

**6<sup>th</sup> ESAM Trust and Care for Aviation Safety**  
Joint meeting with ASMA,  
The Czech Society of Aviation Medicine (CZAAM),  
& the Czech Aeronautical Institute

**Psychiatry Clinical Readings**  
**Of Aviation Accident Investigators' Reports:**  
**An Interactive Workshop**  
**Prague, 20-23 Sept 2018**

Trang Dao, MD, Inc  
Consultant, Aviation Psychiatry,  
Montréal, Canada, 1-514-766 9348

[Trang.dao@hotmail.com](mailto:Trang.dao@hotmail.com)

# Bio

## Training

- Med School, Université Paris VII
- Residency, Université de Montréal
- Fellowship, Harvard University

## Positions

- McGill, 1990-2004
- Centre Intégré Universitaire, Est de Montréal (CIUSSS), Santa Cabrini, 2000-

## Expertise

- Liaison Consultation
- Trans-cultural Psychiatry
- Aviation

# Disclosure

**No financial interest nor affiliation with :**

**Pilot Unions**

**Transporters**

**Ruling Authorities**

**Pharmaceutical companies**

**Adhesions to :**

**Canadian Medical Ethics, Regulations**

**& Best Practice norms**

ASSOCIATION  
MÉDICALE  
CANADIENNE



CANADIAN  
MEDICAL  
ASSOCIATION



COLLÈGE DES MÉDECINS  
DU QUÉBEC

**Psychiatry Clinical Readings  
Of Aviation Accident Investigators' Reports:  
An Interactive Workshop  
Prague, 20-23 Sept 2018**

**Objectives**

- 1. Develop vigilance for subtle signs & symptoms of mental unfitness in Transport Safety Board (TSB) investigation reports**
- 2. Workup differential diagnosis**
- 3. Identify sources of under-detection of psycho-social issues in aviation professionals.**

# **Psychiatry Clinical Readings**

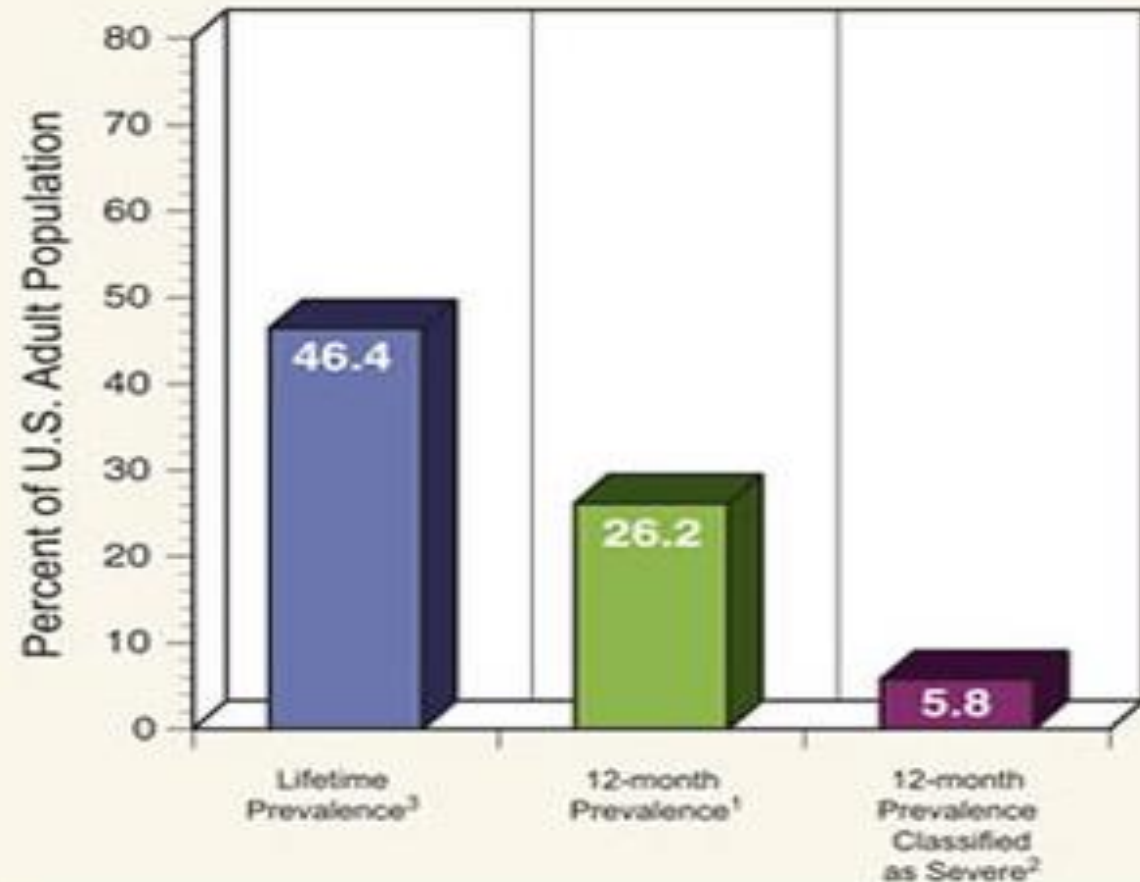
## **Of Aviation Accident Investigators' Reports:**

### **An Interactive Workshop**

- 1. Context**
- 2. Workshop Questions**
- 3. TSB Investigation Reports: selection criteria**
- 4. Analysis of TSB Reports from a psychiatric point of view of :**
  - a) Prototype of report on mental health**
  - b) BA Technicians repairing the wrong Airbus**
  - c) TAM crash into Company's hangar**
  - d) MH370**
- 5. Conclusion**

## Prevalence

- **12-month Prevalence:** 26.2% of U.S. adult population<sup>1</sup>
- **Severe:** 22.3% of these cases (e.g., 5.8% U.S. adult population) are classified as "severe"<sup>2</sup>



# 1 - Context 1: Mental Illnesses in Pilots

- Psychometric screenings not a tool to detect mental illnesses
- Prevalence ?  $\approx$  6% similar to General Population



(Transport Canada; FAA; Parker, 2001; Terouz, 2018.)

## Context 2 : Human factors causes 80% of accidents

- **Cognition:** memory, concentration, orientation
- **Executive functions:** prioritization, sequencing
- **Psychomotor** tonus, speed, reflexes
- **Emotional exhaustion :** instability, vulnerability, resiliency
- **Mental exhaustion :** aberrant thought processing, confusion, restricted awareness, judgment, analysis
- **Physical exhaustion :** incoordination, accident-prone, startle reflexe

Those mental dysfunctions are trademarks of any 3 DSM axis

1. **Symptoms & signs always come in cluster**
2. **Is there a sub-clinical mental condition behind a human error ?**



# 1 - Context 3 : Under-detection of Depression in Pilots

Intention of professional pilots with depression :

- 60% continue flying without meds
- 15% continue flying without reporting meds to FAA
- 25% declare their pills & ground themselves

(ALPA, 1997-2001)





## **2 - Research Question: Psychiatric Issues in TSB investigations**

- 1 - How do TSB Investigators detect psychiatric potential causes for accidents and incidents ?*
- 2 - Which is the standard protocol TSB conform to ?*

# **Psychiatry Clinical Readings**

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# 3 - TSB Investigation Reports: Selection Criteria

## Select-out criteria:

No reason to suspect major human errors, mental issues

Confirmed cases (Egyptair, FedEx, etc.)

- Obvious
- (Yet missed by psychometric “screenings”)

## Select-in criteria:

1. Reports did not answer why other crews did not crash in same conditions
2. *Circumstances were insufficient to explain the accident and possibility of overlooked mental issues.*

# **Psychiatry Clinical Readings Of Aviation Accident Investigators' Reports: An Interactive Workshop**

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4. **Analysis of TSB Reports from a psychiatric perspective of :**
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# **4 - Analysis of TSB Reports on Mental Issues :**

## **4a - Prototype Model on Mental Health**

**ICAO Annex 13 Manual for Accident Investigator :**  
**Non-disclosure of investigation records**

- **Medical or private info**
- **Interview, communications**
- **CVR and CVR transcripts; cockpit recording**

**Inconsistent revelation per jurisdiction of  
investigating State**

# 4 - Analysis of TSB Reports on Mental Issues :

## 4a - Prototype Model on Mental Health

A Medical/Human Factors group is in charge of investigating :

- Rest periods
- Autopsies
- Physical and mental health
- *Activities particularly in the 24 h prior to accident.*

**Assumption** : HF are *able to detect, diagnose* mental issues and to eventually appoint mental health clinicians

**? Guidance material on  
practice norms, protocol for psycho-social autopsy ?**

# 4 - Analysis of TSB Reports on Mental Issues :

## 4a - Prototype Model on Mental Health

Most conclusions are generic :

*“No indication of pilot's performance degraded by medical or physiological factors”*

BEA investigator: *“Case closed once a suitable cause of crash is found”*

- No need to find the cause of the human error
- Another Swiss Cheese hole missed !

**Why did this human error occurred ?**

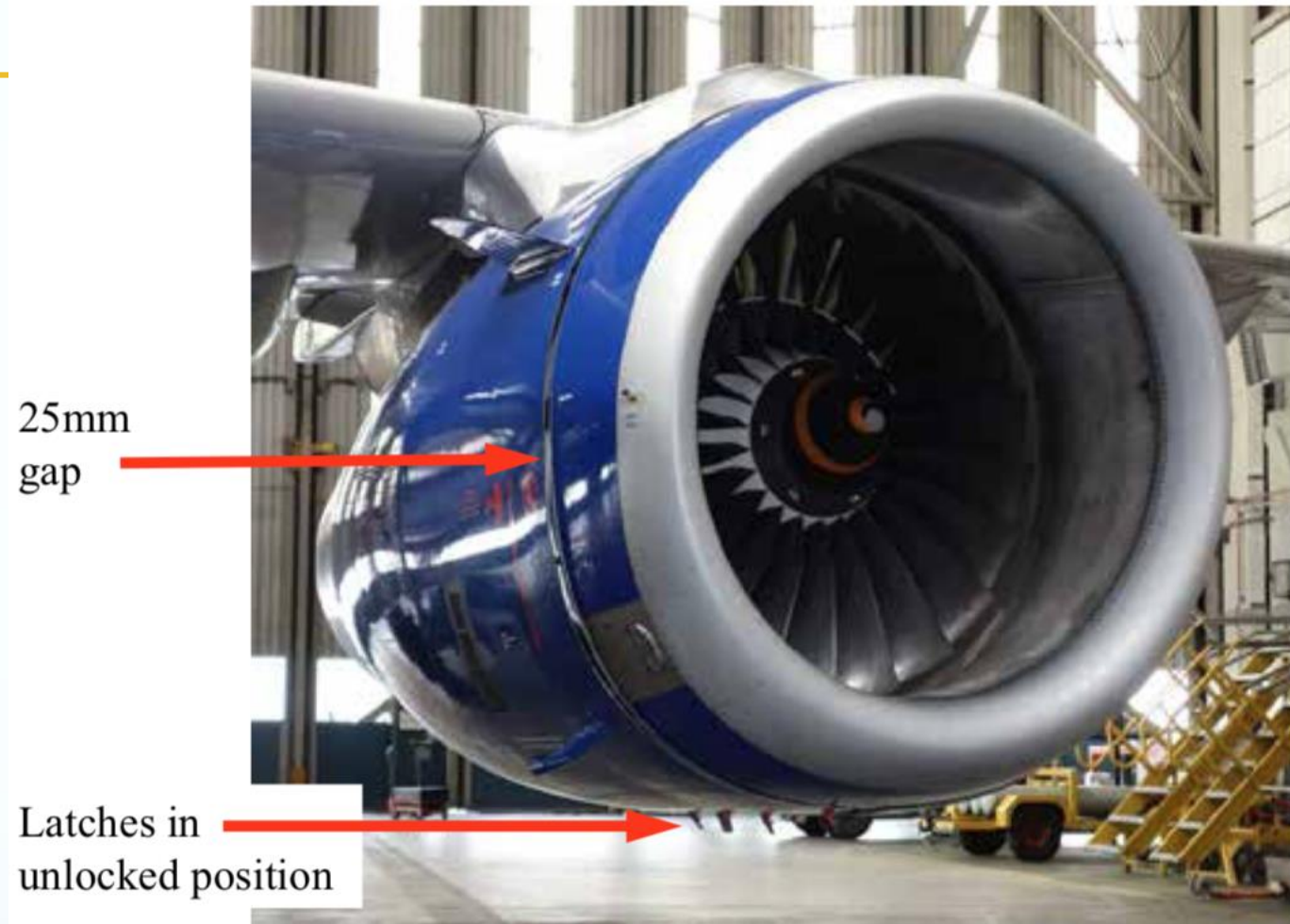


## 4b - British Airways LHR – OSL, 23 May 2013

A319 Emergency landing, both engines caught fire

- 2 nightshift technicians left **A320** engine covers unlatched
- But returned to finish the job later at the **WRONG A321**

[https://assets.publishing.service.gov.uk/media/55a4bdb940f0b61562000001/AAR\\_1-2015\\_G-EUOE.pdf](https://assets.publishing.service.gov.uk/media/55a4bdb940f0b61562000001/AAR_1-2015_G-EUOE.pdf)



**Figure 8**

Fan cowl doors on the hold-open device; latches in unlocked position as shown in Figure 7(e)



## 4b – BA, LHR – OSL, 23 May 2013

### Working time

Technician A, within 3 weeks:

- 5 shifts + 6 overtimes x ~12 h each, 4 days off, 70 h/w

Workload was

- Compliant with BA & EU Working Time Directive  
~ 48 h/w, max 72hr, suggested limit < 60 hr
- “... *not unusual or excessive in one shift*”, “*not specific to A or B*”

Onus on workers to monitor their hours & refuse overtime if fatigued

Reprimanded If non-compliant with policy limits

**A & B did not opt out of working time limits**



## 4b – BA, LHR – OSL, 23 May 2013

Cause: **Fatigue**

No other psycho-social or health information

You are a member of the TSB team

Is your job done ?





## 4c - The TAM crash, São Paulo, July 17, 2007

A very strange accident where the pilot crashed into employer's hangar.

[https://reports.aviation-safety.net/2007/20070717-0\\_A320\\_PR-MBK.pdf](https://reports.aviation-safety.net/2007/20070717-0_A320_PR-MBK.pdf)

1 - Investigator *phoned the PIC family doctor* :

- “... *pilot did not seem to be depressed at the time of the crash...*”
- Depression 3 y ago “*because of a failure in the sim check*”

2 - **Cephalalgia** undetermined type but “*extremely plausible that it may have exerted some influence on his cognitive and psychomotor capabilities*”

3 – Organization **culture and working atmosphere** on > 20/150 pages

## **4c - The TAM crash, São Paulo, July 17, 2007**

**No other health information**

**You are a member of the TSB team:  
what is your next step ?**



# 4c - The TAM crash, São Paulo, July 17, 2007

## 1 - No depression ?

### Off Antidepressant:

- ↗ risk of relapse

### Sim failure:

- A result of an undetected Major Depression ?
- vs a Reactive Depression ?

### Calling the PIC family doctor: *“No medical issue, no depression”*

- For post-mortem psychiatry ?
- Why not an AME, a forensic psychiatrist, or a coroner ?



# 4c - The TAM crash, São Paulo, July 17, 2007

## 1 - No Depression Really ?

? Obstacles of further inquiries:

- Medical charts ?  
*“... the PIC was not monitored in the company as the objective was to comply with legal working-demands”*
- Toxicology ?
- Psycho-socio-financial autopsy ?
- Entourage ?

**No arguments to rule out a diagnosis, even if an active depression may contribute little if at all to the crash !**



# 4c - The TAM crash, São Paulo, July 17, 2007

## 2 - Headache Causing A Crash ?

Headache 4 A's: Anytime Anywhere to Anyone for Anything  
Most headaches preserve mental functions & neuronal circuits.

? **Obstacles of further inquiries with :**

- Post-mortem autopsy
- Neurologist input for handicapping headache
- ? Sudden incapacitation: de novo stroke, hemorrhage, tumor, meningitis, epilepsy, etc.





# 4c - The TAM crash, São Paolo, July 17, 2007

## 3 – Pathogenic Working Atmosphere ?

Pilot's resentment at working conditions ?

- Symbolic meaning of "targeting" employers' hangar to crash
- Freudian slips can be *unconsciously wanted*
- Substantiate intention with the pilot's acting-out pattern ?

Actions against Brazil Aviation Authorities and TAM:

- 8 years of legal debates; case closed in 2015
- Not sure who to blame

Is the Cpt an outlier compared to his peers ?



# 4c – The Québec Professional Code (Art. 37.1, 1973)

Quebec: only licenced health Professionals are qualified to make

- *Assessment*
- *Clinical judgment*
- *Diagnosis*
- *Prognosis*
- *Treatment (Design & implement)*

Goals :

- To advise the Tribunal
- To limit prejudice, commercialization of health
- To protect public safety & vulnerable clientele

**TSB is not qualified to confirm / rule out a diagnosis**

(Office of Professionals, 1970 Editeur Officiel du Québec, Art. 36, Div. III)



# 4c - Tribunal des Professions Penal Provisions

Mind the law!

Art. 37.2: \$2,500 - \$125,000 **liabilities** for :

- Illegal use of *Reserved Professional Title*
- Non-professional engaged  
in *Reserved Activities*

Chapter C-26, Chapter VII, Art. 188  
Ch. C-26, Chapter IV, Division III (1973)  
2002, c. 33, s. 2. Editeur Officiel du Québec  
Updated Sept 1, 2017



Tarot  
Psychotherapist

## 4d - MH370: A Pure Human Design

- A generic basic analysis for an extraordinarily case
- No abnormality in the organization system radar ATC operation maintenance human error engine combined
- *“... the turn back was likely made while the aircraft was under manual control and not the autopilot.”*

<http://mh370.mot.gov.my/MH370SafetyInvestigationReport.pdf>

## **4d - MH370: A Pure Human Design**

**Disproportionate attention attributed to the automation brain above the human brain :**

- **13 / 459 pages of the final report bear on the Cpt, FO, 10 Stewards personnel psycho-socio-financial data.**
- **Investigated by the Police Department: all good**

## 4d - MH370: A Pure Human Design

No other information

You are a member of the TSB team:  
how to make sense of your inability  
to identify this human factor ?



## 4d - MH370: A Pure Human Design

**Interpret the Report in light of cultural aspects :**

- **Psychology sciences almost inexistent in Asian nations**
- **Depression is not considered an illness**
- **Mental illnesses are conceived as :**
  - **Severe psychosis, epilepsy, mental retardation**
  - **Curses that condemns generations and shuts entourage**
- **Treated in religious temples, segregated with addicts...**



## 4d - MH370: A Pure Human Design

So was it considered as a crime ?

Was the Police looking for pathological causes of the crash too ?

No routine investigation yet for :

- Religious habits ?
- Terrorism ?
- Suicide in a sound mind ?





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# Conclusion: Research Questions

**1 - How do TSB Investigators rule out psychiatric potential causes of incident/accident ?**

**They do not – except when mental issues are :**

- **Undeniable**
- **The main hole of the Swiss Cheese**

**2 - Which is their analysis protocol to conform to ?**

- **None**
- **The public is entitled to know the procedures AND the relevant confidential data ?!**

# Conclusion: Research Direction

Minimize under-detection of mental disorders in aviation :

- Sharpen up the *detection culture*
- **Reassess prevalence** of mental pathologies
- Then reformulate management, position papers and policies.

**The most challenging tasks in psychiatry is to prove that a person is normal !**



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**Thank you !**

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