

A Proposed Framework to Regulate Mental Health in Airline Pilots

William R. Hoffman; Anne Suh; Timothy Sprott; Kate Manderson; Quay Snyder; Malcolm Sparrow; Anthony Tvaryanas

INTRODUCTION: The current regulatory approach to U.S. airline pilot mental health may have unintended negative consequences including healthcare avoidance and screening imprecision. An alternative approach should aim to address these factors while maintaining safety. The authors summarize the following related to mental health in U.S. airline pilots: 1) current regulatory approach and limitations, 2) available regulatory tools within the Sparrow fundamentals, and 3) a proposed novel regulatory approach. The authors propose the simultaneous utilization of multiple models to minimize the negative consequences of healthcare avoidance and screening imprecision. The proposed framework aims to address current limitations.

KEYWORDS: mental health, aerospace medicine, aerospace psychology, screening, public health, regulatory design, occupational medicine.

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The existing regulatory approach to risk management in medically certifying pilots with a mental health condition unintentionally fosters pilot healthcare avoidance behaviors.¹ Hence the need to develop alternative regulatory approaches that mitigate healthcare avoidance behaviors while maintaining the present level of aviation safety. This commentary examines the current U.S. regulatory approach to mental health conditions in airline pilots, reviews the role of aeromedical screening, outlines different regulatory frameworks, and recommends an alternative regulatory framework for oversight of mental-health-related safety hazards.

Currently, airline pilots undergo periodic evaluations by a Federal Aviation Administration (FAA) designated aviation medical examiner who screens for mental health conditions and applies algorithmic medical certification guidance.^{2,3} These evaluations result in either issuance of a medical certificate or deferring the application to FAA physicians for additional review and potential special issuance, the latter involving a variable period of pilot restriction from flying duties with concomitant adverse socioeconomic impacts. This guidance is diagnosis-centric and assumes that the presence of a diagnosis or use of healthcare services indicates a safety risk.

Two key problems associated with this approach are pilot mental healthcare avoidance⁴ and screening inaccuracy.^{5,6}

During 2023–2024, these problems were given heightened visibility through a Department of Transportation Inspector General report (no. V2023038), the National Transportation Safety Board's 2023 "Navigating Mental Health in Aviation" summit,⁷ and the FAA's Mental Health & Aviation Medical Clearances Aviation Rulemaking Committee.⁸ While the current pilot medical certification approach has contributed to the U.S. operating a safe aviation system globally, emerging data on pilot healthcare avoidance, continued pilot mental-health-related aviation incidents,⁹ and public calls for change suggest a new paradigm is needed for regulatory oversight of pilot mental-health-related safety risk.

When it comes to a novel approach for screening for mental health conditions impacting pilot fitness for duty, several key

From the 59th Medical Wing, Office of Science and Technology, Joint Base San Antonio, TX, United States.

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Address correspondence to: William Hoffman, M.D., 59th Medical Wing Office of Science and Technology, 3551 Roger Brooke Dr, Joint Base San Antonio, TX 78234, United States; william.r.hoffman43.mil@health.mil.

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concepts must be considered. These include hazard identification, hazard prevalence within the pilot population, and the predictability of change. First, focusing on the safety-impacting manifestations of a condition rather than the diagnosis itself, we propose two broad hazard categories associated with a mental health condition that are the target of aeromedical screening. Hazard Category 1 includes cognitive dysfunctions (i.e., executive dysfunction; impaired learning, attention, and concentration; working memory; judgement; decision-making; self and situation awareness), while Hazard Category 2 includes risks for harmful behaviors (i.e., suicidality and homicidality). Second, we pose an assumption that the proportion of pilots with symptoms varies inversely with the degree of symptom severity such that a minority of pilots have a safety-relevant impairment. Lastly, mental health conditions vary in the predictability of changes in manifestation onset/fluctuations and symptom severity level. The relationship between predictability and severity can be conceptually modeled as shown in **Fig. 1**, where high severity is defined as a level of symptomatology resulting in significant performance impairment. Selection of any regulatory approach should address these aeromedical screening considerations as well as the degree to which the hazard-associated risks can be managed.

The text *Fundamentals of Regulatory Design*¹⁰ outlines several key concepts applicable globally to regulatory and enforcement organizations. First, regulators, such as the FAA, must decide the degree to which they allocate resources to oversight of illegal but not harmful acts (i.e., outdated or ineffective rules); harmful and illegal acts (i.e., relevant rules); and harmful but not illegal acts (i.e., unregulated hazards). Regulators focusing more closely on illegal or on harmful acts are said to follow the Legal or Expert Models of regulation, respectively. Second, regulators determine the degree to which they “promote good” by encouraging the regulated to proactively mitigate risks

(e.g., incentivizing pilot participation in a mental wellness program) or “control bads” by identifying specific risks or hazards in the system and removing or mitigating them (e.g., by temporarily revoking the medical certificate of a pilot reporting anxiety symptoms). Lastly, regulators can choose between several different regulatory frameworks, or models, each of which is distinguished by the division of responsibility between the regulator and the regulated for risk identification, risk analysis and control design, and control implementation (**Fig. 2**). Models can be used simultaneously to address complex hazards. The authors assert that the current regulatory approach to airline pilot mental health follows the Legal Model, focuses on controlling the “bads” by seeking to remove the two broad hazard categories (i.e., cognitive dysfunction and risk of harmful acts) from the national airspace system, and predominately reflects Model 1 in the allocation of responsibility for different aspects of the risk-control task.

An alternative regulatory approach to the current paradigm must ensure airline pilots with mental health conditions are fit to fly by identifying and controlling the two broad hazard categories while also addressing pilot mental healthcare avoidance and aeromedical screening inaccuracies. The proposed approach to achieve these objectives is based on the following premises:

1. The broad hazard categories of cognitive dysfunction and risk of harmful acts require different risk controls;
2. The preferred regulatory model differs based on the predictability and severity of the manifestations of a mental health condition; and
3. Multiple regulatory models can be used simultaneously.

The proposed alternative regulatory framework is described in **Fig. 3**. The regulator adopts the Expert Model approach for

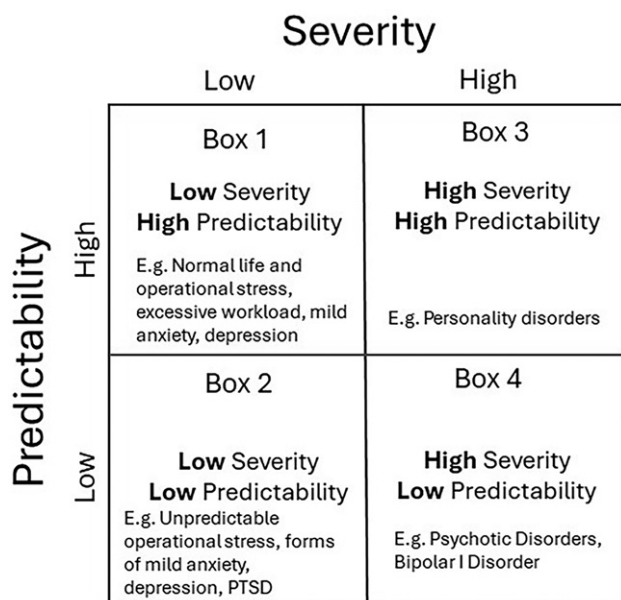


Fig. 1. Severity and predictability of mental health symptoms and conditions.

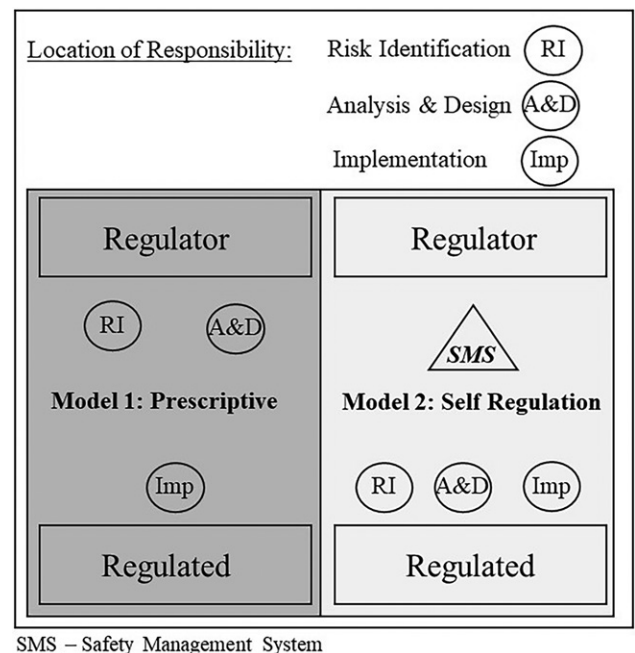


Fig. 2. Sparrow's models of regulatory framework.

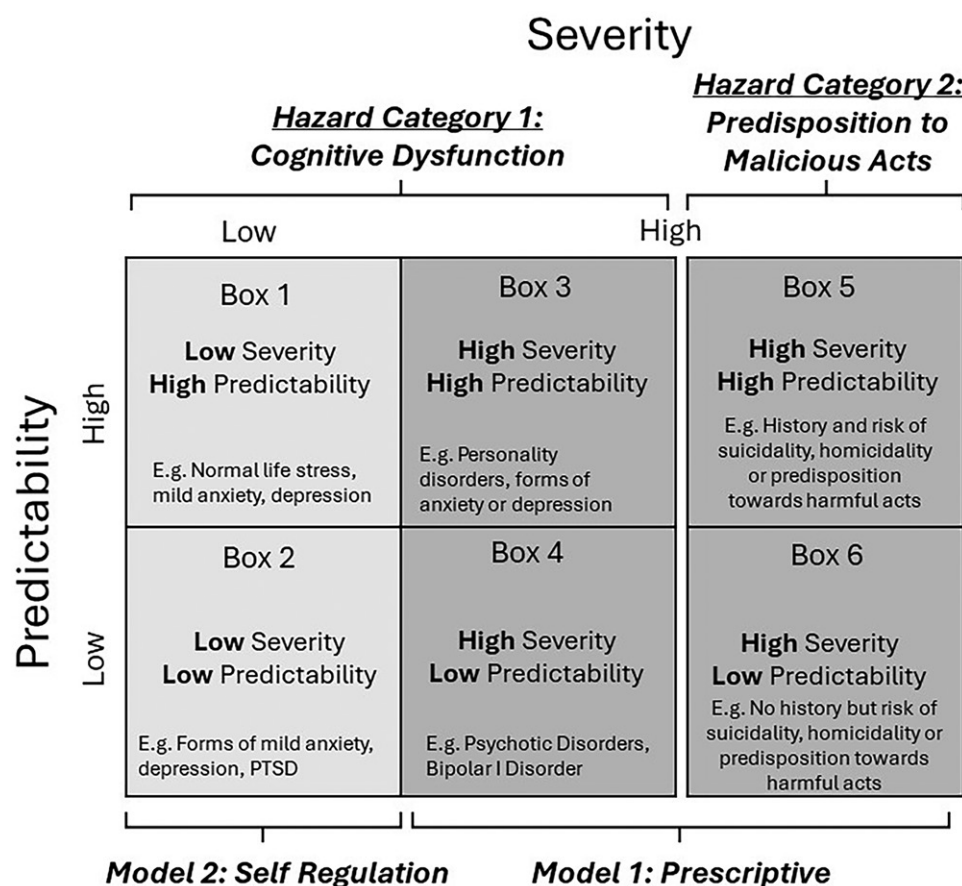


Fig. 3. Proposed approach to regulate individual factors related to mental health in airline pilots.

mental health conditions associated with manifestations of cognitive dysfunction of low severity, implemented through Model 2 (self-regulation), whereby the airlines employ a combination of “promote good” (e.g., encourage mental wellness programs, access to mental healthcare services, peer-to-peer programs, etc.) and “control bad” (e.g., paid time off, additional training or oversight, etc.) strategies, as well as conduct internal assessments to verify risks are controlled to an acceptable level. This approach aims to lower healthcare avoidance and increase accuracy of screening (prevent “false positive”). In contrast, the regulator adopts the Legal Model approach for mental health conditions manifesting with severe cognitive dysfunction or clear risk of harmful acts, implemented through Model 1 (prescriptive), to control potential harm where existing airline risk controls in the system (e.g., automation, protocol driven training, crew resource management) may be foreseeably ineffective. Importantly, this model is conceptual and without data but can serve as a framework for future investigation.

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Authors and Affiliations: William R. Hoffman, M.D., 59th Medical Wing Office of Science and Technology, Joint Base San Antonio, TX, and Department of Aviation, University of North Dakota, Grand Forks, ND, United States; Anne Suh, M.D., Department of Internal Medicine, Northwest University, Chicago, IL, United States; Timothy Spott, MBChB, Office of the Chief Medical Officer, Civil Aviation Authority of New Zealand, Wellington, New Zealand; Kate Manderson, MBBS, MPH, Office of the Chief Medical Officer, Civil Aviation Safety Authority of Australia, Sydney, Australia; Quay Snyder, M.D., M.S.P.H., Viterbi School of Engineering, University of Southern California, Los Angeles, CA, and Aviation Medicine Advisory Service, Centennial, CO, United States; Malcolm Sparrow, Ph.D., M.P.A., John F. Kennedy School of Government, Harvard University, Boston, MA, United States; and Anthony Tvaranas, M.D., Ph.D., Civil Aviation Medical Institute, Federal Aviation Administration, Oklahoma City, OK, United States.

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