COVID RESPONSE/ACTION PLAN

& Ongoing Research...
Pilot Lived Experience & Tools to Support Pilot Coping at Different Levels
(Modelling Problem, Behaviour Model & Link to Field Research/Data Analysis)
Introduction

- Issues to Address
  - Part 1
    - COVID response & action plan
  - Part 2
    - Modelling and framing problem
    - Behaviour model & empirical evidence for tool concepts
    - Personae (Pilots)
    - Tool Framework
    - Tools Framework & Situating in Process (Current & Future)
    - Customer Journey (Current & Future)
    - Auto-harvesting Data
    - Early Stage Prototypes (Tool 1)
Issues to Address

1. What issues pre-Covid – normal business operations were challenging (our research/survey)

2. Now
   - Changes in situation now
   - Pilots not flying – how prevent the issues getting worse
   - Current situation – different environment – flying cargo to new destinations, organisations on the brink (layoffs, cuts)

3. What issues bring to cockpit when flying after Covid
   - Post Covid 19 world look like
   - Operational pressure and impact on individuals
   - GA community come back – not yet flown in 2020
   - Mid July - potential for carnage in system

WELL BEING HIT SQUAD | DEAL WITH THIS | COLLABORATION
PART 1: COVID ACTION PLAN

MIND YOUR HEAD | ATTITUDE | SPIRITUAL & EMOTIONAL | HEALTH & WELLBEING
Next Steps/Action Plan: Covid Response

– We need action NOW!
– Ideas
  1. Stress Coping Booklet (Paul has circulated a version 1)
  2. Summary information on coping strategies and data analysis – to share with stakeholders (format TBD/animation, narrative)
  3. Serious game (education on wellbeing/MH awareness, risk assessment & coping) – linking to stress coping concepts/ideas but gamification
  4. Extend/Modify Checklists – include biopsychosocial rational and questions linking to coping mechanisms (Pave, I’m Safe, Pre-flight briefing)
  5. Dutch Reach & Gestural cueing (Wellbeing & MH)
  6. Mindfulness
  7. John Franklin – ideas on narrative – love them!
– Interventions needs to be empirically supported/validated so that we can stand over for longer term (opportunity to address wellbeing/MH properly)
– Data analysis is ongoing
– We are also working on academic papers...has to be done & keen to ensure good evidence base!

Already existing problems & now COVID context and impact in short, mid and long term content COLLABORATE... with/for stakeholders..
Data is king (survey)
Key to progress...

Safety promotion, culture, training, wellbeing MH awareness, tools ...
Stress Coping Booklet & Other Materials (1 & 2)

- **Stress Coping Booklet** (Paul has circulated a version 1)

- Summary information on **coping strategies and data analysis** – to share with stakeholders
- **Message easy to communicate/user friendly and not complex**
- **Careful with what we say**
- Currently, strategies associated with lower depression levels/not about effectiveness of strategies
- Also not yet looking at interactions – this in progress
- **Need to do more on emotional exhaustion, dis/engagement and burnout – focus on this (more data analysis)**
- **Format TBD/animation, narrative**
- Potential to link in with John Franklin’s ideas on narrative and story telling (EASA Safety Promotion)
Serious Game/Game Based Learning (3)

- **Serious game/game based learning**
- Objective is learning/practicing a skill – often content is put across in video games or other ‘hand’s on’ game based format (not necessarily involving video/augmented reality)
- Link training and practice
- 5 parts – (1) story/plot, (2) gamification, (3) immediate and individualized feedback, (4) simulation and (5) about learning (goal is to learn)
- Used in healthcare – linking to simulation approaches
- **Huge links to CRM approach & simulation, existing games in wellbeing (Jonny Bloomfield)**
- **Develop for (1) pilots and (2) other actors in aviation system (Human Factors Systems Approach)**
- **Suite of games - education on (1) wellbeing/MH awareness, (2) risk assessment/proactive (How am I doing now), and (3) stress coping/advice – link to NICE stepped care approach**
- Linking to booklets and other materials but gamification (rewards, points systems, badges)
- Interactive format, Have app or something on web?
## Extending/Modifying Checklists (4) – Quick Wins

- **I’m Safe Checklist**
- **PAVE (Personal Minimums Checklist for Risk Management)** – pilot, aircraft, environment and external pressures
- **Pre-flight checklist**
- **CRM & Intelligent Flight Plan (Joan PHD)**

### Quick Wins

<table>
<thead>
<tr>
<th></th>
<th>I – Illness</th>
<th>Do I have an illness or any symptoms of an illness?</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Medication</td>
<td>Have I been taking prescription or over-the-counter drugs?</td>
</tr>
<tr>
<td>S</td>
<td>Stress</td>
<td>Am I under psychological pressure from the job? Worried about financial matters, health problems or family discord?</td>
</tr>
<tr>
<td>A</td>
<td>Alcohol</td>
<td>Have I been drinking within eight hours? Within 24 hours?</td>
</tr>
<tr>
<td>F</td>
<td>Fatigue</td>
<td>Am I tired and not adequately rested?</td>
</tr>
<tr>
<td>E</td>
<td>Eating</td>
<td>Am I adequately nourished?</td>
</tr>
</tbody>
</table>

|   | I – Illness & Wellbeing | Do I have an illness or any symptoms of an illness?  
Am I feeling good/well? How is my overall health and wellbeing?  
Physical health?  
Emotional/Psychological Health? What’s my mood and attitude like?  
Social Health? Have I seen family/friends? Getting help/support if needed? |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Medication</td>
<td>Have I been taking prescription or over-the-counter drugs?</td>
</tr>
</tbody>
</table>
| S | Stress & Stress Coping | Am I under psychological pressure from the job? Worried about financial matters, health problems or family discord?  
Am I actively managing my stress? Exercise? Social? Do I need help? |
| A | Alcohol | Have I been drinking within eight hours? Within 24 hours? |
| F | Fatigue | Am I tired and not adequately rested? Have I been managing my sleep? |
| E | Eating & Exercise | Am I adequately nourished and hydrated? Am I taking physical exercise? |

- Move beyond regulatory approach
- Link to **data analysis findings** (importance of sleep, physical exercise, diet and hydration & talking with people)
- Include physical exercise in checklist
- Assessment in relation to current emotional state (including mood and attitude) – not just physical health
- Assessment in relation to stress coping
- Consider the co-pilot ‘the other guy'/team
Dutch Reach (4)

Which hand do you use to open your car door?”

Puzzlement. “Why, this one, my left…of course.” “But the Dutch do it differently.” “Oh???” “They use their right, their far hand. It’s much safer.” “What?! …Ooohh! I get it! It makes you turn, it’s easier to look! So simple! It’s obvious! I just never thought about it!”

Adapt for our context
- Help from pilots and MH experts
- Quick wellness/MH risk signalling in the cockpit – adapt gesture for this context?
- Walk to the aircraft (Paul to elaborate)
- Touch the head? Hand on heart? Pause and breath together – link to mindfulness? Fit to machoism culture, different cultures (parts of Europe, Asia, Africa)?
- Empowering for pilots/self-efficacy and be comfortable

https://www.dutchreach.org/
PART 2: Framing Problem, Behaviour Change & Tools
Understanding & Framing Problem

- Wicked problem
- Problem exists at different levels – different intersecting systems – see 1 to 5
- Frame solution in relation to these different levels
- Consider Fogg (behaviour change and technology)
- Consider diversity (see aspects of model)
- Also, Human Factors & Ethics (See canvas)

1. Pilot level (practices and behaviour) – lived experience model
   - In work
   - Outside work
   - Home/work interface
2. Airline processes and culture, business model
3. Community and social system model – public expectations, pricing, 24/7
4. Health and safety governance (health & wellness in work) - national level
5. Aviation Regulator (national and European/EASA)
Understanding Behaviour: Interacting Systems & Diversity

**INTERACTING SYSTEMS**

1: Individual – in work/outside work, wellbeing, norms and culture, health behaviours and coping strategies

2: Airline – norms, tools, safety practices, reporting, business model

3: Community & social system – expectations about flights, 24/7, low cost

4: Regulatory (Health and safety in Work, Workplace Wellness, Managing Psychological Wellbeing)

5: Aviation Regulatory bodies – health and safety in work, management of wellbeing and mental health (IAA & EASA)

**DIVERSITY**

1: Level of person - individual

2: Work context/person in work

3: Specific operational factors & flight context

4: Airline culture and practices across different regions
1. Main factors that contribute to problem – sources of WRS, lived experience model, influencing factors, diversity
2. Impact scenarios
3. Predictors of good mental health – lived experience model, data analysis (factors and outcomes)
4. Coping Strategies – impact on depression severity
5. Risk Assessment Model & Algorithm (in progress)
Fogg Behaviour Model

Behaviour is the result of three specific elements coming together at one moment

B=MAP

(Behaviour = Motivation, Ability & Prompt/Trigger)
# Project Goals & Fogg Behaviour Model

<table>
<thead>
<tr>
<th>Target Behaviour</th>
<th>Acceptability of MH/self-management of wellbeing and MH</th>
<th>Increased awareness of WRS &amp; wellbeing (including MH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRS &amp; wellbeing awareness and education</td>
<td>Increased acceptability of MH</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normalisation of MH</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acceptability of self-care</td>
<td></td>
</tr>
<tr>
<td>Self-management behaviour</td>
<td>Promote coping</td>
<td></td>
</tr>
<tr>
<td>Safety behaviour</td>
<td>Shift to self-management</td>
<td></td>
</tr>
<tr>
<td>Interface between life in and outside work</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Motivation**
- Safety, health and wellbeing, work policy, health attitudes, social acceptability, work incentives and rewards etc

**Ability**
- Health, time availability, work flexibility, family support

**Prompt**
1. Mobile App + (2) profiles info & model of behaviour/trends (AI + ML) – available to airlines to direct rostering/planning
2. (3) changes in airline policy and practices + (4) health and safety regulatory body - changes re health and safety in work (national policy)
3. (5) aviation regulatory body – changes in practices – IAA/EASA
Influencing Factors

- Concern for own health (self or family)
- Attitudes to health and wellbeing (including MH)
- Attitudes to seeking help/support
- Perception of own MH (normalisation of problem)
- Shift pattern/shift time
- Work contract
- Type of operation
- Male/Female
- Pre-existing MH issue
- Existing health and wellbeing (if fatigue, burnout/exhaustion)
- Use of Coping Mechanisms – sleep, exercise, supports, diet
- Interest in physical exercise
- Social capital and network
- Existing habits and behaviours (sleep, diet, exercise)
- Convenience and access (24/7)
- Pilot education and awareness schemes
- Social acceptability & demonstration of ‘socially desirable’ values and practices (self-care)

B=MAP

(Behaviour = Motivation, Ability & Prompt/Trigger)
Lived Experience Model (Factors & Outcomes)
Sources of WRS, Impact Scenarios

**Workshop Findings**
- Impact scenarios identified by Pilots

**Sources of Work Related Stress (WRS)**

- Biological
- Psychological
- Social

**Safety Impact**

- Pilot mostly coping well
- Pilot mostly coping well but impact on physical health
- Pilot experiencing difficulty but mostly coping well
- Pilot mostly coping but long-term impacts
- Pilots not coping
- Extreme Cases

**Workshop Findings**
- Potential for Serious Incident/Fatal Accident

**Potential for Serious Incident/Fatal Accident**
Coping Strategies Associated with Lower Depression Severity Levels

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Std Error</th>
<th>t-value</th>
<th>p-value</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep - daily</td>
<td>-0.89</td>
<td>0.26</td>
<td>-3.36</td>
<td>0.0007</td>
<td>0.41</td>
</tr>
<tr>
<td>Exercise – few times a week</td>
<td>-0.77</td>
<td>0.22</td>
<td>-3.50</td>
<td>0.0004</td>
<td>0.46</td>
</tr>
<tr>
<td>Exercise - daily</td>
<td>-0.69</td>
<td>0.29</td>
<td>-2.37</td>
<td>0.01</td>
<td>0.50</td>
</tr>
<tr>
<td>Exercise – few times a month</td>
<td>-0.66</td>
<td>0.32</td>
<td>-2.04</td>
<td>0.04</td>
<td>0.52</td>
</tr>
</tbody>
</table>

Interpreting the odds ratio (OR)
- General rule of thumb: if the Odds Ratio is less than 1, then it’s associated with a probability of having a lower depression severity level
- p-value tells us whether a relationship was statistically significant, whereas the Odds Ratio tells us only the nature of said relationship (the p < 0.05 coping strategies to be statistically significant)

Co-relation not causality (coping strategy causing the PHQ score to be below 10 or vice versa)

The model doesn’t tell us whether the strategy made a difference - to claim that, we’d have to observe pilots over a period of time (while controlling all other variables), and asking them to use certain coping mechanisms and see whether they make a difference over a period of time. We’re only claiming association.

Note that this does not consider interaction between different coping methods.
## Algorithm & Risk Rating

<table>
<thead>
<tr>
<th>Classification</th>
<th>Factor</th>
<th>Factor</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological</td>
<td>1</td>
<td>Sleep &amp; fatigue</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Physical Exercise</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Diet</td>
<td>L</td>
</tr>
<tr>
<td>Psychological</td>
<td>4</td>
<td>How feeling (stress)</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Emotional stability and mood</td>
<td>M</td>
</tr>
<tr>
<td>Social</td>
<td>6</td>
<td>Talking to others/seeing people</td>
<td>L</td>
</tr>
</tbody>
</table>
Personae (Pilots)

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Role</th>
<th>Tenure</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karl</td>
<td>28 years</td>
<td>First Officer, short range, F/T</td>
<td>3 years</td>
<td>Uses Fitbit and social media apps, Not working in home country, single, long commute to airport, Healthy habits (exercise, diet), Fatigue, social isolation and loneliness, Manage sleep, physical activity and MH risk</td>
</tr>
<tr>
<td>Francis</td>
<td>45 years</td>
<td>First Officer, Short range, P/T</td>
<td>18 years</td>
<td>Uses social media apps, Working in home country, young family, lives near airport (short commute), Fatigue and burnout, Manage sleep and roster (work life balance), Roster bidding important</td>
</tr>
<tr>
<td>Simon</td>
<td>48 years</td>
<td>Captain, short range, F/T</td>
<td>24 years</td>
<td>Uses social media apps, Working in home country, long commute to airport, Social isolation and health problems (musculoskeletal issues - back and knees), Manage sleep, diet &amp; physical activity</td>
</tr>
<tr>
<td>Brian</td>
<td>56 years</td>
<td>Captain, long range, F/T</td>
<td>34 years</td>
<td>Limited experience with social media and phone apps, Working in home country, Divorced, family grown up, lives outside Dublin (long commute to airport), Unhealthy behaviours (occasional binge drinking, binge eating), Manage sleep, diet and physical activity and MH risk</td>
</tr>
<tr>
<td>Brian</td>
<td>56 years</td>
<td>Captain, long range, F/T</td>
<td>34 years</td>
<td>Limited experience with social media and phone apps, Working in home country, Divorced, family grown up, lives outside Dublin (long commute to airport), Unhealthy behaviours (occasional binge drinking, binge eating), Manage sleep, diet and physical activity and MH risk</td>
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</table>
Tool Framework

1: Pilot Tools (Self Management/Off Duty)
2: Pilot Tools (On Duty)
3: Tools for EAP
4: Tools for Aeromedical Examiners
5: SMS & Flight Planning/Rostering & Wellbeing Integration Tools
Situating In Process (Existing Process)
Situating In Process (New Process)
Customer Journey (Current & Future Technologies)
Tool 1: Pilot Self Management (Outside Work)

- General Information, Resources & Relaxation Exercises
- Wellbeing Tracking & Reporting
- Experience Box
- Link to Airline Flight Planning/Restyling Systems, FRMS & SMS (Anonymous Data)
- Personalised tips/information, assessment and wellness plan
- Self-assessment tools
- Virtual Coaching & Access to Supports

Trinity College Dublin
Coláiste na Tríonóide, Baille Átha Cliath
The University of Dublin
Tool 2: Operational Tools (Pilot In Work/On Duty)

- Pre Flight Self Assessment
- Crisis Support
- Link to Airline EAP
- Information, Resources & Tools
- Crew Briefing
- Safety Reporting
- Surveys

Link to Airline EAP

Crisis Support

Pre Flight Self Assessment

Information, Resources & Tools

Crew Briefing

Safety Reporting

Surveys
# Auto-Harvesting Data

<table>
<thead>
<tr>
<th>Classification</th>
<th>Factor</th>
<th>Specific info</th>
<th>Our App or Other App (Auto-harvesting)</th>
<th>Example Other Apps/Auto-harvesting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bio</strong></td>
<td>1</td>
<td>Sleep &amp; fatigue</td>
<td>No of hours sleep Sleep deficit Sleep disruption Sleep displacement</td>
<td>If using other, get from that Otherwise, 1 or 2 questions</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Physical Exercise</td>
<td>No of steps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Eating</td>
<td>1 question?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Hydration</td>
<td>1 question?</td>
<td></td>
</tr>
<tr>
<td><strong>Psycho</strong></td>
<td>5</td>
<td>How feeling (stress)</td>
<td>Heartrate Perceived stress (self-report)</td>
<td>If not other App, 1 question each day?</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Emotional stability and mood</td>
<td></td>
<td>If not other App, 1 question each day?</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>7</td>
<td>Taking to/contact with family</td>
<td></td>
<td>1 question each day?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Talking to others/seeing people</td>
<td></td>
<td>If using mobile phone calendar – quick question about what pencilled in – did you do X</td>
</tr>
</tbody>
</table>
Examples, Tool 1