

# four | Emerging Health technologies

VR/AR - Dr Tim Ringrose

#FourHealthEmergingTech

@fourhealthmedia

A stylized graphic of a plant with a thick, curved brown stem and two large, oval-shaped leaves, positioned on the left side of the slide.

# VR/AR: the latest hype or a revolution for healthcare?

Dr Tim Ringrose

The logo for Cognitant, featuring the word "COGNITANT" in a white, sans-serif font. A small, stylized green plant sprout with two leaves is positioned above the letter "i".

COGNITANT

What is good health?

What is good healthcare?

“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”

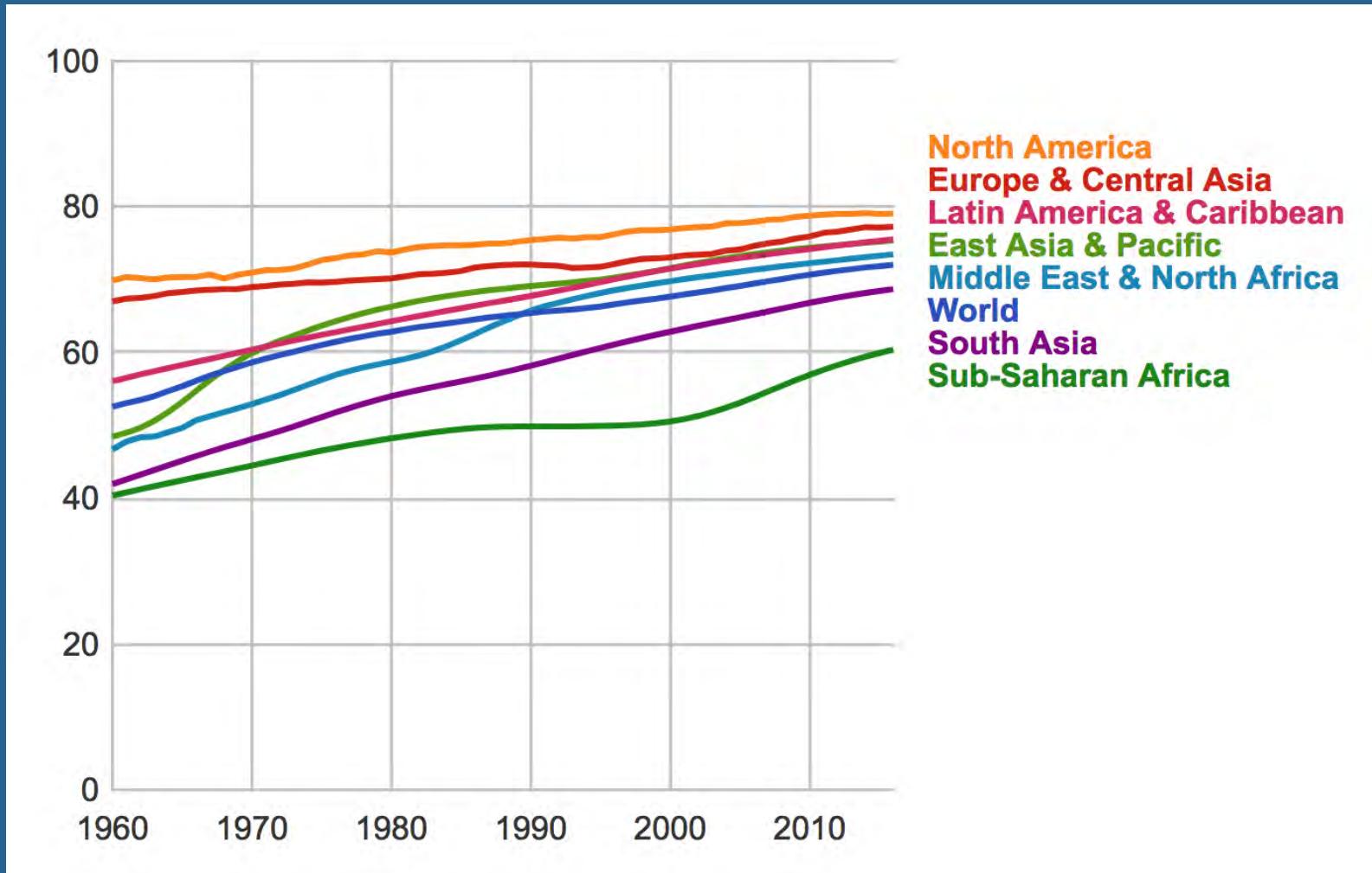
The World Health Organisation, 1948

# What's the matter with you?

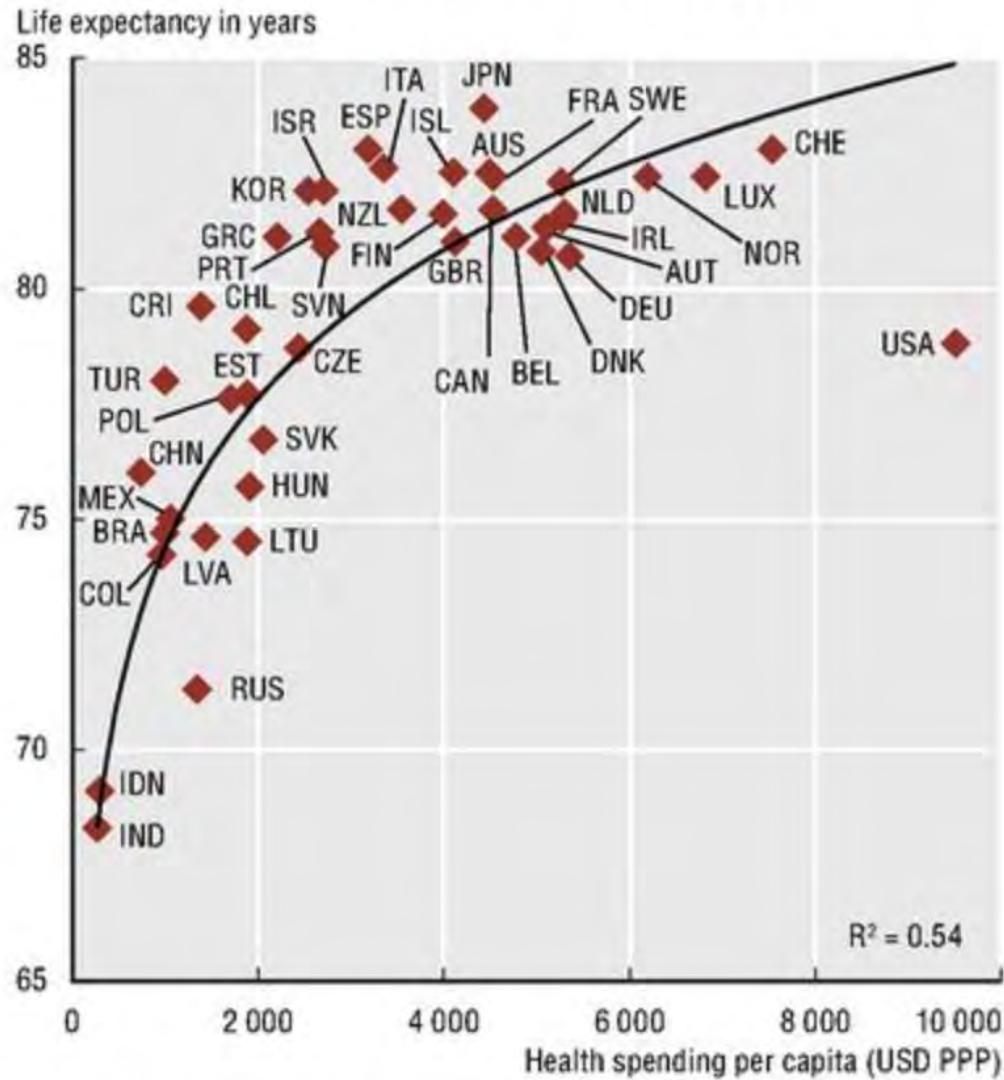


# What matters to you?

# Life expectancy



### 3.3. Life expectancy at birth and health spending per capita, 2015 (or nearest year)

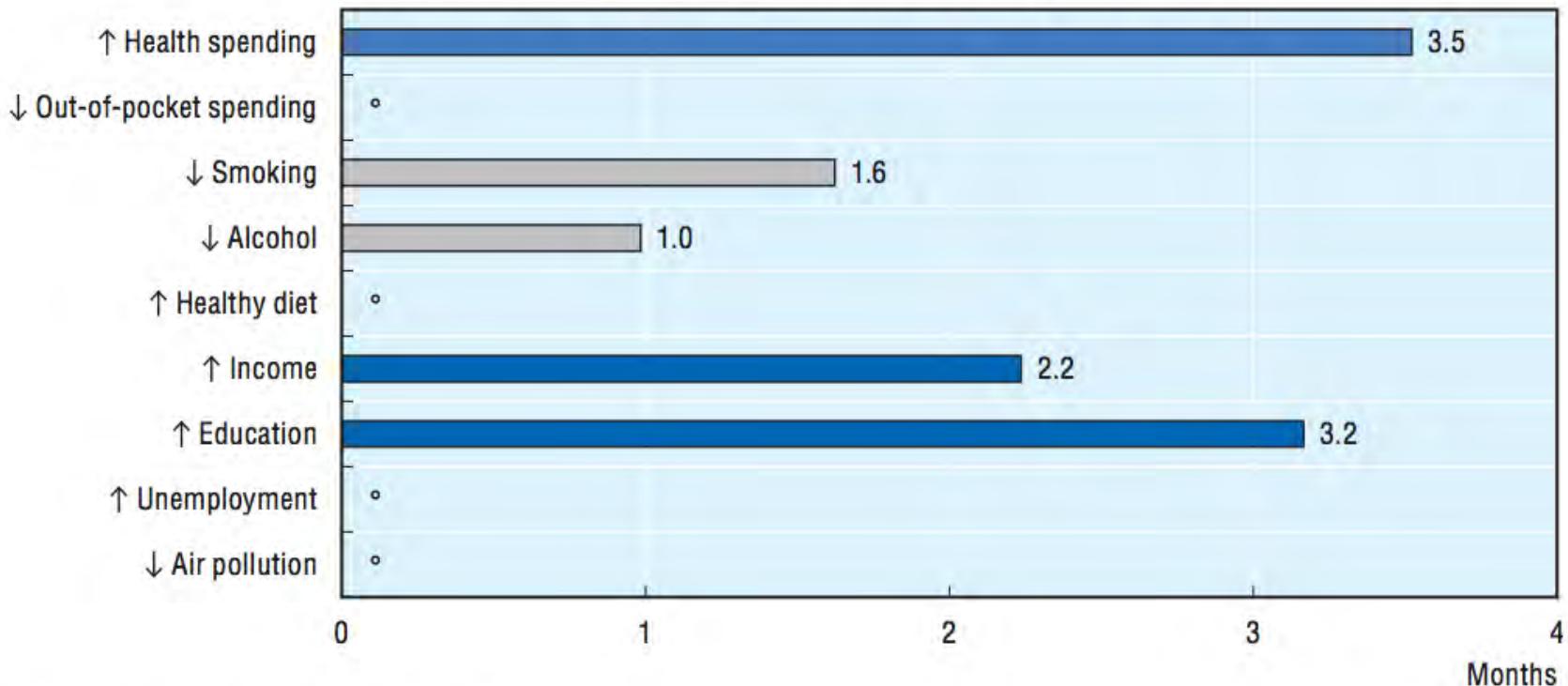


Source: OECD Health Statistics 2017.

StatLink <http://dx.doi.org/10.1787/888933602272>

## Figure 2.3. Life expectancy gains associated with a 10% change in the main determinants of health

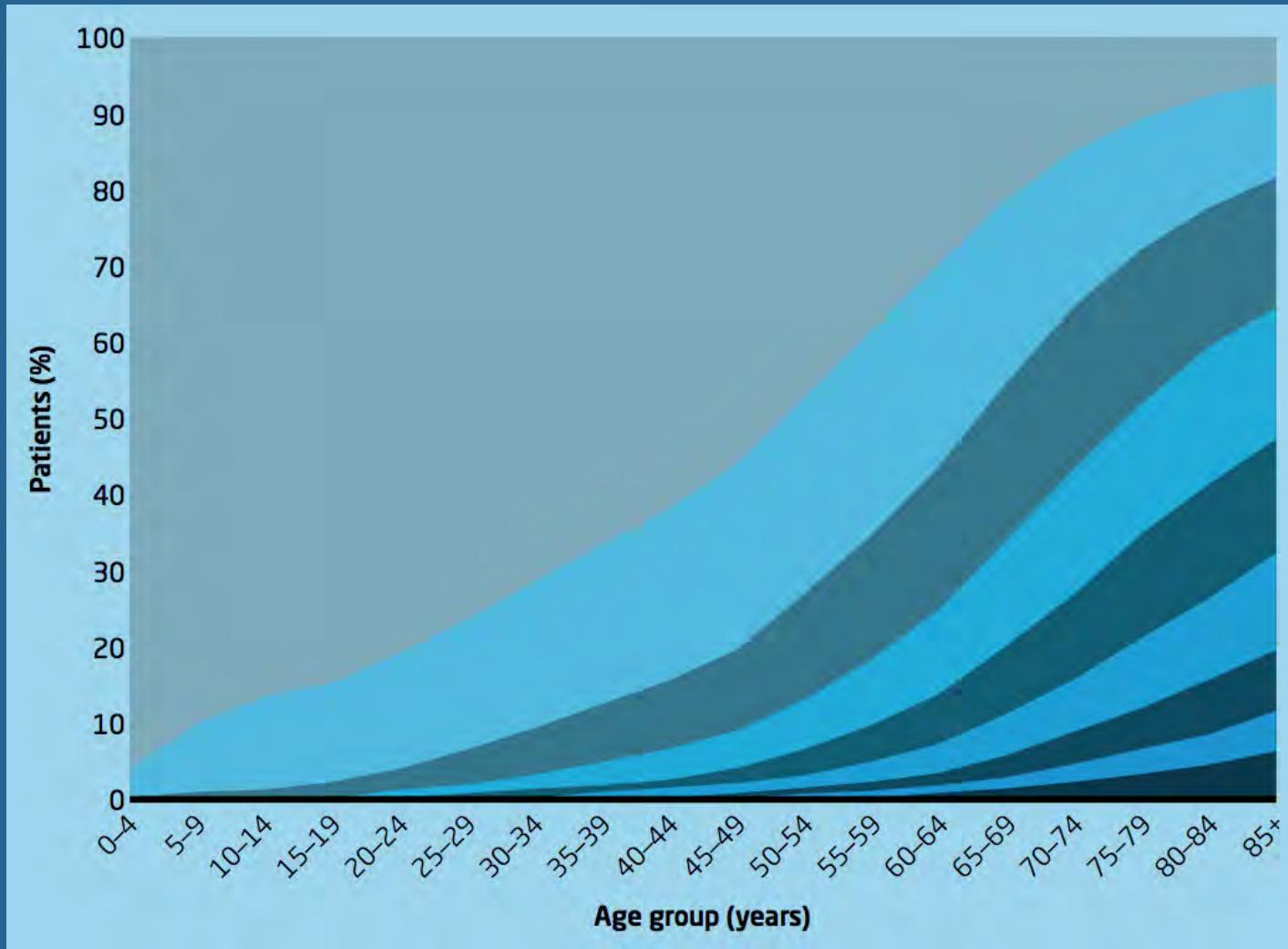
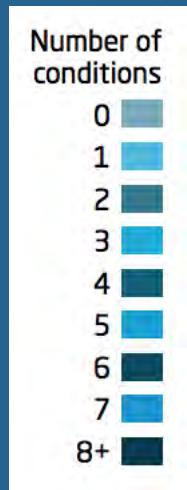
Analysis based on 35 OECD countries for the time period 1995-2015



Note: ° stands for a contribution near zero.

StatLink  <http://dx.doi.org/10.1787/888933602158>

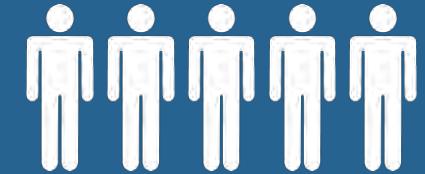
# Chronic disease and age



# Healthcare services are being stretched to the limit



**Increased** public expectations



Mass **shortage** of doctors and  
nurses

**Growing** and  
**ageing** population

We are spending more and more on health:

**20% US GDP** | **10% UK GDP**

# UBER



# NETFLIX



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Solve a problem

Improve patient experience

Save costs



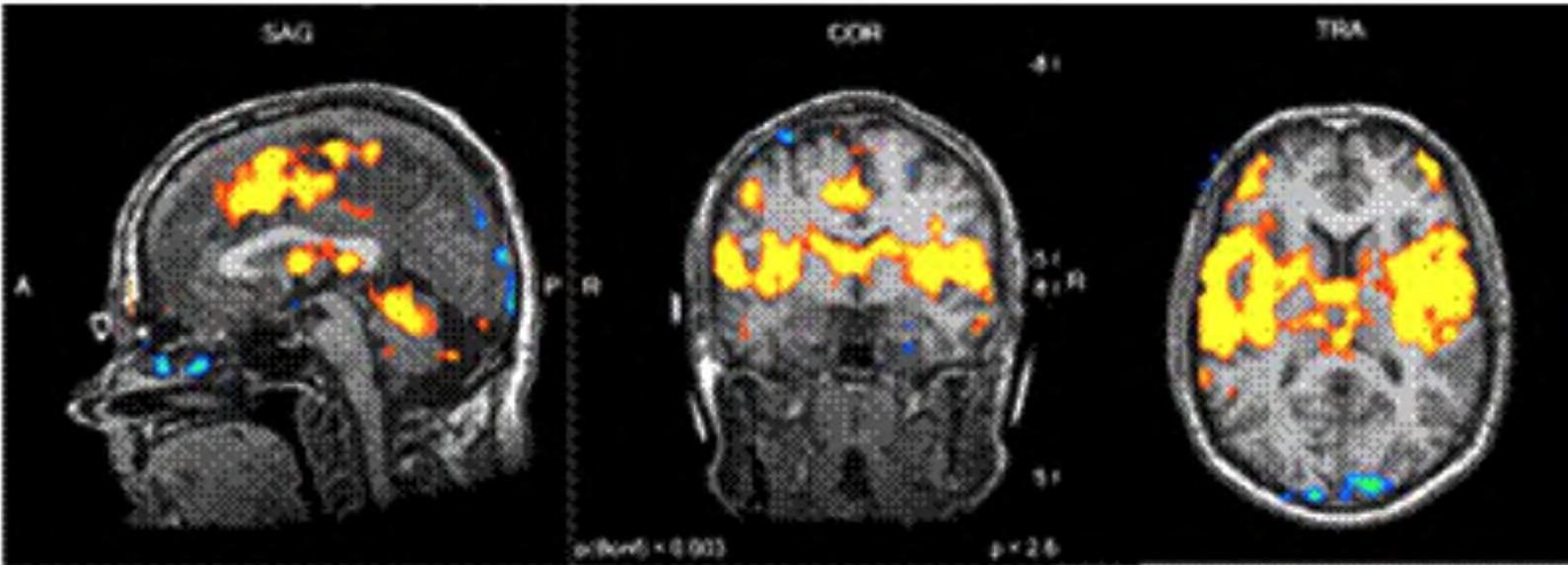
**Virtual reality (VR)** immerses users in a fully artificial digital environment.

**Augmented reality (AR)** overlays virtual objects on the real-world environment.

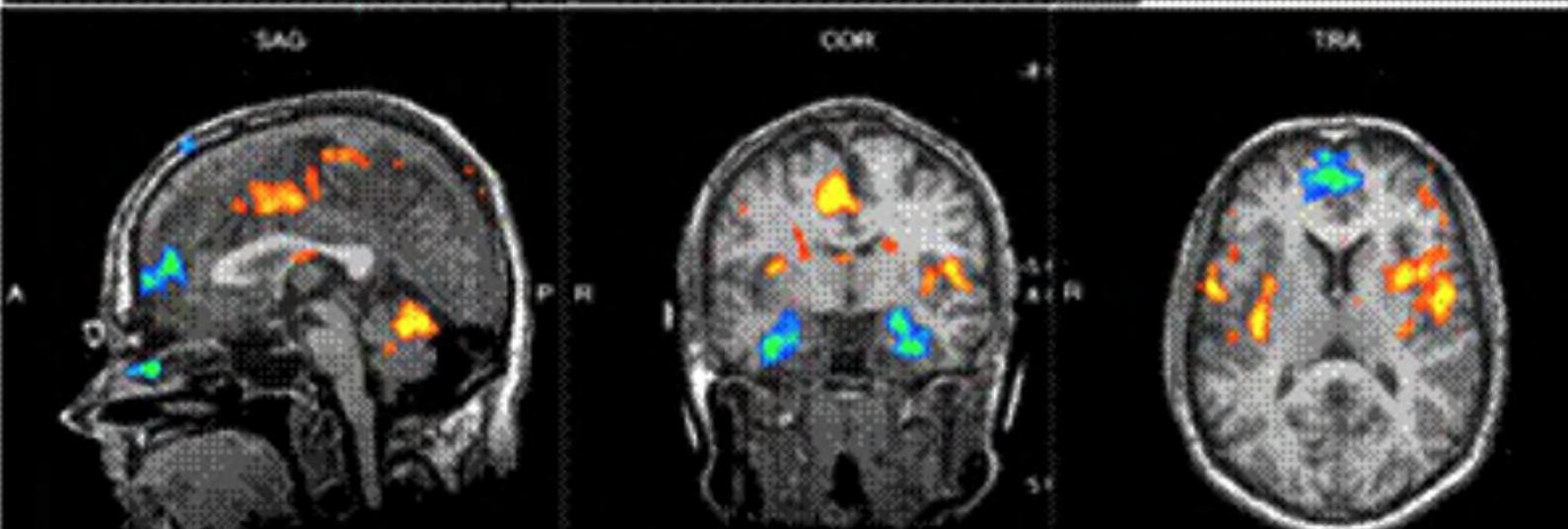
**Mixed reality (MR)** anchors and connects virtual objects to the real world

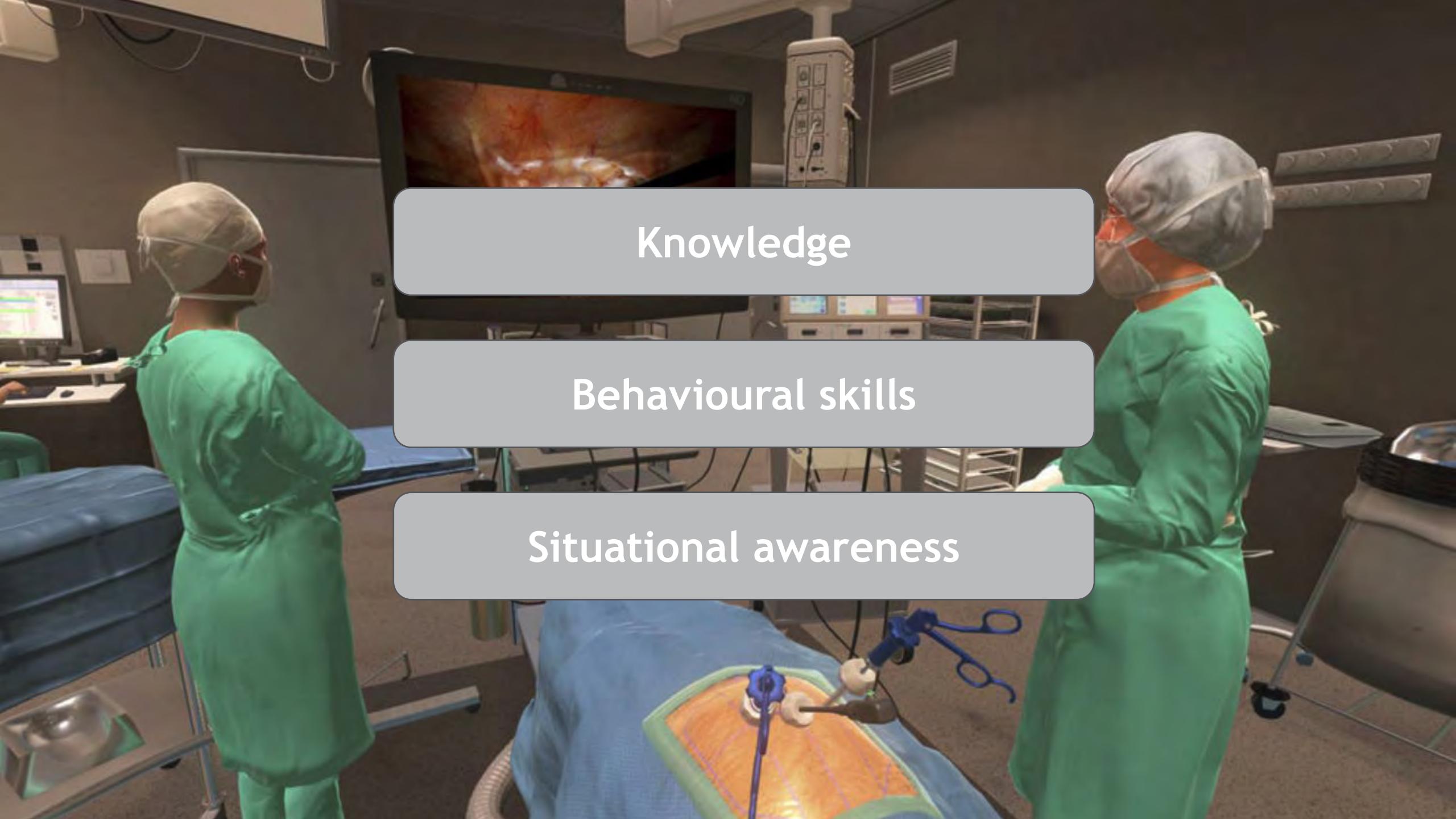
Solving a problem ✓  
Improved patient experience ✓  
Cost saving ✓?

No  
VR



Yes  
VR



A photograph of an operating room. Two surgeons in green scrubs and masks are standing on either side of a patient. The patient is covered with a blue sheet and has a blue surgical drape on their abdomen. A monitor above the patient shows a close-up of the surgical site. In the background, there are medical monitors and equipment. Three text boxes with rounded corners are overlaid on the image. The top box contains the word 'Knowledge'. The middle box contains the words 'Behavioural skills'. The bottom box contains the words 'Situational awareness'.

Knowledge

Behavioural skills

Situational awareness

# Use of VR for HCP training

LIFE: Life-saving Instruction for Emergencies

Developed by the University of Oxford to train healthcare workers across Africa

Reducing infant mortality - potential to save 1m lives

Supported by:



UNIVERSITY OF  
OXFORD



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IOUUI

Solving a problem ✓  
Improved patient experience  
✓  
Cost saving ✓



# LIFE: Life-Saving Instruction for Emergencies

Saving lives through serious games

[www.oxlifeproject.org](http://www.oxlifeproject.org)



NUFFIELD  
DEPARTMENT of  
MEDICINE



# Health information for patients



A high proportion of patients don't understand their condition, their treatment and how to manage their health. Online information is often confusing and unhelpful.



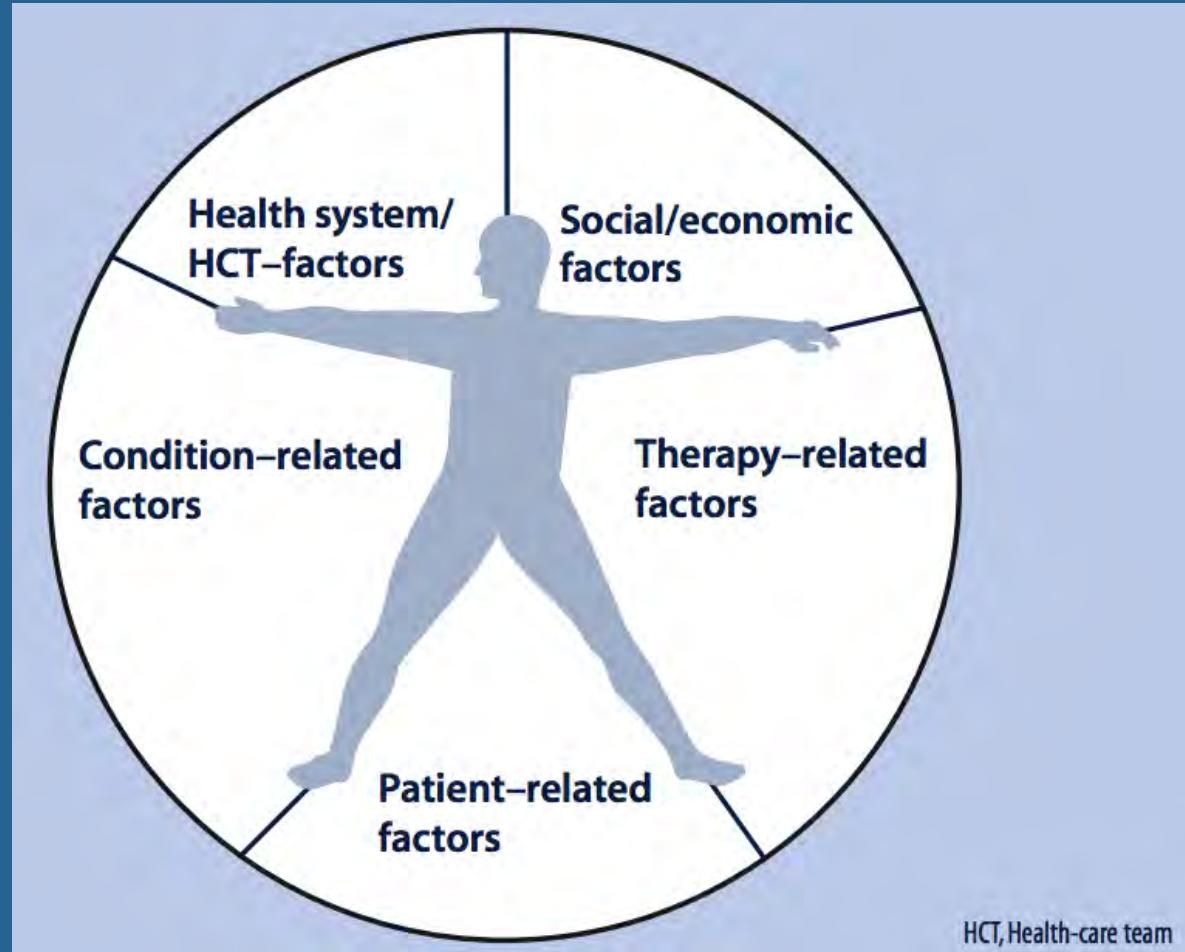
Doctors & HCPs don't have time to provide comprehensive information and training.



In Europe, non-adherence to medication contributes to over 200,000 deaths per annum and costs the economy €125 billion each year.<sup>1</sup> It also contributes to 23% of admissions to nursing homes and 10% of hospital admissions.

<sup>1</sup> <https://social.eyeforpharma.com/column/adherence-and-patient-support-programs>

# Medication Adherence – 5 dimensions



World Health Organisation

Social & Economic  
Healthcare team & system-related  
Condition-related  
Therapy-related  
Patient-related

 **EDUCATION**

 COGNITANT

# Prescribed interactive health information

**Immersive content prescribed by doctors/HCPs to enable patients to understand:**

- their condition
- the reason for their medication
- how they can manage their health most effectively

Data from patients provides **highly valuable real world insight** into compliance issues, unmet needs and patient satisfaction.

Health information prescribed by doctors/HCPs

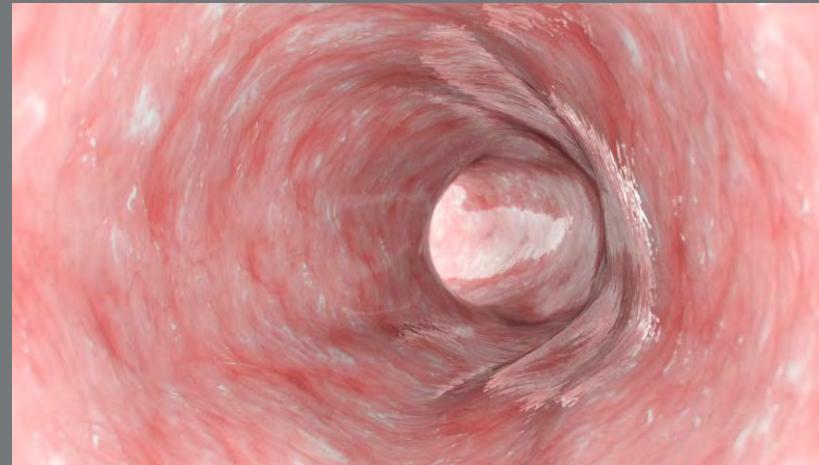
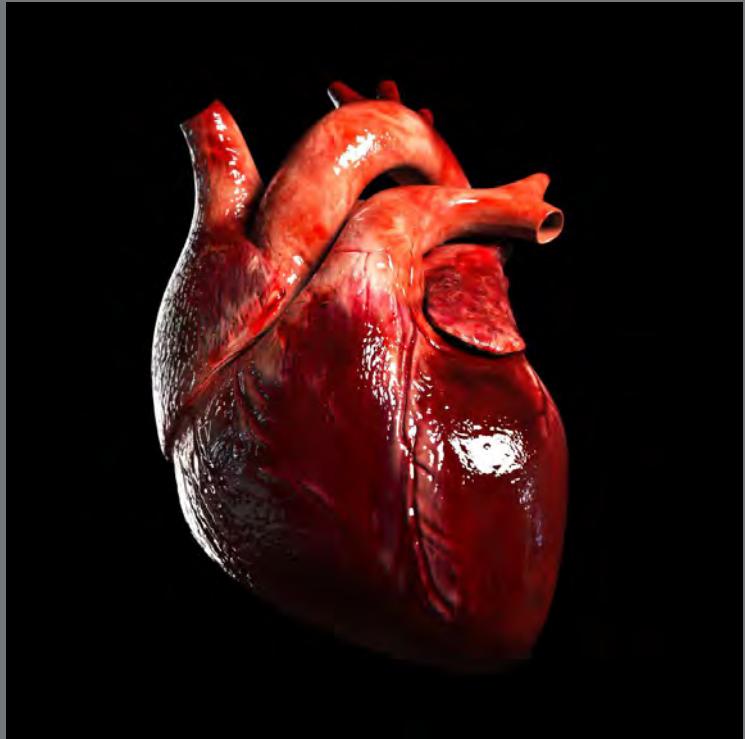
Immersive content for smartphones and VR devices



Informed & empowered patients

Improved compliance with medication & better outcomes

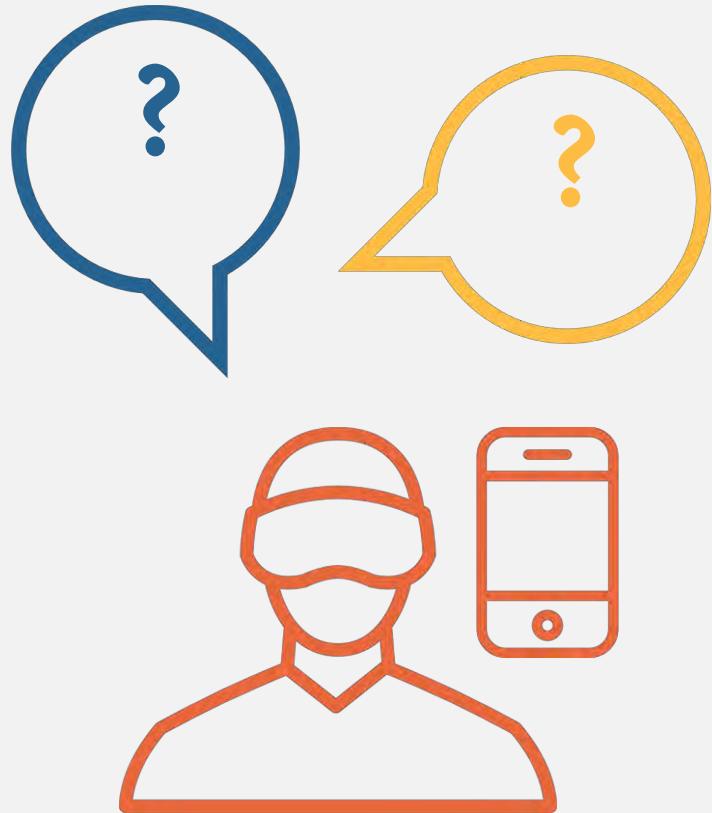
# An introduction to cardiovascular disease



# Example curriculum

Solving a problem ✓  
Improved patient experience ✓  
Cost saving ✓

- Why is my doctor prescribing this new treatment?
- How do biologics work to treat my Arthritis? (3D animation)
- How do I use the treatment? (Administration training, storage, delivery, disposal etc)
- What do I need to be aware of when I am on this treatment? (Vaccinations, interactions, monitoring, intercurrent illness etc)
- Frequently asked questions, e.g what do I do if I want to go on holiday?
- What do I do if I have a question or need help?
- **Options:**
  - Pain/stress relief games
  - Patient diary (pain scores etc)



# Accessibility

**VR headsets such as Oculus Rift and HTC Vive**



Full rich experience and interactivity

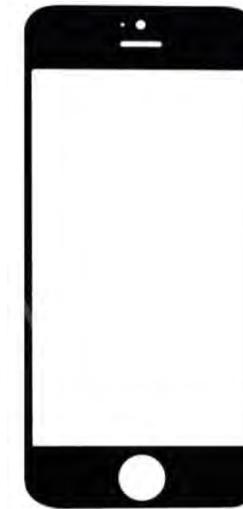
The power of together

**VR-capable smartphones (Daydream/Google Cardboard)**



Retains 3D features and majority of interactivity

**Smartphones**



Content seen in 2D but retains “immersive quality”

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