GENERALITAT VALENCIANA
Conselleria d'Hisenda i Model Econòmic

SEMINARIO DE OTOÑO (Octubre-Noviembre 2020)

"LA ADMINISTRACIÓN REGIONAL ANTE EL RETO DE LA DIGITALIZACIÓN"

LUNES, 9 DE NOVIEMBRE, 9 h - 12 h 30

Sesión 3. La digitalización y el sistema sanitario.

Coordinador de la sesión: Dr. Ricard Meneu (Fundación IISS)

Ponencia 1: *El papel de las nuevas tecnologías en la sanidad;* Dra. Beatriz López Valcarcel, Universidad de las Palmas de Gran Canarias (40 minutos)

Ponencia 2: *¿Cómo digitalizar la sanidad?;* Dr. Bernardo Valdivieso Martínez, hospital La Fe (40 minutos)

Ponencia 3: *La transformación digital en el sistema público catalán*; Francesc López Seguí (40 minutos)

Mesa Redonda (1 hora); Moderador: Dr. Ricard Meneu. Participantes: los ponentes, Mª Llanos Cuenca (DG de Eficiencia Tecnológica y atención al paciente), José Manuel Ventura (DG de Farmacia y Productos sanitarios) y Jose Manuel Duarte (DG TIC).

Indice

Nuevas tecnologías. ¿Innovación?

- Científica, Clínica, organizativa
- Innovaciones **incrementales** e innovaciones **radicales** (“*disruptivas*”)
  - El valor de una innovación incremental: *(“learning by doing”)*

- RAE: Innovación es la “creación o modificación de un producto, y su introducción en un mercado”

MINISTERIO DE SANIDAD, CONSUMO Y BIENESTAR SOCIAL

2006-2010

Tecnología de la Información y las Comunicaciones

Plan de Calidad para el Sistema Nacional de Salud

:: Documentos

- Utilización de las tecnologías de la información para mejorar la atención a los ciudadanos

:: Normativa

- Ley General de Sanidad
- Ley de Cohesión y Calidad del Sistema Nacional de Salud
- Ley de la Función Estadística Pública
- Ley de protección de datos de carácter personal
- Ley de autonomía del paciente y de información y documentación clínica
- Ley 29/2006, de 26 de julio, de garantías y uso racional de los medicamentos y productos sanitarios
- RD Tarjeta Sanitarias

Una apuesta por la accesibilidad

El **Plan de Calidad para el Sistema Nacional de Salud** incluye la utilización de las tecnologías de la información en el SNS para mejorar la atención a los ciudadanos. Una de las estrategias para su desarrollo en el proyecto "Sanidad en Línea", dentro de la iniciativa gubernamental del Plan Avanza que persigue generalizar el uso de las tecnologías en la sociedad española.

En los últimos 15 años, los Servicios de Salud de las Comunidades Autónomas (CCAA) que integran el SNS, han priorizado sus líneas de actuación en materia de tecnologías de la información, teniendo en cuenta una serie de criterios que abarcan desde elementos de oportunidad y factibilidad hasta compromisos presupuestarios. Aunque existe una cierta diversidad en las actuaciones funcionales existe, sin embargo, una coincidencia plena en cinco grandes líneas de actuación:

- Un sistema fiable de **identificación** de los usuarios (Tarjeta Sanitaria Individual)
- La informatización de los **registros clínicos** de cada usuario o paciente (Historia Clínica Digital)
- Un sistema que soporte y relacione entre sí todos los procesos que es necesario realizar para hacer efectiva la **prestación farmacéutica** a los pacientes y usuarios (prescripción, visado, dispensación).
- Mecanismos que ayuden a agilizar la **citación** de los usuarios con su médico de familia o pediatra de atención primaria y con los especialistas de área.(Telecita) y dispositivos de **diagnóstico y tratamiento a distancia** evitando desplazamientos (Telemedicina).

El Plan de Calidad para el SNS, consecuentemente, recoge estas líneas de actuación comunes en su apuesta por extender al conjunto del SNS los beneficios que reportan dentro de cada ámbito territorial. Para ello, señala aquellos elementos funcionales y tecnológicos necesarios para hacer posible la interoperabilidad de los sistemas en todo el territorio nacional.

:: Plan Calidad SNS

- Estrategia 11.- Sanidad en Línea

:: Foro

- I Foro de Historia Clínica Electrónica en el Sistema Nacional de Salud. Madrid 2 y 3 de diciembre 2008

2020

De la "Sociedad de la Información" a la "Sociedad del Dato"(plan recuperación… del gobierno, pag. 45: estrategia nacional de IA)

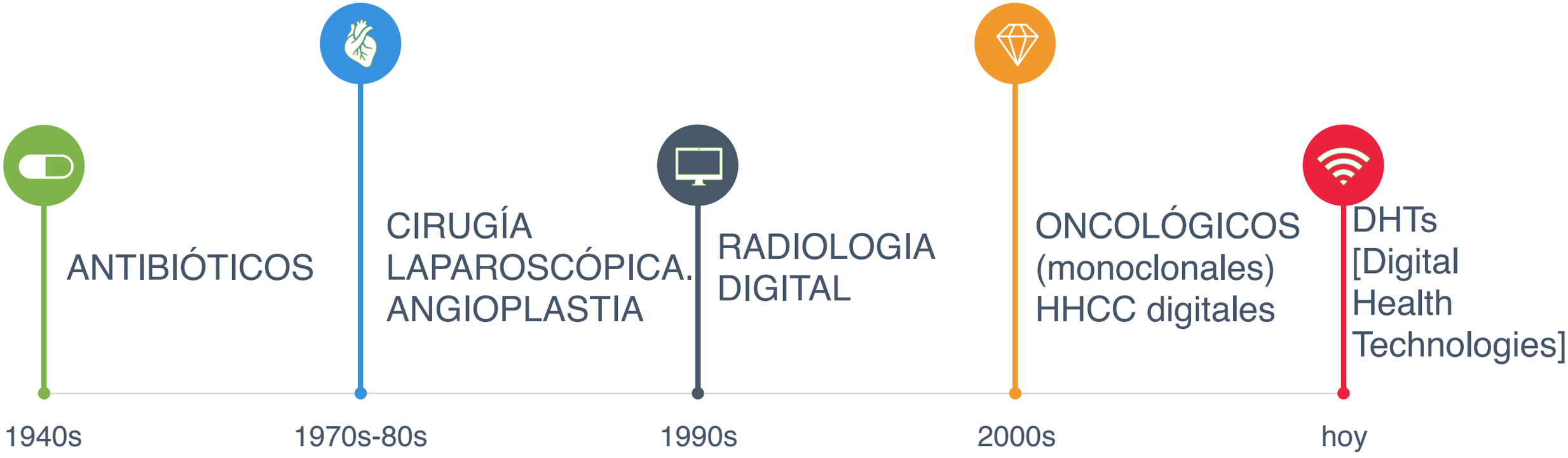
PLAN DE RECUPERACIÓN, TRANSFORMACIÓN Y RESILIENCIA DE LA ECONOMÍA

España Puede.

El Plan, que se presentó el 7 de octubre, guiará la ejecución de 72.000 millones de euros de fondos europeos hasta 2023 y movilizará en los próximos tres años el 50% de los recursos con los que cuenta España gracias al instrumento Next Generation EU.

Descargar (PDF)

¿Nuevas Tecnologías?



DHT

- ***Digitalización*** se ha convertido en un ***mantra***
- El foco se ha desplazado de la ***telemedicina*** hacia la medicina (atención, gestión, sanidad, salud) ***digital***
- … que abre puertas a la **Inteligencia Artificial**
- Hoy en día, elementos digitales forman parte de (casi) cualquier innovación en sanidad, aunque muchas veces **únicamente como herramientas**

DHT

- Hoy en día, elementos digitales forman parte de (casi) cualquier innovación en sanidad, aunque muchas veces **únicamente como herramientas**

Ejemplos (1):

https://vimeo.com/468991286

Instagram y tratamiento de trastornos alimentarios hospital de día psiquiátrico San Juan de Dios. Premio Barea 2020. 11,800 seguidores. @stoptca_sjd

DHTs [Digital Health Technologies]

hoy

https://www.fundacionsigno.com/premios.php

DHT

- Hoy en día, elementos digitales forman parte de (casi) cualquier innovación en sanidad, aunque muchas veces **únicamente como herramientas**

Ejemplos (2):

Servicio de Farmacia Hospital 12 Octubre: Intervención para evitar reingresos: conciliación medicación, consejo,.

Usan algoritmo para detectar al alta pacientes con alto riesgo de reingreso y ponen una marca en la historia clínica

DHTs [Digital Health Technologies]

hoy

https://vimeo.com/469684070

https://www.fundacionsigno.com/premios.php

DHT

- Hoy en día, elementos digitales forman parte de (casi) cualquier innovación en sanidad. En algunos proyectos, la propia **tecnología digital es el elemento esencial**

Ejemplo:

https://vimeo.com/469709930

Business Intelligence para la gestión Hospital Son Espases (en Azure)

https://www.fundacionsigno.com/premios.php

NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

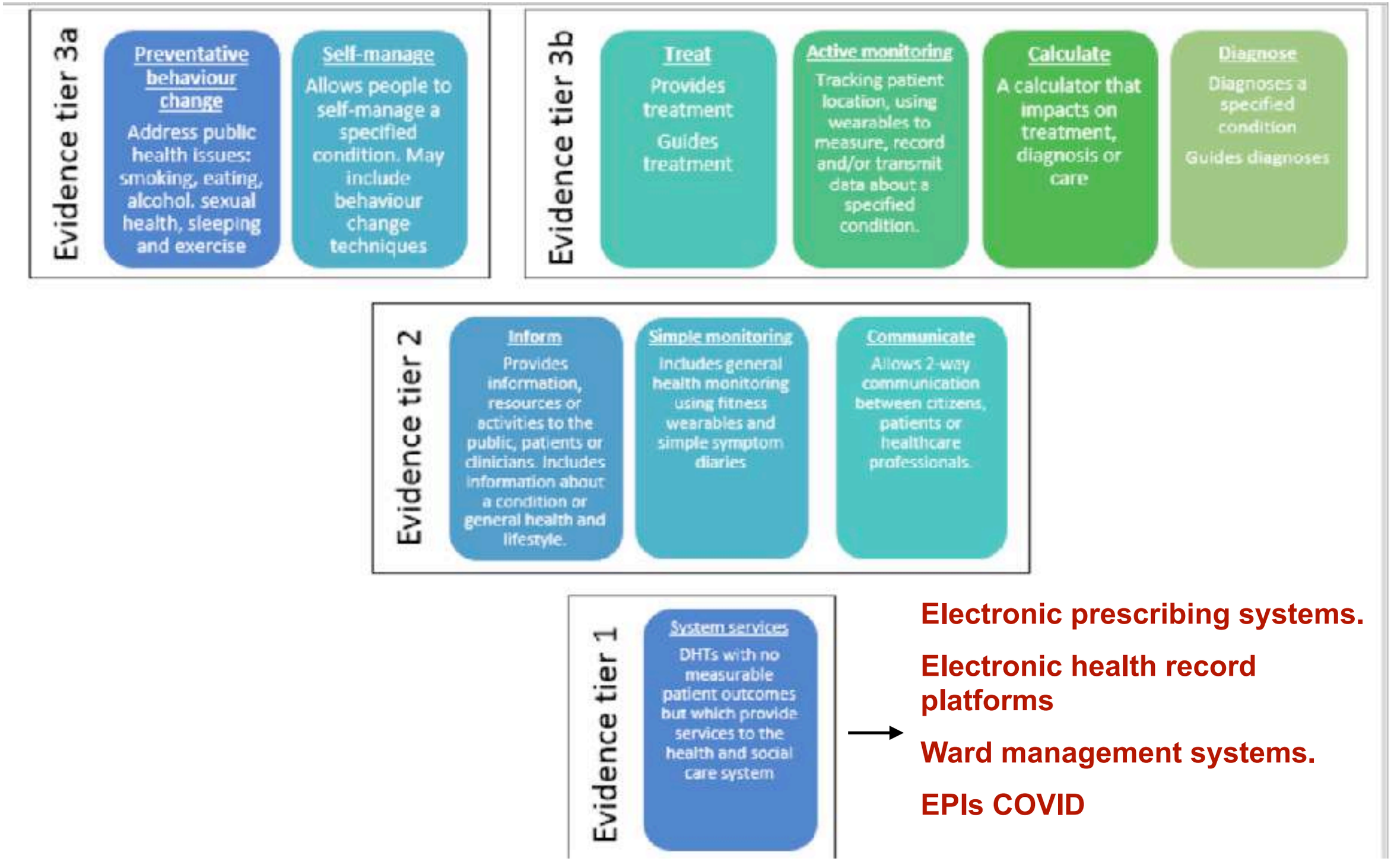
EVIDENCE STANDARDS FRAMEWORK FOR DIGITAL HEALTH TECHNOLOGIES

March 2019

Digital health technologies comprise a wide range of products used in the health and care system including apps, software and online platforms that are intended to benefit people or the wider health and care system. They may be standalone or combined with other products such as medical devices or diagnostic tests.

https://www.nice.org.uk/about/what-we-do/our-programmes/evidence-standards-framework-for-digital-health-technologies

Figure 1 DHTs classified by function and stratified into evidence tiers



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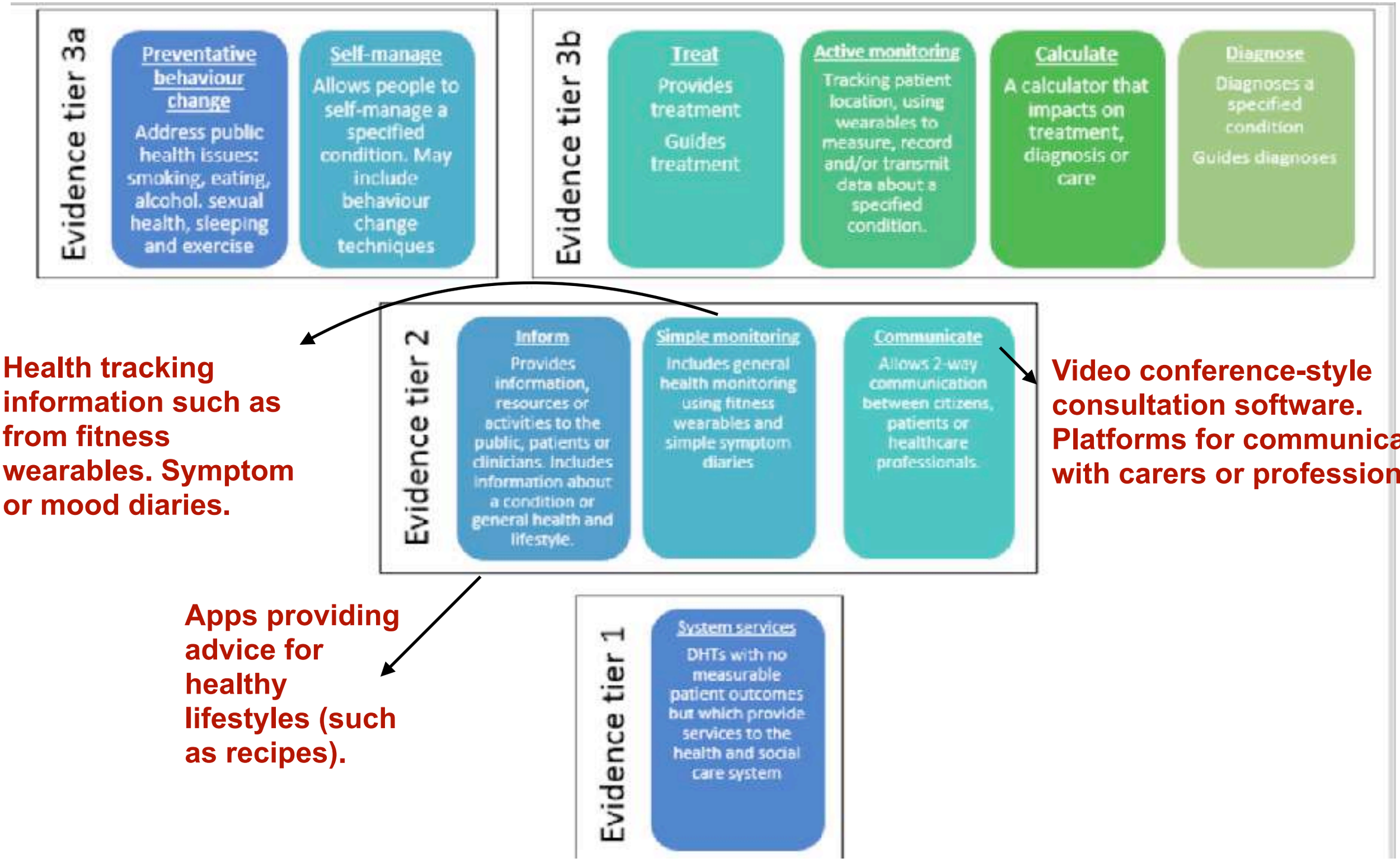


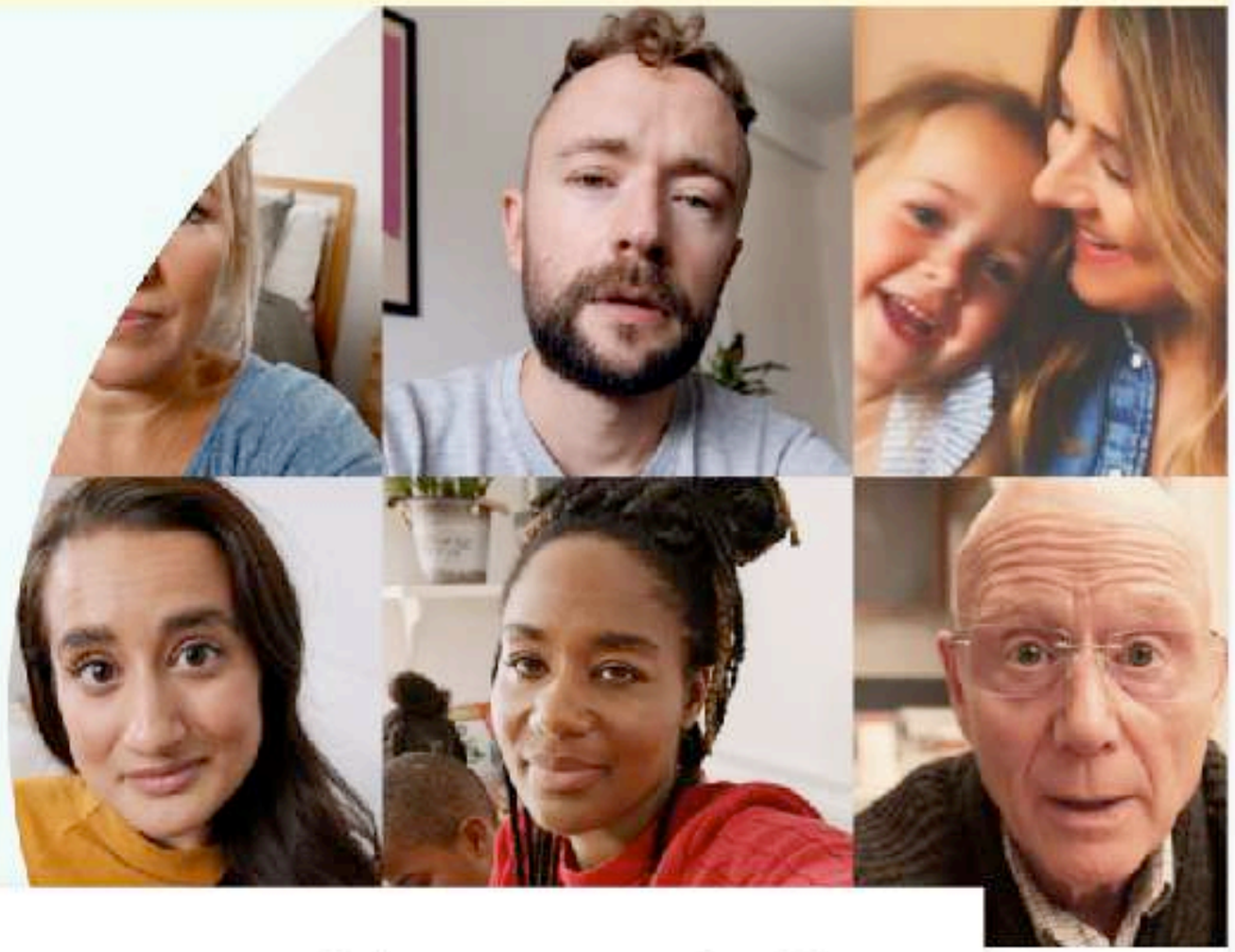
livi

Home | NHS Partners | Become a Livi GP | Conditions | About | Your Health | FAQ | Livi Connect

Helpful information and advice on coronavirus

See a GP by video. In minutes.

- GP appointments from home, work, or on the go
- Get medical advice, referrals and prescriptions
- Free NHS service in eligible areas



"Wonderful. Talked with a doctor within five minutes of asking. Brilliant!"

4.9 App Store rating ★★★★★

95% of patients helped

85% Seen within an hour

Soporte

NHS

How Livi works

Download the Livi app

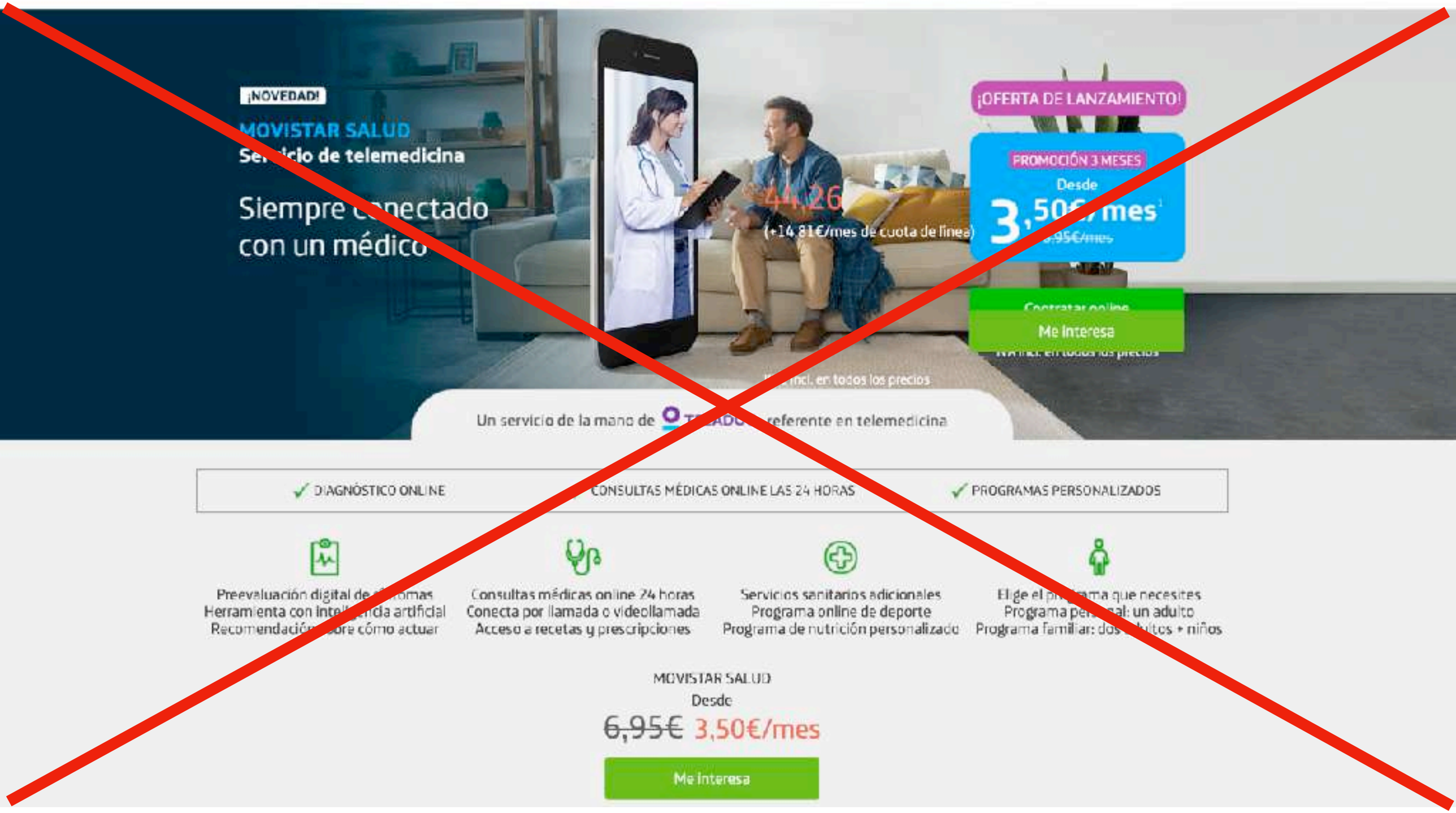
Sign up and select your existing GP practice for our free NHS service. If you're not yet eligible you can choose to use our pay-as-you-go service instead.

Book an appointment - at a time that suits you

See a GP in minutes or book up to 7 days ahead. Your GP will call you in the app to start your appointment.

Get medical advice, prescriptions & referrals

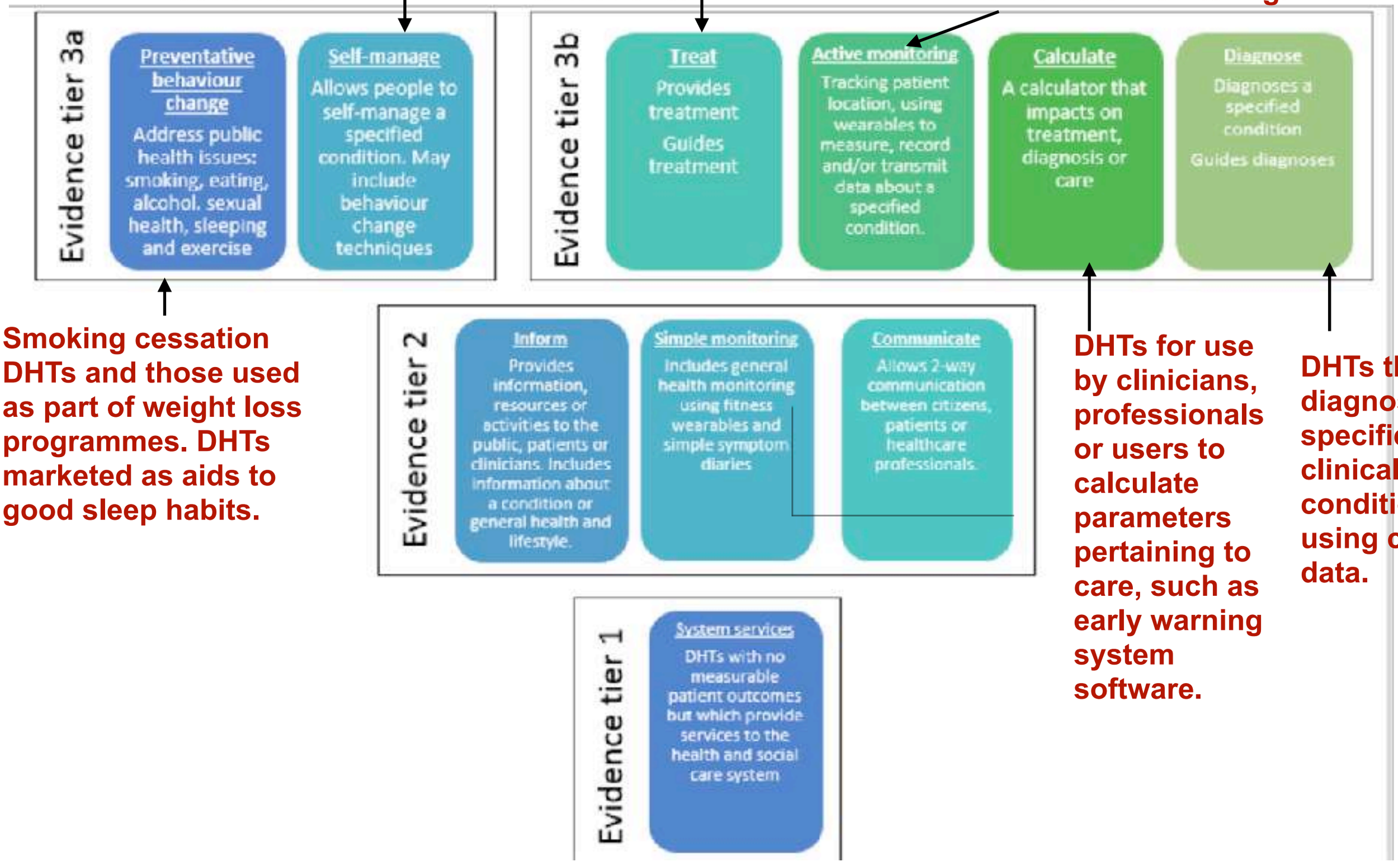
Our GPs can offer medical advice, prescriptions delivered to a pharmacy near you and referrals to a specialist, if necessary.


¡NOVEDAD!
MOVISTAR SALUD
Servicio de telemedicina
Siempre conectado con un médico
41,26
(+14,81€/mes de cuota de línea)
¡OFERTA DE LANZAMIENTO!
PROMOCIÓN 3 MESES
Desde
3,50€/mes¹
6,95€/mes
Contratar online
Me interesa
IVA incl. en todos los precios
Un servicio de la mano de referente en telemedicina
DIAGNÓSTICO ONLINE
CONSULTAS MÉDICAS ONLINE LAS 24 HORAS
PROGRAMAS PERSONALIZADOS
Preevaluación digital de síntomas
Herramienta con inteligencia artificial
Recomendación sobre cómo actuar
Consultas médicas online 24 horas
Conecta por llamada o videollamada
Acceso a recetas y prescripciones
Servicios sanitarios adicionales
Programa online de deporte
Programa de nutrición personalizado
Elige el programa que necesites
Programa personal: un adulto
Programa familiar: dos adultos + niños
MOVISTAR SALUD
Desde
6,95€ 3,50€/mes
Me interesa

DHTs that allow users to record, and optionally to send, data to a healthcare professional to improve management of their condition.

DHTs for treating mental health or other conditions. Clinician-facing apps that advise on treatments in certain situations.

DHTs linked to devices such as implants, sensors worn on the body or in the home. Data are automatically transmitted through the DHT for remote monitoring.



Smoking cessation DHTs and those used as part of weight loss programmes. DHTs marketed as aids to good sleep habits.

DHTs for use by clinicians, professionals or users to calculate parameters pertaining to care, such as early warning system software.

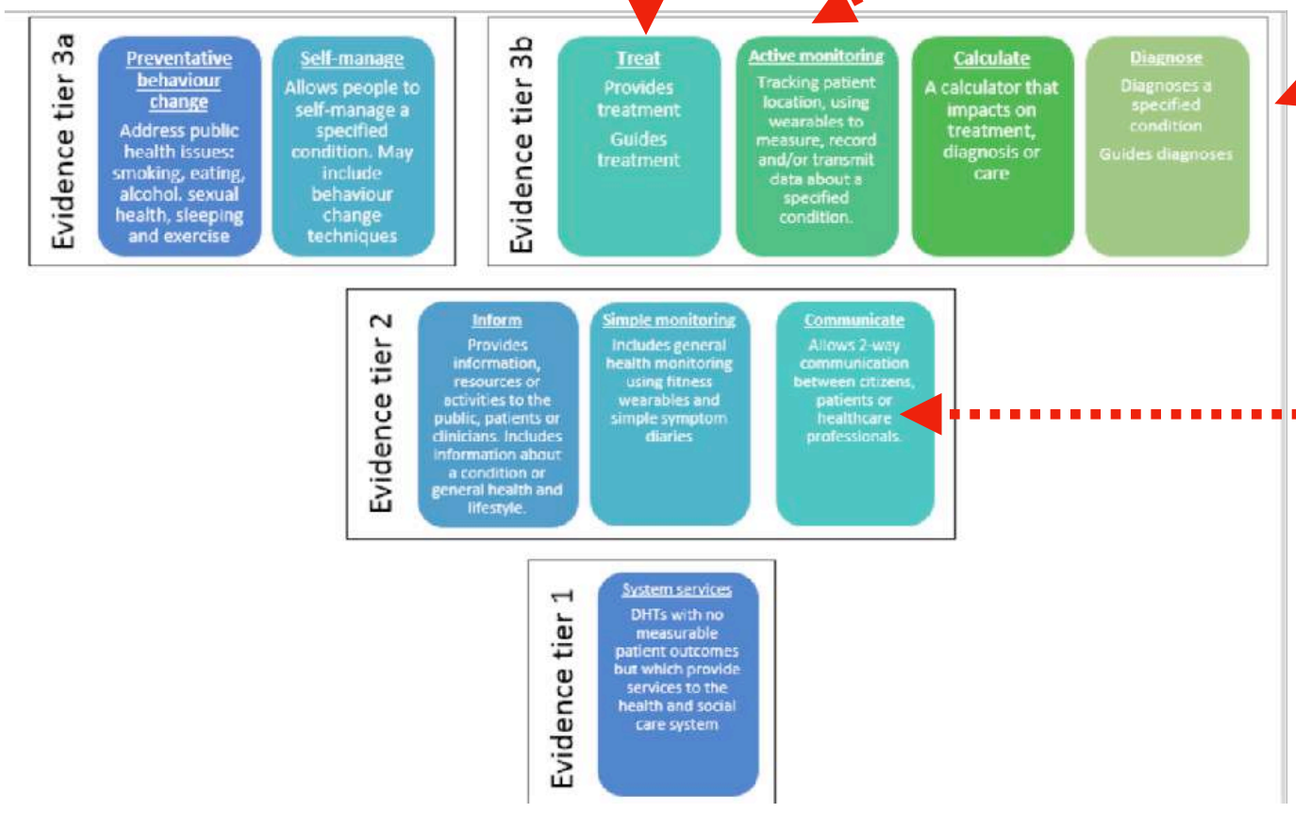
DHTs that diagnose specified clinical conditions using clinical data.

Telemedicina

Telecirugía
Teleasistencia

Telemonitorización

Telediagnóstico



Teleconsultas (incluídas interconsultas)

Indice

1. Introducción: ¿qué son Nuevas Tecnologías?

2. Las NT han de ser evaluadas [¿con qué métodos?]. Arquitectura institucional en España

3. Dos tendencias contrapuestas en la transformación digital en sanidad

4. Evidencia sobre el valor de las NT

5. Conclusión

Necesitamos un marco de evaluación

- ⚖️ La evaluación es necesaria para tomar **decisiones** sobre programas e **intervenciones públicas**
  - **Ex-ante**
  - Ex-post
- ⚖️ También evaluación **económica** completa [coste de oportunidad; coste-efectividad; impacto presupuestario]

- ⚖️ En sentido amplio, evaluación de las políticas públicas (ej. **confinamientos; Next Generation**)

Necesitamos un marco de evaluación para evaluar…

Ejemplos de innovaciones (“tecnologías sanitarias”) a evaluar

- Nuevos medicamentos
- Procedimientos diagnósticos (TAC, PCR)
- Procedimientos quirúrgicos
- Intervención clínica preventiva (ej. consejo médicos para dejar de fumar)
- Hospitalización a domicilio
- Coordinación o integración de atención sanitaria y sociosanitaria
- Digital Health Technologies (DHT)

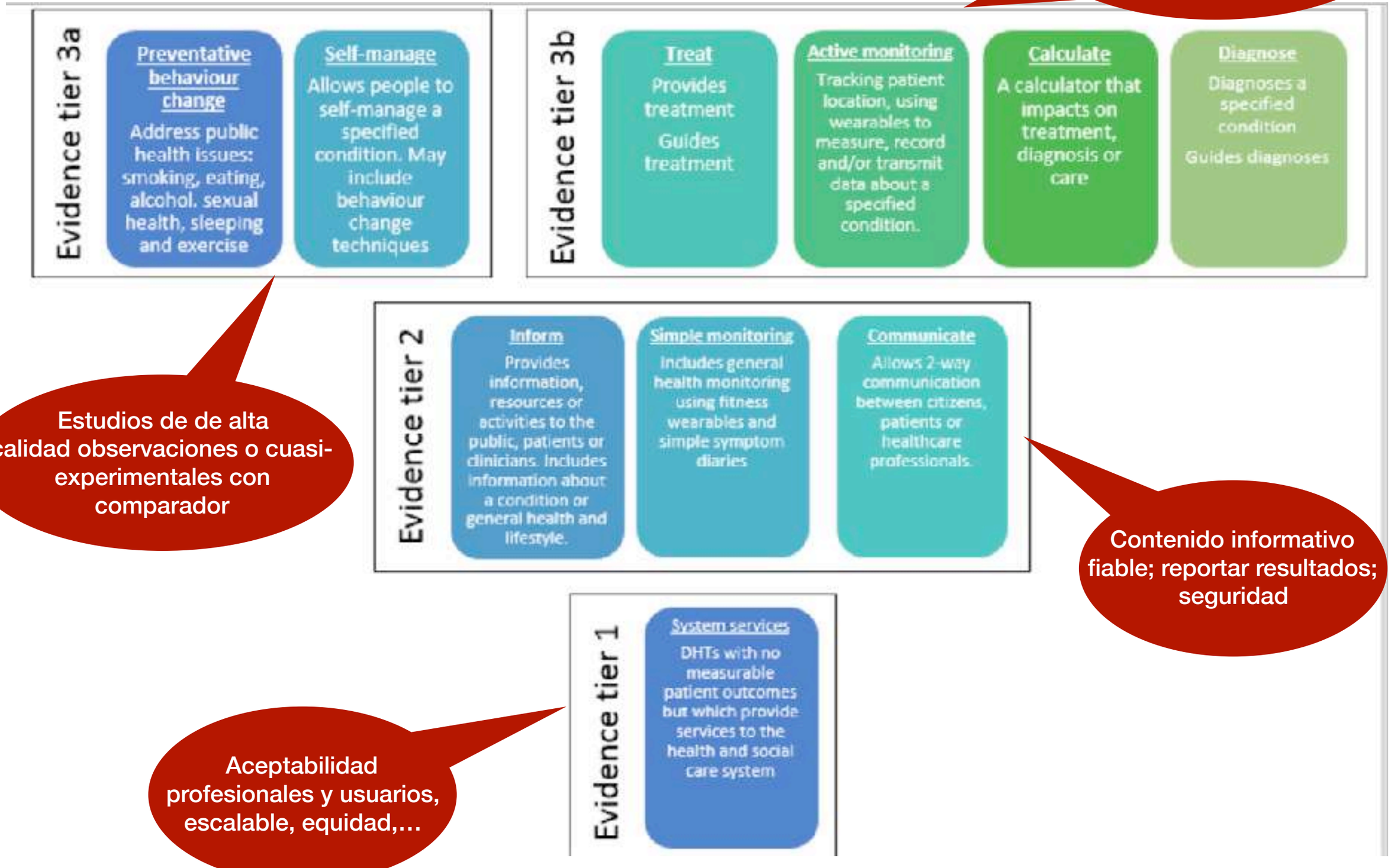
¿Los mismos métodos sirven para las DHT?

- Cribado de cancer
- Carril bici; el bus que camina
- Impuestos sobre bebidas azucaradas

Diferentes estándares de evidencia de efectividad

Figure 1 DHTs classified by function and stratified into evidence tiers

Estudios de intervención de alta calidad. Diseño experimental o cuasi-experimental (RCS)



Estudios de de alta calidad observaciones o cuasi-experimentales con comparador

Contenido informativo fiable; reportar resultados; seguridad

Aceptabilidad profesionales y usuarios, escalable, equidad,…

Impacto económico

Figure 1 DHTs classified by function and stratified into evidence tiers

The economic impact standards aim to promote a consistent and streamlined pathway for economic assessment of DHTs. They are designed to help developers and others understand what information is needed for an effective economic analysis, with the ultimate aim of increasing the capacity for economic analysis across the wider innovation landscape. A better understanding of economic impact should result in more accurate business cases and increasing confidence in investing in DHTs.

Comparar los costes y los beneficios de la intervención con la práctica estándar

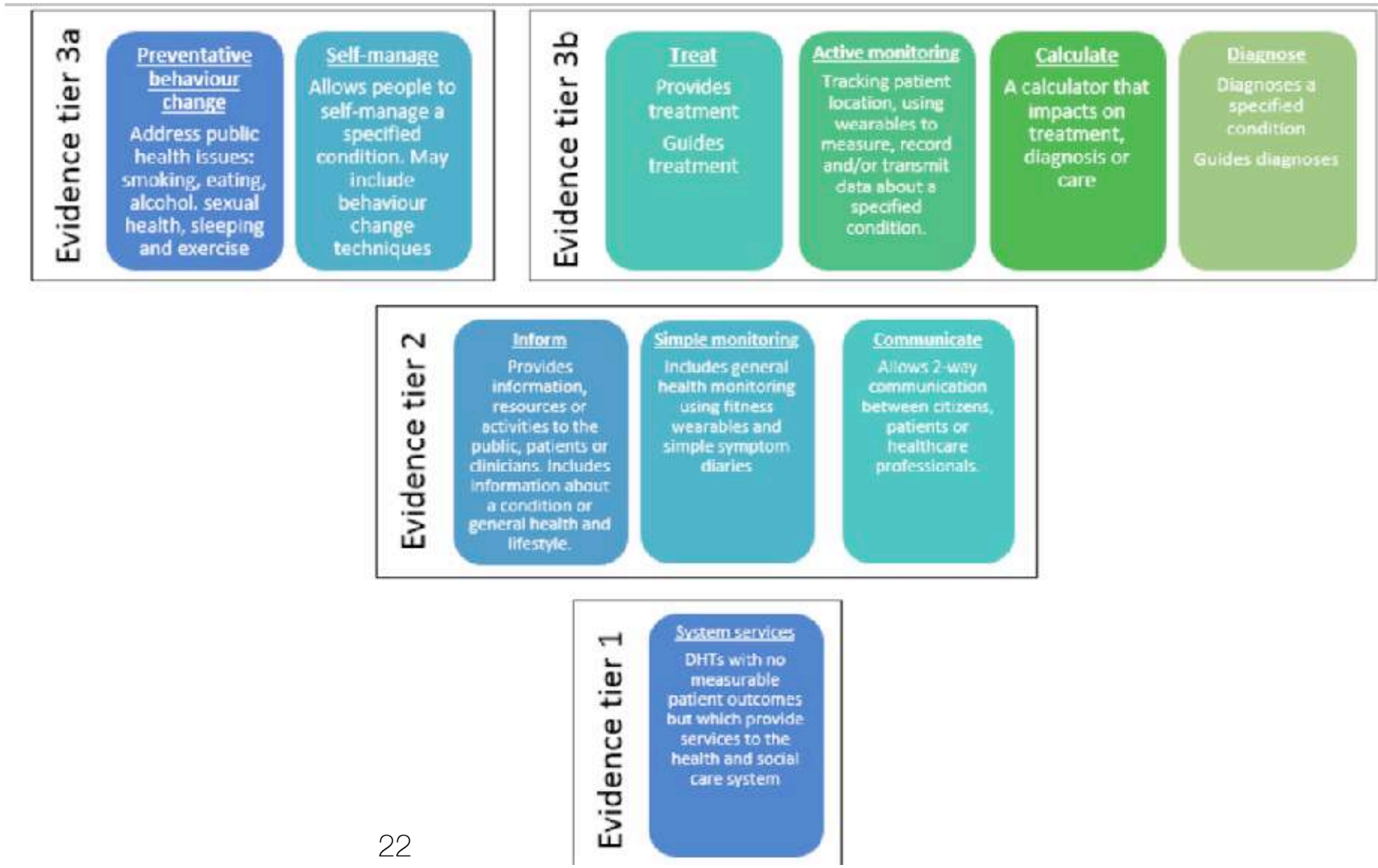


Table 8 Economic impact standards: levels of economic analysis

Typical commissioning decision	Typical level of economic risk to the payer	Economic analysis level
Pilot study or local commissioning decision.	Low.	Basic.
Local or regional commissioning and national commissioning for cost-saving DHTs.	Medium (for example, significant implementation costs but the DHT is expected to save money overall).	Low financial commitment.
National commissioning for cost-incurring DHTs.	High (for example, service redesign costs).	High financial commitment.

Economic analysis level
Basic.
Low financial commitment.
High financial commitment.

Figure 2. Overview showing the relationship between components of evidence standards for economic impact

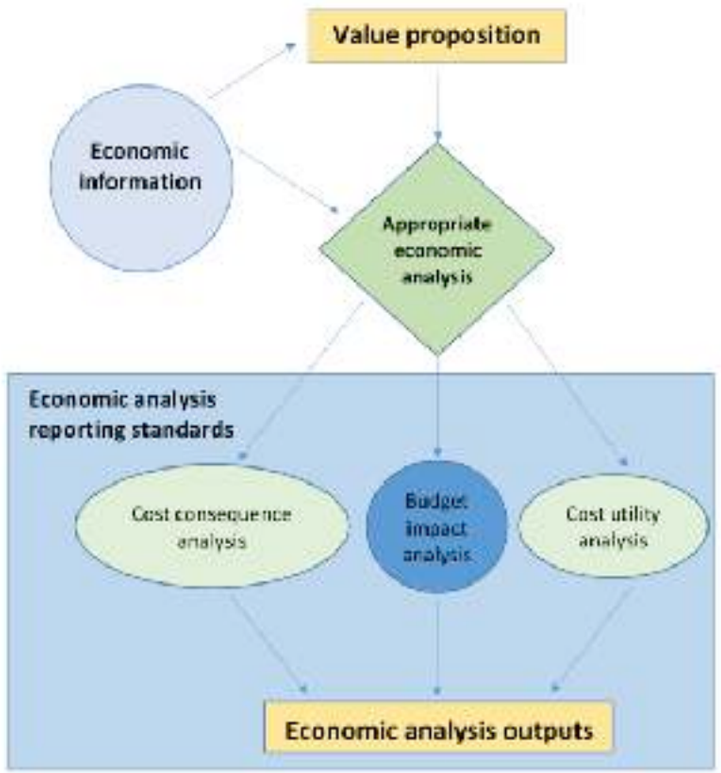


Table 9 Evidence for economic impact standards: appropriate economic analysis

Economic analysis level	Appropriate economic analysis	Outputs
Basic.	Budget impact analysis.	Estimated yearly budget impact for years 1 to 2. Data may be collected to inform future economic analyses.
Low financial commitment.	Cost-consequence analysis.	Estimated costs and benefits. Sensitivity analysis results.
	Budget impact analysis.	Estimated yearly budget impact for years 1 to 5. Sensitivity analysis results.
High financial commitment.	For DHTs with health outcomes funded by the NHS and Personal Social Services, a cost-utility analysis should be done using NICE's guide to the methods of technology appraisal as a reference case.	Estimated incremental cost-effectiveness ratio. Sensitivity analysis results.
	For DHTs funded by the public sector with health and non-health outcomes, or for DHTs that focus on social care, a cost-utility analysis should be done. If this is not possible, a cost-consequence analysis may be acceptable. The analysis should be done using developing NICE guidelines: the manual as a reference case.	Estimated incremental cost-effectiveness ratio (cost-utility analysis) or estimated costs and benefits (cost-consequence analysis). Sensitivity analysis results.
	Budget impact analysis.	Estimated yearly budget impact for years 1 to 5. Sensitivity analysis results.

Arquitectura institucional problemática

- ⚖️ **Agencias de evaluación** de tecnologías sanitarias: mas que en ningún otro país y de gran **calidad**, **coordinadas** transversalmente, así como proyectos voluntario(sos) como **GENESIS**

- ⚖️ Avances en **compra pública innovadora**

- ⚖️ **Sin cuarta barrera** (aún no se exige demostración de coste-efectividad de nuevas tecnologías para entrar en financiación pública)

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Dos tendencias contrapuestas

1. ***Compartir datos*** (*Hubs*; ejemplo datos epidemiológicos COVID, 1+M genoma, biobancos,…) y ***códigos*** en abierto.

Democratización del ***software*** (comunidades R, o Matlab); Herramientas preparadas para Business Intelligence (ej Azure, de microsoft)

Datos

Ciencia de datos, oportunidad única y necesidad de enfoque multidisciplinar

> *COVID-19 thus is also a massive stress test on data scientists, because it creates a perfect storm for data science. We are given extremely dark data, bafflingly complex problems, very little time, an enormous number of affected stakeholders, and life-or-death consequences.*

Meng, X. L. (2020). COVID-19: a massive stress test with many unexpected opportunities (for data science). *Harvard Data Science Review*

La COVID-19, oportunidad única para la Ciencia de Datos

*The **versatility** of **AI/ML** technologies enables scientists and technologists to address an impressively **broad range of biomedical, epidemiological, and socio-economic challenges.** This wide-reaching scientific capacity, however, also raises a diverse array of ethical challenges.*

*AI design and discovery (…) centered on **open, accountable, equitable, and democratically governed** processes and products*

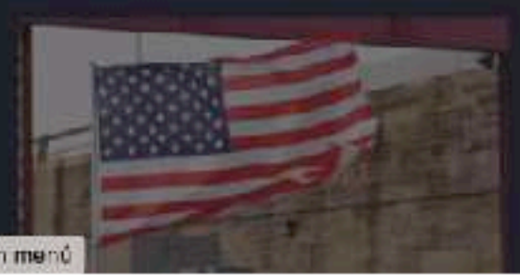
Datos

Leslie, D. (2020). Tackling COVID-19 through responsible AI innovation: Five steps in the right direction. *Harvard Data Science Review (2020)*.

Covid-19: The global crisis – in data

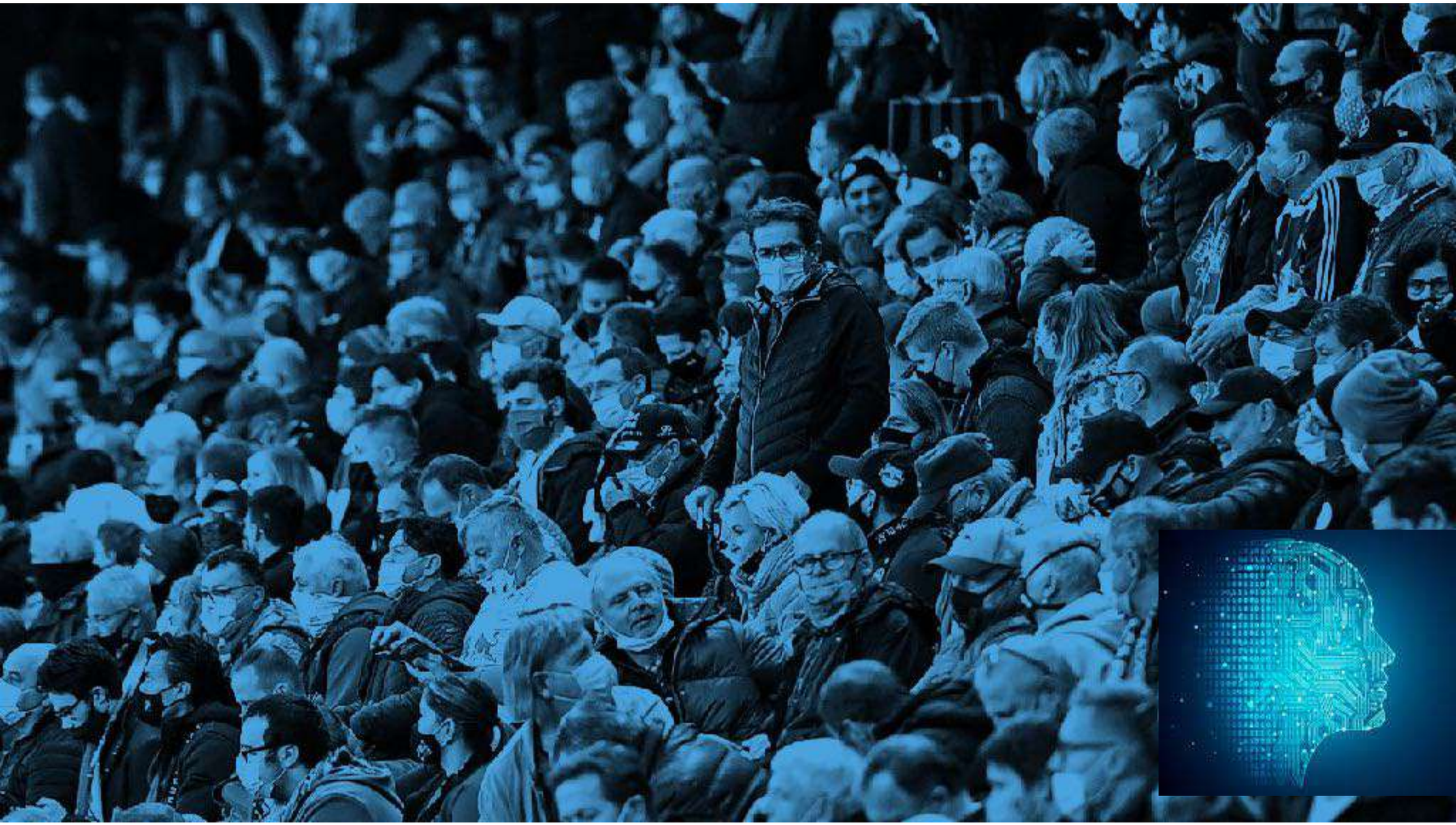
Charts and maps show paradoxes of a pandemic that has claimed a million lives

By **FT Visual & Data Journalism team** OCTOBER 18 2020



Data has been the only way to truly understand the scale and impact of Covid-19.

https://ig.ft.com/coronavirus-global-data/?utm_source=Nature+Briefing&utm_campaign=a01241894e-briefing-dy-20201019&utm_medium=email&utm_term=0_c9dfd39373-a01241894e-45417342



IA

China: Baidu

Desde detectar gente sin mascarilla y hacer 1500 llamadas de seguimiento por segundo, hasta diagnosticar o analizar movilidad humana

In response to the outbreak, Baidu has leveraged AI-powered mapping systems to identify the flow of travel across high-risk areas using Baidu Maps' "Migration Big Data Platform." The population movements out of Wuhan can broadly track the early spread of the coronavirus. AI is helping epidemiologists build an approximate picture of people's migration with some carrying coronavirus.

IA

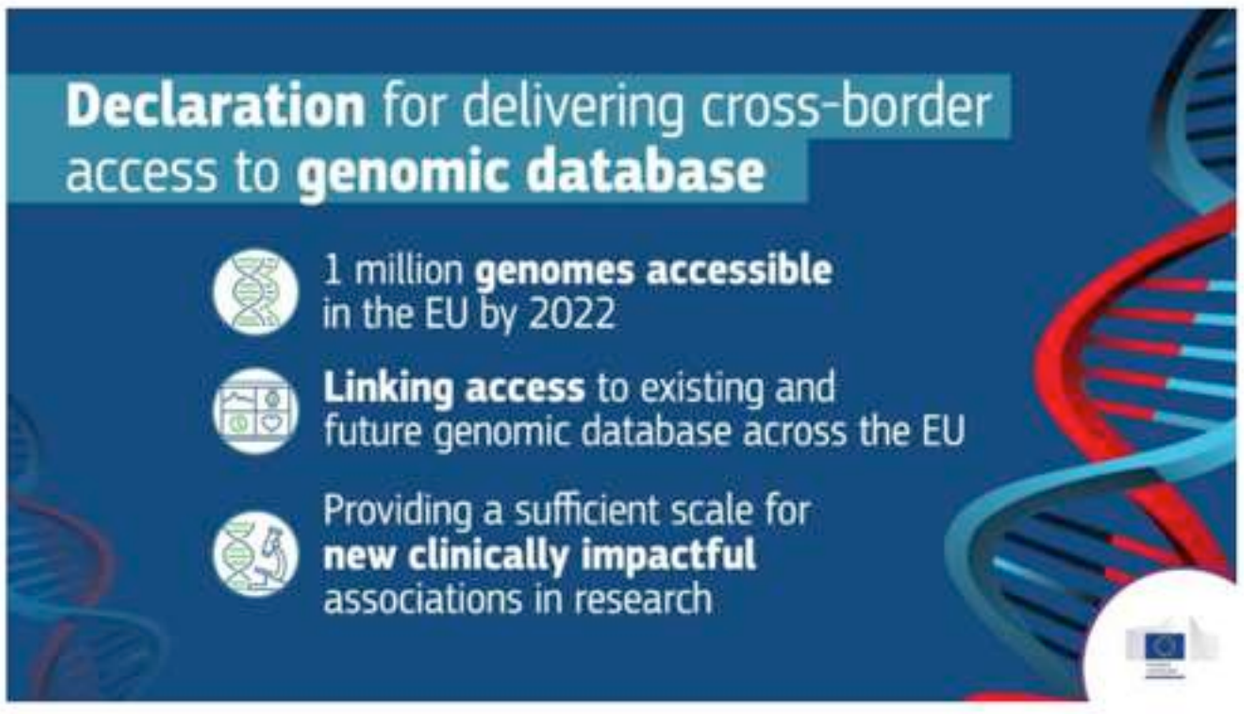
Europa

Shaping Europe's digital future

POLICY

European '1+ Million Genomes' Initiative

The Signatories of the declaration of cooperation "Towards access to at least 1 million sequenced genomes in the EU by 2022" are setting up a collaboration mechanism with the potential to improve disease prevention, allow for more personalised treatments and provide a sufficient scale for new clinically impactful research.



Datos e infraestructuras para el análisis de la COVID-19

Europa

PROJECTS STORY | 18 March 2020

Forecasting the coronavirus pandemic with help from EU projects

The whole world is currently dealing with a novel coronavirus pandemic and we all want to try to understand what the future may hold. Using computer-based models would allow us to keep up with the spread and evolution of the pandemic.

Fighting epidemics through modelling

The EPIWORK project aimed to develop a set of tools and knowledge to design infrastructures that could forecast epidemics. It resulted in the Global Epidemic and Mobility Model project (GLEAM). whose objective was to deliver the analytic and forecasting power that could minimize the impact of potentially devastating epidemics. Researchers who worked on these projects are currently using those results to try to understand how the current pandemic

European Commission | Strategy > Shaping Europe's digital future > Projects |

Shaping Europe's digital future

PROJECTS STORY | 14 July 2020

Can supercomputers help find a COVID-19 treatment?

Launched in January 2020, the first project to receive funding from the European High-Performance Computing Joint Undertaking (EuroHPC JU) is now helping to support research into SARS-CoV-2.

PROJECTS STORY | 20 March 2020

SocialTruth: fighting fake news with trust at the times of Covid-19

SocialTruth is an Horizon 2020 funded project that focuses on aggregating large volumes of datasets enriched with metadata that will be useful to assess credibility levels.

EUROPEAN GENOME-PHENOME ARCHIVE

Search...

Tips on how to search

ABOUT | SUBMISSION | BROWSE | ACCESS | DOWNLOAD | METADATA | Helpdesk | Log in

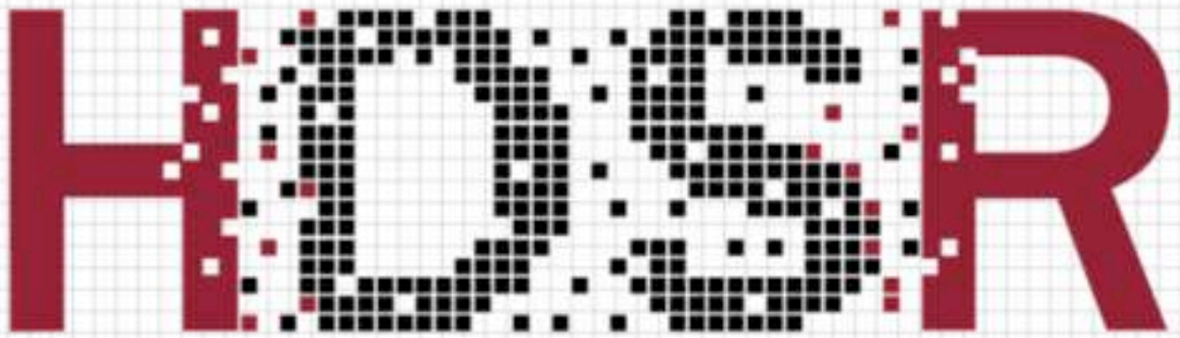
The European Genome-phenome Archive (EGA) is a service for permanent archiving and sharing of all types of personally identifiable genetic and phenotypic data resulting from biomedical research projects.

EUROPE BIOBANK WEEK

About | Programme Overview | Abstracts | Registration | Sponsorship | News | Contact

ESBB | BBMRI-ERIC

Join us for the Virtual Edition of the annual Europe Biobank Week conference:
"Biobanking for Global Challenges!"



HARVARD DATA SCIENCE REVIEW

A Telescopic, Microscopic, and Kaleidoscopic View of Data Science

As an open access platform of the Harvard Data Science Initiative, the *Harvard Data Science Review* features **foundational thinking, research milestones**, **educational innovations, and major applications,** with a primary emphasis on **reproducibility, replicability, and readability**. It aims to publish contents that help to define and shape data science as a scientifically rigorous and globally impactful multidisciplinary field based on the principled and purposed production, processing, parsing and analysis of data. By disseminating **inspiring, informative, and intriguing** articles and media materials, HDSR aspires to be a global forum on "***everything data science and data science for everyone.***"

Launch of the COVID-19 Data Portal

Repositorios de datos

By SDSN Secretariat · 09 Oct, 2020 · 0 Comments

The COVID-19 Data Portal of the Lancet COVID-19 Commission contains over 3 million data points and more than 100 indicators on the pandemic. It is updated daily.

About the COVID-19 Data Portal

Today, we launch the COVID-19 Data Portal of the Lancet Commission on COVID-19. It provides access to the latest data available on COVID-19, such as new cases, deaths, positive test rate, and other valuable data to gauge the transmission and response to the pandemic. It features 3.5 million data points, covering 216 countries over a period of 284 days (and counting).

The datais pooled from different sources, including Johns Hopkins University, Our World in Data, Oxford, YouGov, and Google. The full database (in CSV format) is accessible here: https://sdsna.github.io/lancet-covid-19-database/data/database.csv. The full list of the indicators and their description are available here: https://data.covid19commission.org/indicators

The data portal is updated daily from Monday to Friday. Over time, more heat maps and graphs will be added, including data to track the socio-economic impacts of the pandemic.

Repositorios de datos

https://ourworldindata.org/mortality-risk-covid

https://covid19.who.int

https://covidtracking.com/data

https://www.google.com/covid19/mobility/ Datos de movilidad de google

https://experience.arcgis.com/experience/5e442514cc604efc87ff11c0c3fff8ed/page/page_47/?views=view_3

Datos movilidad INE (Orange)

Datos en abierto España : https://github.com/datadista/datasets/tree/master/COVID%2019

Somos una cooperativa ciudadana de datos que acelera la investigación e innovación en el sector de la salud.

Dos tendencias contrapuestas

1. ***Compartir datos*** (*Hubs*; ejemplo datos epidemiológicos COVID, 1+M genoma, biobancos,…) y ***códigos*** en abierto.

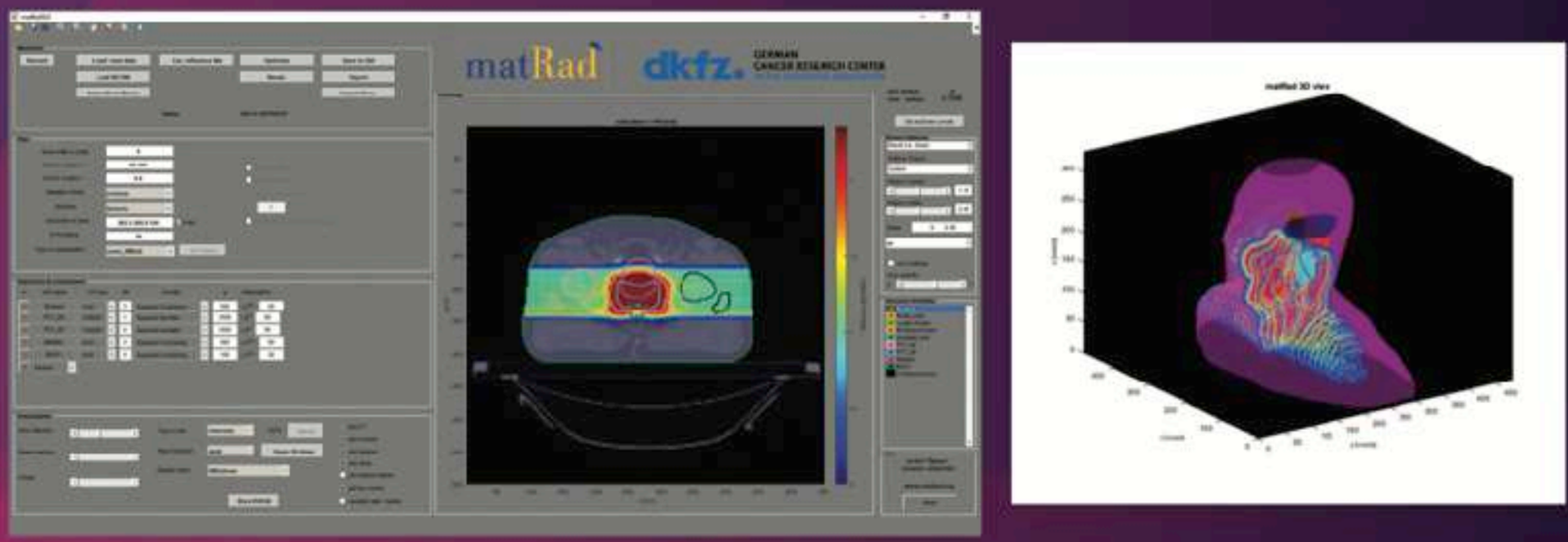
   Democratización del ***software*** (comunidades R, o Matlab); Herramientas preparadas para Business Intelligence (ej Azure, de microsoft)

Developing an Open-Source Toolkit for Radiation Therapy Planning

Clinicians who treat cancer patients with radiation rely on treatment planning software that optimizes the radiation dose to ensure tumor coverage while sparing surrounding tissue and organs.

Commercially developed treatment planning software is proprietary and closed source. As a result, many institutes and universities either invest significant effort in developing and maintaining their own or use open-source packages, most of which cover only a single step in trectment planning.

Researchers at the German Cancer Research Center (Deutsches Krebsforschungszentrum, or DKFZ) have developed matRad[1], a multimodality dose calculation and optimization toolkit for radiation treatment planning. Because matRad is written entirely in MATLAB®, researchers can easily modify the code to evaluate new algorithms. MATLAB excels at performing the many sparse matrix operations involved in treatment planning; as a result, matRad produces clinically accurate treatment plans as quickly and easily as its commercial counterparts.



Left: The matRad 2.10.0 interface, with workflow, plan, optimization, and visualization controls.
Right: 3D rendering of computer tomography and planned proton dose in the coronal plane of a head-and-neck cancer case.

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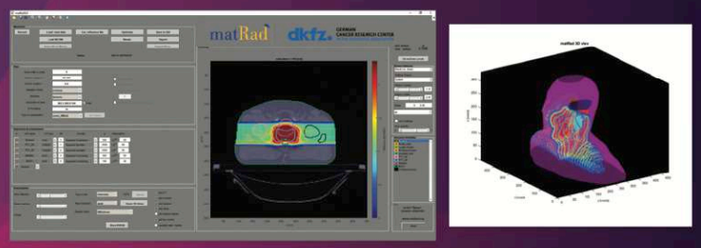

Left: The matRad 2.10.0 interface, with workflow, plan, optimization, and visualization controls.
Right: 3D rendering of computer tomography and planned proton dose in the coronal plane of a head-and-neck cancer case.

The matRad package includes MATLAB scripts, functions, and classes that span the entire treatment planning workflow, from setting treatment parameters and optimizing the plan to visualizing and evaluating the results.

matRad remains under active development, and the team regularly accepts pull requests from researchers. For example, they recently worked with Dr. Edgardo Dörner at Pontificia Universidad Católica de Chile to incorporate a Monte Carlo photon dose calculation engine into matRad.

Since matRad was designed as a research tool, it cannot be used to treat actual patients. The dose calculations it produces, however, closely match those produced by clinically approved treatment planning systems. This level of performance opens opportunities to use matRad as an independent tool for validating treatment plans generated by other software.

[1] The current release is matRad 'Blaise' 2.10.0. *http://doi.org/10.5281/zenodo.3879616*

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Los científicos de datos aplican las técnicas de aprendizaje automático para formar, evaluar e implementar modelos que resuelvan problemas empresariales.

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Azure Data Scientist

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Dos tendencias contrapuestas

1. ***Compartir datos*** (*Hubs*; ejemplo datos epidemiológicos COVID, 1+M genoma, biobancos,…) y ***códigos*** en abierto. Democratización del ***software*** (comunidades R, o Matlab); Herramientas preparadas para Business Intelligence (ej Azure, de microsoft)

2. ***Los datos*** tienen un alto valor de mercado. Son un ***subproducto*** de la atención sanitaria
   1. Aumenta el **valor de la sanidad** (antes sector de gasto)
   2. Google, Amazon, apuestas fuertes
   3. Colaboración público-privada, ética

      La población es mas proclive a ceder datos “por un buen fin” en la era COVID(*)

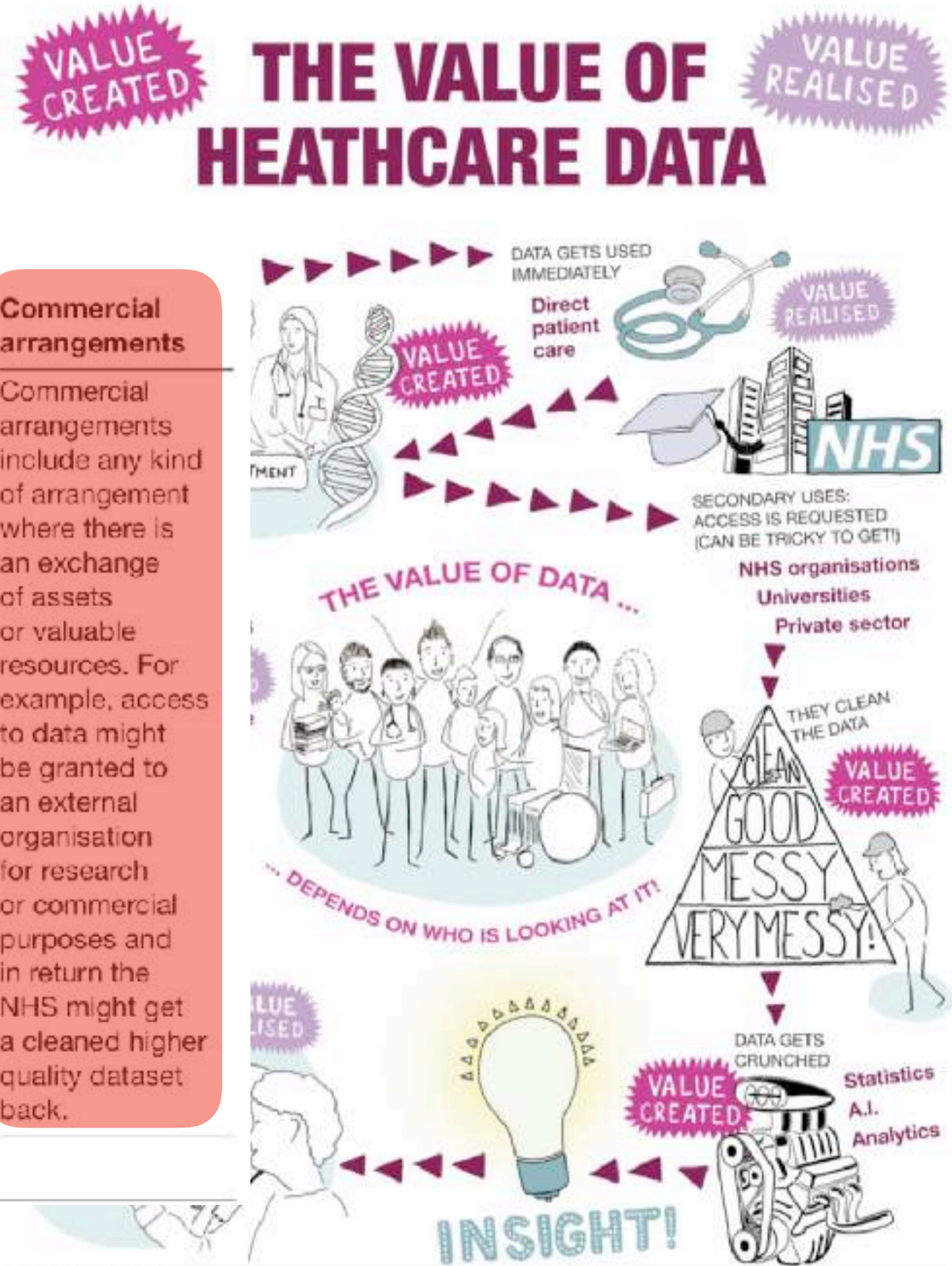
(*) Gerdon, F., Nissenbaum, H., Bach, R. L., & Kreuter, F. (2020). Individual Acceptance of Using Health Data for Private and Public Benefit: Changes During the COVID-19 Pandemic. *Harvard Data Science Review*.

Figure 7: Current models

Data sharing agreements	Grant-funded collaboration	Licencing	Cost-recovery	Commercial arrangements
Various organisations including private sector companies can access NHS data for a specific purpose with patient-consent for secondary uses or without patient consent for direct care. Profits generated from the secondary uses of that data are retained by the private sector.	Grants can be allocated either by academic or public sector organisations for specific purposes to other organisations including the private sector as long as they can demonstrate evidence of innovative potential.[144]	An external organisation is given or pays a fee to hold a licence to use or access data. In most cases, this fee will cover the cost of maintaining the data. The licence might also stipulate privacy restrictions and ethical regulations. Profits generated from the use of that data is retained by the private sector.	This model often operates using a licence. In this case the data controller cleans the data and provides services in exchange for a fee to organisations hoping to do research or create products or services. There are variations in cost recovery models.	Commercial arrangements include any kind of arrangement where there is an exchange of assets or valuable resources. For example, access to data might be granted to an external organisation for research or commercial purposes and in return the NHS might get a cleaned higher quality dataset back.

Source: *Reform* research and interviews.

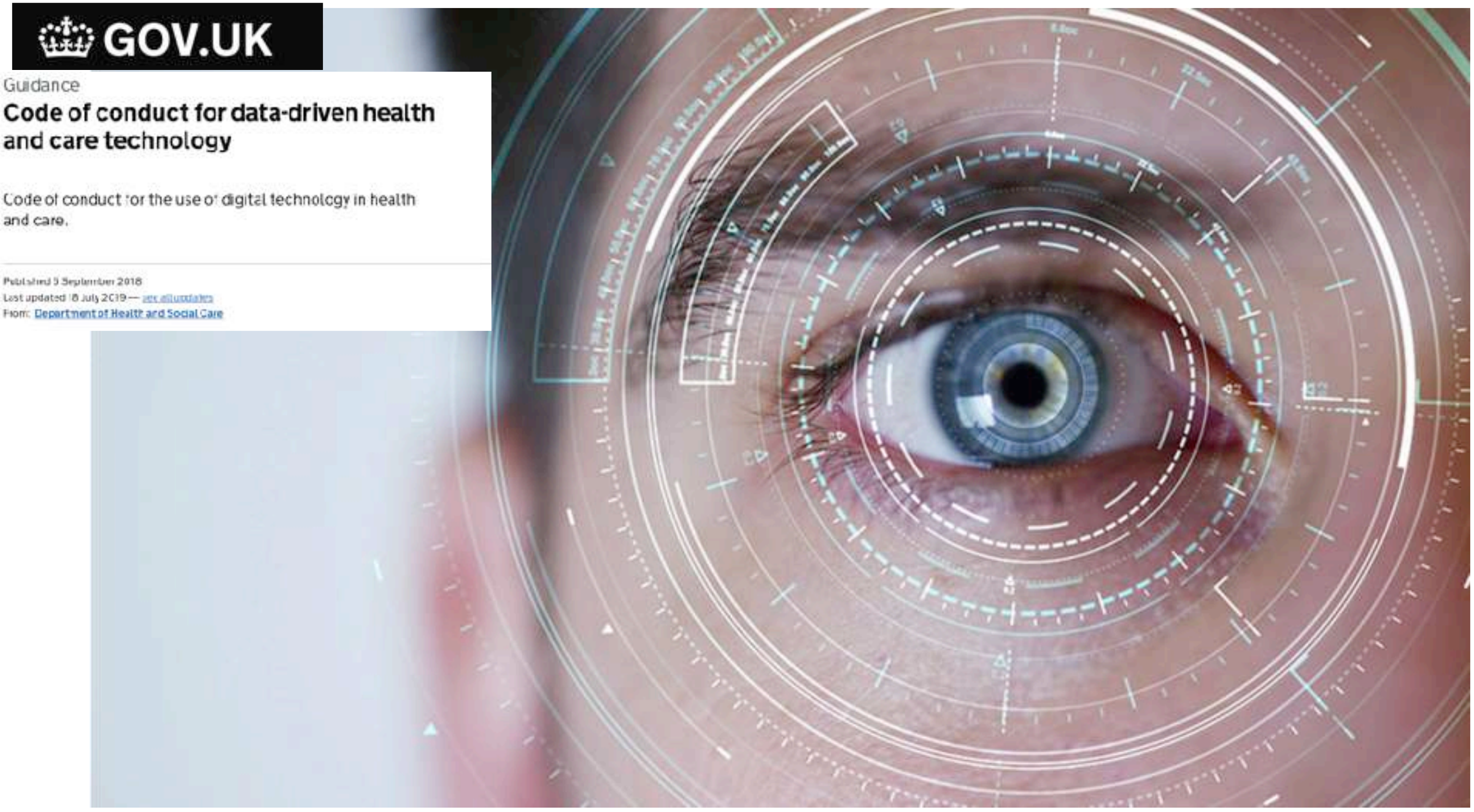
Figure 2: Value(s) of NHS data



https://reform.uk/research/making-nhs-data-work-everyone

https://www.gov.uk/government/publications/code-of-conduct-for-data-driven-health-and-care-technology/initial-code-of-conduct-for-data-driven-health-and-care-technology

Código de conducta



https://www.gov.uk/government/publications/code-of-conduct-for-data-driven-health-and-care-technology/initial-code-of-conduct-for-data-driven-health-and-care-technology

Código de conducta

1. Understand **users**, their **needs** and the context
2. Define the **outcome** and how the technology will **contribute** to it
3. Use data that is in line with appropriate **guidelines** for the **purpose** for which it is being used
4. Be **fair, transparent and accountable** about what data is being used
5. Make use of **open standards**
6. Be transparent about the **limitations** of the data used and algorithms deployed
7. Show what type of **algorithm** is being developed or deployed, the **ethical examination** of how the data is used, how its performance will be validated and how it will be integrated into health and care provision
8. Generate evidence of **effectiveness** for the intended use and **value for money**
9. Make **security** integral to the design
10. Define the **commercial strategy**

https://www.gov.uk/government/publications/code-of-conduct-for-data-driven-health-and-care-technology/initial-code-of-conduct-for-data-driven-health-and-care-technology

Indice

1. Introducción: ¿qué son Nuevas Tecnologías?

2. Las NT han de ser evaluadas [¿con qué métodos?]. Arquitectura institucional en España

3. Dos tendencias contrapuestas en la transformación digital en sanidad

4. Evidencia sobre el valor de las NT

5. Conclusión

Estrategia TTQ

El coste de la COVID-19

VIEWPOINT

David M. Cutler, PhD
Department of Economics, Harvard University, Cambridge, Massachusetts.

Lawrence H. Summers, PhD
Harvard Kennedy School, Cambridge, Massachusetts.

Viewpoint and Editorial

Related article

The COVID-19 Pandemic and the $16 Trillion Virus

The SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) pandemic is the greatest threat to prosperity and well-being the US has encountered since the Great Depression. This Viewpoint aggregates mortality, morbidity, mental health conditions, and direct economic losses to estimate the total cost of the pandemic in the US on the optimistic assumption that it will be substantially contained by the fall of 2021. These costs far exceed those associated with conventional recessions and the Iraq War, and are similar to those associated with global climate change. However, increased investment in testing and contact tracing could have economic benefits that are at least 30 times greater than the estimated costs of the investment in these approaches.

Since the onset of coronavirus disease 2019 (COVID-19) in March, 60 million claims have been filed for unemployment insurance. Before COVID-19, the greatest number of weekly new unemployment insurance claims (based on data from 1967 on) was 695 000 in the week of October 2, 1982. For 20 weeks beginning in late March 2020, new unemployment claims exceeded 1 million per week; as of September 20, new claims have been just below that amount.

The total cost [of the pandemic] is estimated at more than $16 trillion, or approximately 90% of the annual gross domestic product of the US.

Recessions feed on themselves. Workers not at work have less to spend, and thus subsequent business revenue declines. The federal government offset much of the initial loss owing to the shutdown, which has averted what would likely have been a new Great Depression. But the virus is ongoing, and thus full recovery is not expected until well into the future. The Congressional Budget Office projects a total of $7.6 trillion in lost output during the next decade.[1]

Lower output is not the only economic cost of COVID-19; death and reduced quality of life also can be measured in economic terms. To date, approximately 200 000 deaths have been directly attributable to COVID-19; many more will doubtless occur in the US, approximately 5000 COVID-19 deaths are occurring per week and the estimated effective reproduction number (R_t [ie, the average number of people who become infected by a person with SARS-CoV-2 infection]) is approximately 1. If these rates continue, another 250 000 deaths can be expected in the next year. Seasonal factors could increase mortality, although whether COVID-19 will display a large seasonal pattern is unknown. In addition to COVID-19 deaths, studies suggest increased deaths from other causes amounting to almost 40% of COVID-19–related deaths. Thus, if the current trajectories continue, an estimated 625 000 cumulative deaths associated with the pandemic will occur through next year in the US.

Although putting a value on a given human life is impossible, economists have developed the technique of valuing "statistical lives"; that is, measuring how much it is worth to people to reduce their risk of mortality or morbidity. This approach has been used as a standard in US regulatory policy and in discussions of global health policy.[2]

There is a lengthy economic literature assessing the value of a statistical life; for example, in environmental and health regulation. Although no single number is universally accepted, ranges are often used. In environmental and health policy,[3] for example, a statistical life is assumed to be worth $10 million. With a more conservative value of $7 million per life, the economic cost of premature deaths expected through the next year is estimated at $4.4 trillion.

Some individuals who survive COVID-19 are likely to have significant long-term complications, including respiratory, cardiac, and mental health disorders, and may have an increased risk of premature death. Data from survivors of COVID-19 suggest that long-term impairment occurs for approximately one-third of survivors with severe or critical disease.[4] Because there are approximately 7 times as many survivors from severe or critical COVID-19 disease as there are COVID-19 deaths, long-term impairment might affect more than twice as many people as the number of people who die.

Given the predominance of respiratory complications among COVID-19 survivors, affected individuals may be like those with moderate chronic obstructive pulmonary disease, which has been estimated to have a quality-of-life disutility of approximately −0.25 to −0.35. Assuming a total reduction in quality-adjusted life expectancy, including length as well as quality of life, of 35% and taking into consideration the assumed value of a year of life yields an estimated loss from long-term complications of $2.6 trillion for cases forecast through the next year.

Even individuals who do not develop COVID-19 are affected by the virus. Loss of life among friends and loved ones, fear of contracting the virus, concern about economic security, and the effects of isolation and loneliness have all taken a toll on the mental health of the population. The proportion of US adults who report symptoms of depression or anxiety has averaged approximately 40% since April 2020; the comparable figure in early 2019 was 11.0%.[5] These data translate to an estimated 80 million additional individuals with these mental health conditions related to COVID-19. If, in line with prevailing estimates, the cost of these conditions is valued at about $20 000 per person per year and the mental health symptoms

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Table. Estimated Economic Cost of the COVID-19 Crisis

Category	Cost (billions), US$
Lost GDP	7592
Health loss	
Premature death	4375
Long-term health impairment	2572
Mental health impairment	1581
Total	16 121
Total for a family of 4	196 475
% of annual GDP	90

Abbreviation: GDP, gross domestic product.

*However, increased investment in testing and contact tracing could have economic benefits that are at least **30 times** greater than the estimated costs of the investment in these approaches.*

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October 2020

ABSTRACT

We assess the economic value of screening testing programs as a policy response to the ongoing COVID-19 pandemic. We find that the fiscal, macroeconomic, and health benefits of rapid SARS-CoV-2 screening testing programs far exceed their costs, with the ratio of economic benefits to costs typically in the range of 4-15 (depending on program details), not counting the

Table 1. Economic and mortality impacts of three screening programs

Testing frequency (days)	Additional testing costs ($B)	Additional GDP ($B)	Additional federal receipts ($B)	Deaths averted (thou)
A. 98.5% specificity, 50% confirmatory PCR, screening-alone adherence 25%				
30	12	67	18	16
14	26	142	40	36
7	50	244	67	65
4	88	333	92	94
B. 98.5% specificity, universal confirmatory PCR, screening-alone adherence 25%				
30	13	262	72	65
14	27	426	117	111
7	55	541	149	152
4	97	593	163	172
C. Two-stage 99.7% specificity, no confirmatory PCR, screening-alone adherence 50%				
30	7	193	53	50
14	14	305	84	83
7	28	395	108	117
4	50	429	118	139

Notes: Counterfactual simulations suppose that the testing program was put in place on June 1, 2020. The simulations end December 31, 2020. Entries are relative to a baseline with diagnostic testing at rates comparable to the summer of 2020 and no screening testing. Deaths are as of January 1, 2021, and monetary values are current dollars for June 1, 2020 – December 31, 2020

Reformas *ingenieriles:*
gran potencial para conseguir ahorros de coste y aportar **valor social (coste-efectividad**)
Cuanto más **tangible** y micro, más fácil visibilizar los ahorros (ej. ahorro energético; rediseño de flujos de información intrahospital).

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Examples of Effectiveness and Economic Digital Health Case Studies

JOYCE CRAIG, Associate Project Director
JUDITH SHORE, Research Consultant
JOEL RUSSELL, Research Consultant

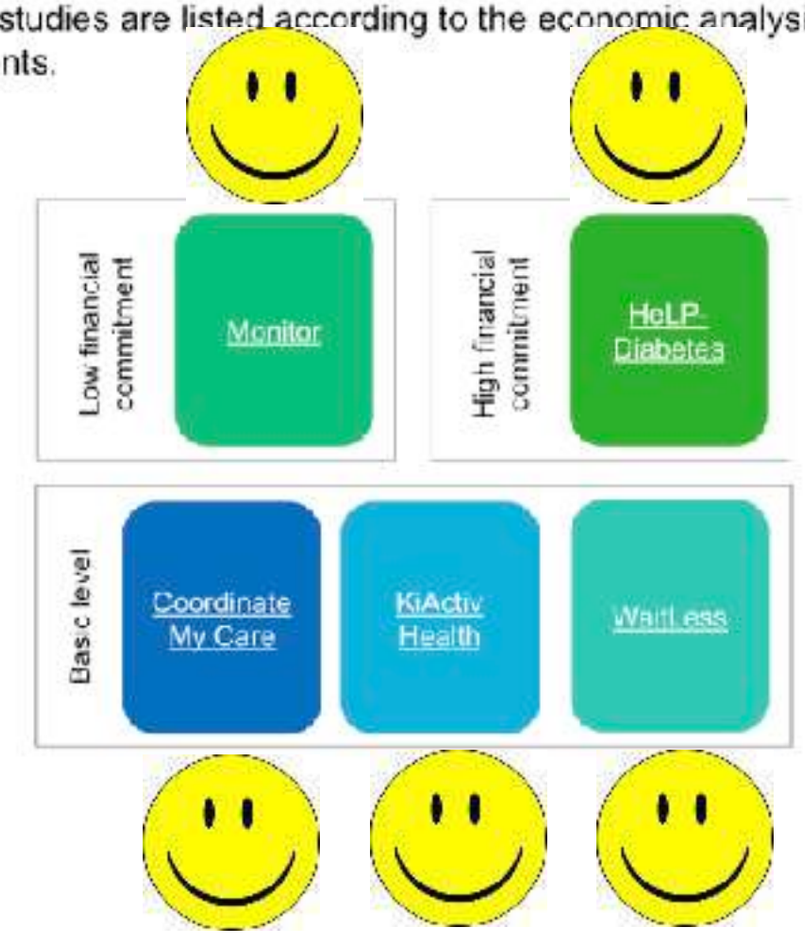
25 February 2019

INVESTORS IN PEOPLE

UNIVERSITY of York

Economic Impact Evidence Case Studies

The case studies are listed according to the economic analysis requirements.



https://www.nice.org.uk/Media/Default/About/what-we-do/our-programmes/evidence-standards-framework/functional-classification-case-studies.pdf

Original Paper

The Cost-Effectiveness of Digital Health Interventions on the Management of Cardiovascular Diseases: Systematic Review

Xinchan Jiang*, BSc, M

Abstract

Background: With the advancement in information technology and mobile internet, digital health interventions (DHIs) are improving the care of cardiovascular diseases (CVDs). The impact of DHIs on cost-effective management of CVDs has been examined using the decision analytic model–based health technology assessment approach.

Objective: The aim of this study was to perform a systematic review of the decision analytic model–based studies evaluating the cost-effectiveness of DHIs on the management of CVDs.

Methods: A literature review was conducted in Medline, Embase, Cumulative Index to Nursing and Allied Health Literature Complete, PsycINFO, Scopus, Web of Science, Center for Review and Dissemination, and Institute for IEEE Xplore between 2001 and 2018. Studies were included if the following criteria were met: (1) English articles, (2) DHIs that promoted or delivered clinical interventions and had an impact on patients' cardiovascular conditions, (3) studies that were modeling works with health economic outcomes of DHIs for CVDs, (4) studies that had a comparative group for assessment, and (5) full economic evaluations including a cost-effectiveness analysis, cost-utility analysis, cost-benefit analysis, and cost-consequence analysis. The primary outcome collected was the cost-effectiveness of the DHIs, presented by incremental cost per additional quality-adjusted life year (QALY). The quality of each included study was evaluated using the Consolidated Health Economic Evaluation Reporting Standards.

Results: A total of 14 studies met the defined criteria and were included in the review. Among the included studies, heart failure (7/14, 50%) and stroke (4/14, 29%) were two of the most frequent CVDs that were managed by DHIs. A total of 9 (64%) studies were published between 2015 and 2018 and 5 (36%) published between 2011 and 2014. The time horizon was ≤1 year in 3 studies (21%), >1 year in 10 studies (71%), and 1 study (7%) did not declare the time frame. The types of devices or technologies used to deliver the health interventions were short message service (1/14, 7%), telephone support (1/14, 7%), mobile app (1/14, 7%), video conferencing system (5/14, 36%), digital transmission of physiologic data (telemonitoring; 5/14, 36%), and wearable medical device (1/14, 7%). The DHIs gained higher QALYs with cost saving in 43% (6/14) of studies and gained QALYs at a higher cost at acceptable incremental cost-effectiveness ratio (ICER) in 57% (8/14) of studies. The studies were classified as excellent (0/14, 0%), good (9/14, 64%), moderate (4/14, 29%), and low (1/14, 7%) quality.

Conclusions: This study is the first systematic review of decision analytic model–based cost-effectiveness analyses of DHIs in the management of CVDs. Most of the identified studies were published recently, and the majority of the studies were good quality cost-effectiveness analyses with an adequate duration of time frame. All the included studies found the DHIs to be cost-effective.

(J Med Internet Res 2019;21(6):e13166) doi: 10.2196/13166

Arquitectura institucional dificulta mucho las cosas….

Madrid: 2/09 acceso a códigos. 8/10 empiezan a repartirlos
Cataluña: empieza a dar códigos el 27/10

"Nadie supo darme el código", el caos de Radar COVID: códigos que no llegan, notificaciones con retraso y mucho trabajo por hacer

Esta app aún no está disponible en App Store para iPhone.

Radar Covid 12+
Ministerio de Asuntos Economicos y Transformacion Digital
Núm. 1 en Salud y forma física
★★★★★ 15 • 2,8 mil valoraciones
Gratis

País	App	Descargas	% de descargas	Fecha de lanzamiento
Irlanda	COVID Tracker	1.28 mln	26%	7 julio 2020
Alemania	Corona-Warn App	18.4 mln	22%	16 julio 2020
Reino Unido	NHS COVID-19	12.5 mln	19%	24 septiembre 2020
Portugal	StayAway Covid	1.26 mln	12%	1 septiembre 2020
Italia	Immuni	7 mln	12%	15 junio 2020
Austria	Stopp Corona	1 mln	11%	25 marzo 2020
España	Radar COVID	4.6 mln	10%	15 septiembre 2020
Bélgica	Coronalert	0.65 mln	5,5%	30 septiembre 2020
Francia	StopCovid	2.5 mln	3,5%	02 junio 2020

ra.es/sites/default/files/pdf/Informe%20-APPS%20Covid%20en%20Europa.pdf

Indice

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Conclusión

1. Nueva tecnología (NT) o innovación tecnológica abarca desde los medicamentos hasta los cambios organizativos y las intervenciones sociales. Las tecnologías digitales **(DHT)** emergen con fuerza
2. Las NT han de **evaluarse ex-ante**, incluyendo evaluación **económica**. Las DHT requieren distinto grado de evidencia de efectividad y análisis de costes según riesgo financiero y de salud
3. Muchas de las evaluaciones de **DHT** dan resultados **favorables**
4. Hay **dos tendencias contrapuestas** en la digitalización de la sanidad, **colaborativa** (compartir datos y códigos en abierto) y los datos como **negocio**. Derivas éticas importantes
5. La estrategia COVID-19 basada en **TTQ** (test-trazabilidad-aislamiento) es **muy coste efectiva** (hasta 1/30)
6. También importante transparencia y **rendición de cuentas** (ej. **Radar COVID**)

Muchas gracias!

beatriz.lopezvalcarcel@ulpgc.es