



four | **Emerging**
Health | **technologies**

VR/AR - Dr Tim Ringrose

#FourHealthEmergingTech

@fourhealthmedia

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

Dr Tim Ringrose



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”

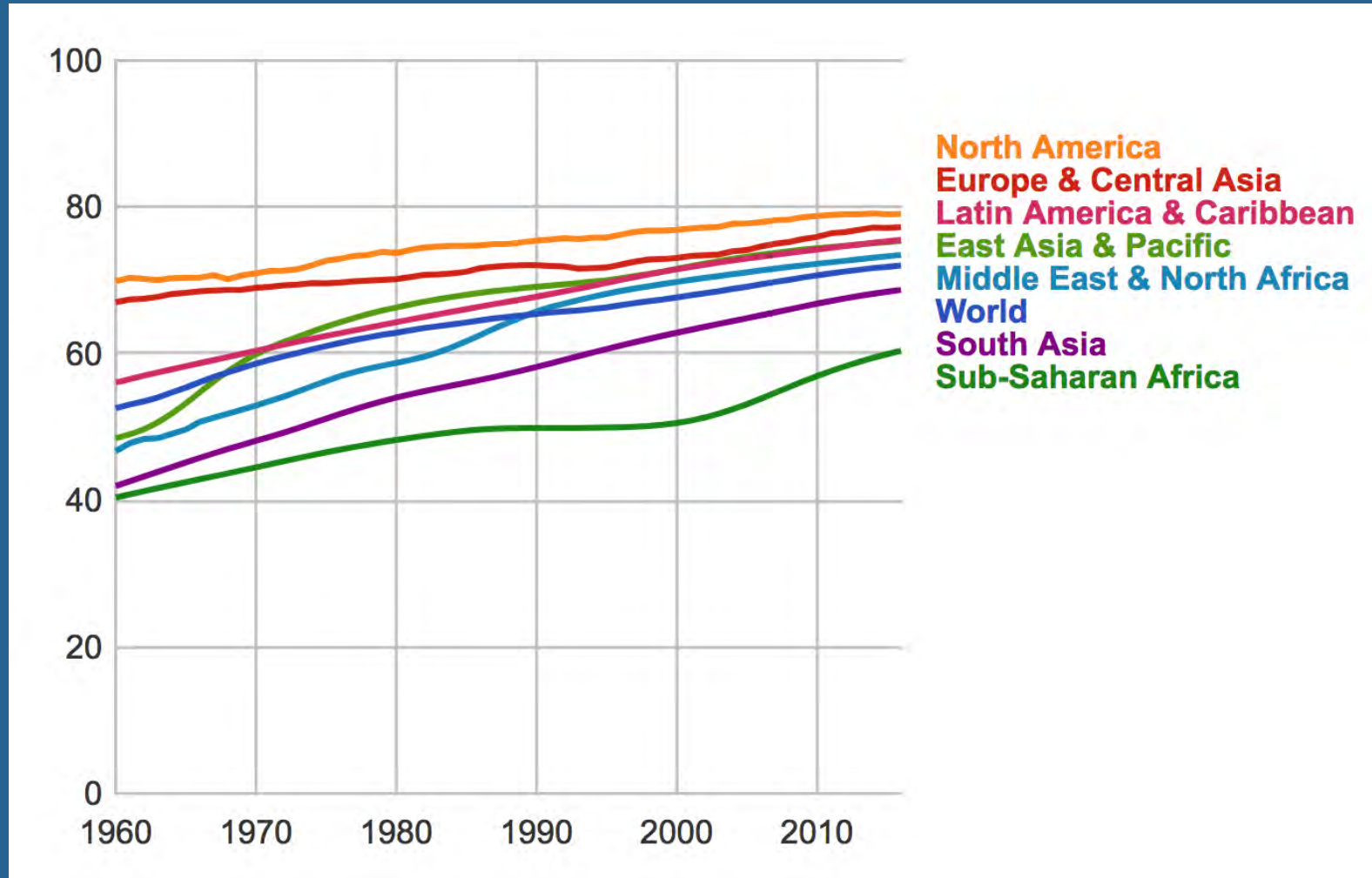
The World Health Organisation, 1948

What's the matter with you?

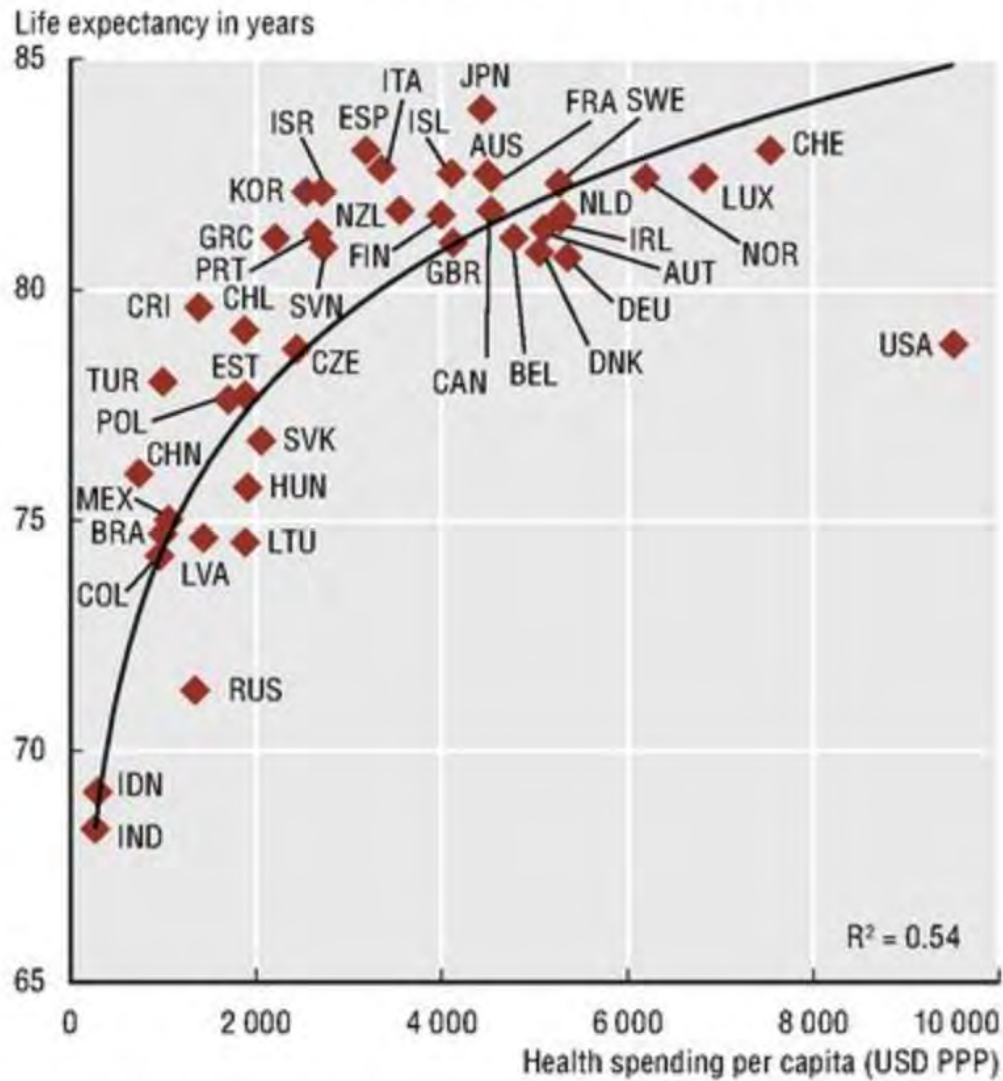


What matters to you?

Life expectancy



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

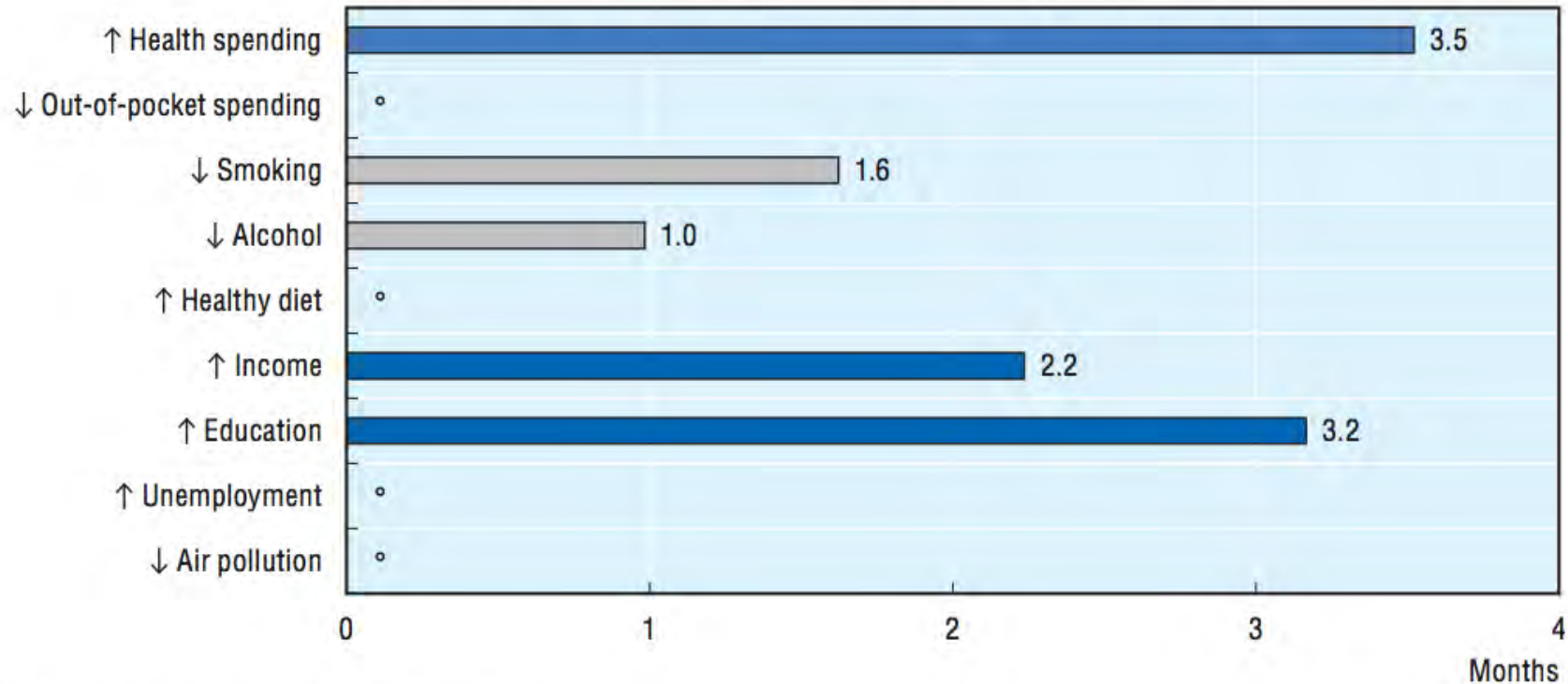


Source: OECD Health Statistics 2017.


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

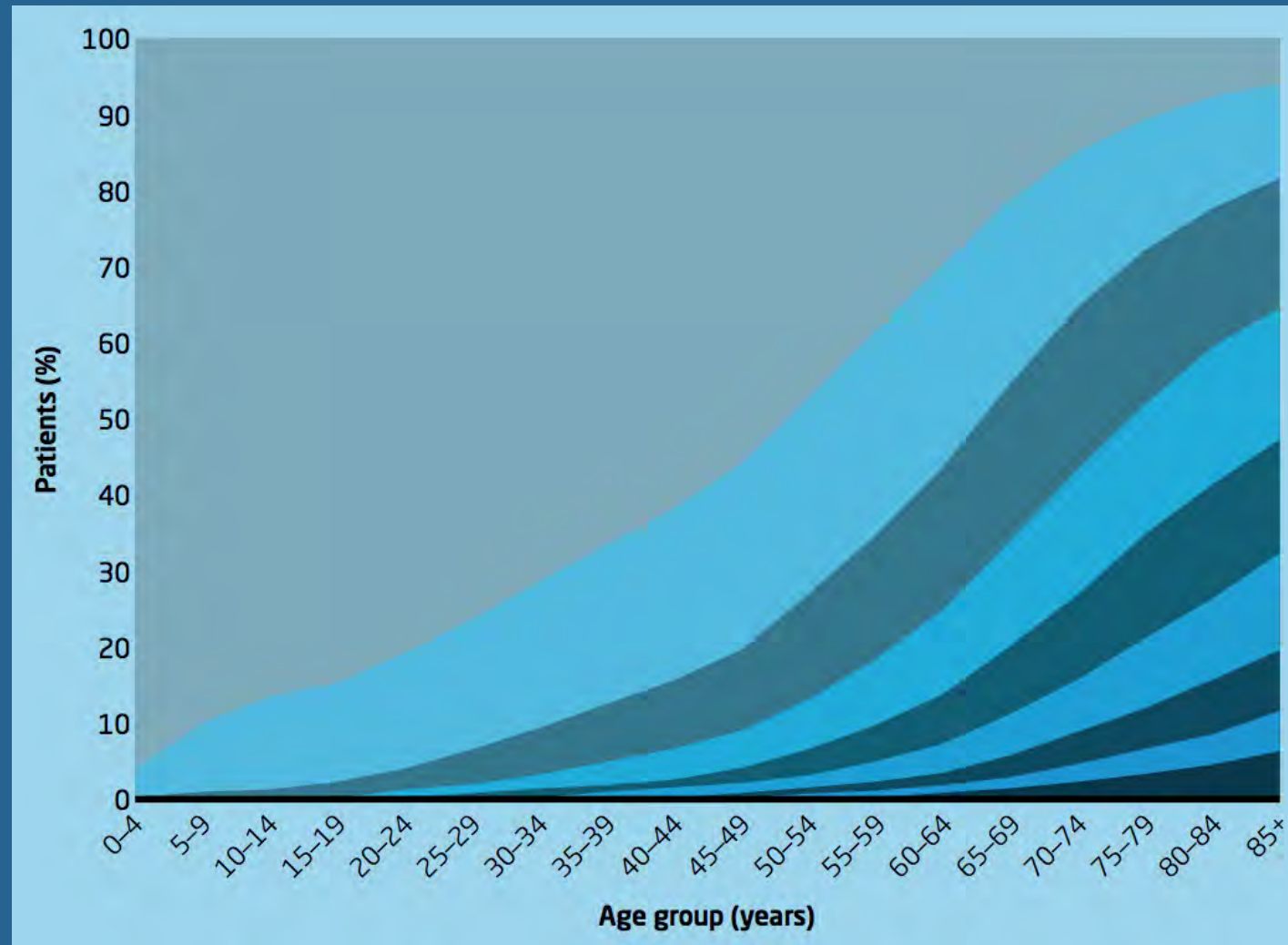
Analysis based on 35 OECD countries for the time period 1995-2015



Note: ◦ stands for a contribution near zero.

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

Chronic disease and age



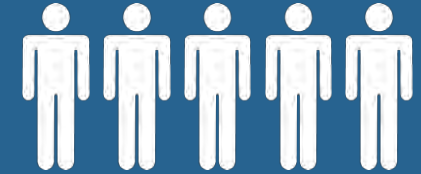
Healthcare services are being stretched to the limit



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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The background is a stylized, isometric illustration of a medical or healthcare environment. It features a large laptop on the left with a screen showing a heart rate monitor and a person icon. To the right, there's a stethoscope, a pill bottle, and a blister pack. In the foreground, a person is in a wheelchair, and another is using a cane. In the background, a doctor is talking to a patient, and a family is walking. The overall theme is digital healthcare and patient care.

Solve a problem

Improve patient experience

Save costs



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

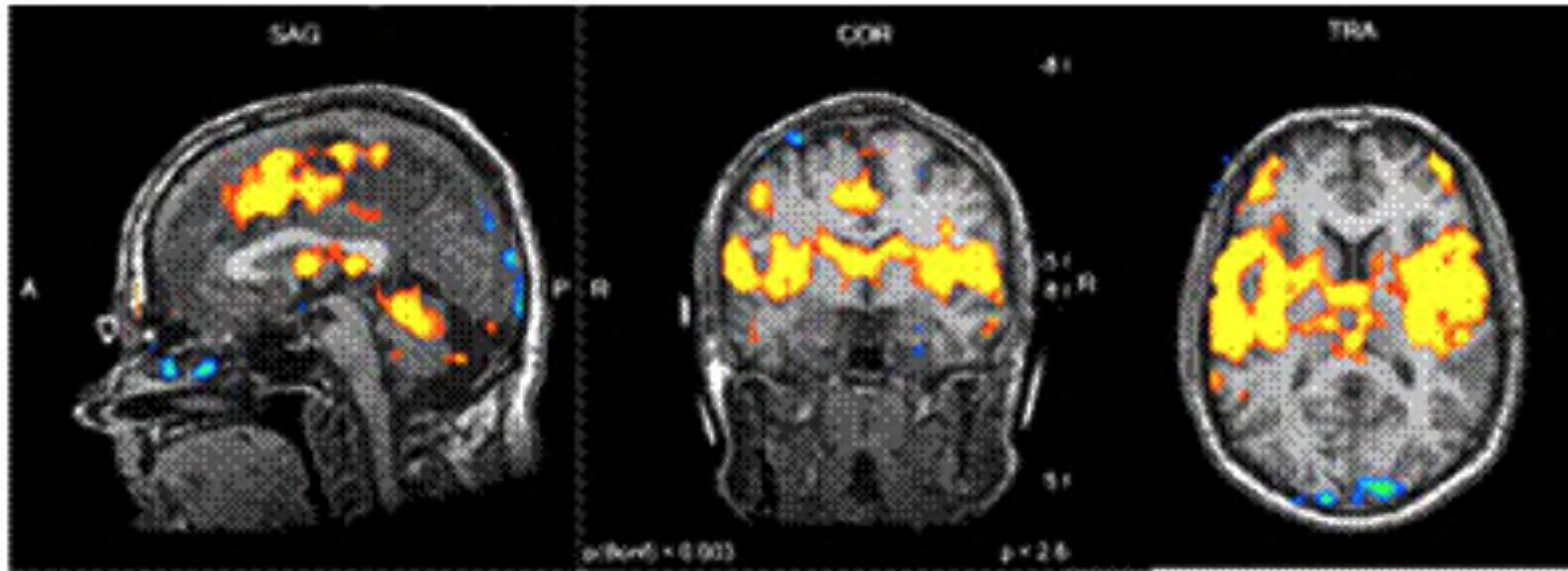
Augmented reality (AR) overlays virtual objects on the real-world environment.

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

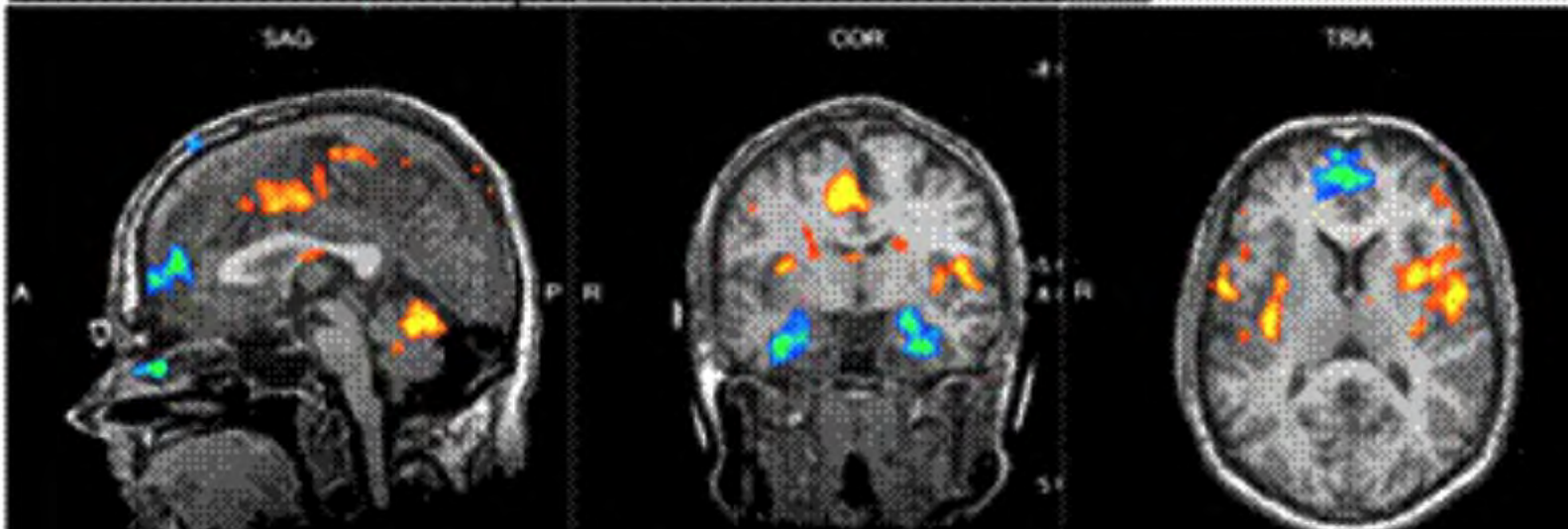
Solving a problem ✓
Improved patient experience

✓
Cost saving ✓?

No
VR



Yes
VR





Knowledge

Behavioural skills

Situational awareness

Use of VR for HCP training



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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:



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Solving a problem ✓
Improved patient experience ✓
Cost saving ✓



LIFE: Life-Saving Instruction for Emergencies

Saving lives through serious games

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.



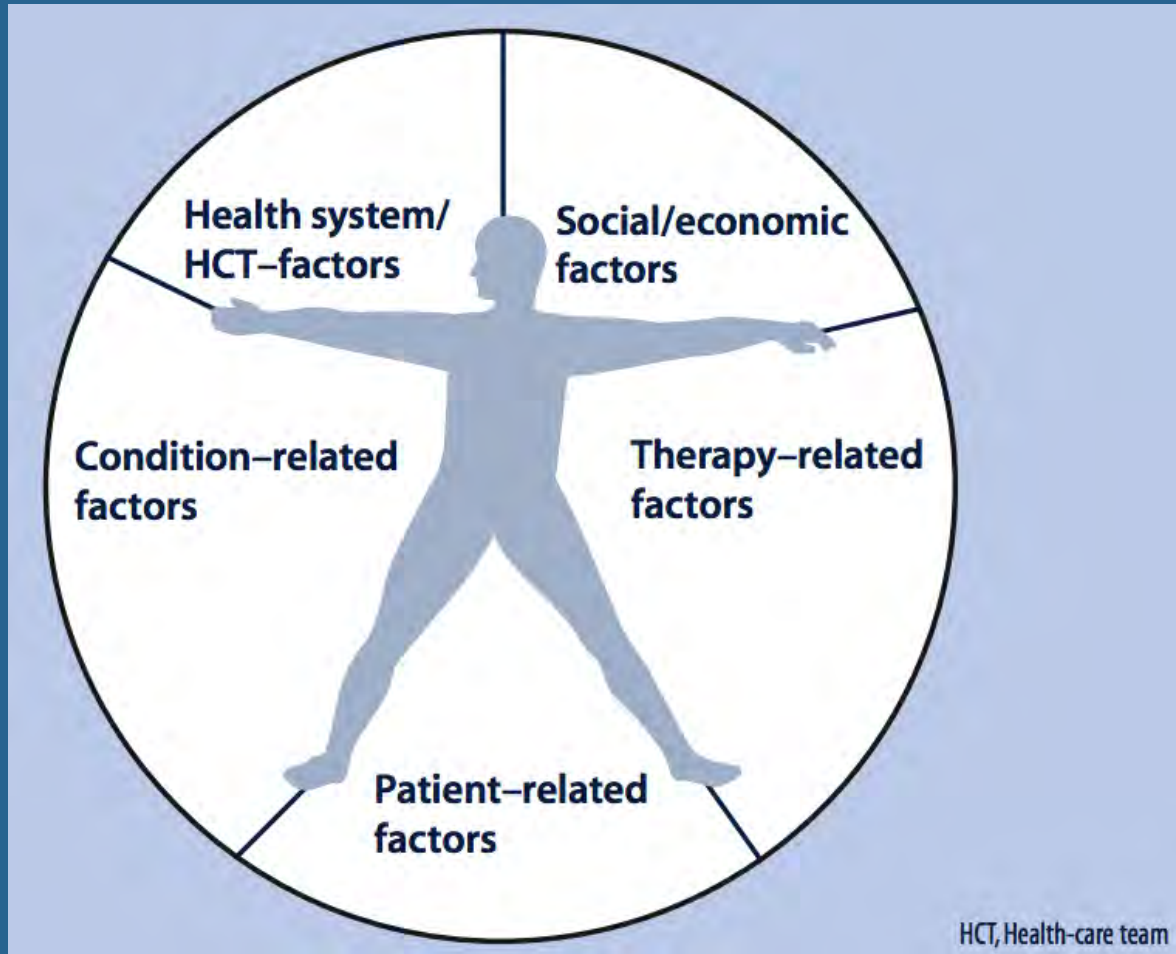
Doctors & HCPs don't have time to provide comprehensive information and training.



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

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

Medication Adherence – 5 dimensions



Social & Economic

Healthcare team & system-related

Condition-related

Therapy-related

Patient-related



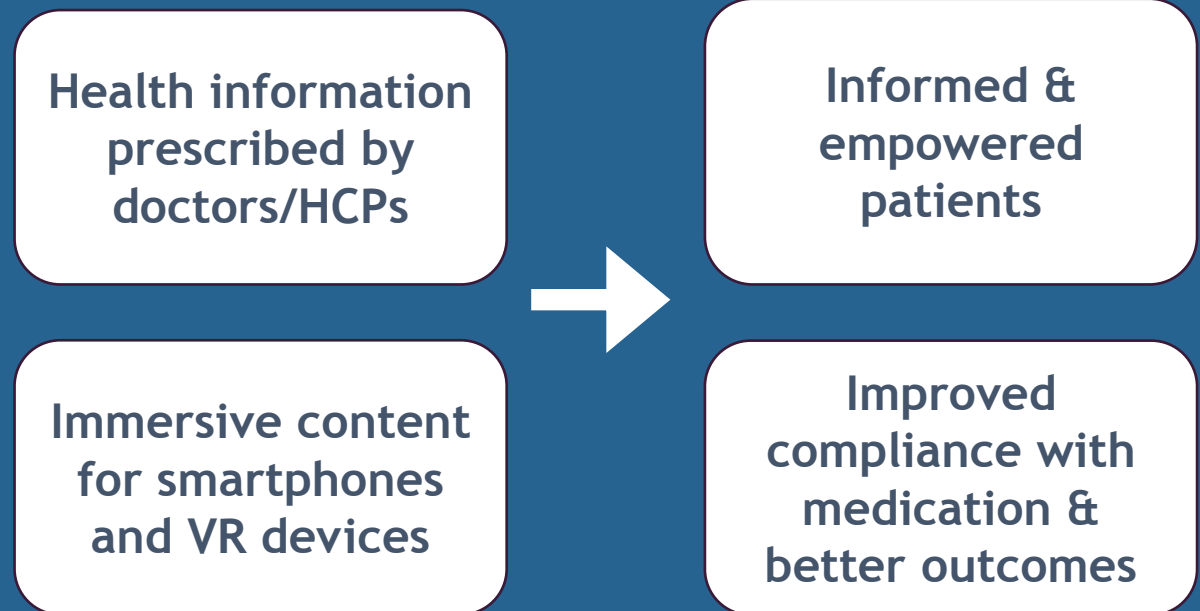
EDUCATION

Prescribed interactive health information

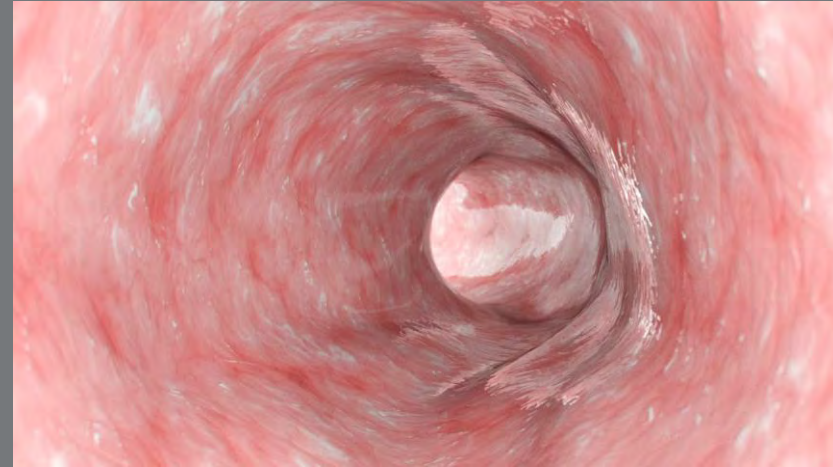
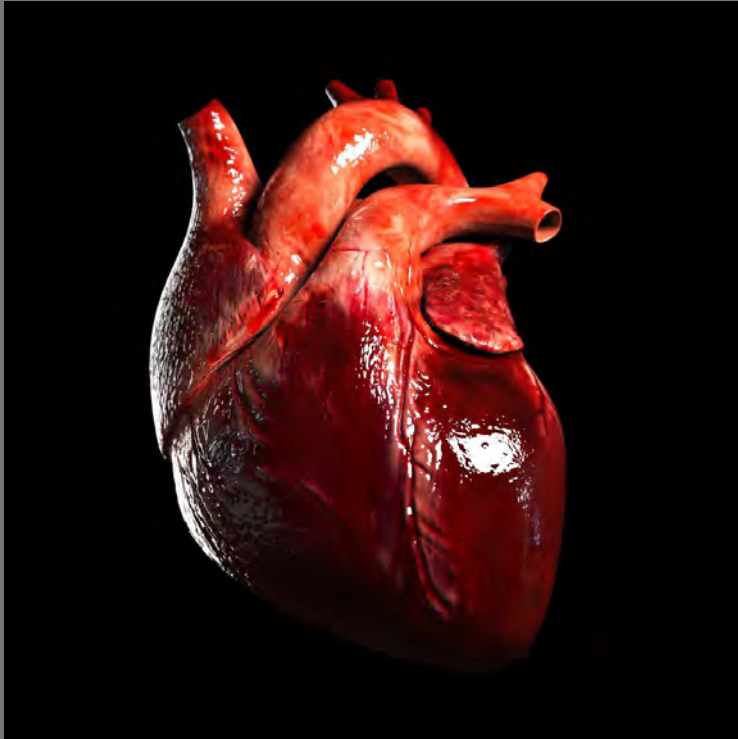
Immersive content prescribed by doctors/HCPs to enable patients to understand:

- 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.



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**



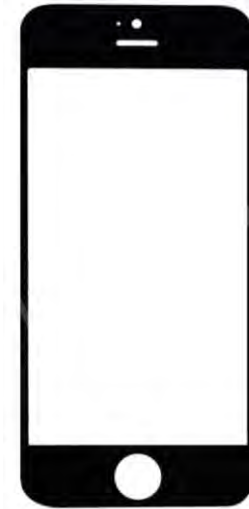
Full rich experience and interactivity

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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