performs a suicide attempt by drinking a bottle of wine (he had already started to drink more often) and trying to drown himself in a small lake by putting weights on his legs. He leaves his telephone at home, writes a letter to his relatives with instructions for his funeral and takes several precautions not to be found. The attempt fails because a police officer incidentally passes by. Two weeks later, he feels a deep regret about what he has done. The mental health expert is impressed by the sincere presentation, the promise he makes never to perform a suicide attempt again and the eagerness to start treatment. Notwithstanding this clinical impression, receiving a medical certification is not (yet) possible, as there are several (and epidemiologically well confirmed) risk factors for suicide:

- *Male gender*
- *Age*
- *Marital problems*
- *Alcohol use*
- *Well prepared suicide attempt*
- *Highly dangerous suicide attempt*

In conclusion, after the possible mental incapacitation events have been identified and their severity has been assessed, the next steps can be taken to assess their probability.

- History with details and frequency of previous mental incapacitation events. A hetero-anamnesis is strongly recommended, and drawing a timeline of previous events may be considered (by the MHS).
- Analyse previous mental health events that have occurred during operations (by the MHS, the AME and the occupational physician).
- Evaluate coping mechanisms and other protective factors, as well as relevant personality factors (by the MHS).
- Evaluate the effects of treatment (by the MHS).
- Evaluate relevant epidemiological data/ relevant scientific data (by the MHS and the AME).
- Determine applicability of epidemiological data to the situation of the individual applicant (by the MHS and the AME)
- Combine all information into an estimation of the probability of future events (by the MHS and the AME).

4.2.4 Step 4: apply the matrix to determine the risk level

Figure 76 describes step 4. The purpose of step 4 is to define the risk level associated with the MIEs identified in Step 1, based on their severity and probability levels (respectively step 2 and 3). The expected output is determining whether this risk is acceptable.

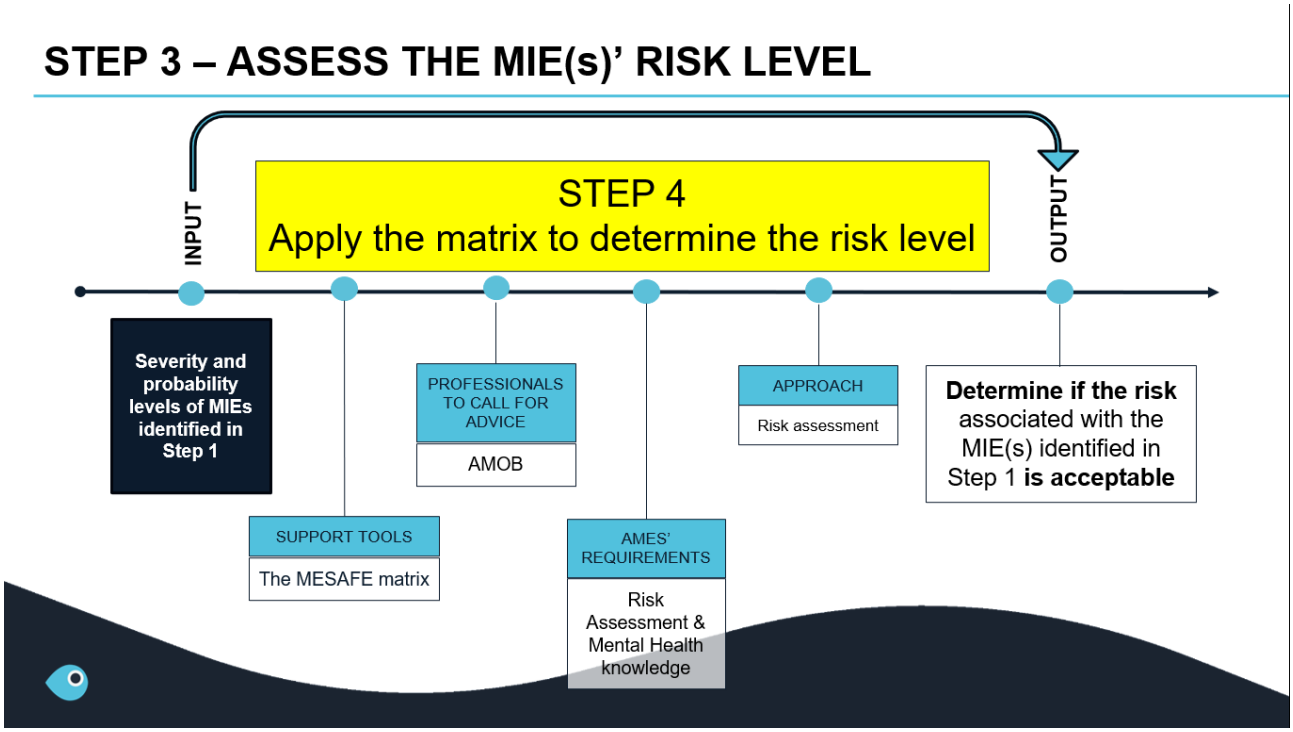


Figure 76 - Step 4: apply the matrix to determine the risk level

In Figure 77, the risk level has been decided and plotted on the matrix, based on a "remote" probability (10-99% per year) of a "Major" MIE. As we can see, the risk called "MIE1" is in the square named "3C". This risk is yellow, and therefore may be acceptable, but may require operational and/or personal risk reduction for the acceptance. If the same MIE had an "Occasional" probability, it would be in square 4C and be orange – This example is labelled "MIE 2" in the figure. This would normally be unacceptable, but in some could be acceptable with special control measures or mitigation. An Orange risk would be a challenge to evaluate, and should be decided by a board of experts, that we have called Aeromedical Operational Board (AMOB) and will describe in section 5.3 of this document. A MIE where the risk is evaluated as being in any red square is deemed unacceptable, while an MIE where the risk is evaluated as being in any green square is deemed acceptable.

MESAFE MATRIX Risk assessment of mental health			**Catastrophic - A**	**Hazardous - B**	**Major - C**	**Minor - D**	**Negligable - E**
			May cause catastrophic event	may cause flight safety critical event	May comprimise flight safety	Reduced effectiveness and capacity to adapt to operational requirements	Minimal impact on flight safety
	Frequency per year	Flight hours between each event (approx) *	Total incapacitation	Severe incapacitation	Major decrement on performance	Minor to moderate performance compromise, may continue duties	Minimal impact on performance
Frequent 5	> 1/month	100	5A	5B	5C	5D	5E
Occasional 4	1-10 times	1.000	4A	4B	4C	4D	4E
Remote 3	10-99%	10.000	3A	3B	3C	3D	3E
Improbable 2	1-10%	100.000	2A	2B	2C	2D	2E
Extremely improbable 1	<1%	>1.000.000	1A	1B	1C	1D	1E

MIE 2 (4C)

MIE 1 (3C)

*given random onset of event unconnected to flight. If event is connected to flying activity (e.g. Murder suicide or flight anxiety),use career frequency rather than yearly

	Risk unacceptable	**Operational risk reduction could be co-pilot, backup crew, time window to land helicopter etc. Personal risk factors could be close follow-up by psychologist, peer-support etc. Formalised risk reduction is documented and required in the certificate.**
	Risk unacceptable, but may in some cases be acceptable after thorough review and specific mitigation. A medical board should in such cases be employed**	
	Risk may be acceptable - may require operational and/or personal risk reduction**	
	Risk acceptable	

Figure 77 – The scores on the matrix

If there are several MIEs, which often would be the case, each MIE is subject to the process of finding the risk level in the matrix. Thus, each MIE is treated as a separate risk even though several possible MIEs may have their root in the same mental disorder's diagnosis. In most cases, the single most severe MIE risk will be decisive; for MIE probability, any step to a higher probability level is on average a 10-fold increase in probability. Similarly, for MIE severity, there is a large increase in severity for each step. In other words, the total risk of 2 MIE risks of one severity do not usually bring the total MIE risk for both MIEs to the level above, since they will probably not occur at the same time. The probability will be doubled, but usually this will not bring the total MIE probability to a higher level (since the higher level is 10-fold).

If step 4 provides, as an output, an acceptable MIR level, the process can move to step 7, where the decision is to release the mental fitness certification. On the contrary, in case step 4 gives, as an output, the presence of an unacceptable MIR, the process can move forward to step 5, where mitigations to decrease the risk are assessed (Gate 2 -see Figure 72).

What follows provides a list of possible mitigations.

4.2.5 Step 5: identify risk mitigation strategies

4.2.5.1 Operational Incapacitation Risk Mitigations

When working in a team (ATCOs) or in a multi-pilot setting (pilots), the below-mentioned operational job principles and incapacitation training form an operational extra defence layer to identify and mitigate the risks of mental incapacitation events.

For multi-pilot operations the following operational principles and training that are required for piloting an aircraft are considered to reduce the operational safety consequences of in-flight incapacitation:

- Two pilots on the flight deck. Current incapacitation risk assessment concepts for Class 1 pilots are based on a two-pilot cockpit and it is generally accepted that a second pilot in the cockpit is a major determinant of flight safety (DeJohn et al., 2004). The aim of "fail-safe crewing" is to establish a crew in which there is always at least one fully competent pilot at the controls.
- Strict adherence to standard operating procedures and standard flight profiles and routine monitoring and cross-checking of flight instruments and crew actions. It is frequently a procedural deviation that provides the first indication of incapacitation. In such a case a lack of appropriate communication should trigger a high degree of suspicion (IFALPA, 2013).
- Crew Resource Management (CRM): A basic fundament of this philosophy is that it is the responsibility of every crew member, if s/he be unsure, or unhappy about operation of the flight, to question the pilot-in-command as to the nature of her/his concern.
- Two Communication Rule: flight crew members should have a very high degree of suspicion of a subtle incapacitation whenever a flight crew member does not respond appropriately to two verbal communications, or whenever there is no appropriate response to any verbal communication, associated with a significant deviation from a standard flight profile.
- Incapacitation training. In their AMC1 ORO.FC.230 "Recurrent training and checking" EASA mandates -except for single pilot operations- that procedures should be established to train flight crew to recognise and handle flight crew incapacitation (EASA, 2016). This training should be conducted every year and can form part of other recurrent training. If an FSTD (Flight Simulation Training Device) is available for the type of aircraft operated, practical training on flight crew incapacitation should be carried out at intervals not exceeding 3 years. Although EASA demands that examples of types of incapacitation and the means for recognising them should be included, information concerning the types of incapacitation in the existing training programmes is difficult to find or to retrieve. It is assumed that most aircrew will be rather unfamiliar with mental incapacitation events.

Obvious mental incapacitation events, such as a heavy panic attack, may be clearly noticeable by a colleague pilot, or may be indicated by the affected pilot. However, in the context of identifying and managing subtle incapacitation it is important recognise mild forms of mental incapacitation events. Therefore, it is recommended to pay ample attention to the identification and management of in-flight mental incapacitation events in the incapacitation training.

ATCOs use Team Resource Management (TRM) which is a corresponding concept of CRM for pilots. TRM is defined as: Strategies for the best use of all available resources - information, equipment and people - to optimise the safety and efficiency of Air Traffic Services and also have to complete an incapacitation training. In analogy to pilots, ATCOs also have to follow an incapacitation training, but in most cases this training includes training of ATCOs how to act/react in cases in which they have to control an aircraft which has reported an in-flight pilot incapacitation, whereas incapacitation of an ATCO team member is often not mentioned in the curricula. Regulation 2015/340 (2015) requires Abnormal and Emergency Situations (ABES) training and mentions it should include real-life scenarios, but allows the National Competent Authorities and ANSPs to further detail the content of the scenarios. ATCOs most often work in teams and a team member who feels significant discomfort (e.g. chest pain) can advise other team members that s/he wants to be replaced, or -in case of a sudden loss of consciousness- other team members will be alarmed and will replace the affected ATCO. Cases of incapacitation caused by a mental event will not always be timely apparent to other team members or may not be indicated by the affected ATCO. Therefore, ATCOs need to be trained to recognise signs of a (subtle) mental incapacitation event of their colleagues and of themselves in order to achieve a timely replacement of the ATCO position. Timely replacement may, however, be complicated in single-ATCO operations.

In the context of risk mitigation, it may be considered that in special cases ad hoc briefings on recognising and managing mental incapacitation events can be given to aircrew or ATCOs to stimulate their awareness of above operational principles in relation to a colleague at risk who has given her/his informed consent to inform the colleagues.

4.2.5.2 Incapacitation risk mitigations applicable to individual pilot and ATCO activities

Regulatory requirements for incapacitation risk assessment in the context of medical certification, as laid down in EASA Part Med (EASA, 2022) and EASA Part ATCO Med (EASA, 2019) are an important mitigation of the incapacitation risk for pilots and ATCOs. The aim of these requirements is to prevent applicants with an unacceptable risk of medical incapacitation to operate as ATCO or pilot. This risk mitigation applies to single pilot as well as multi-pilot operations and is based on the estimation of the probability (frequency) and the severity of the event as shown in Figure 71.

Risk mitigation measures in individual cases

In some cases, applicants may have a mental incapacitation event (MIE) risk that may be mitigated to an acceptable level using case-specific measures, which may result in specific limitations mentioned on the applicable licence. Part MED and Part ATCO MED requirements provide opportunities to mitigate risk using appropriate limitations in individual cases, covering an array of measures such as biological or psychological treatment, controlled follow up by a MHS or AME, other treatment or observation measures, and/or changes or safety measures in the Pilot or ATCO´s work environment (EASA, 2022; EASA, 2019).

The aim of a mitigation is to reduce the probability (frequency) and/or severity of a mental incapacitation event (MIE) to an acceptable risk level.

According to Part-MED and Part ATCO MED, a limitation means a condition placed on the medical certificate that shall be complied with whilst exercising the privileges of the licence. When assessing whether a limitation is necessary, particular consideration shall be given to whether accredited medical conclusion indicates that in special circumstances the applicant's failure to meet any requirement is such that exercise of the privileges of the licence is not likely to jeopardise the safe exercise of the privileges of the licence. In this respect the applicant's experience relevant to the operation to be performed is also important.

For reasons of understanding the regulatory limitation principles, the limitations that may be relevant for mitigating risks of mental incapacitation events of applicants are cited from Part MED and Part ATCO MED in below text.

Limitations to class 1 and class 3 medical certificates (EASA, 2022; EASA, 2019)

In regulation MED.B.001 "Limitations to medical certificates" and corresponding AMC1 MED.B.001 and AMC2 MED.B.001 (EASA, 2022) it is stated that if an applicant does not fully comply with the requirements for the relevant class of medical certificate but is considered to be not likely to jeopardise the safe exercise of the privileges of the applicable licence, it should be evaluated whether the applicant is able to perform his/her duties safely when complying with one or more limitations endorsed on the medical certificate. In such case the medical certificate can be issued with limitation(s) as necessary.

Current operational limitations as listed in MED.B.001 and corresponding AMCs are (EASA, 2022), relevant for mental health issues, are:

- Operational multi-pilot limitation (OML – class 1 only)

- Valid only as a qualified co-pilot (OCL). This limitation is an extension of the OML and is restricted to the role of co-pilot.
- Special restriction as specified (SSL)
- - Time limitation (TML)
- Specific regular medical examination(s) (SIC)

  - Assessment of holders of a class 1 or 3 medical certificate may require psychiatric and/or psychological evaluation as determined by the medical assessor of the licensing authority. A SIC limitation should be imposed in case of a fit assessment. Follow-up and removal of SIC limitation should be determined by the medical assessor of the licensing authority.

Cases that may be considered for a fit assessment using a risk-mitigating limitation.

a) Applicants with a mental health condition of which the probability (frequency) of an incapacitation event combined with the severity is estimated to be in the yellow range of the MESAFE risk matrix shown in Figure 77 (1A, 2B, 3C, 4D, 5E), may qualify for a fit assessment with (an) appropriate limitation(s). Depending on the individual characteristics of the mental health symptoms such applicant might obtain the medical certificate with an OML, OCL, TML, SSL and/or SIC limitation. In "yellow" cases in the context of MIE risk assessment it is recommended to seek an accredited medical conclusion in consultation with a mental health expert and - if indicated- with an operational expert. The accredited conclusion should be based on objective and non-discriminatory criteria for the purposes of the case concerned and should include an operational risk assessment (EASA Part MED.A.010 in EASA, 2022).

b) Applicants with a mental health condition of which the probability (frequency) of an incapacitation event combined with the severity is considered to be in the orange range of the MESAFE risk matrix (fig. X; 2A, 3B,, 4C, 5 D) bear an a priori unacceptable safety risk. However, it is recommended to seek an accredited medical conclusion for such cases by an aeromedical-operational board (AMOB). Such board is recommended to comprise of AME(s), MHS acceptable to the licensing authority (psychiatrist, clinical psychologist), operational, other experts (if deemed necessary), and preferably the applicant. It is, for example, conceivable that in a case the severity of the mental incapacitation event is expected to be mild but that the probability (frequency) of the event to occur is high. If such cases will be discussed by the medical-operational board, opportunities for a(n) acceptable mitigation(s) of the risk might emerge during the expert discussions. In such case the risk level might be reduced to the "yellow" level of the matrix recommended in this project (Figure 71; EASA-MESAFE-2.1, 2023).

c) Applicants who use psychoactive medication likely to affect flight safety should be assessed as unfit. If stability on maintenance psychoactive medication is confirmed, a fit assessment with an OML may be considered. If the dosage or type of medication is changed, a further period of unfit assessment should be required until stability is confirmed (EASA, 2022; EASA, 2019). It is conceivable that in some cases also a SIC and/or TML limitations might be imposed.

d) Sobriety testing after successful therapy for alcohol and/or drugs addiction. According to the EASA rules for Class 1 and 3 (EASA, 2022; EASA, 2019) a fit assessment may be considered after a period of two years of documented sobriety or freedom from psychoactive substance use or misuse (see section 4.5 EASA-MESAFE, 2023-3.1). At revalidation or renewal, a fit assessment may be considered earlier with an OML subject to satisfactory psychiatric evaluation. Applicants shall be referred to the licensing authority. It is conceivable that in addition to OML other limitations, such as TML or SIC, may be applied to further reduce the risk in specific individual cases.

4.2.5.3 Eligible biological treatment

The most common biological treatments in mental healthcare and their possible side-effects in relation to aviation safety are discussed in section 2 of the MESAFE deliverable D1.2 - Report on the review of treatment options and section 2.6 of the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests. The decision on the compatibility with certification can only be made on a case-by-case basis combining all relevant clinical parameters, whereby it is advised to follow the recommendations made in section 3 of deliverable 1.2, especially section 3.1.1.

Based on their effects and side effects, SSRI's (selective serotonin reuptake inhibitors) have the best chance to be compatible with aeromedical certification. Also bupropion and tricyclic antidepressants (although for the latter, caution with regards to orthostatic hypotension and sedation should be applied), might in several cases be compatible with certification.

A stable situation after a successfully finished treatment course with repetitive Transcranial Magnetic Stimulation (rTMS) will also often be considered acceptable.

Due to their sedative properties, benzodiazepines are incompatible with flying or ATC duties. From a pharmacological viewpoint, using a short acting benzodiazepine (such as oxazepam, temazepam, zolpidem or zopiclone) incidentally, with sufficient time taken before flight duties start, will, most likely, have no negative influences on performing pilot or ATCO duties. However, the clinical conditions making infrequent use of benzodiazepines necessary, will often not be eligible for certification.

Practical example
An airline pilot has been diagnosed with a bipolar disorder and uses zolpidem from time to time when feeling stressed, in order to sleep better and by doing so, prevent a manic episode. In this case, the major risk is caused by the bipolar disorder and possible manic episodes, not by the infrequent use of zolpidem. *A long-haul airline pilot has a depressive disorder that has been in a full remission for almost a year. He wants to use zolpidem twice a month after returning home from a transatlantic trip, when he is sure he will not fly for the next couple of days, in order to diminish the effects of his jet lag. His psychiatrist agrees that this may reduce the risk of developing a new depressive episode. In this (rather uncommon) case, the use of a benzodiazepine might be considered acceptable.*

4.2.6 Step 6: re-apply the matrix to determine the risk level

As stated earlier, the risk is the function of the possible mental incapacitation event (MIE) and the probability/severity of that MIE.

In the figure 79, the same figure as used in 4.2.4, the risk level has been decided and plotted on the matrix, based on an "remote" probability (10-99% per year) of a "Major" MIE. As we can see, the risk called "MIE1"is

in the square named “3c”. This risk is yellow, and therefore may be acceptable, but may require operational and/or personal risk reduction for the acceptance.

MESAFE MATRIX Risk assessment of mental health			Catastrophic - A	Hazardous - B	Major - C	Minor - D	Negligable - E
			May cause catastrophic event	may cause flight safety critical event	May comprimise flight safety	Reduced effectiveness and capacity to adapt to operational requirements	Minimal impact on flight safety
	Frequency per year	Flight hours between each event (approx) *	Total incapacitation	Severe incapacitation	Major decrement on performance	Minor to moderate performance compromise, may continue duties	Minimal impact on performance
Frequent 5	> 1/month	100	5A	5B	5C	5D	5E
Occasional 4	1-10 times	1.000	4A	4B	4C	4D	4E
Remote 3	10-99%	10.000	3A	3B	3C	3D	3E
Improbable 2	1-10%	100.000	2A	2B	2C	2D	2E
Extremely improbable 1	<1%	>1.000.000	1A	1B	1C	1D	1E

MIE 2

MIE 1

*given random onset of event unconnected to flight. If event is connected to flying activity (e.g. Murder suicide or flight anxiety), use career frequency rather than yearly

	Risk unacceptable	**Operational risk reduction could be co-pilot, backup crew, time window to land helicopter etc. Personal risk factors could be close follow-up by psychologist, peer-support etc. Formalised risk reduction is documented and required in the certificate.
	Risk unacceptable, but may in some cases be acceptable after thorough review and specific mitigation. A medical board should in such cases be employed	
	Risk may be acceptable - may require operational and/or personal risk reduction	
	Risk acceptable	

Figure 78 - Step 6: re-apply the matrix to determine the risk level

Re-application of an original risk in the yellow category

After applying the risk reduction measures, the risk level in this case will be as follows:

- in the yellow region if there is need for regular follow-up of the risk reduction measures for continued certification.
- If the risk mitigation is a limitation to the certificate, or another method that does not need specific follow-up, the risk can be re-applied in the appropriate green region (whether it in this case would be 2c or 3D would depend on whether the mitigation affects the probability or severity of the risk).

Re-application of an original risk in the orange category

If the same MIE had an “Occasional” probability, it would be in square 4C and be orange – This example is labelled “MIE 2” in the Figure 78. This would normally be unacceptable, but in some cases could be acceptable with special control measures or mitigation. An Orange risk should be decided by a board of experts, that we have called Aeromedical Operational Board (AMOB) and will describe in section 5.3 of this document.

The AMOB can decide the following:

- That risk mitigation would not bring the risk into an acceptable level. Certification is denied.
- If the risk reduction measures have reduced the risk sufficiently and can be followed up by an AME or an assigned specialist, the risk level can be re-applied as a yellow risk level. This may allow certification with risk reduction measures in place.
- The medical board can decide that the risk level is acceptable due to employed and effective risk mitigation, but this needs re-evaluation by the medical board after a set time period. Then the risk level will still be orange. In this case certification may be possible.
- If very effective risk mitigation measures were put in place, also the orange risk could change to an appropriate green risk category, given that the risk mitigation does not need follow up. For instance, this could be a change in crew category combined with a specific treatment or control measure.

Risk mitigations measures necessary for certification will always be entered as a limitation or comment in the medical certificate.

4.2.6.1 Analysis of the risk of incapacitation for each class of aeromedical certification, taking into account the acceptable risk level

The classes of aeromedical certification which are considered in this project are Class 1 (pilots) and Class 3 (ATCOs).

When analysing the risk of incapacitation due to an MIE, there is, as mentioned earlier, both severity and probability to be considered. These are discussed in section 4.2.2 and 4.2.3, respectively. The same procedure for assessing an MIE regarding both severity and probability is applied regardless of aeromedical certification class. However, as certification class provides specific privileges for the bearer, general inferences may be made regarding risk acceptance. Simple judgements may therefore be made, and as long as the MIE in question falls into the red or green sector, further analysis of the pilot or ATCOs tasks are not necessary.

Example 1 (MIE 1): A pilot class 1 with a psychotic episode leading to sensory hallucinations will have the potential of causing a catastrophic event. If the probability is 10-99% per year this will be a risk level 3A (se figure below). This is an unacceptable risk.

Example 2 (MIE 2): A behavioural problem such as mild anxiety with a probability of 1 -10% will (if well documented) may be deemed a minor to moderate performance compromise in an ATCO. This will fall into risk 2D (see figure below). This in an acceptable risk.

MESAFE MATRIX Risk assessment of mental health			**Catastrophic - A**	**Hazardous - B**	**Major - C**	**Minor - D**	**Negligable - E**
			May cause catastrophic event	may cause flight safety critical event	May comprimise flight safety	Reduced effectiveness and capacity to adapt to operational requirements	Minimal impact on flight safety
	Frequency per year	Flight hours between each event (approx) *	Total incapacitation	Severe incapacitation	Major decrement on performance	Minor to moderate performance compromise, may continue duties	Minimal impact on performance
Frequent 5	> 1/month	100	5A	5B	5C	5D	5E
Occasional 4	1-10 times	1.000	4A	4B	4C	4D	4E
Remote 3	10-99%	10.000	3A	3B	3C	3D	3E
Improbable 2	1-10%	100.000	2A	2B	2C	2D	2E
Extremely improbable 1	<1%	>1.000.000	1A	1B	1C	1D	1E

MIE 1 (2A) MIE 2 (2D)

*given random onset of event unconnected to flight. If event is connected to flying activity (e.g. Murder suicide or flight anxiety),use career frequency rather than yearly

	Risk unacceptable	**Operational risk reduction could be co-pilot, backup crew, time window to land helicopter etc. Personal risk factors could be close follow-up by psychologist, peer-support etc. Formalised risk reduction is documented and required in the certificate.
	Risk unacceptable, but may in some cases be acceptable after thorough review and specific mitigation. A medical board should in such cases be employed**	
	Risk may be acceptable - may require operational and/or personal risk reduction**	
	Risk acceptable	

Figure 79 - Analysis of the risk of incapacitation for each class of aeromedical certification, taking into account the acceptable risk level

Both examples above are rather simple but show that simple evaluations of risk can be done using certification class alone.

However, for more complex decisions arising from a yellow risk category or, always in the orange risk category – more specific evaluation is needed of the actual operational tasks which are performed by the applicant/license holder. These evaluations must focus on safety-critical tasks and responsibilities which are vulnerable to the MIE in question.

An evaluation of a MIE in a yellow category will often, or for the orange category – always - need some form of risk reduction or mitigation.

Risk mitigation to reduce either severity of probability of an MIE has been described in 4.2.5.1. one such mitigation is a limitation put on the license.

4.2.6.2 Limitations

As earlier stated in 4.2.5.1, a limitation means a condition placed on the medical certificate that shall be complied with whilst exercising the privileges of the license (Part-med and Part ATCO MED). The different operational limitations are also listed and explained in 4.2.5.1. In short, these are repeated here:

- Operational multi-pilot limitation (OML – class 1 only)
- Valid only as a qualified co-pilot (OCL). This limitation is an extension of the OML and is restricted to the role of co-pilot.
- Special restriction as specified (SSL)
- Time limitation (TML)
- Specific regular medical examination(s) (SIC)

Other limitations are described in sections 4.2.5.2 and 4.2.5.3.

These lists provide many possibilities for limitations which may be applied to a specific license holder in order to bring the risk from yellow or orange into an acceptable risk level.

In some cases, a limitation can in a simple way decrease the severity of an MIE. Such a limitation could be an OML or an OCL. The limitation of having to only fly with a co-pilot would allow the other pilot to take over in a specific situation, decreasing the severity by at least one order of magnitude in many cases.

An ATCO with an MIE risk which is in the orange level, might receive a limitation SSL which could include a restriction to not be a single operator, but has to operate in a team.

If a limitation is imposed as a risk mitigation, it should follow from a thorough evaluation of the MIE severity, probability and other risk mitigation possibilities. The impact of specific limitation must be assessed in this process, which should include operational competence to assure that the specific aim of the limitation would be effective in the operational environment. Limitations due to an MIE which is an orange level, must be set by an AMOB. Limitations due to an MIE which is a yellow category, should as a general rule be informed by operational competence.

Imposing limitations might also generate side-effects on the colleagues of the applicant or the entire organisation: additional stress factor for another individual or the entire organisation should therefore be considered in detail.

4.2.7 Step 7: decision and follow-up

It is important to discuss with the applicant the results of the aeromedical mental health assessment, especially when limitations are applied or the license has to be suspended.

This would hopefully foster the acceptance by the applicant and reduce the mental health risks associated to reduced acceptance of the limitations or even license suspension. Indeed, the loss of license is acknowledged among the major work-related stressors in aviation, and there is also evidence, in the general population, that losing job / being unemployed might generate post-traumatic stress effects, increase the risk of stress and isolation, as well as the risk of developing or worsening a mental health issue.

To mitigate the post-traumatic stress effects of the license suspension, such discussion should cover the following:

- Transparent communication on the risk identified and reasons underlying the decision of issuing limitations/suspension;
- Clear identification and agreement about next steps, that should cover financial aspects, professional reorientation and mental health treatment.

The same can be applied when reduced acceptance of limitations is probable.

In MESAFE we recommend to involve the MHS to properly address all of these and help the applicant build coping strategies. Peer Support Groups can also provide non-judgmental help for those colleagues who have had limitations or lost their licence and help them cope with the new situation.

5. MIRAP cooperation processes and professionals involved

As implicit in what described so far, MESAFE aims to propose a network of connections between medical professionals, operational experts and MHS, to support aeromedical decision-making.

The following sections present the proposed cooperation processes among the AMEs and the other actors involved in the MIRAP, based on the MESAFE's experts' advice and the users' requests (according to the three MESAFE surveys respectively targeted to AMEs, pilots and ATCOs).

5.1 The MHS

This section provides information about the role of MHS and their background and competency framework.

5.1.1 Role of the MHS

Mental Health specialists can support the aeromedical mental fitness certification process in four ways, namely help AMEs to carry out the MIRAP, develop support tools for the aeromedical mental health assessment, meet the requirements to carry the MIRAP out and foster the connection with applicants. What follows describes each of them.

5.1.1.1 Support MIRAP implementation

As anticipated in section 4.2, the direct involvement of the MHS is necessary:

- when the severity and probability of MIEs is assessed (respectively steps 2 and 3);
- when determining the risk level is challenging, as for example in the orange cases (step 4), in the framework of the AMOB;
- when reduced acceptance of the aeromedical decision is probable and post-traumatic stress effects need to be mitigated (step 7). The AMEs should refer applicants to the MHS for counselling or treatment when they have concerns about the applicant's mental health status. These concerns can be based on the applicant's responses to the evaluation, the applicant's behaviour during the evaluation, or other information that the AME has gathered. Generally, it is indicated that AMEs make a referral to the MHS for counselling or treatment if they observe at least three of the Mental Disorders Indicators (MESAFE - D-1.1 - Report on the review of diagnostic measures), namely: subjective distress, maladaptiveness, statistical deviance, violation of the standards of society, social discomfort, irrationality and unpredictability, and dangerousness. The MHS can then assess the applicant's mental health status and develop a plan to address any concerns.

The AMEs could also call for the MHS's advice to:

- identify real or potential MIE(s) (step 1). In these cases, the MHS can provide support to carry out the clinical interview and clinical judgment about the presence of any real or potential MIE(s).
- recommend incapacitation risk mitigations applicable to individual pilot and ATCO activities (step 5). In these situations, the MHS can act as a counsellor/therapist for applicants who are experiencing mental health issues. This can help to mitigate the risk of incapacitation and keep the applicant on duty or structure paths back to fitness to fly.

When no MIEs are identified (gate 1), there is no need to involve the MHS.

5.1.1.2 Develop support tools for aeromedical mental health assessment

Figure 73, Figure 74 and Figure 75 provide information about the support tools that are necessary to carry out the MIRAP properly, as follows:

- Interview checklist and target questionnaires (for step 1);

- Epidemiology, clinical information, previous certification, operational environment information (for step 2);
- Timeline of past MIEs, epidemiology, clinical information (for step 3).

The MHS can help address all of them, except for operational environment information, as follows:

- interview checklist: MHS can generate a list of key aspects to address in the aeromedical interview and expected outcomes (see Table 8 and Table 9);
- target questionnaires: the MHS can provide advice on the use of already existing specific scales to further investigate some mental disorders' symptoms that have been identified, as for example low mood, psychoactive substance abuse, cognitive decline. For an extensive description of these scales see, respectively, sections 4.1.3.3, 4.1.1 and 4.2.5 of the MESAFE deliverable D2.1 Report on the analysis of the availability of diagnostic tests;
- epidemiology: the MHS can have access to epidemiological data on mental disorders' symptoms, when available, to inform the assessment of the MIEs' probability and severity levels;
- clinical information: of course, the MHS can leverage on her/his mental health knowledge to assess the MIEs' risk level;
- previous certification: the MHS can help analyse and interpret the meaning of previous mental health status certification made by independent practitioners and also previous records regarding the applicant's psychosocial and professional history;
- timeline of past MIEs: the MHS can help generate the timeline of past MIEs of applicants as support tool to foresee the probability of occurrence of MIEs.

5.1.1.3 Support AMEs to meet the requirements to carry out the MIRAP

Figure 73, Figure 74 and Figure 75 provide information about the requirements that AMEs should have to carry out the MIRAP properly, as follows:

- Interview skills;
- Mental health knowledge.

The MHS can design and deliver target training modules for AMEs, including:

- training and educational materials on mental health issues to promote appropriate identification of MIEs;
- clinical interview skills so to better understand how to assess and counsel applicants;
- psychodiagnostic skills to ensure that the AME is using the most appropriate instrument and to be methodologically consistent both from the questions asked and the data collected.

These materials can be provided by the MHS or other mental health organizations.

5.1.1.4 Foster AMEs-applicants connection

It is advisable that the MHS acts as a link between AMEs and PSPs: this enables the MHS to share information about the applicant's mental health status with the PSP and to provide support to the AME in making decisions about the applicant's fitness for duty.

Moreover, the MHS can provide PSGs with educational material on mental health issues and stress coping.

Section 5.2 further details the AME-MHS-PSP cooperation process.

5.1.2 MHS competency framework

MHS could be either psychologists or psychiatrists. Each of them has different competency framework and accreditation schemes as regards their role in the Aviation domain.

While the profile of Aviation Psychologists, including competency frameworks and accreditation schemes, is under development in EU, the same does not applies to Aviation Psychiatrists.

What follows provides a description of the current legal framework of the Aviation Psychologists and Psychiatrists at EU level.

In the next phases of MESAFE, a proposed description of the profiles and competency framework for the MHS will be provided in detail, based on the MHS role described in section 5.1.

5.1.2.1 The Aviation Psychologist

As stated in the EAAP Competence Handbook, "EASA has laid down general requirements and criteria for those practicing psychological assessments, be it in the selection of pilots or in mental health evaluations. The implementation and detailing is left to the operators and national competent authorities in the EU Member States. The Commission Regulation (EU) 2018/1042 implementing rule CAT.GEN.MPA.175 Endangering safety has been extended and under (b) now includes that 'The operator shall ensure that flight crew has undergone a psychological assessment before commencing line flying'. Pursuant to that, AMC1 CAT.GEN.MPA.175(b) Endangering safety states under (a)(2) that the psychological assessment should be 'validated and either directly performed or overseen by a psychologist with acquired knowledge in aviation relevant to the flight crew's operating environment and with expertise in psychological assessment, and where possible, the psychological selection of aviation personnel'. Part-MED in ANNEX IV of the AIRCREW regulation (Commission Regulation (EU) No 1178/2011) has also been amended. Former 'Psychiatry' and 'Psychology' articles have been merged to form the new 'MED.B.055 Mental Health', sub (a) of which is stating that 'Comprehensive mental health assessment shall form part of the initial class 1 aero-medical examination'. Pursuant to that, AMC1 MED.B.055 Mental Health (a)(4) states: 'Where there are signs or is established evidence that an applicant may have a psychiatric or psychological disorder, the applicant should be referred for specialist opinion and advice.' Pursuant to that, AMC1 MED.B.055 Mental Health (f)(3) says: 'The psychological opinion and advice should be based on a clinical psychological assessment conducted by a suitably qualified and accredited clinical psychologist with expertise and experience in aviation psychology.' […]. Regarding competence requirements for psychologists, the EASA Acceptable Means of Compliance (Commission Regulation (EU) No 1178/2011, AMC1 MED.B.055 Mental Health) only state clinical psychological tasks for aircrew shall be performed in accordance with EU Regulation and related AMCs of EASA by ´accredited psychologists´ as a professional requirement. Comparable qualitative accreditation requirements for psychologists performing other operational or human factors tasks in aviation do not exist." (EAAP, 2023).

New and updated legal and regulatory requirements in aviation increasingly ask for ´eligibility to exercise/practice´. As with other professions within aviation, there is an increasing need for psychologists and human factors practitioners to provide proof of competency.

Competency framework

EAAP has proposed a competency framework and associated accreditation of Aviation Psychologists (AVPSYs) and Aviation Human Factors Specialists (AVHFS) to be recognised at EU level. The framework includes mandatory and recommended competencies for both profiles.

Mandatory competencies for Aviation Psychologists include Global Aviation-System/ Domain Knowledge, Knowledge about Humans, Methodological Approaches & Tools, Areas of Practice and transversal skills (Biede S. et al, 2023).

5.1.2.2 The Aviation Psychiatrist

Aviation psychiatrist is not an official qualification or title, and any psychiatrist is free to refer to him- or herself as an aviation psychiatrist. There is no official body providing accreditation. Nevertheless, most psychiatrists who refer to themselves as aviation psychiatrists do have affinity and experience with aviation. Some psychiatrists are also practicing as an AME. Some have aviation experience themselves, for example by having or training for a PPL. Others have experience with mental examinations upon referral from AME's

and/or airline occupational physicians, or participate in scientific activities. Many combine one or more of the abovementioned activities.

Competency framework

There is no official competency framework for aviation psychiatrists, and the only demand for the aviation psychiatrist in relation to aeromedical certification is to be acceptable to the licensing authority.

Nevertheless, there are some parameters that could indicate whether a psychiatrist has experience with regards to aviation:

- Membership of a national aeromedical association (which in the European Union will be member of ESAM – European Society of Aerospace Medicine).
- Participation in aeromedical congresses and/or aeromedical publications.
- Training/ practicing as an AME.
- Personal flying experience (Although e.g., flying small aircraft as a private pilot is very different compared to the operations of commercial pilots flying large commercial aircraft. Even among commercial pilots, operational circumstances can differ substantially. So personal experience does not automatically indicate knowledge of the operational circumstances an applicant is working in).

Establishing formal qualifications and a formal body providing psychiatrists with a qualification as aviation psychiatrist is as of 2023 challenging:

- The number of psychiatrists providing aeromedical consultations is small and they are not organised, at least not at a European level. So, determining who should develop official qualifications may be difficult.
- Formal qualifications may deter psychiatrists from becoming involved in the aeromedical community, leading to a too small pool of psychiatrists to provide independent mental expert consultations in all member states.

Furthermore, it is advisable to apply a similar competency framework to psychiatrists providing expert advice in aeromedical consultations as to other medical specialists.

Instead of establishing a formal competency framework, for now it may be better to support the networking and sharing of knowledge among psychiatrists involved in aerospace medicine from various European countries. Suggestions to this end (which may also be applicable to other medical specialists) are:

- Organising meetings of aviation psychiatrists by ESAM, e.g., a sub-meeting during the ESAM congress.
- Encouraging aviation psychiatrists to develop intervision groups (given the relatively small numbers, perhaps internationally and online).
- Developing an online training course for psychiatrists (and perhaps also other medical specialists) providing expert advice for aeromedical examinations.

ESAM may be the most appropriate organisation to support these developments.

5.2 Role of Peer Support Programmes

PSPs can help AMEs as follows:

- By helping to prevent escalation of mental health problems
- By mental health monitoring in between two medical examinations

- By providing access to accurate medical information so as to support applicants with medical licensing issues or concerns
- By detecting signs and symptoms of decreased fitness in between two medical examinations
- By promoting a mental well-being culture in a just-culture oriented work environment
- By reporting, discussing and mitigating the impact of organizational stressors on mental health of safety critical personnel

AMEs can help PSPs as follows:

- The AME can recommend various ways to address mental issues outside of the medical, in order to prevent them becoming an issue that could impact the applicant's fitness to fly in the future.
- This might include Peer Support Programmes!
- AMEs should be trained to know the key–principles and the aims of the local PSP(s) and fully utilize its opportunities

What follows provides an extensive description of PSPs.

It is considered that Peer Support Programmes (PSPs) contribute significantly to flight safety by supporting pilots and ATCOs with mental wellbeing or life stress issues (MESAFE Report D1.2; EPPSI Guide 2020). This section is to describe which professionals are involved in running a Peer Support Programme. When describing the different roles of professionals involved, it should be considered that a PSP is not an emergency service. It should be made clear to pilots and ATCOs that in cases of medical or psychiatric emergencies, such as threatening suicide (or 'suicidality'), acute psychosis, or a complete mental breakdown, the first point of contact should always be an appropriate medical emergency service. A PSP primarily acts as a relief and signposting programme rather than offering direct medical, psychiatric or therapeutical assistance (EPPSI, 2020). A PSP can be defined as a formal structure or system whereby a pilot needing help can get support with mental wellbeing or life stress issues from a dedicated and trained colleague in a setting in which the confidentiality of the support process is absolute and is obeyed by all professional involved (EPPSI, 2020) also including the administrative project coordinator and programme lead. PSPs should ideally be independently run programmes and will require an administrator to lead and coordinate the programme. This should preferably be someone with psychological and administrative experience but this role might also be taken by a pilot trained for this work.

The European Pilot Peer Support Initiative (EPPSI) has laid down the key-principles and requirements of a PSP for aviation in a guide that is widely used as blueprint for setting up a PSP in EASA member states. This guide provides the following requirements of qualifications and functions of professionals engaged in a PSP (EPPSI, 2020):

Trained Peers

A 'peer' is a trained person who shares common professional qualifications and experience, and has encountered similar situations, problems or conditions with the person seeking assistance from a PSP. This may or may not be a person working in the same organisation as the person seeking assistance from the support programme. A peer's involvement in a support programme can be beneficial due to similar professional backgrounds between the peer and the person seeking support. A mental health professional should always be available to support the peer when required, for instance in all cases where intervention is required to prevent endangering safety. That PSP support can include intervention scenarios supervised by a Mental Health Professional (MHP) differentiates a PSP from an Employee Assistance Programme or other support mechanisms.

Peers should hold no managerial or pilot or ATCO representative body position because there should be no perceived authority gradient between the pilot or ATCO contacting the programme and the Peer. Peers are the interface between the pilots or ATCOs and the help mechanisms available. They are recruited with care, then trained, supported and managed appropriately. This responsibility lies with the MHP with guidance of

an Overview Committee, particularly in the recruitment phase. Peers must be good listeners and must do so in a non-judgemental fashion. They must observe strict confidentiality in all cases at all times.

Mental Health Professional

The key feature which marks a PSP out from other forms of employee support programmes is the presence of a suitably trained Mental Health Professional at the heart of the programme, and the close relationship between them and the Peers. When a pilot or ATCO contacts a PSP, the first contacts are with a Peer who is trained and mentored by an aviation mental health professional. Experience from existing PSPs has shown that the success of a programme is closely linked to an effective working relationship between the Peers and the MHP. In relation to the Peers, the MHP will:

- interview and recruit the Peers;
- conduct the initial and continuous training of the Peers;
- mentor the Peers on individual cases;
- counsel and support the Peers with regard to their personal wellbeing within the programme.

As a minimum, EPPSI (2020) recommends as competency requirements for the MHP:

- by formal education and practice be knowledgeable and experienced in assessing, coaching and counselling clients with mental health issues;
- have relevant knowledge of the aviation environment and of safety threats in aviation;
- be knowledgeable about mental disorders, especially those more common in aviation personnel;
- have access to and making use of professional consultation with AMEs, colleagues
- is a clinical aviation psychologist or psychiatrist with experience in the aviation field when appropriate;
- be an effective trainer and team worker;
- be well-trained in matters of confidentiality and data protection

Depending on the nature of the case, a PSP client (pilot or ATCO) can be referred by a Peer to the MHP who can have direct further contacts with the client.

A PSP may employ its own MHPs without contracting the service out to a third party provider. In that case, the Peer may refer the Client to a MHP (not the one mentoring the Peer) for treatment via the programme's Clinical Director/coordinator. In smaller scale PSPs the MHP is most likely to be a third-party contractor. In that case care must be taken to avoid a conflict of interest and it should be considered unethical for a MHP to recommend via a Peer that the client is referred to their own practice.

Referral to specialist psychological or psychiatric treatment (EPPSI, 2020)

In some cases, the MHP will consider that a client may need specialist psychological or psychiatric assessment and treatment. It is likely that a pilot who requires specialist psychological or psychiatric treatment will need an assessment as well as a referral. The various agencies which can do this include the pilot's AME, family doctor, the company's aeromedical person, or the CMO of the national authority. The Terms of Reference for the PSP should give guidance on how to direct the pilot towards appropriate medical help, and on how to deal with possible confidentiality problems in such cases. Another pathway to help the client may be to arrange time off work to deal with immediate problems. If pilots or ATCOs require time off from work to address their problems then, with the support of the Peer, they will come out of the confidential Safe Zone and approach the Fleet / HR team. This pathway may require the MHP to validate the pilot's requirements and liaise with the airline's medical department and/or Fleet office. This will only be done with the pilot's consent. Other forms of help needing to step outside the confidential Safe Zone can be arranged with the guidance and support of the Peer, who retains overview of the case.

Steps in the Peer Support Process (EPPSI, 2020)

The whole process is strictly data protected.

1. Within a confidential Safe Zone, the Client makes contact with the programme.
2. A Peer is then allocated to the case.
3. The Peer then contacts (text or phone) the Client to arrange a mutually convenient time to talk, and the first of possibly a series of conversations is held.
4. The Peer is mentored and supported by the MHP who is always available to guide the Peer as required through the case and will indicate and coordinate further steps, such as referral to a specialist, taking the client off the roster, or other steps as indicated.
5. If the required pathway is medical / psychological, the Peer works with the clients to help them ask for professional help. The medical confidentiality is retained, and any dealings between the client and the medical department of the company remain within an expanded confidential Safe Zone.
6. In case clients require time off from work to address their problems they will come out of the confidential Safe Zone and approach the Fleet / HR team with the support of the Peer (client's consent needed).
7. This process may require the MHP to validate the pilot's requirements and liaise with the medical department and/or Fleet office. This will only be done with the client's consent.
8. The third pathway to help (Other) is outside the confidential Safe Zone, and is guided and supported by the Peer who will retain overview of the case and record basic notes for statistical purposes (client's consent needed).

5.3 The aeromedical-operational board (AMOB)

As discussed in section 4.2.4, the evaluation of the incapacitation risks caused by mental health events may be difficult in cases that are not clearly unfit or fit. When it is considered that the risk of a mental incapacitation event (MIE) of an applicant might -or might not- be mitigated to an acceptable level using measures as described in section 4.2.5 of the present report, it is recommended to try and reach an accredited conclusion using a team of experts relevant for the case. According to EASA an "accredited medical conclusion" means a conclusion reached by one or more medical experts on the basis of objective and non-discriminatory criteria, including an operational risk assessment for the purposes of the case concerned in consultation with flight operations or other experts (EASA, 2019; EASA, 2022). To reach an accredited conclusion in cases such as those assigned to the orange categories of the MESAFE Risk Matrix (shown in Figure 77 in section 4.2.5.1) it is recommended to set up an AeroMedical-Operational Board (AMOB).

In modern medical decision making it is recommended that decisions, that might significantly affect a patient's (or applicant's) life or wellbeing, should be taken in consultation with a team of relevant experts. Adoption of this principle in aeromedical decision making will enable AMEs to share their considerations and arguments with a team of experts in order to reach a well-considered accredited aeromedical-operational conclusion based on expert opinion.

Such aeromedical-operational board is recommended to comprise of (an) AME(s), MHS acceptable to the licensing authority (psychiatrist, clinical psychologist), and operational experts. Moreover, it is recommended to actively involve the applicant concerned in the deliberations of the board whenever possible. This is considered to be useful because 1) the applicant can think along with the board about the operational safety consequences of her/his mental health symptoms; and 2) the applicant might better understand the arguments and decision of the board, and this might facilitate the applicant's acceptance of the decision.

Considerations on impact of setting up an aeromedical-operational board (AMOB)

In cases of risk assessment of mental incapacitation issues an advantage of the AMOB is that it facilitates a regular contact and "cross-fertilisation" as well as building bridges between AMEs, assessors, and MHS. The impact for AMEs is that they can seek support of MHS and operational experts and that they will become more familiarised with all relevant aspects of mental health issues.

It is however considered that, depending on availability of MHS and operational experts, some EASA member states might have problems to set up an AMOB on a national level. In this regard it can be considered that an AMOB might digitally exchange their views (e-mail and online meetings) which might enable to set up a mutual board between countries that have similar cultural backgrounds.

6. Conclusions and next steps

In the context of the EASA-MESAFE project "Mental Health for Aviation Safety" the MESAFE team recommended to use a risk matrix approach for the risk assessment of mental incapacitation events. The risk matrix, as recommended by MESAFE and shown below, can act as an important structured communication tool between medical assessors, AMEs, MHS, and operational experts and for the discussion with the applicant, because it is focused on incapacitation events rather than on diagnoses of mental disorders. Using the risk matrix concept will add to the scientific evidence of an accredited medical conclusion.

Using the risk matrix requires knowledge of operational effects of mental incapacitation events. Such a risk matrix can be used for aeromedical risk assessment by the AME assisted by a qualified aviation mental health professional and in consultation with operational competence.

MESAFE MATRIX Risk assessment of mental health			**Catastrophic - A**	**Hazardous - B**	**Major - C**	**Minor - D**	**Negligable - E**
			May cause catastrophic event	may cause flight safety critical event	May comprimise flight safety	Reduced effectiveness and capacity to adapt to operational requirements	Minimal impact on flight safety
	Frequency per year	Flight hours between each event (approx) *	Total incapacitation	Severe incapacitation	Major decrement on performance	Minor to moderate performance compromise, may continue duties	Minimal impact on performance
Frequent 5	> 1/month	100	5A	5B	5C	5D	5E
Occasional 4	1-10 times	1.000	4A	4B	4C	4D	4E
Remote 3	10-99%	10.000	3A	3B	3C	3D	3E
Improbable 2	1-10%	100.000	2A	2B	2C	2D	2E
Extremely improbable 1	<1%	>1.000.000	1A	1B	1C	1D	1E
*given random onset of event unconnected to flight. If event is connected to flying activity (e.g. Murder suicide or flight anxiety),use career frequency rather than yearly							
	Risk unacceptable					**Operational risk reduction could be co-pilot, backup crew, time window to land helicopter etc. Personal risk factors could be close follow-up by psychologist, peer-support etc. Formalised risk reduction is documented and required in the certificate.	
	Risk unacceptable, but may in some cases be acceptable after thorough review and specific mitigation. A medical board should in such cases be employed						
	Risk may be acceptable - may require operational and/or personal risk reduction						
	Risk acceptable						

Figure 80 - The MESAFE matrix

To assess the usability, suitability and acceptability of the proposed application of the matrix in the MIRAP, in its next tasks (namely task 5 and 6), MESAFE will engage in:

- A detailed description of the profiles and competency framework for the MHS
- A MIRAP proof of concept study.

What follows provides the description of the protocol for the Proof of concept study.

6.1 Proof of concept evaluation protocol

6.1.1 Introduction

Proof of concept (POC or PoC), also known as proof of principle, is a realisation of a certain concept or method in order to demonstrate the method's feasibility and a demonstration of its practical potential. A proof of concept is usually small because its principal aim is to demonstrate potential advantages and flaws of a new concept to its developers. The results of a POC will be informative for decisions to implement, adapt, or abandon a newly developed concept.

6.1.2 Aim of the POC evaluation

The aim of the proof of concept is to apply the MESAFE MIRAP concept to assess the risk of mental incapacitation events using real-life cases of applicants of which a risk of mental health incapacitation events played a role in the outcome of their medical certification decision. The outcome including the argumentation of the cases evaluated using the MESAFE matrix will be compared to the argumentation and outcome of the cases as these have been evaluated by each provider of the case. Differences in argumentation and/or outcome of the cases as well as problems encountered by using the MESAFE MIRAP will be described. The outcome of the POC could lead to adaptations of the concept in order to optimise the MESAFE MIRAP concept.

6.1.3 Method and Constraints

National Medical Assessors will be requested to provide cases in which risk assessment of (a) mental incapacitation event(s) has been complex or difficult irrespective of the outcome (fit, fit with limitation(s), unfit). Cases should be completely anonymised and should preferably be provided in a format where the medical history (anamnesis) is separated from the argumentation and outcome of the case in order to create the possibility of blinding the outcome for the MESAFE Research team.

The MESAFE research team will evaluate relevance of the cases and perform the POC evaluation.

It is being strived for to evaluate at least 3 cases. Due to time and funding constraints the maximum number of cases will be limited to 5.

The outcome of the POC will be published in the next deliverables of MESAFE.

Disclaimer

The MESAFE research team is aware of the risk that insufficient cases will timely (i.e. before the deadline of Tasks 5 and 6) be provided by the National Medical Assessors. In that case the MESAFE team will try and retrieve example cases from a clinical psychiatric practice and use these cases to explore the feasibility and possible problems of the concept.

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8. Annexes

Annex A Aeromedical mental health assessment: a survey to collect the EU pilots' point of view – Survey template.

01/08/23, 10:26 Aeromedical mental health assessment: a survey to collect the EU pilots' point of view

Aeromedical mental health assessment: a survey to collect the EU pilots' point of view

About the project

This survey is being conducted as part of the **MESAFE project**, funded by the European Union's Horizon Europe research and innovation programme and managed by EASA.

MESAFE assesses new medical developments for the early diagnosis as well as treatment of mental health conditions which could pose a safety risk for aviation and would consequently lead to pilots' and air traffic controllers' (ATCOs) unfitness. By identifying the needs of the stakeholders, MESAFE will develop evidence-based recommendations targeted to AMEs and the aeromedical staff working in the AeMCs for a suitable and effective aeromedical mental health assessment process.

About this survey

As part of this research, the MESAFE project aims to collect the point of view of European pilots about current gaps and needs with respect to the aeromedical mental health assessment process. The main objectives of this survey are to:

- Identify misalignments between the available resources and the resources required for the mental health assessment and support.
- Determine the factors that have an impact on the pilot's acceptability of the mental health aeromedical assessment.

The survey will take approximately 15 minutes to complete (23 questions in total).

About your participation

Your participation in this study is fully voluntary and all the collected data will be anonymized and treated confidentially. The research outputs resulting from this work will only include collated data, without the possibility for anyone to identify individual answers. The survey does not require you to provide any information that could identify you personally (e.g., your name). If, whilst completing the survey, you wish to withdraw, please just close the browser without submitting your answers.

By proceeding with this survey you confirm that you are a Commercial Pilot, have read and understood the above information, agree to participate in this research study and agree that your data will be included in our analysis and any research publications resulting from it.

If you have any questions or would like to hear about the MESAFE project results, please contact Paola Tomasello at paola.tomasello@dblue.it

Thank you for your participation in this survey.

The MESAFE Project Team

https://docs.google.com/forms/d/1oad3SHjuVQITIQ3IZURkO5dFN-NKDNe18SnlMm89J0E/edit 1/19

01/08/23, 10:26 Aeromedical mental health assessment: a survey to collect the EU pilots' point of view

* Indicates required question

General Information

https://docs.google.com/forms/d/1oad3SHjuVQITIQ3IZURkO5dFN-NKDNe18SnlMm89J0E/edit 2/19

01/08/23, 10:26 Aeromedical mental health assessment: a survey to collect the EU pilots' point of view

1. 1. In which member state are you certified as a pilot? *

Mark only one oval.

- Greece
- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czechia
- Denmark
- Estonia
- Finland
- France
- Germany
- Hungary
- Iceland
- Ireland
- Italy
- Latvia
- Liechtenstein
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- Other

https://docs.google.com/forms/d/1oad3SHjuVQITIQ3IZURkO5dFN-NKDNe18SnlMm89J0E/edit 3/19

01/08/23, 10:26 Aeromedical mental health assessment: a survey to collect the EU pilots' point of view

2. 1a. If other, please specify which country

____

3. 2. How many flight hours of experience do you have as a pilot? *

Mark only one oval.

- 1000
- 1000-5000
- 5000-10.000
- > 10.000

4. 3. Currently, what class of licence do you possess? (please select all that apply) *

Check all that apply.

- Class 1
- Drone Pilot (RPAS operator)
- Other: _______________

Your current experience with the aeromedical assessment of mental health for class 1 applications

5. 4. In your current experience, is any mental health assessment carried out for class 1 initial applications? *

Mark only one oval.

- Yes
- No

https://docs.google.com/forms/d/1oad3SHjuVQITIQ3IZURkO5dFN-NKDNe18SnlMm89J0E/edit 4/19

6. 4a. If yes, who performs the mental health assessment for class 1 initial applications?

Mark only one oval.

- The AME alone
- The AME, referring to aviation psychologist or psychiatrist if indicated
- Aviation Psychologist
- Aviation Psychiatrist
- I don't know
- Other: _____

7. 4b. If yes, how is the mental health assessment for class 1 initial applications performed? (please select all that apply)

Check all that apply.

- [ ] Self-administered questionnaire(s)
- [ ] Questionnaire(s) administered during the examination
- [ ] Interview
- [ ] Combination of questionnaires and interview
- [ ] Other: _____

8. 4c. If yes, how much time is dedicated to the mental health assessment during the aeromedical checks for class 1 initial applications?

Mark only one oval.

- Less than 15 minutes
- Half an hour
- 1 hour
- I don't know
- Other: _____

9. 5. In your current experience, is any mental health assessment carried out for class 1 revalidation/renewal applications? *

Mark only one oval.

- Yes
- No

10. 5a. If yes, who performs the mental health assessment for class 1 revalidation/renewal applications?

Mark only one oval.

- The AME alone
- The AME, referring to aviation psychologist or psychiatrist if indicated
- Aviation Psychologist
- Aviation Psychiatrist
- I don't know
- Other: _____

11. 5b. If yes, how is the mental health assessment for class 1 revalidation/renewal applications performed? (please select all that apply)

Check all that apply.

- [ ] Self-administered questionnaire(s)
- [ ] Questionnaire(s) administered during the examination
- [ ] Interview
- [ ] Combination of questionnaires and interview
- [ ] Other: _____

12. 5c. If yes, how much time is dedicated to the mental health assessment during the aeromedical checks for class 1 revalidation/renewal applications?

Mark only one oval.

- Less than 15 minutes
- Half an hour
- 1 hour
- I don't know
- Other: _____

Gaps and needs

13. 6. Mental health issues may have an impact on the safety of operations *

Mark only one oval.

	Totally disagree	1	2	3	4	5	6	7	Totally agree

14. 7. The current aeromedical assessment process is effective to detect mental health problems impacting on safety *

Mark only one oval.

	Totally disagree	1	2	3	4	5	6	7	Totally agree

15. 8. The time currently allocated for the aeromedical mental health assessment is enough *

Mark only one oval.

Totally disagree
1
2
3
4
5
6
7
Totally agree

16. 9. The aeromedical mental health assessment should include the collection of data about the applicant's psychosocial history. *

Mark only one oval.

Totally disagree
1
2
3
4
5
6
7
Totally agree

17. 10. The aeromedical mental health assessment should include the collection of data about the applicant's professional history *

Mark only one oval.

Totally disagree
1
2
3
4
5
6
7
Totally agree

18. 11. Should the aeromedical mental health assessment process involve a mental health specialist? *

Mark only one oval.

- Yes, especially for initial applications
- Yes, both for initial and for renewal/revalidation applications
- Yes, but only when a particular need arises
- No, never
- Other:

19. 12. The aeromedical examiner should refer the applicants to a mental health specialist *

Mark only one oval.

- Yes, all initials
- Yes, but only when a particular need arises
- No, never
- Other:

20. 13. A close cooperation between AMEs and mental health specialists would improve the effectiveness of the aeromedical mental health assessment *

Mark only one oval.

Totally disagree
1
2
3
4
5
6
7
Totally agree

Mental Health and the safety of operations

21. 14. Pilots are able to detect signs of mental discomfort in themselves easily *

Mark only one oval.

Totally disagree

1
2
3
4
5
6
7

Totally agree

22. 15. It is easy to detect signs and symptoms of mental discomfort or stress in colleagues *

Mark only one oval.

Totally disagree

1
2
3
4
5
6
7

Totally agree

23. 16. It is easy to detect signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues *

Mark only one oval.

Totally disagree

1
2
3
4
5
6
7

Totally agree

24. 17. Have you ever taken any action when a colleague shows signs and symptoms of stress potentially impacting operational safety? *

Mark only one oval.

Yes
No

25. 17a. If yes, what actions did you take?

26. 17b. If no, why?

27. 18. Have you received any training about mental health issues' signs and symptoms (for example, in the framework of CRM or HF courses)? *

Mark only one oval.

Yes
No

28. 19. Have you received any training about the safety impact of alcohol, drugs and other psychoactive substances? *

Mark only one oval.

Yes
No

29. 20. Have you received any training about the safety impact of psychoactive medication? *

Mark only one oval.

- Yes
- No

Peer Support Programmes

30. 21. Do you know what peer support programmes are? *

Mark only one oval.

- Yes
- No

31. 21a. If yes, do you think peer support programmes are effective to mitigate pilots' stress?

Mark only one oval.

- Yes
- No

32. 21b. If yes, do you think that a close cooperation between aeromedical examiners and peer support groups would help mitigate the safety risks related with mental health issues?

Mark only one oval.

	Totally disagree						Totally agree
	1	2	3	4	5	6	7

Final remarks

33. 22. Currently, what are the issues preventing a good aeromedical mental health assessment? *

34. 23. What would you recommend to improve the aeromedical mental health assessment process? *

Thanks for your participation!

Please click on the button below to submit your replies!

For more information about the project: MESAFE (Mental Health)

If you have any questions or would like to hear about the MESAFE project results, please contact Paola Tomasello at paola.tomasello@dblue.it

Thank you for your participation!

The MESAFE Project Team

Annex B Aeromedical mental health assessment: a survey to collect the EU ATCOs' point of view – Survey template

01/08/23, 10:26 Aeromedical mental health assessment: a survey to collect the EU ATCOs' point of view

Aeromedical mental health assessment: a survey to collect the EU ATCOs' point of view

About the project

This survey is being conducted as part of the **MESAFE project**, funded by the European Union's Horizon Europe research and innovation programme and managed by EASA.

MESAFE assesses new medical developments for the early diagnosis as well as treatment of mental health conditions which could pose a safety risk for aviation and would consequently lead to pilots' and air traffic controllers' (ATCOs) unfitness. By identifying the needs of the stakeholders, MESAFE will develop evidence-based recommendations targeted to AMEs and the aeromedical staff working in the AeMCs for a suitable and effective aeromedical mental health assessment process.

About this survey

As part of this research, the MESAFE project aims to collect the point of view of European ATCOs about current gaps and needs with respect to the aeromedical mental health assessment process. The main objectives of this survey are to:

- Identify misalignments between the available resources and the resources required for the mental health assessment and support.
- Determine the factors that have an impact on the ATCOs' acceptability of the mental health aeromedical assessment.

The survey will take approximately 15 minutes to complete (23 questions in total).

About your participation

Your participation in this study is fully voluntary and all the collected data will be anonymized and treated confidentially. The research outputs resulting from this work will only include collated data, without the possibility for anyone to identify individual answers. The survey does not require you to provide any information that could identify you personally (e.g., your name). If, whilst completing the survey, you wish to withdraw, please just close the browser without submitting your answers.

By proceeding with this survey you confirm that you are an ATCO, have read and understood the above information, agree to participate in this research study and agree that your data will be included in our analysis and any research publications resulting from it.

If you have any questions or would like to hear about the MESAFE project results, please contact Paola Tomasello at paola.tomasello@dblue.it

Thank you for your participation in this survey.

The MESAFE Project Team

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* Indicates required question

General Information

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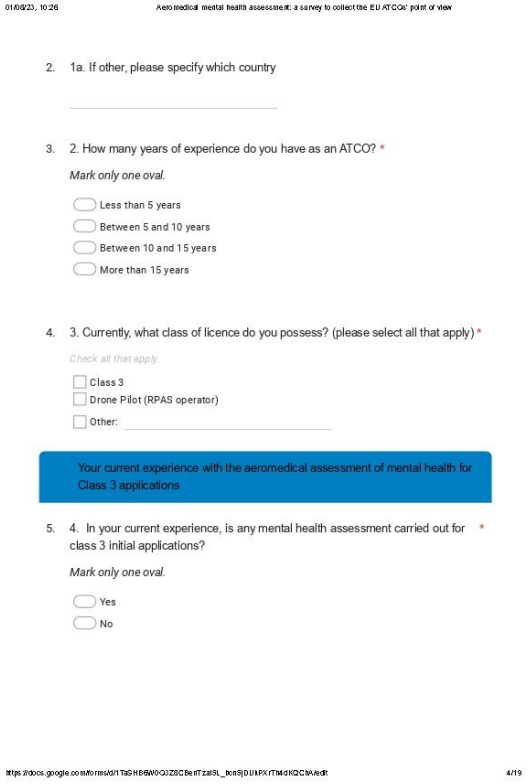
1. 1. In which member state are you certified as an ATCO? *

Mark only one oval.

- Greece
- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czechia
- Denmark
- Estonia
- Finland
- France
- Germany
- Hungary
- Iceland
- Ireland
- Italy
- Latvia
- Liechtenstein
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- Other

https://docs.google.com/forms/d/1TaSHB6W0Q3Z8CBenTzaISL_tcnSjDUkPXrTMdKQCtkA/edit 3/19



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2. 1a. If other, please specify which country

3. 2. How many years of experience do you have as an ATCO? *

Mark only one oval.

- Less than 5 years
- Between 5 and 10 years
- Between 10 and 15 years
- More than 15 years

4. 3. Currently, what class of licence do you possess? (please select all that apply) *

Check all that apply.

- Class 3
- Drone Pilot (RPAS operator)
- Other:

Your current experience with the aeromedical assessment of mental health for Class 3 applications

5. 4. In your current experience, is any mental health assessment carried out for class 3 initial applications? *

Mark only one oval.

- Yes
- No

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6. 4a. If yes, who performs the mental health assessment for class 3 initial applications?

Mark only one oval.

- The AME alone
- The AME, referring to aviation psychologist or psychiatrist if indicated
- Aviation Psychologist
- Aviation Psychiatrist
- I don't know
- Other: _____

7. 4b. If yes, how is the mental health assessment for class 3 initial applications performed? (please select all that apply)

Check all that apply.

- [ ] Self-administered questionnaire(s)
- [ ] Questionnaire(s) administered during the examination
- [ ] Interview
- [ ] Combination of questionnaires and interview
- [ ] Other: _____

8. 4c. If yes, how much time is dedicated to the mental health assessment during the aeromedical checks for class 3 initial applications?

Mark only one oval.

- Less than 15 minutes
- Half an hour
- 1 hour
- I don't know
- Other: _____

9. 5. In your current experience, is any mental health assessment carried out for class 3 revalidation/renewal applications? *

Mark only one oval.

- Yes
- No

10. 5a. If yes, who performs the mental health assessment for class 3 revalidation/renewal applications?

Mark only one oval.

- The AME alone
- The AME, referring to aviation psychologist or psychiatrist if indicated
- Aviation Psychologist
- Aviation Psychiatrist
- I don't know
- Other: _____

11. 5b. If yes, how is the mental health assessment for class 3 revalidation/renewal applications performed? (please select all that apply)

Check all that apply.

- [ ] Self-administered questionnaire(s)
- [ ] Questionnaire(s) administered during the examination
- [ ] Interview
- [ ] Combination of questionnaires and interview
- [ ] Other: _____

12. 5c. If yes, how much time is dedicated to the mental health assessment during the aeromedical checks for class 3 revalidation/renewal applications?

Mark only one oval.

- Less than 15 minutes
- Half an hour
- 1 hour
- I don't know
- Other: _____

Gaps and needs

13. 6. Mental health issues may have an impact on the safety of operations *

Mark only one oval.

	Totally disagree	1	2	3	4	5	6	7	Totally agree
		◯	◯	◯	◯	◯	◯	◯	

14. 7. The current aeromedical assessment process is effective to detect mental health problems impacting on safety *

Mark only one oval.

	Totally disagree	1	2	3	4	5	6	7	Totally agree
		◯	◯	◯	◯	◯	◯	◯	

15. 8. The time currently allocated for the aeromedical mental health assessment is enough *

Mark only one oval.

Totally disagree
1
2
3
4
5
6
7
Totally agree

16. 9. The aeromedical mental health assessment should include the collection of data about the applicant's psychosocial history *

Mark only one oval.

Totally disagree
1
2
3
4
5
6
7
Totally agree

17. 10. The aeromedical mental health assessment should include the collection of data about the applicant's professional history *

Mark only one oval.

Totally disagree
1
2
3
4
5
6
7
Totally agree

18. 11. Should the aeromedical mental health assessment process involve a mental health specialist? *

Mark only one oval.

- Yes, especially for initial applications
- Yes, both for initial and for renewal/revalidation applications
- Yes, but only when a particular need arises
- No, never
- Other:

19. 12. The aeromedical examiner should refer the applicants to a mental health specialist *

Mark only one oval.

- Yes, all initials
- Yes, but only when a particular need arises
- No, never
- Other:

20. 13. A close cooperation between AMEs and mental health specialists would improve the effectiveness of the aeromedical mental health assessment *

Mark only one oval.

Totally disagree
1
2
3
4
5
6
7
Totally agree

Mental Health and the safety of operations

21. 14. ATCOs are able to detect signs of mental discomfort in themselves easily *

Mark only one oval.

Totally disagree

1
2
3
4
5
6
7

Totally agree

22. 15. It is easy to detect signs and symptoms of mental discomfort or stress in colleagues *

Mark only one oval.

Totally disagree

1
2
3
4
5
6
7

Totally agree

23. 16. It is easy to detect signs and symptoms of alcohol, drugs and other psychoactive substances abuse in colleagues *

Mark only one oval.

Totally disagree

1
2
3
4
5
6
7

Totally agree

24. 17. Have you ever taken any action when a colleague shows signs and symptoms of stress potentially impacting operational safety? *

Mark only one oval.

Yes
No

25. 17a. If yes, what actions did you take?

26. 17b. If no, why?

27. 18. Have you received any training about mental health issues' signs and symptoms (for example, in the framework of TRM or HF courses)? *

Mark only one oval.

Yes
No

28. 19. Have you received any training about the safety impact of alcohol, drugs and other psychoactive substances? *

Mark only one oval.

Yes
No

29. 20. Have you received any training about the safety impact of psychoactive medication? *

Mark only one oval.

- Yes
- No

Peer Support Programmes

30. 21. Do you know what peer support programmes are? *

Mark only one oval.

- Yes
- No

31. 21a. If yes, do you think peer support programmes are effective to mitigate ATCOs' stress?

Mark only one oval.

- Yes
- No

32. 21b. If yes, do you think that a close cooperation between aeromedical examiners and peer support groups would help mitigate the safety risks related with mental health issues?

Mark only one oval.

	Totally disagree						Totally agree
	1	2	3	4	5	6	7

Final remarks

33. 22. Currently, what are the issues preventing a good aeromedical mental health assessment? *

34. 23. What would you recommend to improve the aeromedical mental health assessment process? *

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Thank you for your participation!

The MESAFE Project Team

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An Agency of the European Union