U.S. NATIONAL ACADEMY OF MEDICINE
Healthy Longevity

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INSTITUTO NACIONAL DE GERIATRÍA

Knowledge and awareness for healthy aging

Health Care & Public Health Systems for Healthy Longevity:
A Workshop for the Global Roadmap for Healthy Longevity Initiative

Session 6
Envisioning a System of Health and Well-Being for All

Luis Miguel Gutiérrez Robledo

Vision

- Health will be defined holistically as an **overall state of well-being** encompassing mental, social, emotional, functional, and spiritual health.

- We will have access to detailed information about our own **function**, we **will own our health data** and play a central role in making decisions about our health and well-being.

- **Healthcare will be centered on persons empowered to improve function** rather than seek treatment.

- We will receive personalized health **solutions in ways that are integrated seamlessly** into our daily lives.

- All of this will be **enabled by data and AI** provided within a healthcare system that is organized and regulated in an entirely new way.

RESOURCES PRINCIPLES

Ageing as an opportunity

Innovation & technology advances

New professions & skills in health

1. Paradigm shift: Recognize the malleability of ageing and **move away from age** towards intrinsic capacity

2. Paradigm shift: **not** centered in the hospital and towards wellness and function, preventing disability rather than disease

3. Exploit and invest in **new technologies**

4. Optimizing health and social **care for all** (UHC with **equity** in access, Value based)

Health systems around the world face several megatrends

Different health systems feel the forces of these trends to varying degrees

Caduceus

- "Every healthy person who undergoes whole genome sequencing will effectively become a patient, requiring further clinical investigation and follow up."

Genome sequencing for sale on the NHS. BMJ 2019;364:l78

Asclepios

Hermes

Ivan Illich on Public Health

- The level of public health corresponds to the degree to which the means and responsibility for coping with illness are distributed amongst the total population.

- **That society which can reduce professional intervention to the minimum will provide the best conditions for health.**
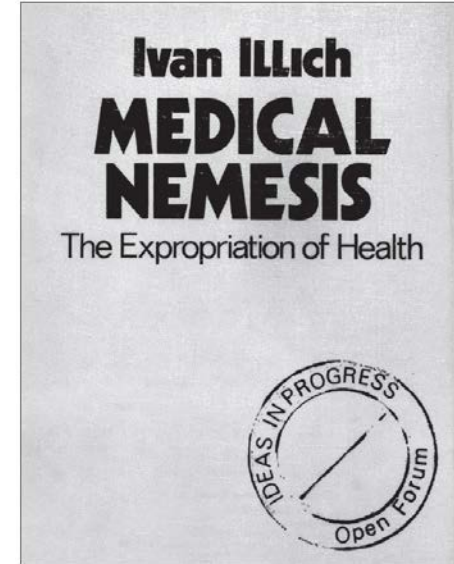
Ivan Illich Medical Nemesis 1974

- We believe medicine to be a force for good, nevertheless some would agree with Ivan Illich that "The medical establishment has become a **major threat to health**."

- Many might accept that **increasing medical inputs will at some point become counterproductive** and produce more harm than good.

- Do we want to keep developing increasingly expensive treatments that achieve **marginal benefits** when most in the world do not have the undoubted benefits that come with simple measures?

Public health strategies for optimizing function from a life course perspective
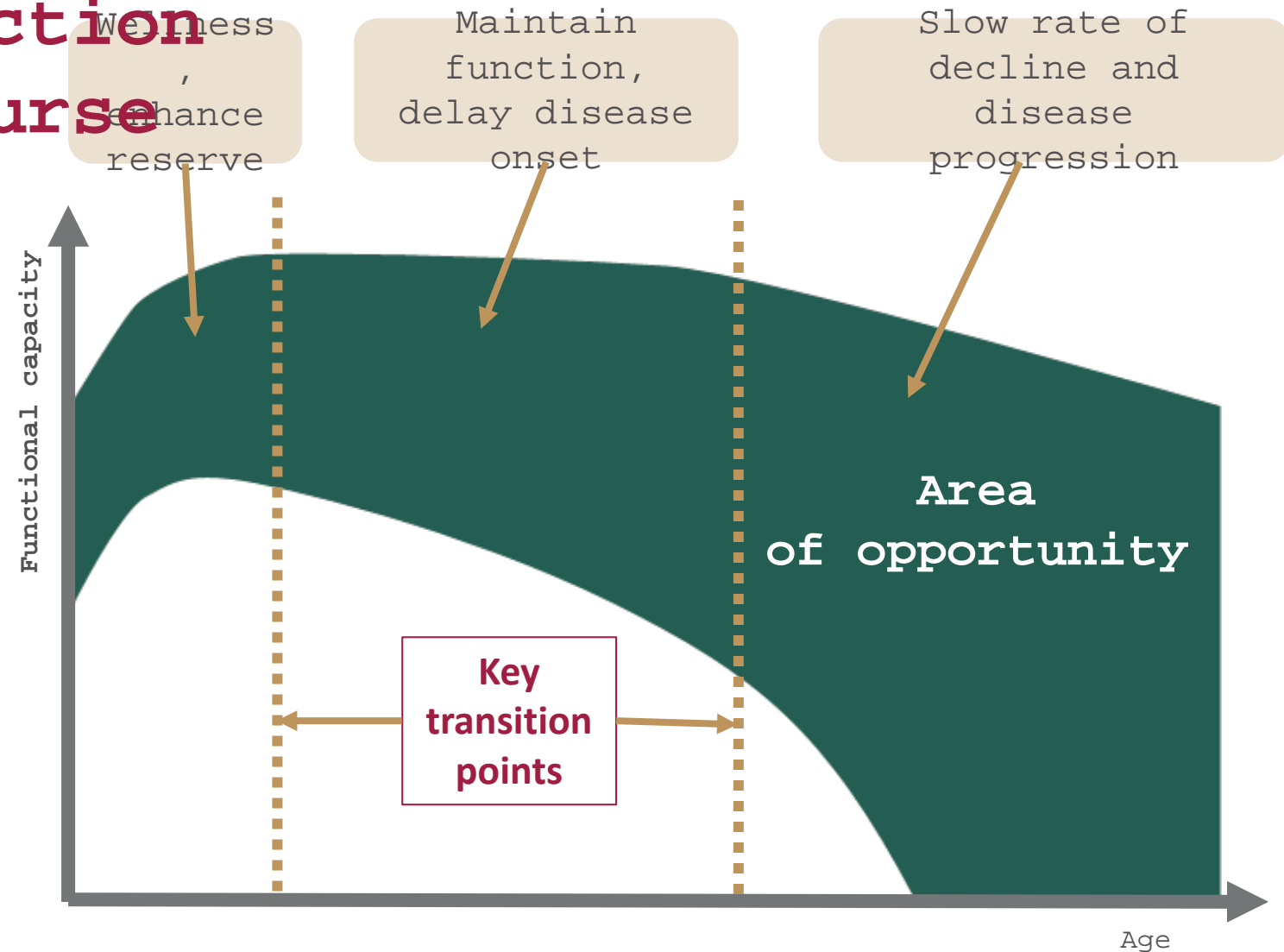
Wellness, enhance reserve

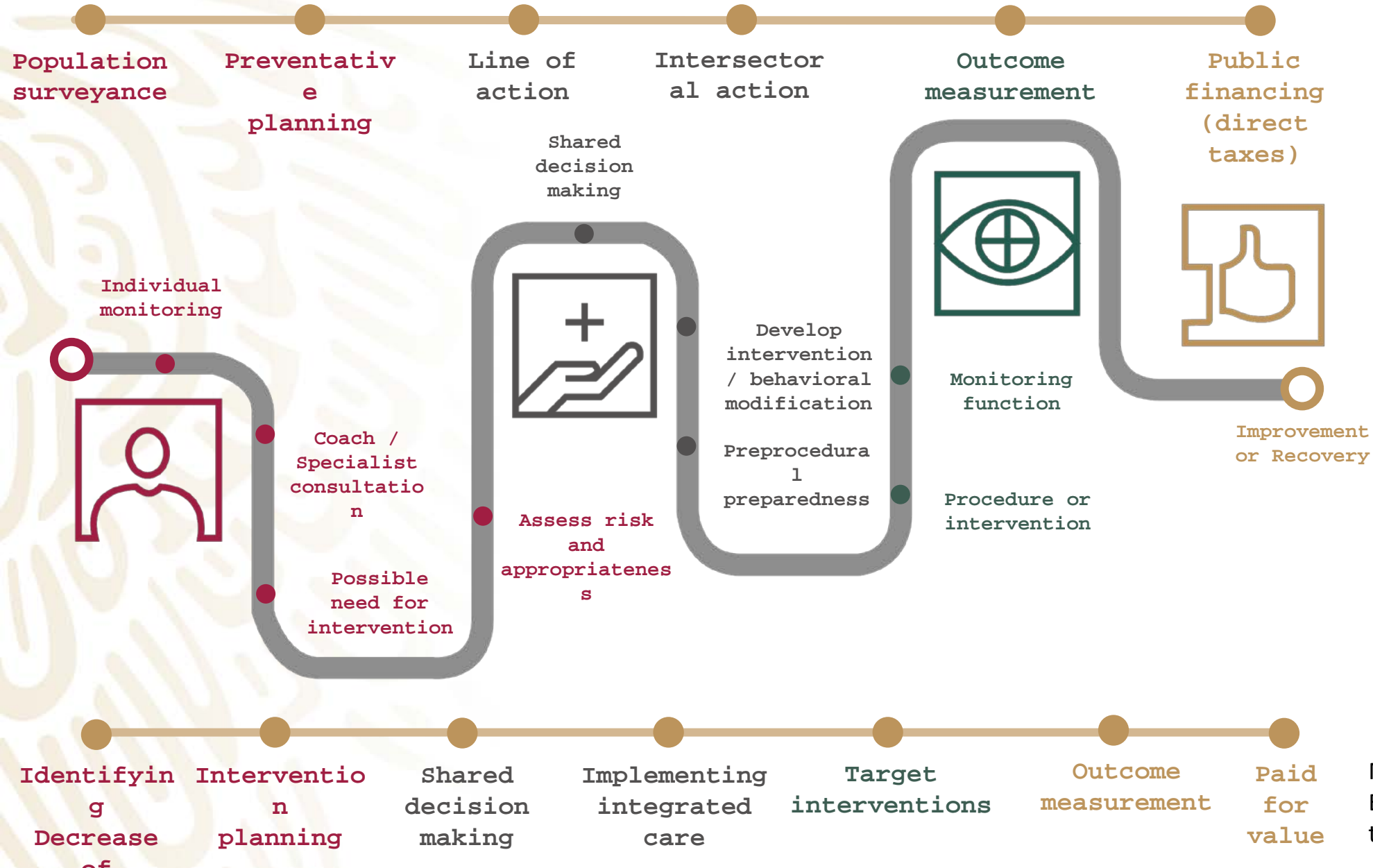Maintain function, delay disease onset

Slow rate of decline and disease progression

Functional capacity

Area of opportunity

Key transition points

Age

Knowledge and awareness for healthy aging

Population surveyance
Preventative planning
Line of action
Intersectoral action
Outcome measurement
Public financing (direct taxes)

Shared decision making

Individual monitoring

Coach / Specialist consultation

Possible need for intervention

Assess risk and appropriateness

Develop intervention / behavioral modification

Preprocedural preparedness

Monitoring function

Procedure or intervention

Improvement or Recovery

Focus: Quality of care, wellness and preventative care

Value: Improved care quality and outcomes

Payment: Value Based

Identifying Decrease of
Intervention planning
Shared decision making
Implementing integrated care
Target interventions
Outcome measurement
Paid for value

Modified from: Wallstein M. Enabling Value Based Care pathways to partnerships

The future of health will be driven by digital transformation enabled by radically inter-operable data and open, secure platforms
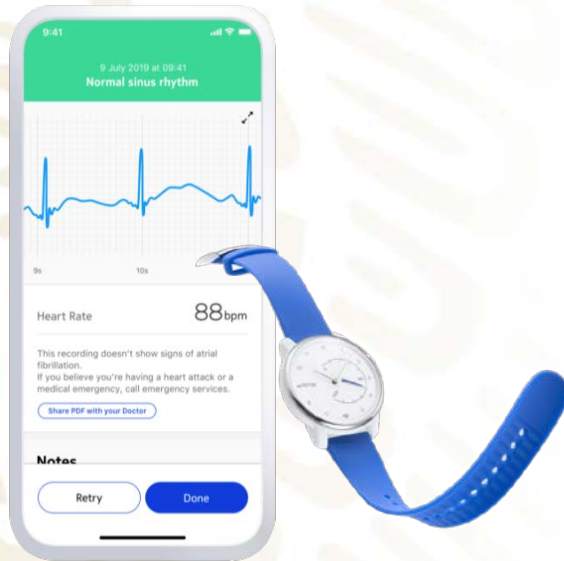
Always-on sensors that capture data and platforms that aggregate, store, and derive insights from individual, institutional, population, and environmental data will catalyze the transformation

NOTE: "MOVE ECG" analogic clock winner of CES INNOVATION AWARDS,

Wellness +

Advise

Insi

Connected data sets

Monitor

Data + Platform

Sustain well-being

care

Standards

Treat

Do You Really Want Your Insurer Buying You An Apple Watch?

Jessica Baron Contributor ⓘ
Consumer Tech
Jessica Baron is a tech ethicist and a freelance writer and editor.

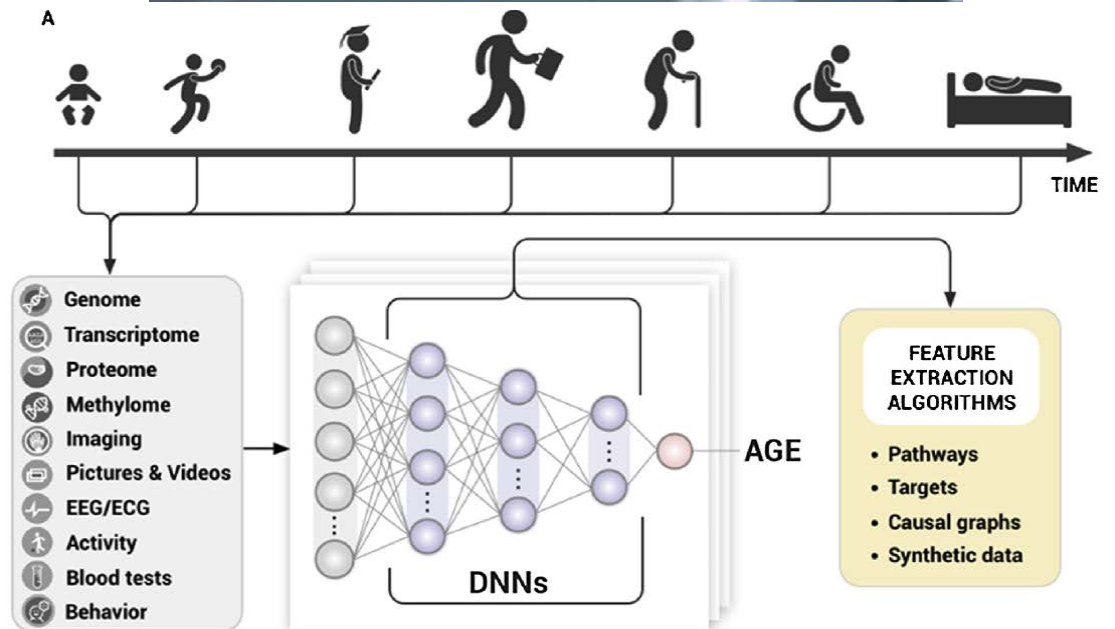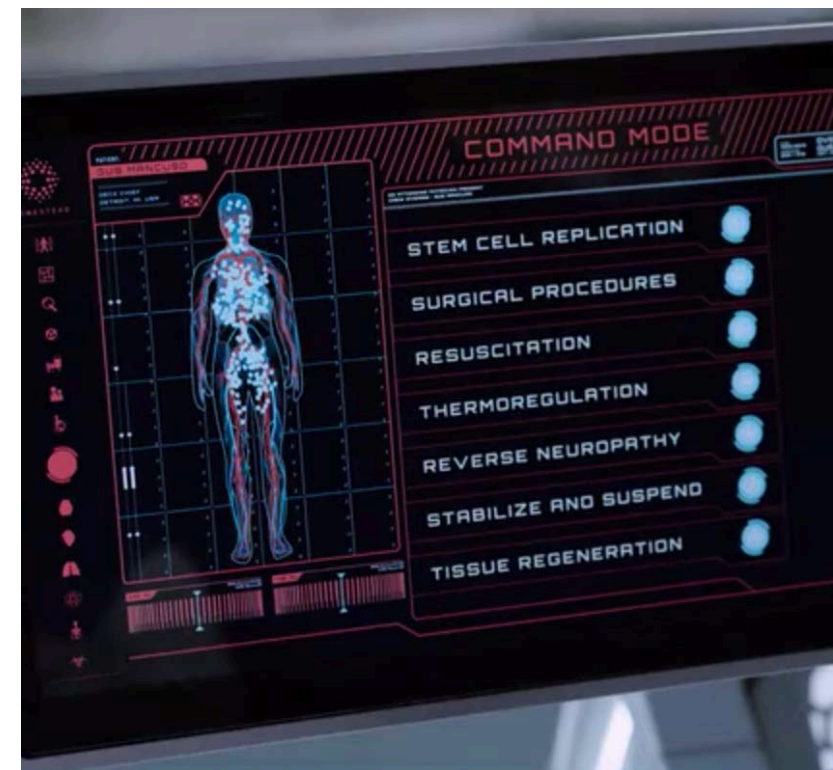Source: Modified from Deloitte análisis: Forces of change The future of health.

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"We can choose a technological solution to the profound human disconnection that exists today in health care; a more humane medicine, enabled by machine support, can be the path forward. **The triad of deep phenotyping, deep learning and deep empathy** can be a major remedy."

Eric Topol, Deep Medicine 2019

Holistic individual data will enable personalization of highly specific plans and interventions

Omics data

Claims and utilization data

Health and fitness data

Buying habits

Biometric data

Social determinants of health

In the near term, once we have access to this whole set of data, the **next challenge will be influencing people's behavior** through coaching, incentives, and education.

A

TIME

- Genome
- Transcriptome
- Proteome
- Methylome
- Imaging
- Pictures & Videos
- EEG/ECG
- Activity
- Blood tests
- Behavior

DNNs

AGE

FEATURE EXTRACTION ALGORITHMS
- Pathways
- Targets
- Causal graphs
- Synthetic data

Behavioral Medicine

Biopsychosocial Aspects of Health

"How much longer do I have before I have to change to a healthy lifestyle?"

AI in Healthcare

Assisting in monotonous tasks

Treatment design

Mining medical records

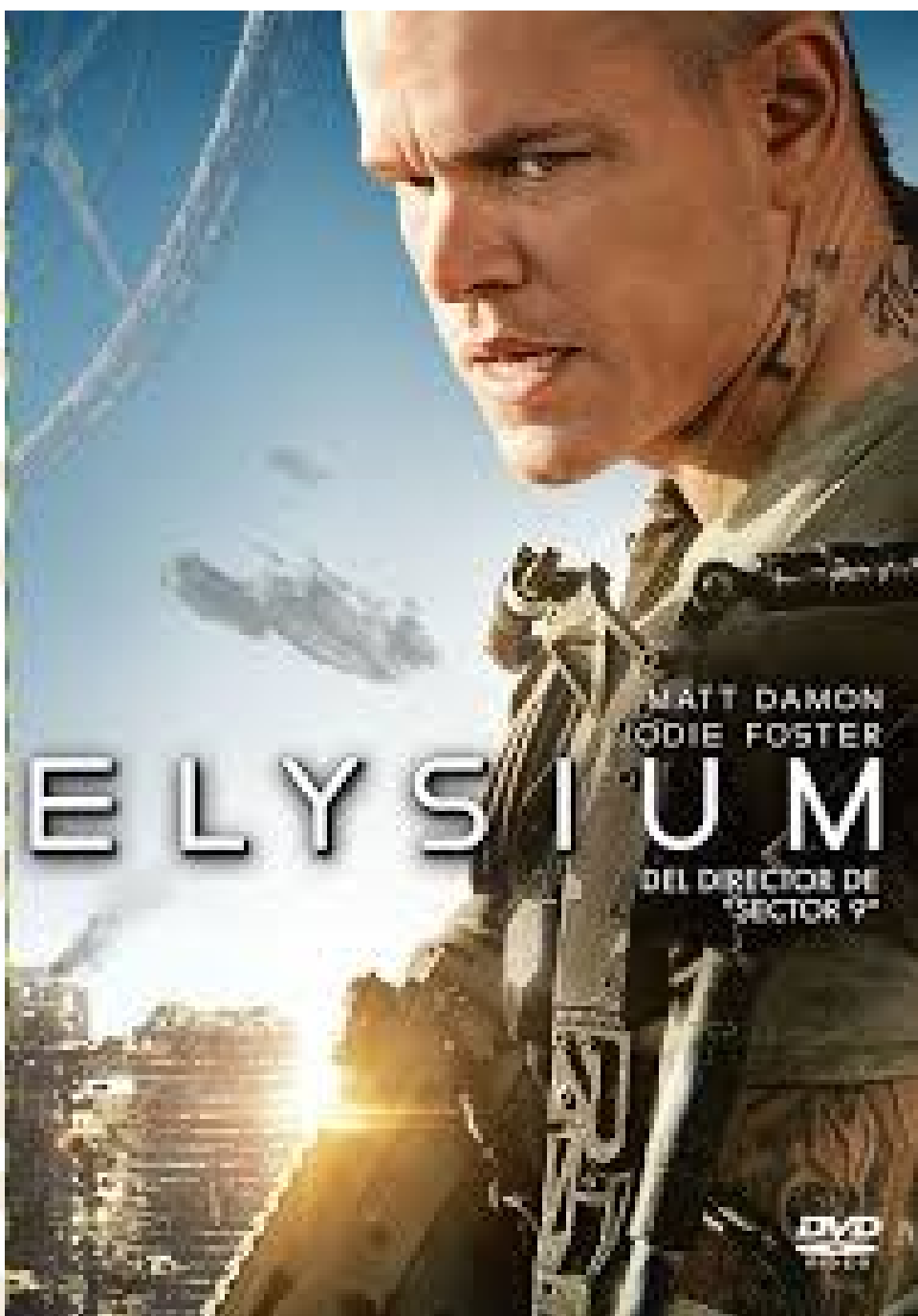AI chatbots

Virtual Healthcare Assistants

MATT DAMON

JODIE FOSTER

ELYSIUM

DEL DIRECTOR DE "SECTOR 9"

DVD

YAHOO! MOVIES

Preventing Ageing Unequally

- **Prevent inequality before it cumulates over time.** Provide good quality childcare and early education, help disadvantaged youth into work and expand health spending on prevention.

- **Mitigate entrenched inequalities.** Patient-centered approach and boost efforts to help the unemployed back into work, remove barriers to retain and hire older workers.

- **Cope with inequalities at older ages.** Reforms to retirement income systems can limit the impact of socio-economic differences in life expectancy. Making home care affordable and providing better support to informal carers would also help reduce inequalities in long-term care.

OECD 2017

1. Self care and Consumer empowerment

Identify and deliver on what consumers value most, putting the **patient at the center**. Use patient reported outcomes to measure success and support better decisions

2. Keeping people's IC and function

Shift focus from treatment of illness to **wellness** and prevention of disability considering **social determinants of health**. Increase health literacy and encourage people to take greater responsibility for their health

3. Integrated care, right place and time

Implement new models of **integrated care**. Increase quality and eliminate waste. Rethink business models,

4. Digital and analytics

Leverage technology and integrated data to deliver **more convenient affordable and personalized prevention and care.** Build cyber security capabilities to manage increased risks

5. Reconfigure the work

Build **new capabilities for the future**, e.g. Digital and analytics, multi-disciplinary teams, and new professions. Consider how new technologies like AI and robotics can complement human capital.

6. Outcomes – based funding

Shift from volume to value, enable prevention, new care models and eliminate cost-shifting. Explore new models to drive innovation, e.g. Social benefits bonds, PPPs, Integrate **behavioral incentives** .

7. Partnerships

Public and private organizations, State and established players, even competitors can benefit by partnering to deliver consumer-centered health services.