

# FrailtySIM

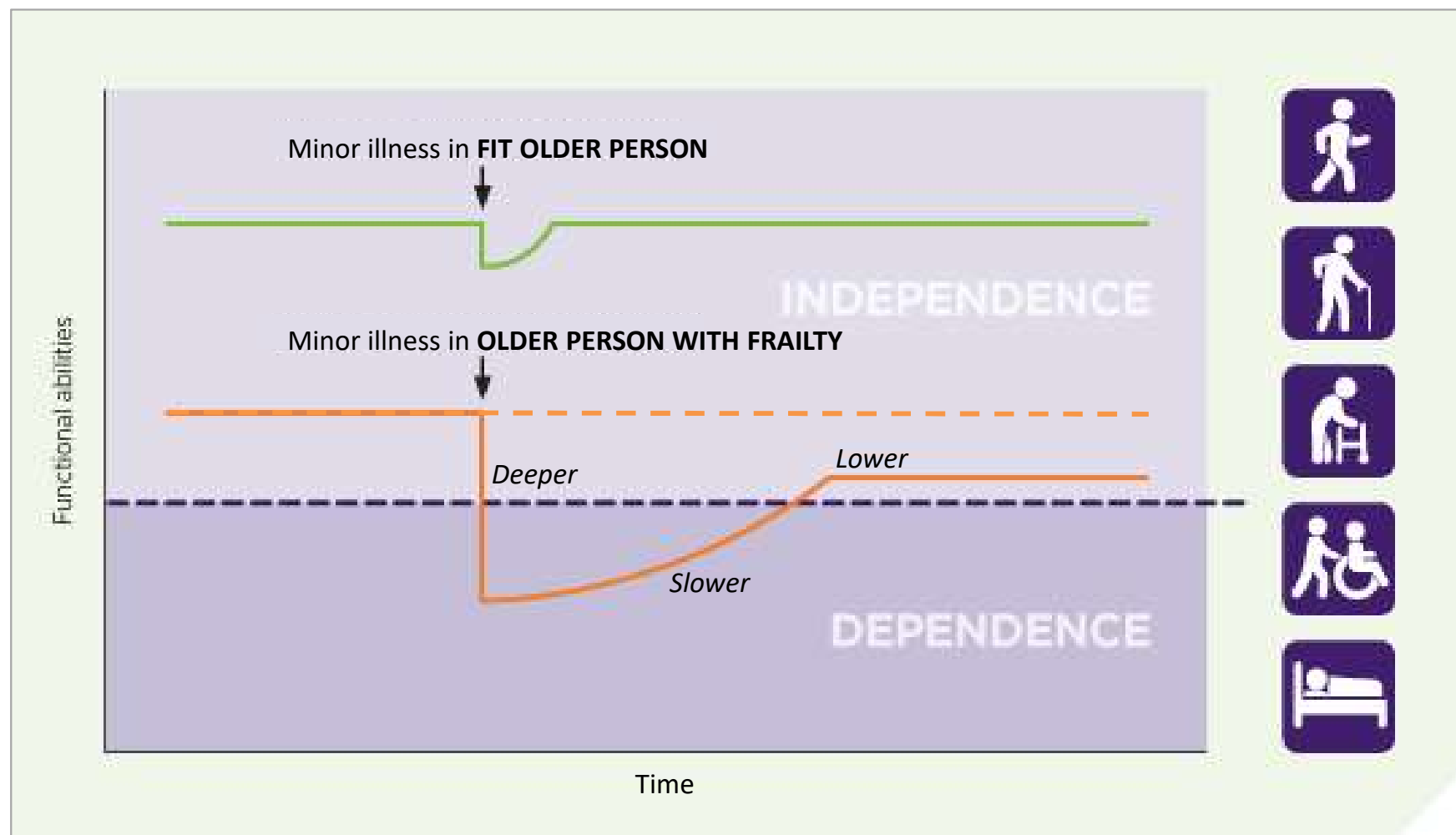
**Changing perceptions and improving the lives  
of older people**



**Dr Sunil Angris**  
[sunil@fusion48.net](mailto:sunil@fusion48.net)

**David Seymour**  
[david@fusion48.net](mailto:david@fusion48.net)

# What is frailty?



Reduced resilience and increased vulnerability to decompensation after a stressor event

# What is 'Frailty'?

**An important part of  
many life stories.**



Related to but distinct from  
ageing, comorbidity and  
disability.

# What does Frailty look like?



*“The sixth age shifts into  
the lean and slippered  
pantaloon, with spectacles  
on nose and pouch on side,  
his youthful hose, well  
saved, a world too wide for  
his shrunk shank”*

**William Shakespeare,  
As you like it (c. 1599)**

- Unintentional weight loss
- Exhaustion
- Weakness (measured by grip strength)
- Slow walking speed
- Low physical activity

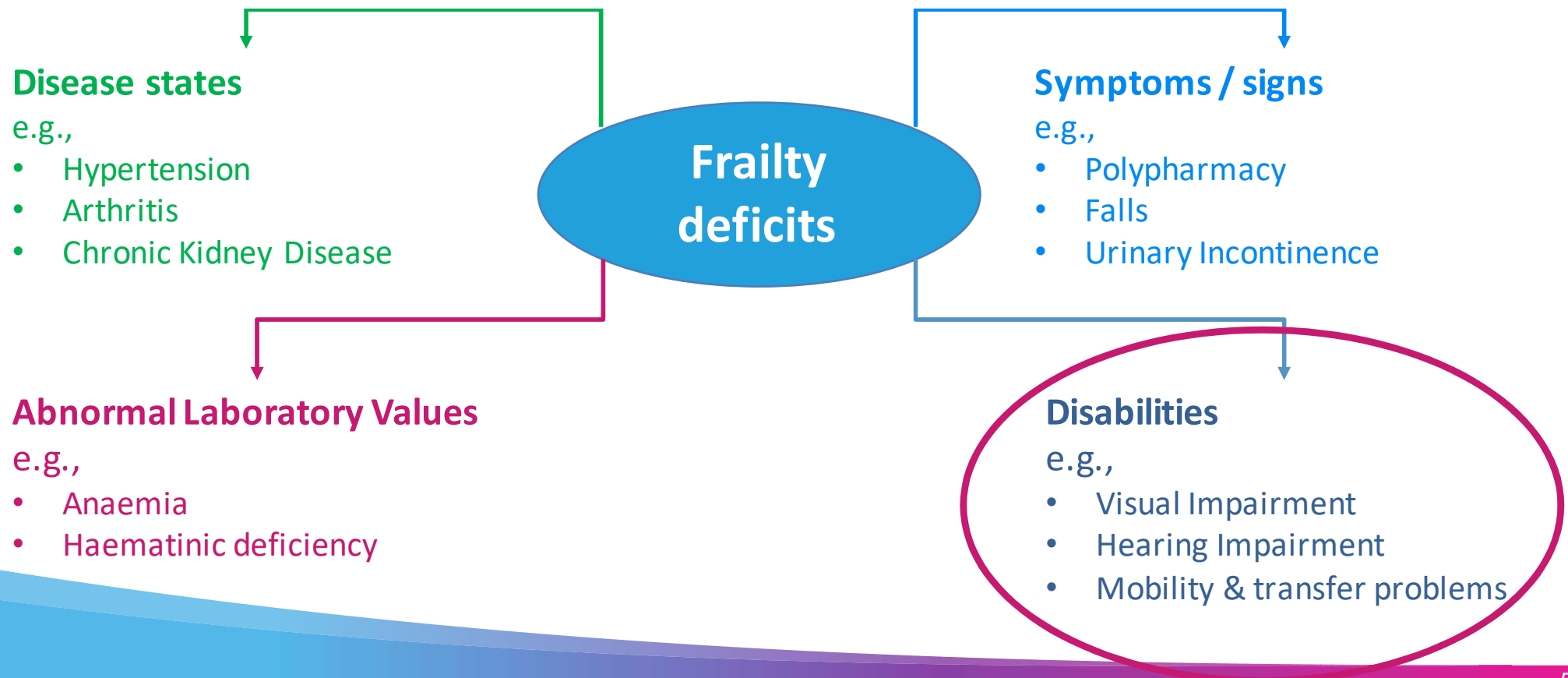
**Phenotype  
Model**

# What is Frailty made up of?

## Cumulative Deficit Model

*“Pragmatically, at some point, the number of things that people have wrong with them becomes more important than the exact nature of what they have wrong with them...”*

Rockwood & Theou  
Introduction to **Frailty in Ageing**, 2015





# How does Frailty present in acute settings?

## The Frailty Syndromes

Delirium



Incontinence



Side-effects of  
medication



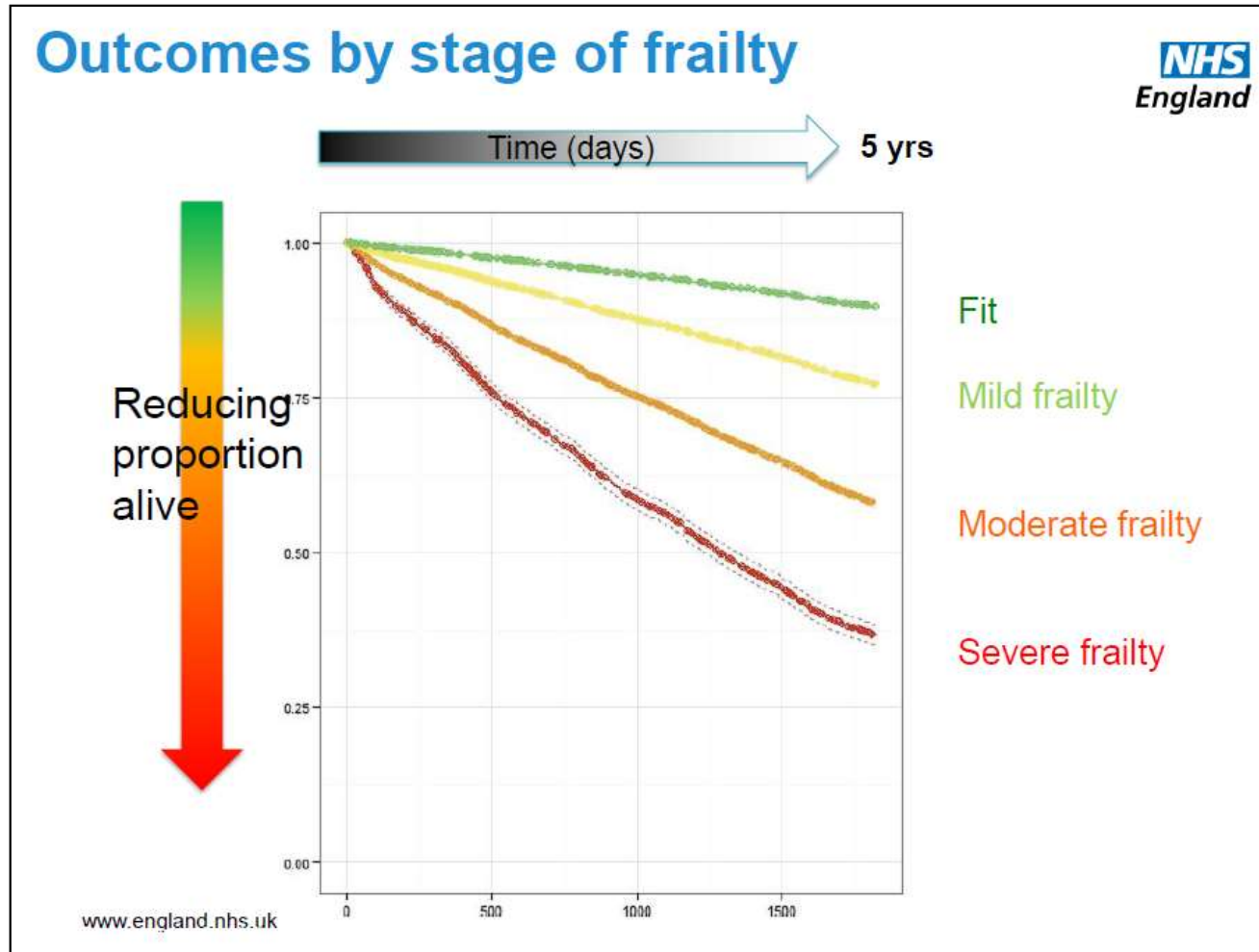
Falls



Immobility



# Why it matters: outcomes by stage of frailty



1 year outcome (Hazard Ratio)	Fit	Mild	Moderate	Severe
Mortality	1.0	1.9	3.1	4.5
Hospitalisation	1.0	1.9	3.0	4.7
Nursing home admission	1.0	1.9	3.2	4.8

# Considering Frailty as a Long Term Condition

- ✓ Guide the **most appropriate interventions** at each stage of fitness and frailty
- ✓ Helps to **influence the course** of a person's frailty
- ✓ Helps them to **remain as independent as possible** at each stage

## Managing frailty as a long-term condition FREE

Jennifer K. Harrison ; Andrew Clegg; Simon P. Conroy; John Young

Age Ageing (2015) 44 (5): 732-735. DOI: <https://doi.org/10.1093/ageing/afv085>

Published: 13 July 2015 **Article history** ▼

PDF Cite Share ▼ Tools ▼

### Abstract

Frailty is a distinctive late-life health state in which apparently minor

**NHS**  
England

About us

Our work

Resources

Commissioning

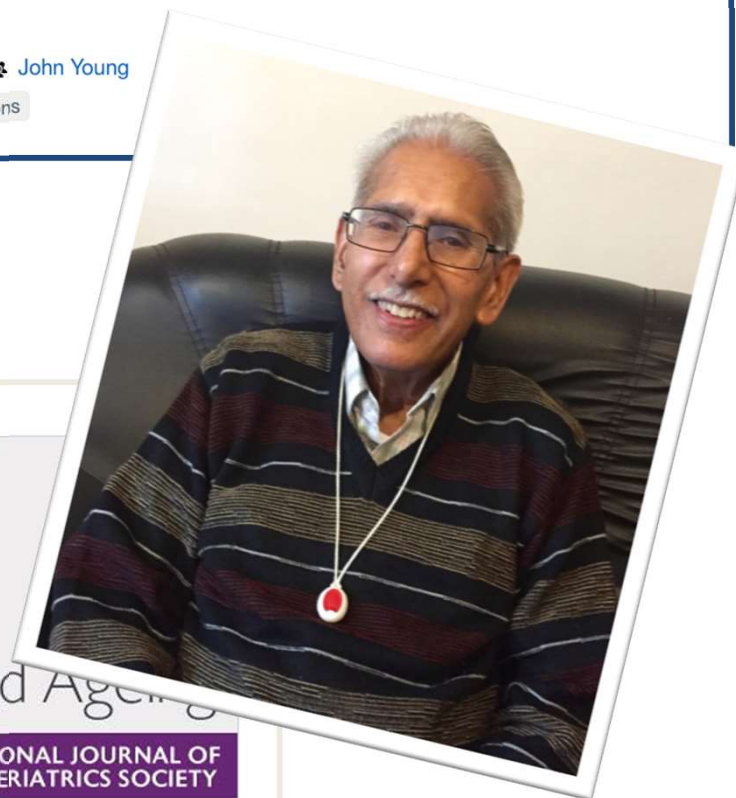
Get involved

## Blog

### We must recognise frailty as a long term condition – John Young

7 May 2014 John Young

Long term conditions

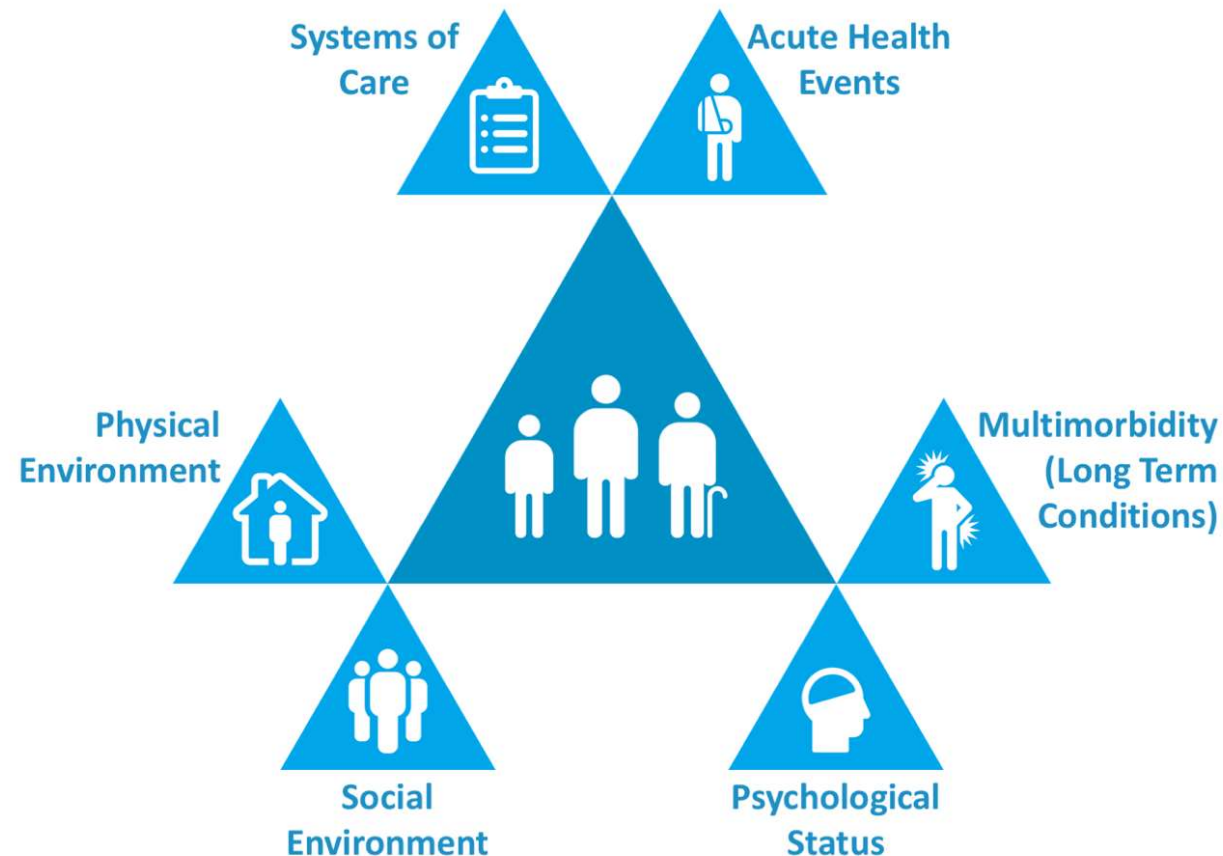




# What does Frailty mean to the individual?

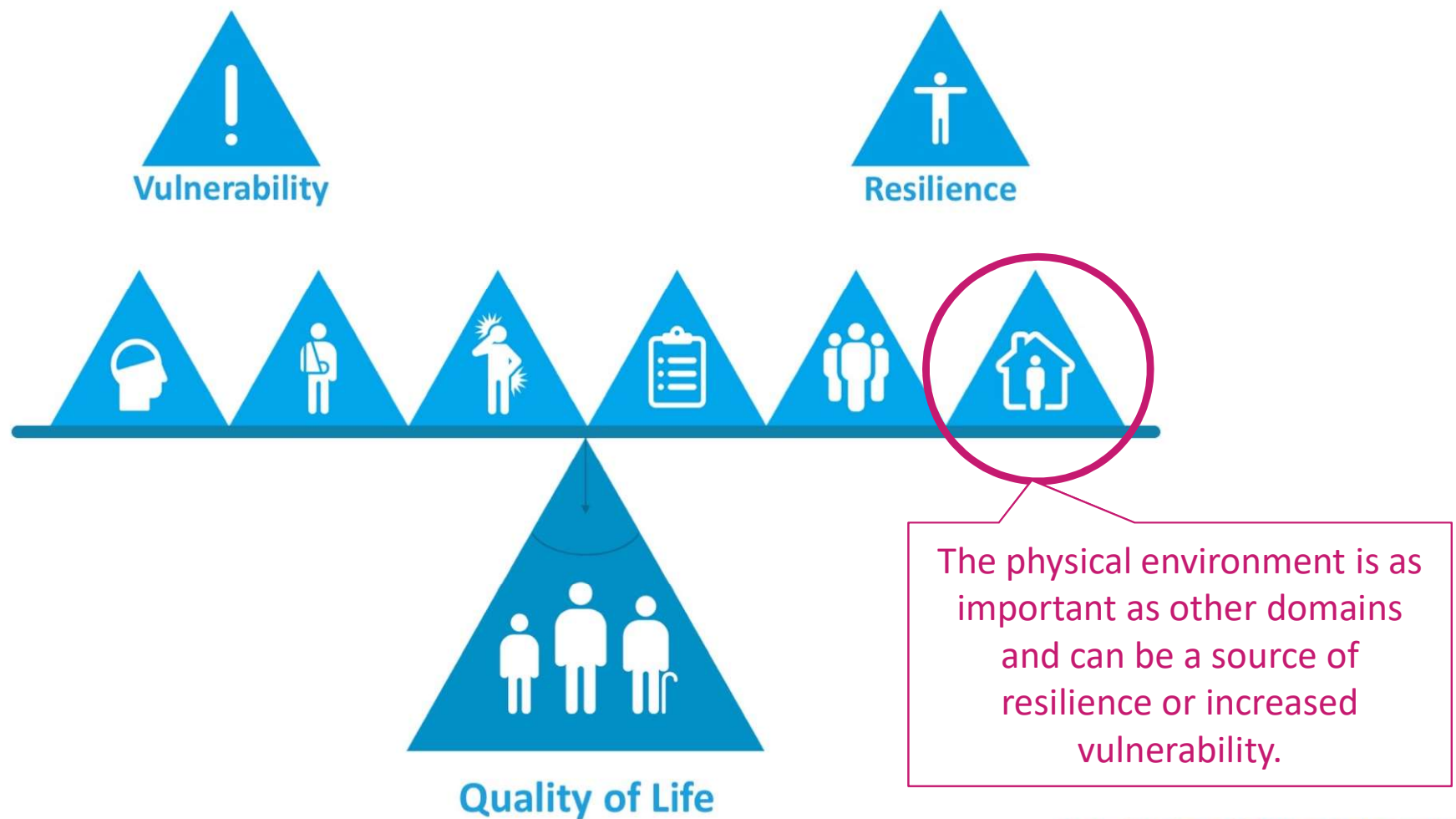
## Multi-dimensional Model

*Frailty can be described as a 'collection of modifiable health and social needs'. For the individual with frailty, it goes beyond physical health and includes psychological, social, physical domains*

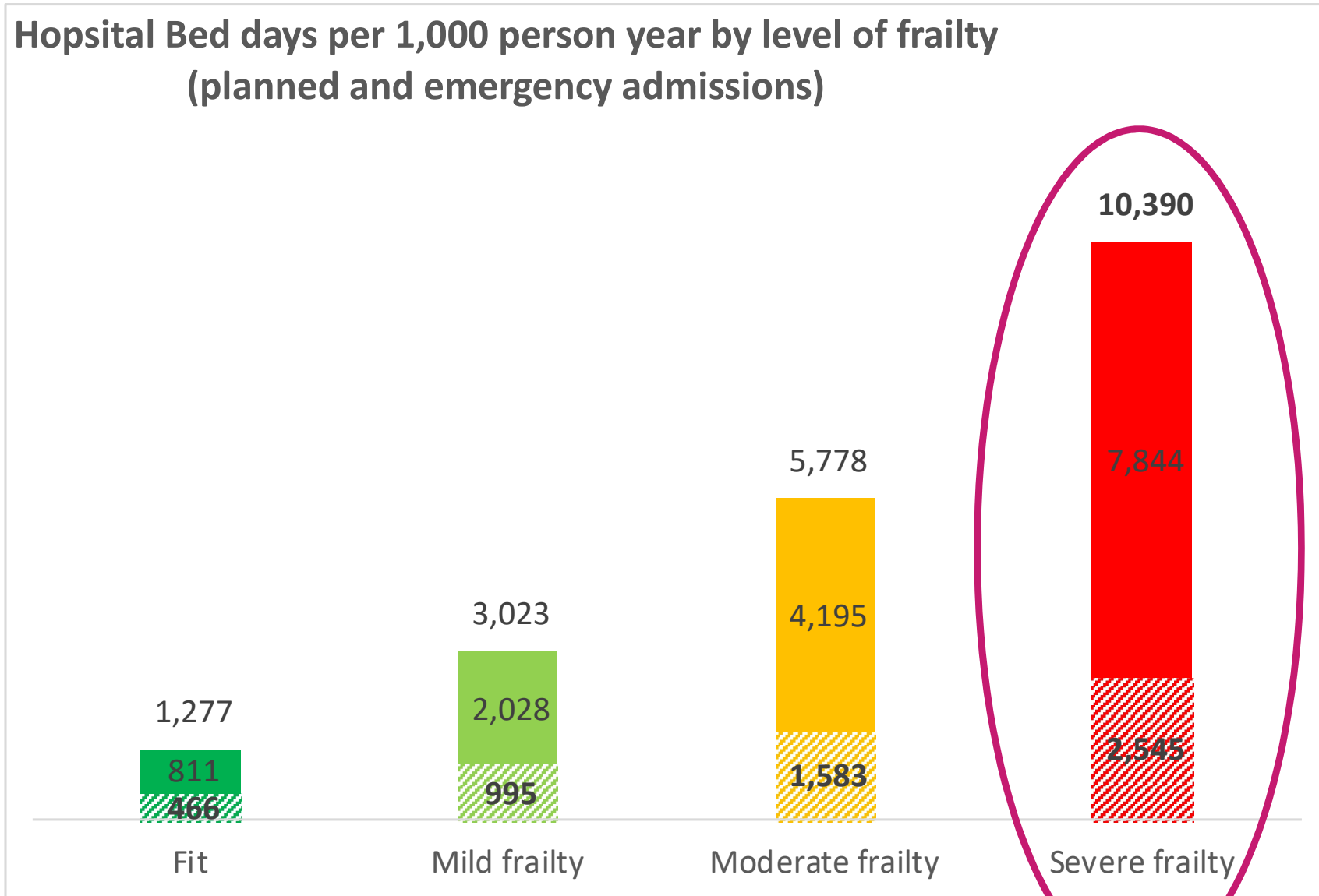


# The Frailty Fulcrum

A model for understanding frailty and the opportunities to improve quality of life

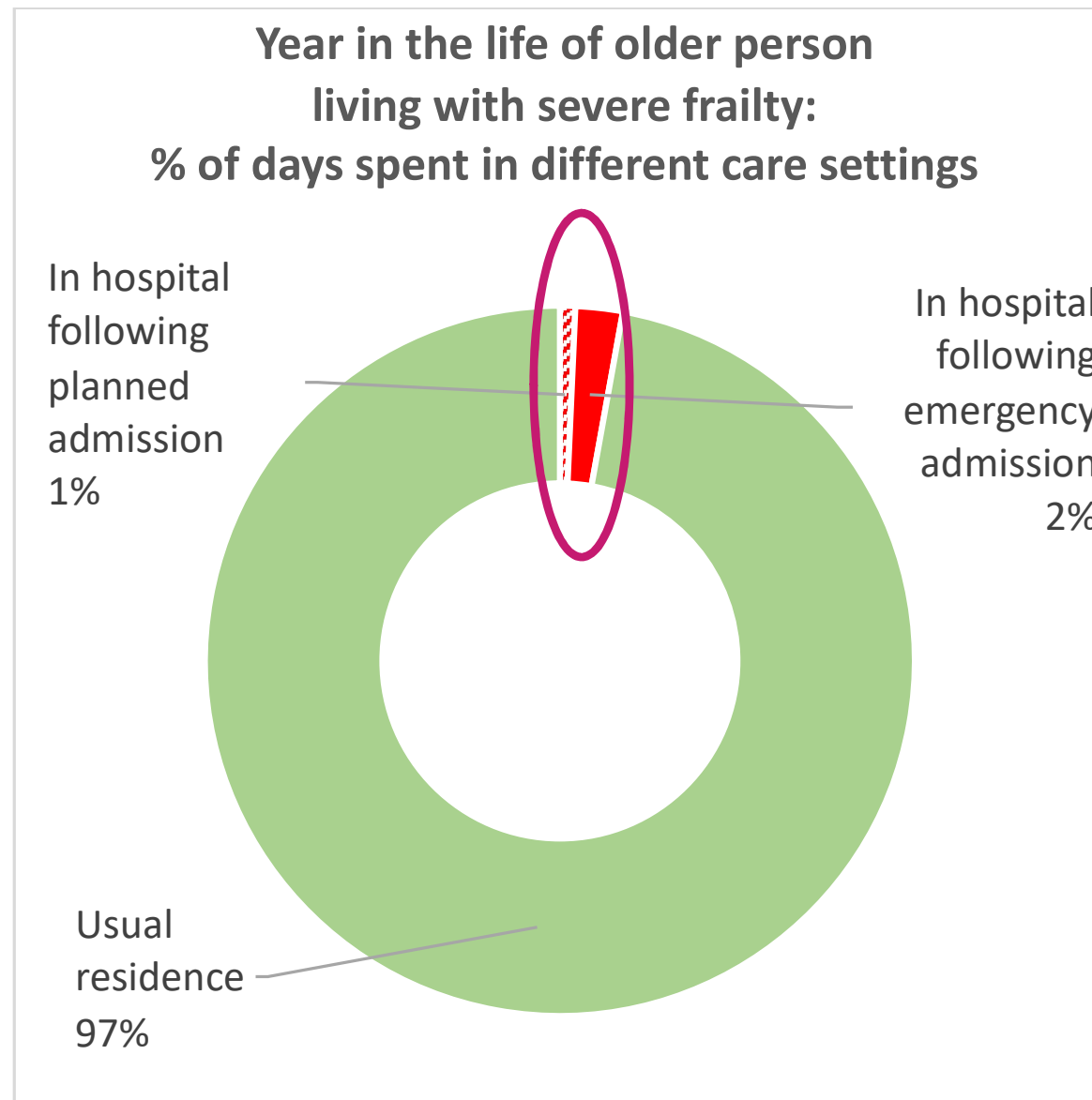


# Frailty: Settings of Care – hospital bed days by level of frailty



**Source:** Analysis of supplementary data from Development and validation of an electronic frailty index using routine primary care electronic health record data

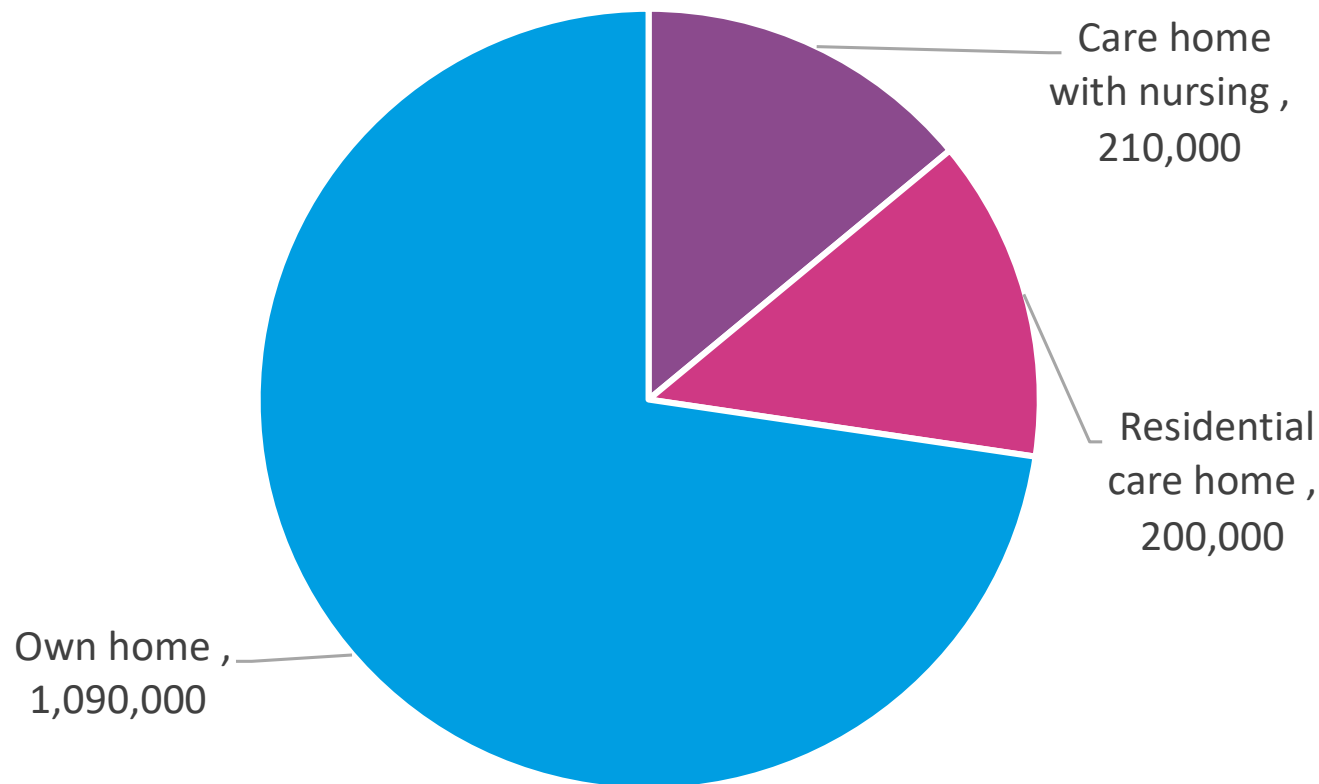
# Frailty: Settings of Care – an average year for an older person living with severe frailty



**Source:** Analysis of supplementary data from Development and validation of an electronic frailty index using routine primary care electronic health record data

# Frailty: Settings of Care – Usual Residence of those living with moderate or severe frailty

**Older People with moderate or severe frailty living in England:  
Estimated population by type of usual residence**



- Around 15% of 10 million adults aged 65 and over living in England estimated to be living with moderate (12%) or severe (3%) frailty
- Just over 400,000 care home beds for older people, almost equally split between nursing and residential
- Almost 3/4s of the population with moderate or severe frailty are cared for within their own home

**Source:** Development and validation of an electronic frailty index using routine primary care electronic health record data; CQC Database of registered locations



Victor is one of those people supported to live at home



**Vic's story is told**

# Learning goals



✓ Increases awareness of frailty



✓ Develops understanding and empathy



✓ Enhances observational skills

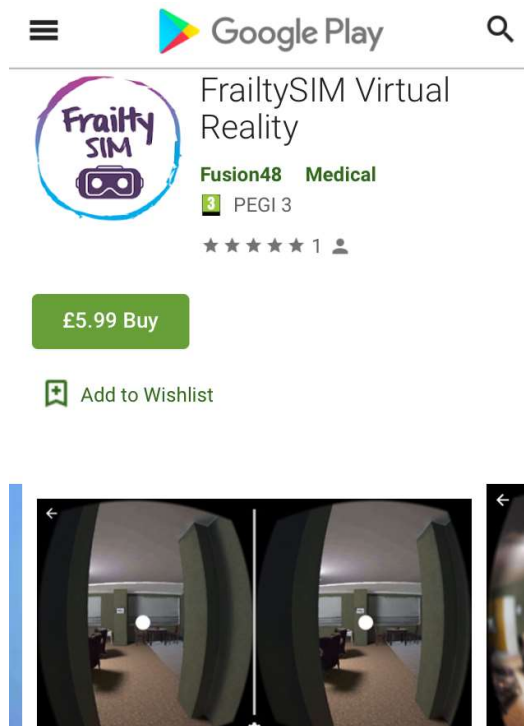


✓ Deploys assistive technology

# The technology



1. **VR software** built in Unity Games Engine pre-loaded onto Smart Phone



2. Viewed through **Google Cardboard compatible headset** with integrated or standard headphones for audio



3. **Supporting resources** for individual or group learning





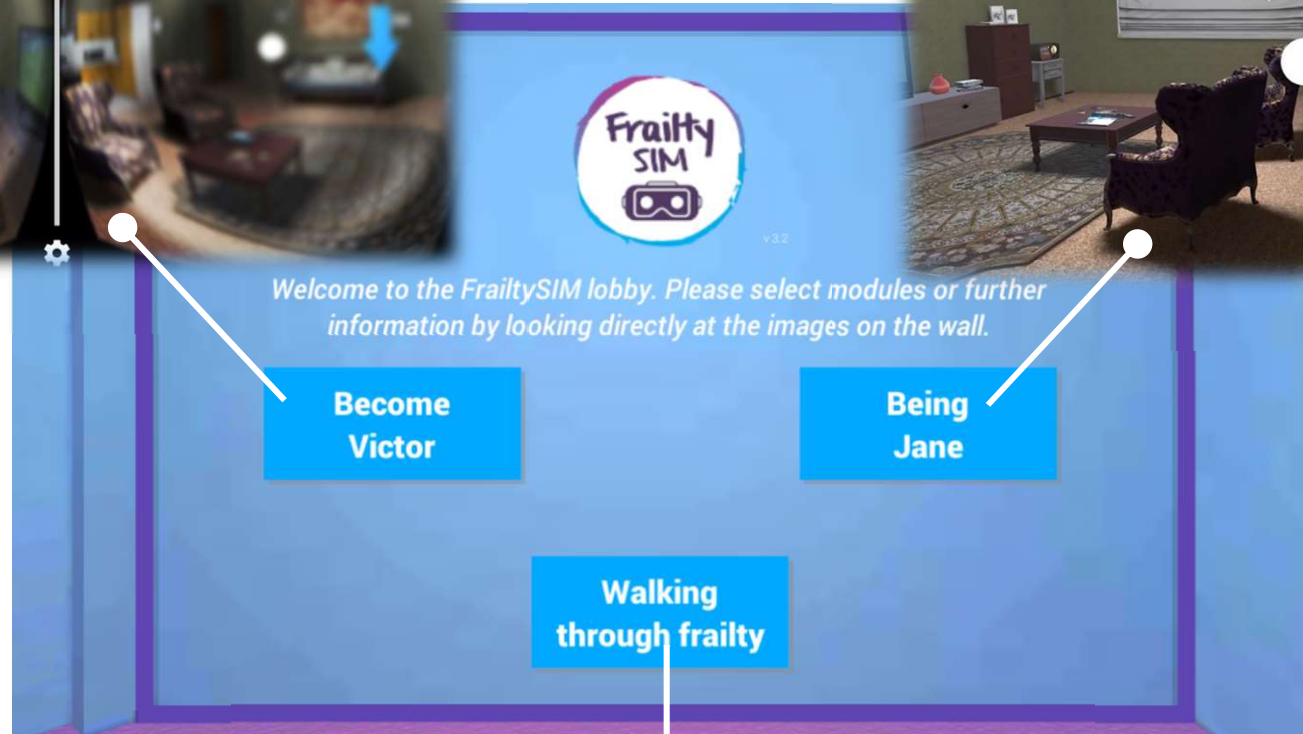
# Three complementary VR scenarios



## Empathy

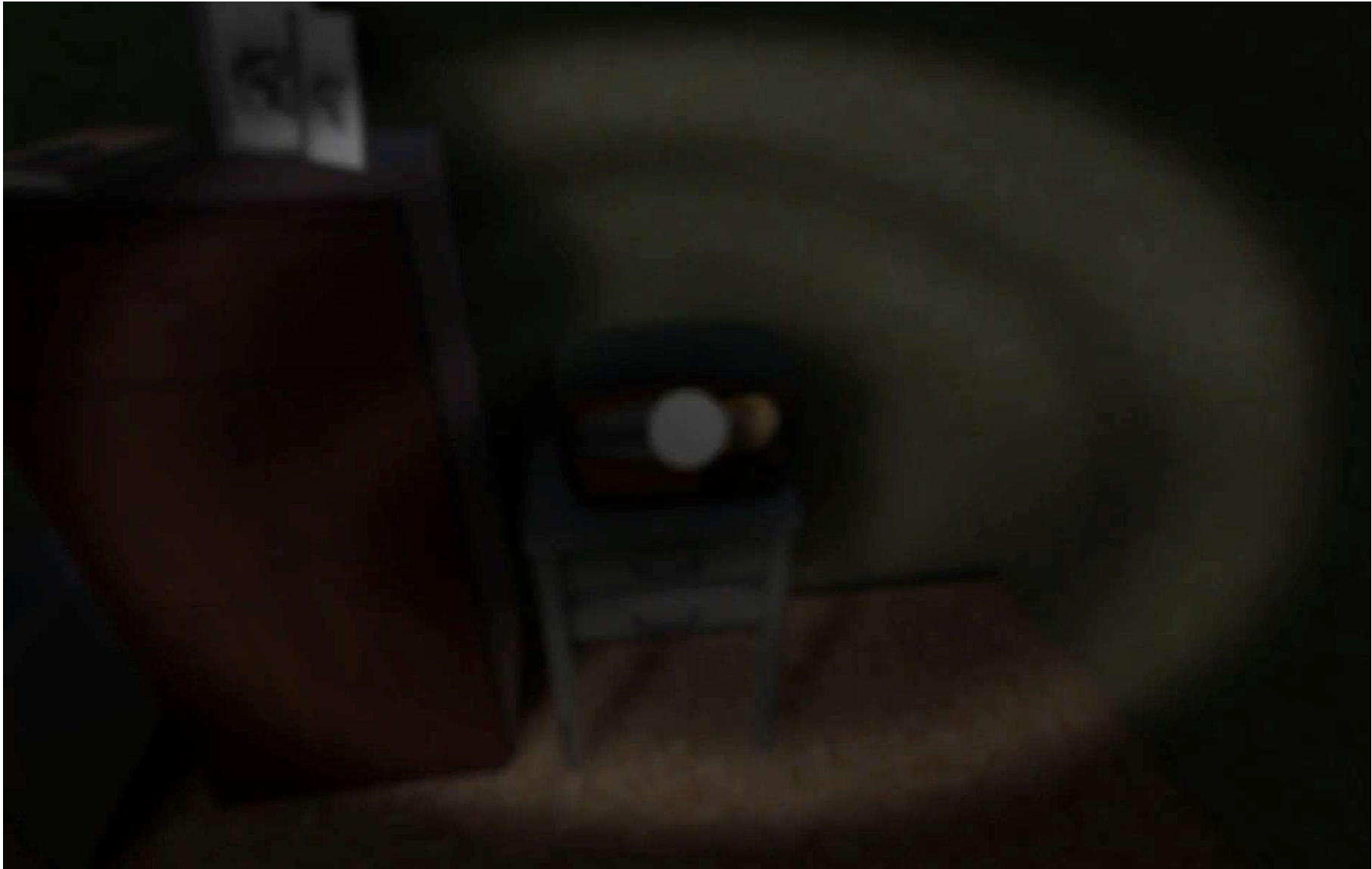


## Observational skills



## Care and support

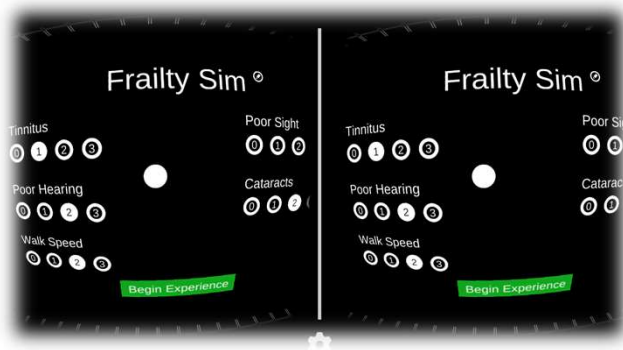
# Become Victor – a 2-D taster





# The development process

Prototype developed as part of Health Education England programme



Progressed through grant funding from Ufi charitable trust



Extensive user testing through training events (over 2,000 participants)



Feedback from wide range users from health, care and beyond.



Engagement with leading home care provider to support roll-out

# Feedback from participants



Immersive and interactive training to engage everyone involved in the care & support of older people.



# How might the VR components be relevant to design & planning of care infrastructure...

## Impairments

Tinnitus

0 1 2 3

Poor Sight

0 1 2

Poor Hearing

0 1 2 3

Cataracts

0 1 2

Walk Speed

0 1 2 3

## Scenarios & interaction

2:56

It's time for my morning tablet.  
I'd better have a cup of tea.

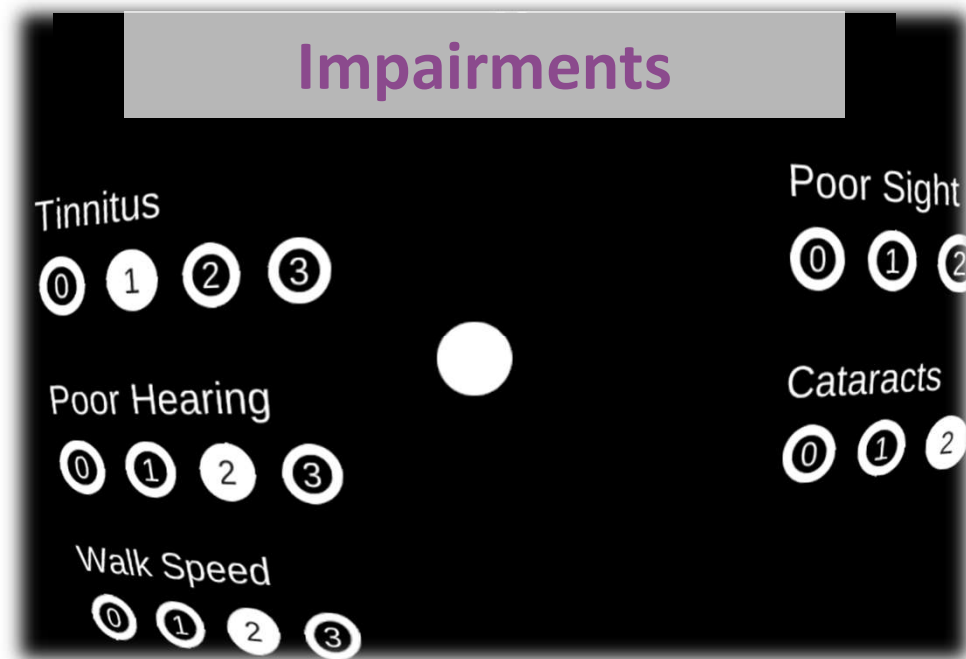
## Environments



## Highly scalable



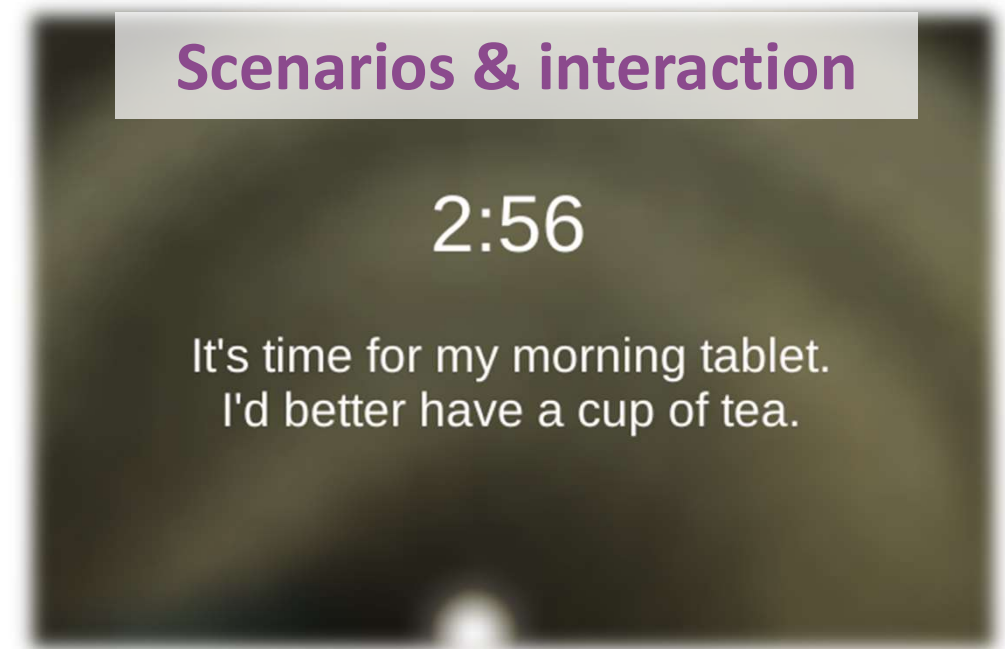
# ...some initial thoughts (1/4)



- FrailtySIM provides a set of **frailty-related impairments** that can be set to different levels.
- This is just the start of potential customisation to the individual.
- Development of a **suite of 'virtual impairments'** that can be combined allow current and future **environments to be experienced from the perspective of the older person / service user.**

# ...some initial thoughts (2/4)

- **Scenarios and interactions** enable realistic testing of how different people chose to move around and undertake tasks i.e., **how they use the lived environment**
- **How behaviours are modified** with changes to the environment (and to the impairment levels) can also be tested and understood.





# ...some initial thoughts (3/4)



- **Virtual environments and gaze tracking technology** can be used to see where and how people with different impairments look?
- How does this change with changes to physical environment – **can assess objectively** even for people with cognitive impairments or otherwise who may not be able to communicate how easy they can see things?
- **360 video** allows existing environments to be 'tested' remotely

# ...some initial thoughts (4/4)

- VR enables the **input of lots of people** to be brought together – it can provide a shared experience for people many miles apart, but **generates different perspectives**.
- For example, our walkthrough has developed through input from the wide range of users e.g., Fire & Rescue
- It enables **‘remote’ testing** of plans and designs. May also help individual designers / planners to understand their own ‘blind spots’.



# Try walking in Victor's shoes during the coffee break!



Dr Sunil Angris  
[sunil@fusion48.net](mailto:sunil@fusion48.net)

David Seymour  
[david@fusion48.net](mailto:david@fusion48.net)



Fusion48 works with commissioners and providers of care to improve services with a particular focus on older people's care.



**Frailty Toolkit** is a web-based application designed to provide quick and easy access to a range of frailty-related resources, including the **Frailty Fulcrum**



**Frailty360** provides access to frailty training for all through immersive and interactive training resources with case studies based on real people's stories.



**FrailtySIM** is a Virtual Reality (VR) workforce development tool that improves care for older people living with frailty through building awareness, understanding and empathy.

**@Fusion48net**  
**<http://fusion48.net>**