



The FrailSafe system

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FrailSafe Consortium

October 19th 2018

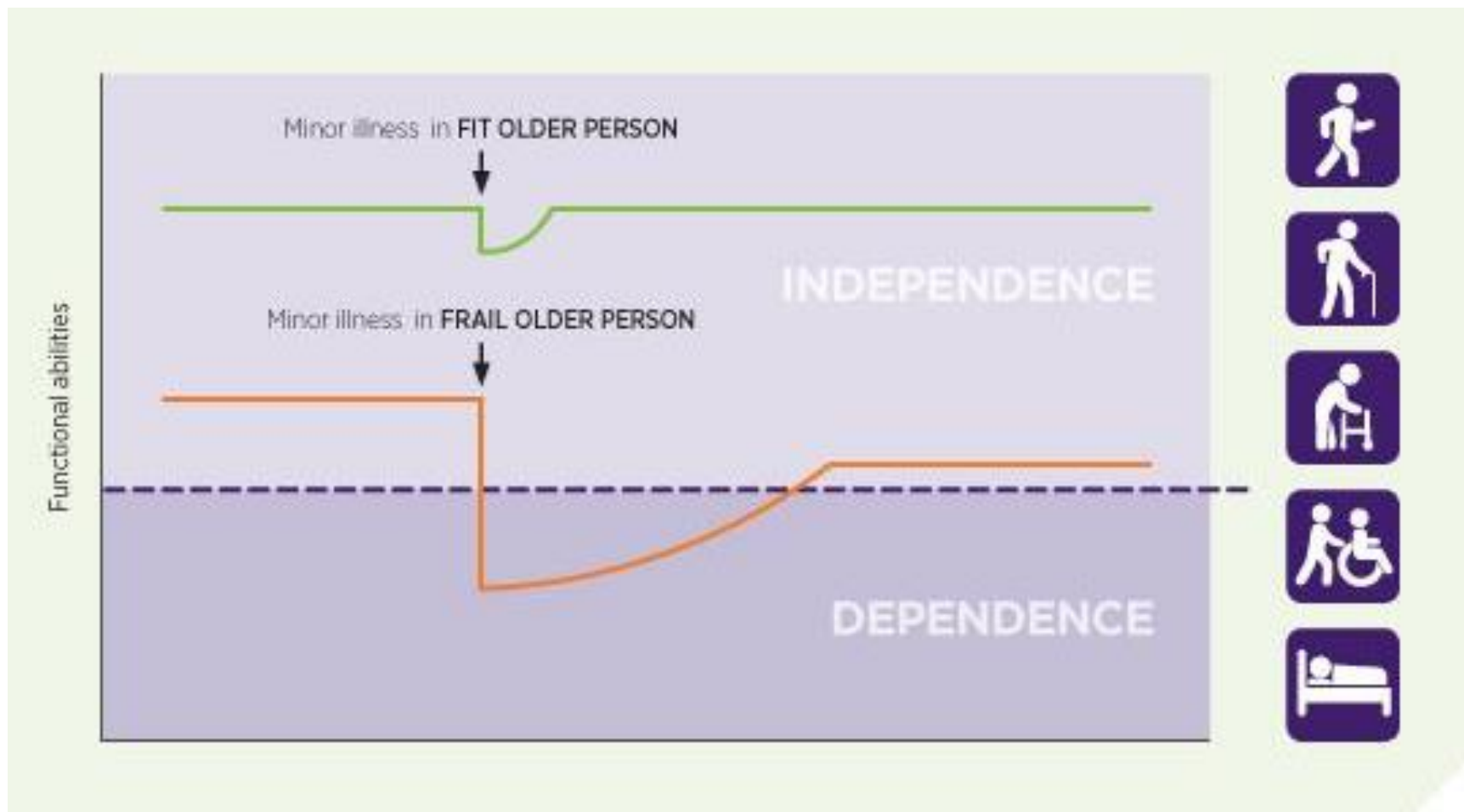


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 690140

www.frailsafe-project.eu

What frailty is?

- Frailty is not a disease
- Frailty is **loss of physiological reserve**
- Frailty makes individuals **vulnerable to stressors**



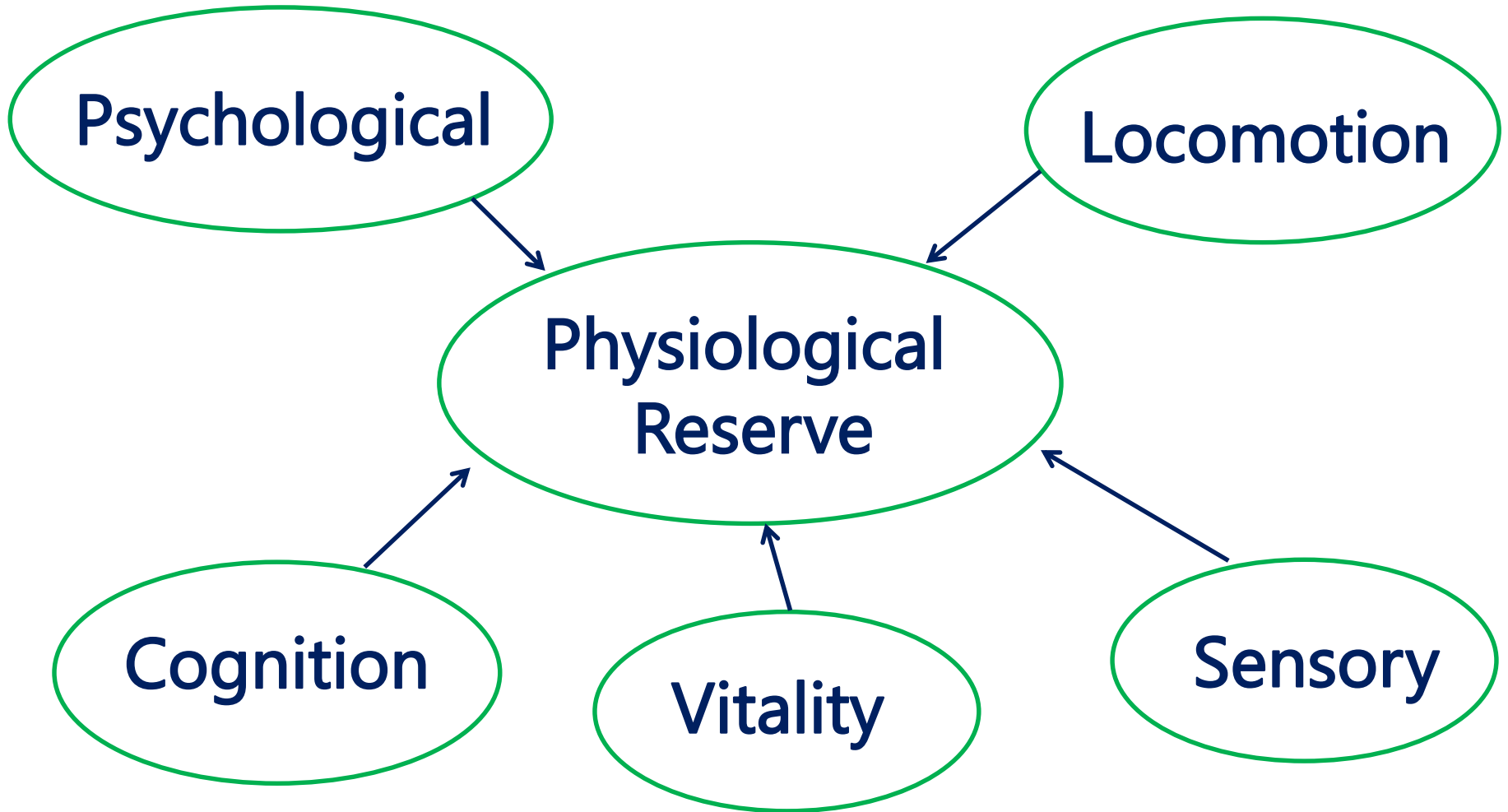
Frail older people display low resilience to minor stressors (e.g. urinary tract infection)

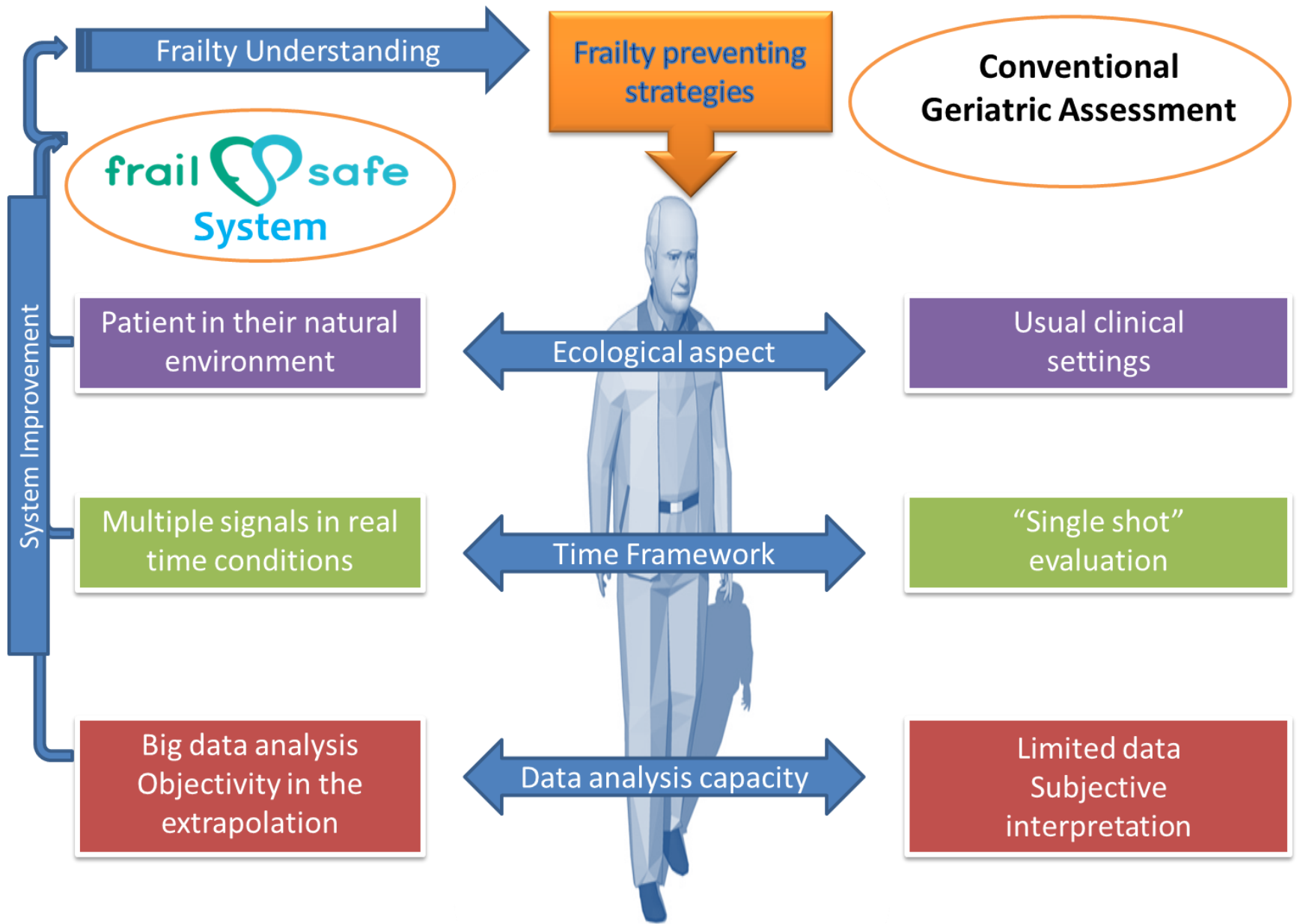
Clegg et.al, Lancet 2013

What frailty is:

- Common 25-50% of people over 80yrs
- Progressive
- Episodic deteriorations
- Impact to quality of life
- Expensive
- Preventable components

Components of frailty





Measurable parameters and units of measurement



Smart garment with 9 DoF IMUs (Smartex)



Heart rate, respiration rate, posture and activity, steps/minute, falls, instability



Blood pressure monitor



Blood pressure



Mobil-o-graph



Arterial stiffness



Dynamometer



Grip strength



Impedance scale



Body Weight / Body Mass Index



Questionnaires



Nutrition, Social Interaction, Cognitive state



Medical record



Co-morbidities



AR Serious Game



Cognitive state and Behaviour, Physiological state, Motor state



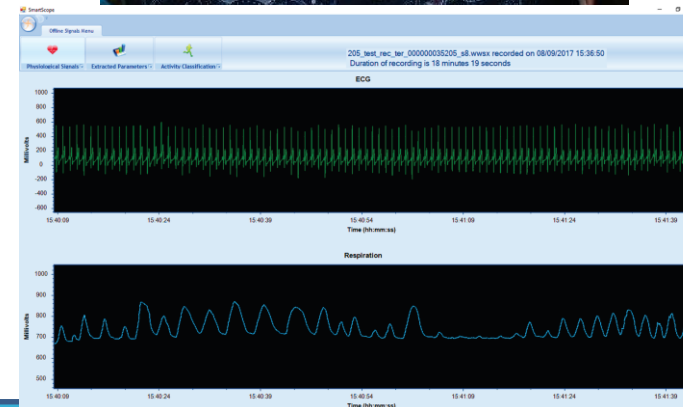
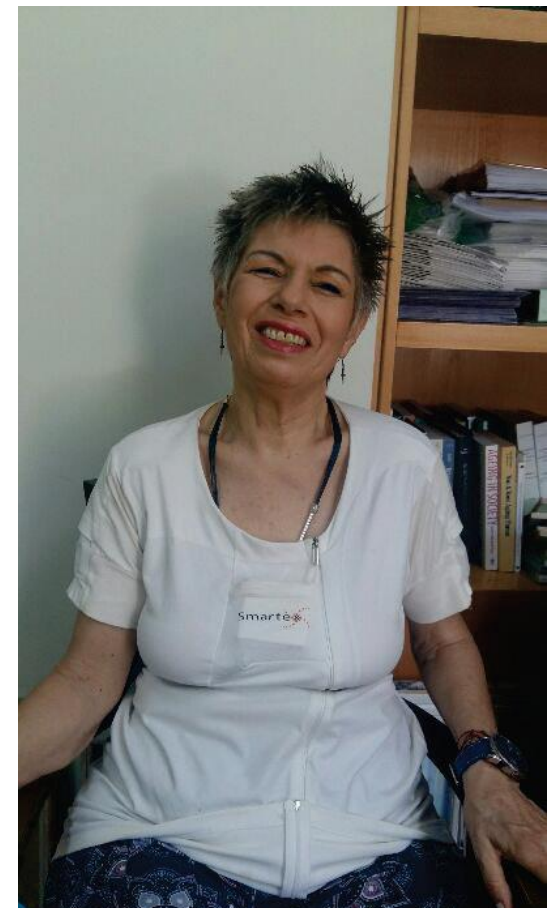
Smartphone/Tablet



Indoor/Outdoor activities, Physiological state, Motor state, Social Interaction

Smart Garment

- Continuous monitoring of **ECG/Heart Rate** and **Breathing Rate**
- Collect data used to identify **movement** (Sitting, standing, lying, walking, climbing stairs)
- Why it is **important**
 - Update **clinical profile** of the older person and check for **irregularities** in heart rate and breathing rate
 - Identification of **dangerous states/events** (fall, loss of balance)



Smart Garment

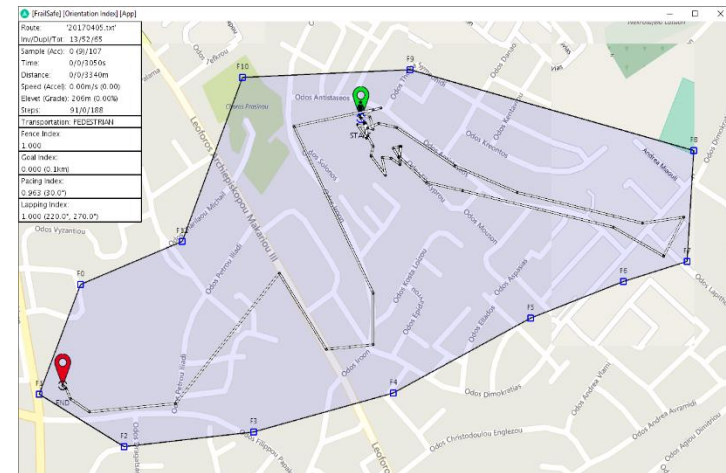
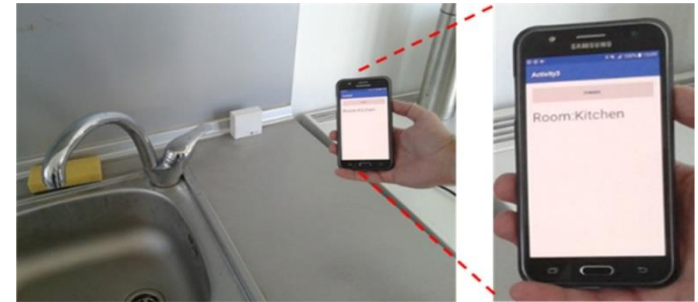
- Fall Detection smartphone app

frail  safe Fall Detection



Indoor & Outdoor monitoring

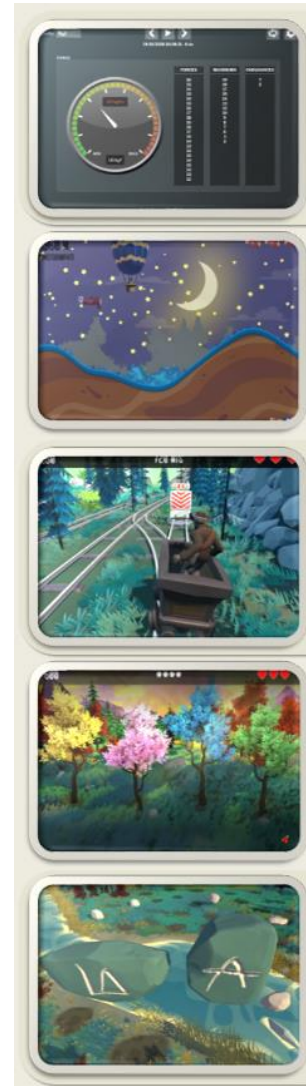
- Indoor and outdoor monitoring systems (smartphone/beacons)
- Why it is **important**
 - Understanding of **behavior** and **lifestyle**
 - Identification of **dangerous states/events** (loss of orientation)



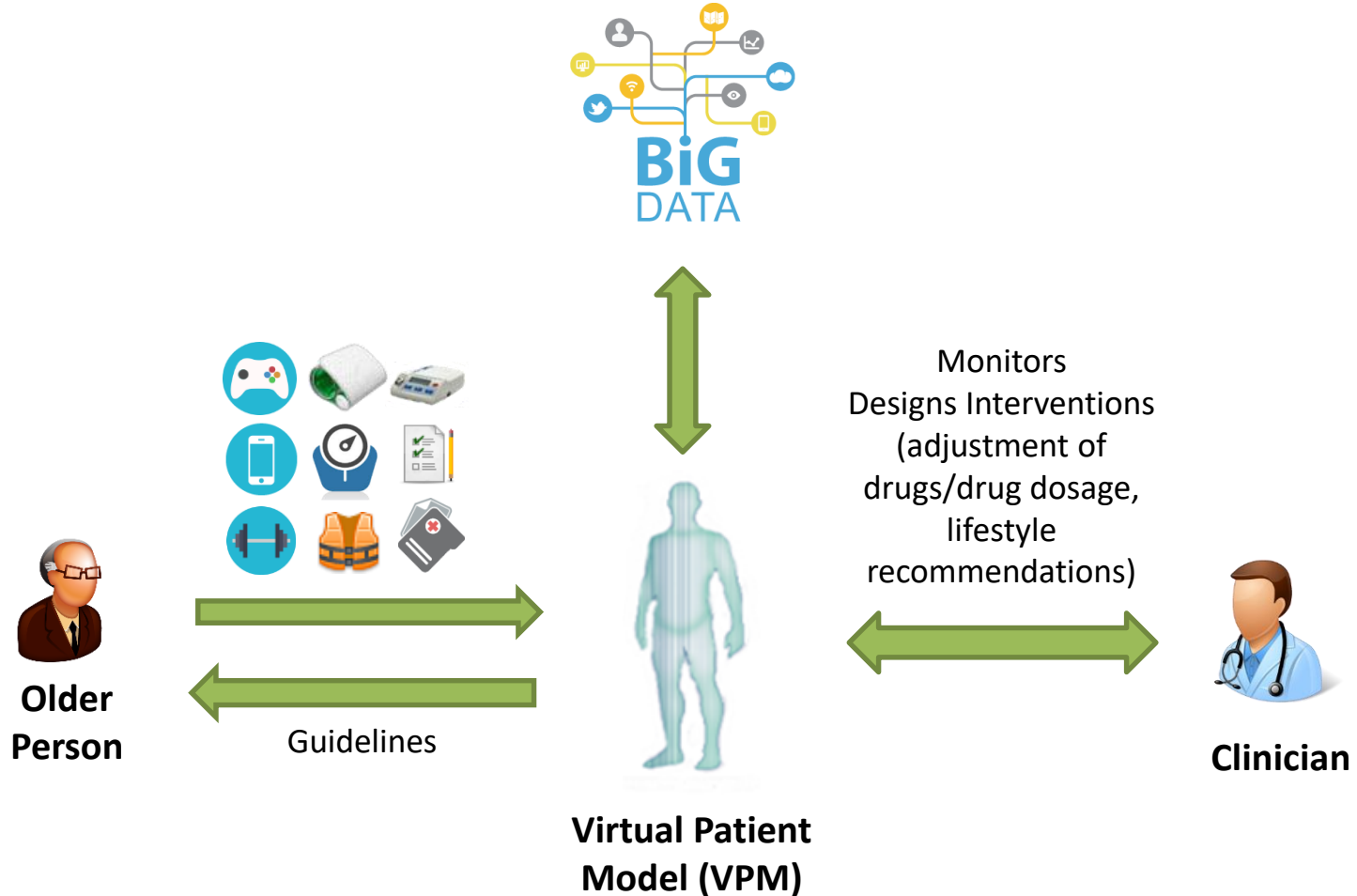
FrailSafe Games



- Collect **cognitive** (memory, concentration etc) and **physiological** (strength, endurance, balance etc) data
- Why it is **important**
 - Allows us to collect data about the older person in an **unobtrusive** way
 - Apply **personalized interventions** for older persons in order to **train their skills** at home and **reinforce their intrinsic capacities** (i.e. play the "Simon" game to train your memory)



FrailSafe Conceptual Philosophy



DASHBOARD

- What it does
 - Older person dashboard
 - Clinical state (physical, cognitive, social etc)
 - Alerts and interventions
- Why it is **important**
 - Visualization of **alerts** and proposed **interventions**
 - Personalization of settings
 - Clinicians / researchers can use the summaries of profiles of older people for monitoring and analysis



Dashboard

DASHBOARD

- For older people and their families



Dashboard

+ 3089

OVERVIEW CLINICAL PHYSIOLOGICAL BEHAVIOURAL GAMES ALERTS

Participant 3089

Female, 80 years old
Nancy
Employees



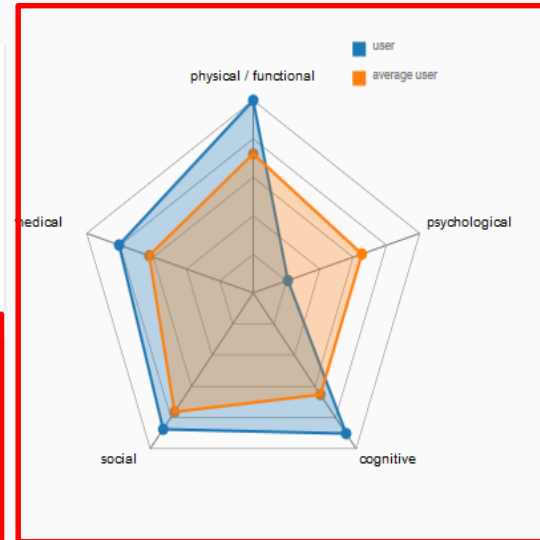
physical /
functional
72%

medical
58%

social
63%

cognitive
65%

psychological
15%



DASHBOARD



- For older people and their families
 - Recommendations



Dashboard

A screenshot of the FrailSafe dashboard for 'Participant 1035'. The interface has a teal header with the 'frail safe' logo and user information. A sidebar on the left contains 'Overview' and 'My Profile'. The main content area has tabs for 'OVERVIEW', 'CLINICAL', 'PHYSIOLOGICAL', 'BEHAVIOURAL', 'GAMES', 'ALERTS', and 'INTERVENTIONS'. The 'INTERVENTIONS' tab is active, showing a 'Recommendations' section with two rows. The first row, highlighted with a red border, contains the text: 'To increase your cognitive level in an entertaining way, playing FrailSafe's 'Memory', 'Simon' 'Supermarket' or 'Reflex' games frequently is recommended.' The second row contains: 'Consider a healthy diet for achieving a balanced weight. Eat plenty of fruits, vegetables and protein.' At the bottom right of the table, it says 'Rows per page: 5' and '1 - 2 of 2'.

To increase your cognitive level in an entertaining way, playing FrailSafe's "Memory", "Simon", "Supermarket" or "Reflex" games frequently is recommended.

DASHBOARD

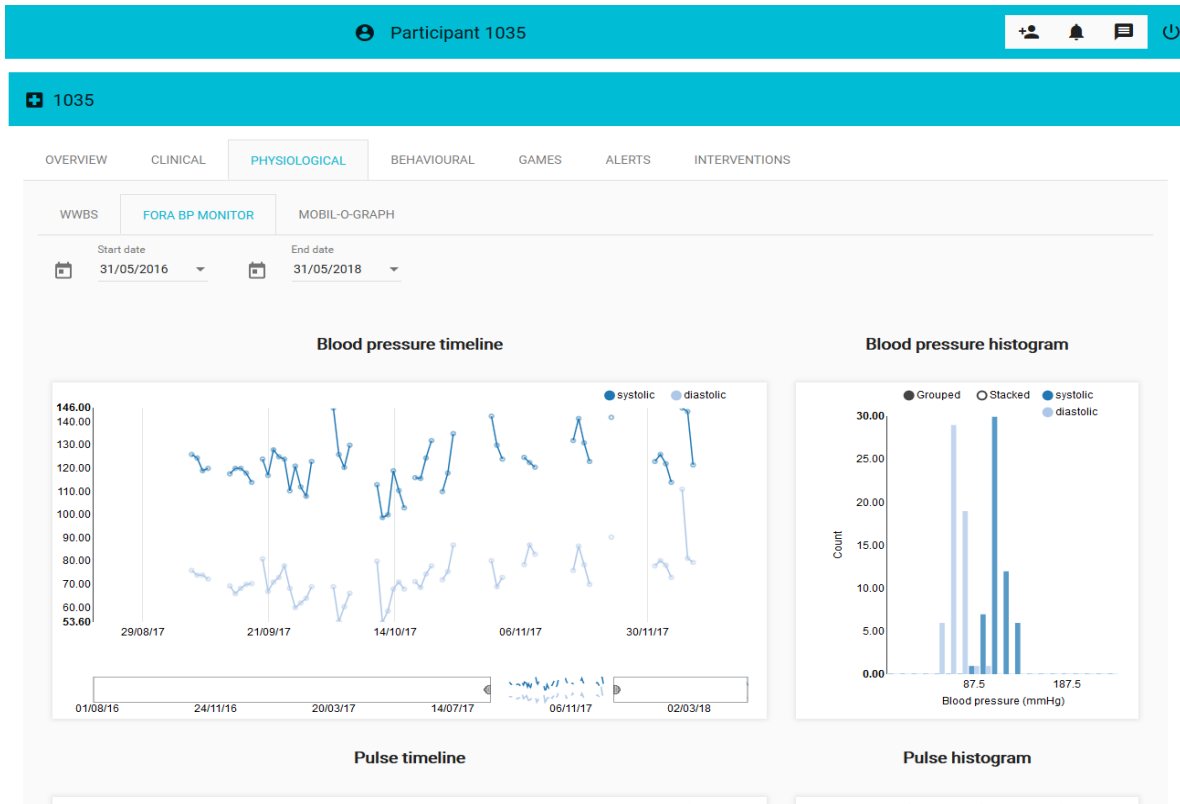


- For clinicians / medical professionals

Check individual older person's dashboard



Dashboard



DASHBOARD

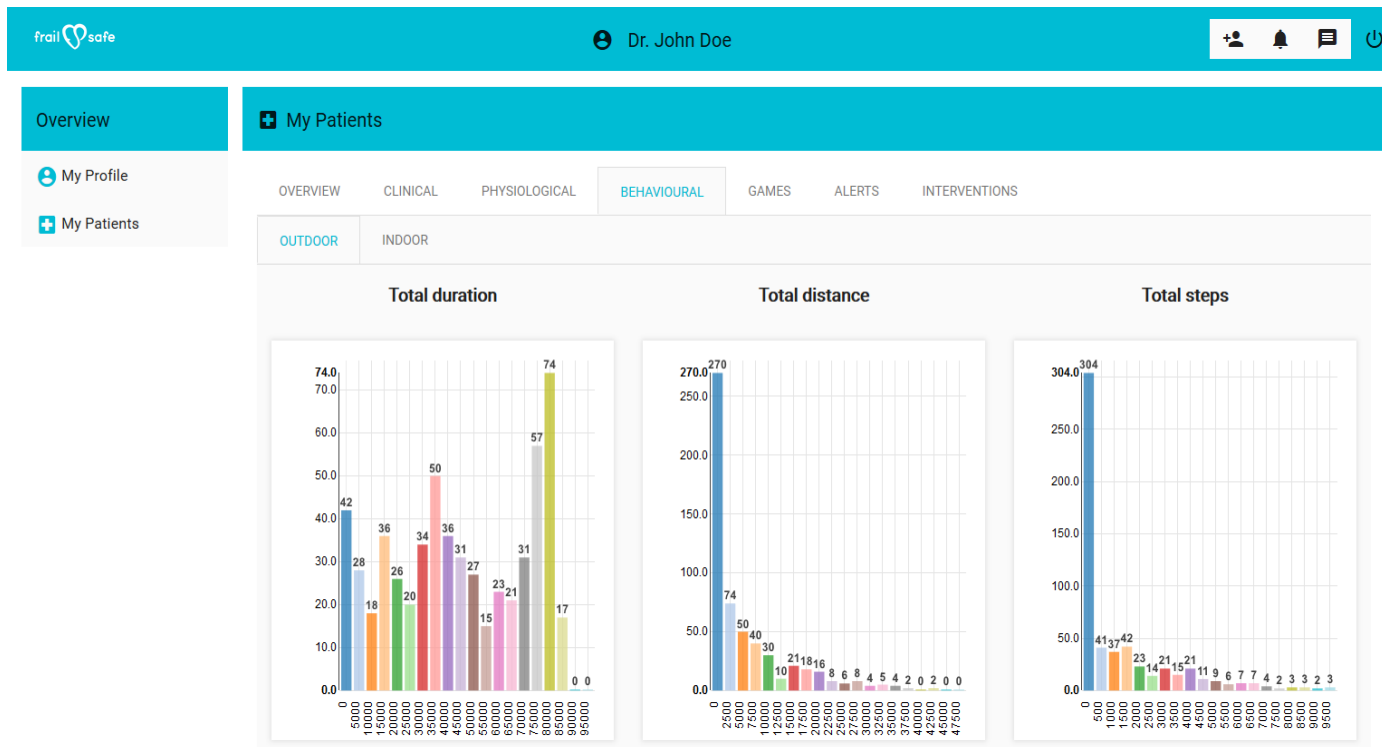


- For clinicians / medical professionals

Collective view of older people data



Dashboard

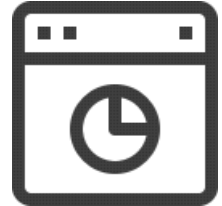


DASHBOARD



- For clinicians / medical professionals

Panel for alerts (and customization) and rules for interventions



Dashboard

The screenshot displays the FrailSafe dashboard for Dr. John Doe. The interface is organized into several sections:

- Header:** A teal bar with the FrailSafe logo, the user name 'Dr. John Doe', and navigation icons for profile, notifications, messages, and power.
- Left Sidebar:** A vertical menu with 'Overview' (selected), 'My Profile', and 'My Patients'.
- Top Navigation:** A teal bar with 'My Patients' and a sub-menu for 'ALERTS' (selected) and 'INTERVENTIONS'.
- Alerts Panel (Left):** Shows 'ALERT HISTORY' and 'VIEW RULES'. The 'VIEW RULES' section includes a dropdown for 'Match any' and a list of parameters: 'Heart rate standing' and 'Heart rate standing'.
- Interventions Panel (Right):** Shows 'INTERVENTIONS' with sub-sections for 'VIEW RULES' and 'EDIT RULES'. A 'Saved rules' table is displayed below.

| ↑ Rule ID | Parameter ↑ | Operator ↑ | ↑ Value | Recommendation ↑ |
|-----------|------------------------------|-----------------------------|---------|--|
| 1 | MMSE score | equals to | 24 | Participation to a cognition enhancement programme is encouraged. |
| 2 | MMSE score | is greater than or equal to | 25 | To increase your cognitive level in an entertaining way, playing FrailSafe's 'Memory', 'Simoni' 'Supermarket' or 'Reflex' games frequently is recommended. |
| 3 | BMI | is greater than | 30 | Consider a healthy diet for achieving a balanced weight. Eat plenty of fruits, vegetables and protein. |
| 4 | Alcohol consumption (weekly) | is greater than | 21 | Alcohol can cause severe damages to the liver. Consider lowering consumption. |

Page: 1 ▾ Rows per page: 5 ▾ 1 - 4 of 4 | < > >>

DASHBOARD

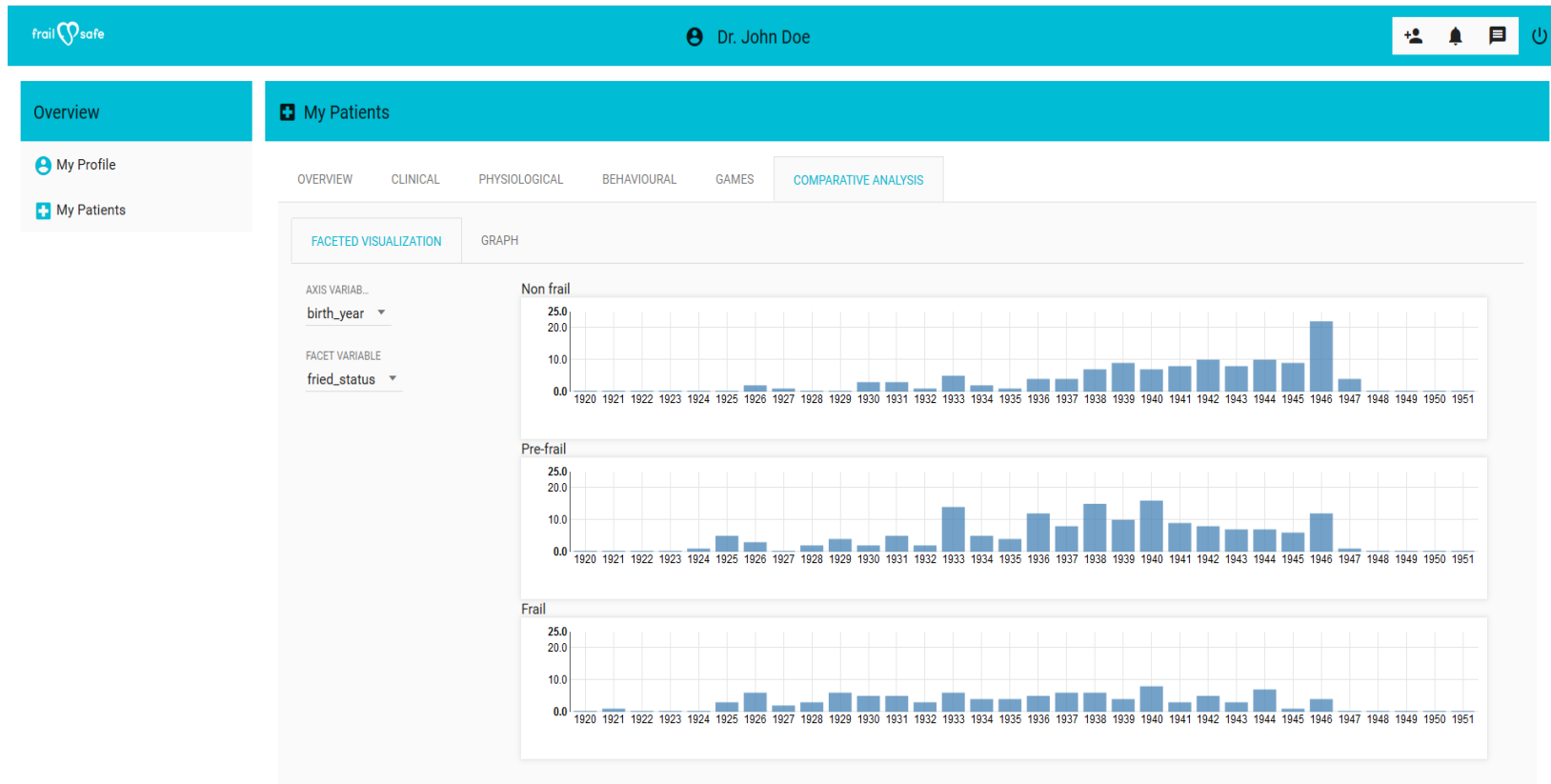


- For researchers

Group Analysis



Dashboard



DASHBOARD

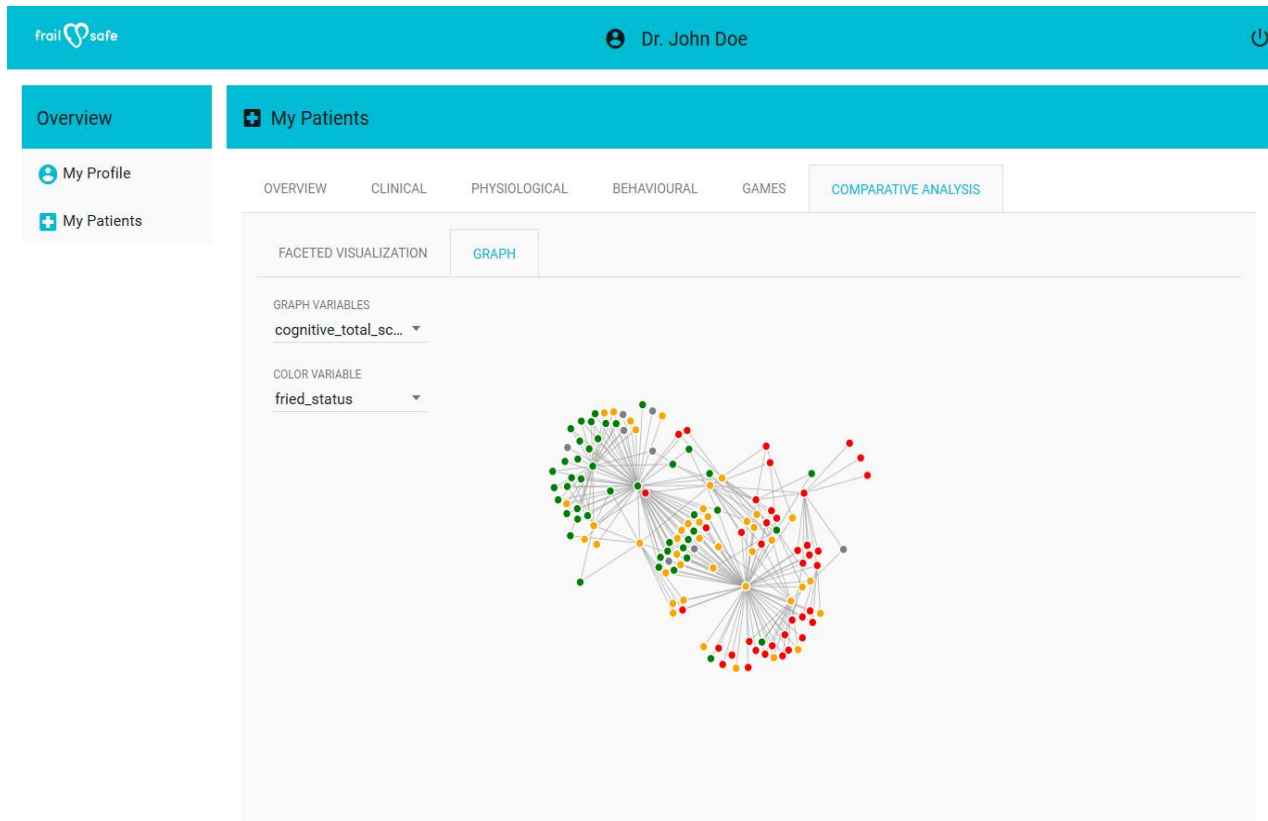


- For researchers

Correlation graphs



Dashboard





**Thank you
for your attention!**



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