



**MINISTÈRE
DU TRAVAIL
DE LA SANTÉ
ET DES SOLIDARITÉS**

*Liberté
Égalité
Fraternité*

Délégation au numérique en santé



DEPLOYMENT OF DIGITAL HEALTH STRATEGY IN FRANCE: ROLE OF AN ETHICAL FRAMEWORK TO PROMOTE ADOPTION

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DIGITAL HEALTH DELEGATION OF THE FRENCH MINISTRY OF HEALTH

October 9th, 2024

Summary

- 1.State of Digital Health in France by 2018
- 2.First Digital Health Roadmap: 2019-2022
- 3.National programs to promote Digital Health
- 4.Second Digital Health Roadmap: 2023-2027
- 5.Going forward

1. State of Digital Health in France by 2018

Digital health in France by 2018

The patient, « forgotten » in the digital health shift

- Patient as an object of care provided by health professionals
- Often relegated to a passive role in shaping their care pathway
- Very limited visibility on the use of their health data
- Very limited access to digital health services as compared to other sectors

A fragmented offer of digital health solutions, making usage complex

- Digital tools provided in a fragmented, non-interoperable, manner
- Multiple tools are needed which complicates daily tasks, from patient care to administrative duties
- Essential functions like information sharing, professional coordination, and administrative tasks simplification are inadequately addressed, hindering efficiency

An incomplete deployment of basic tools necessary for the development of digital health

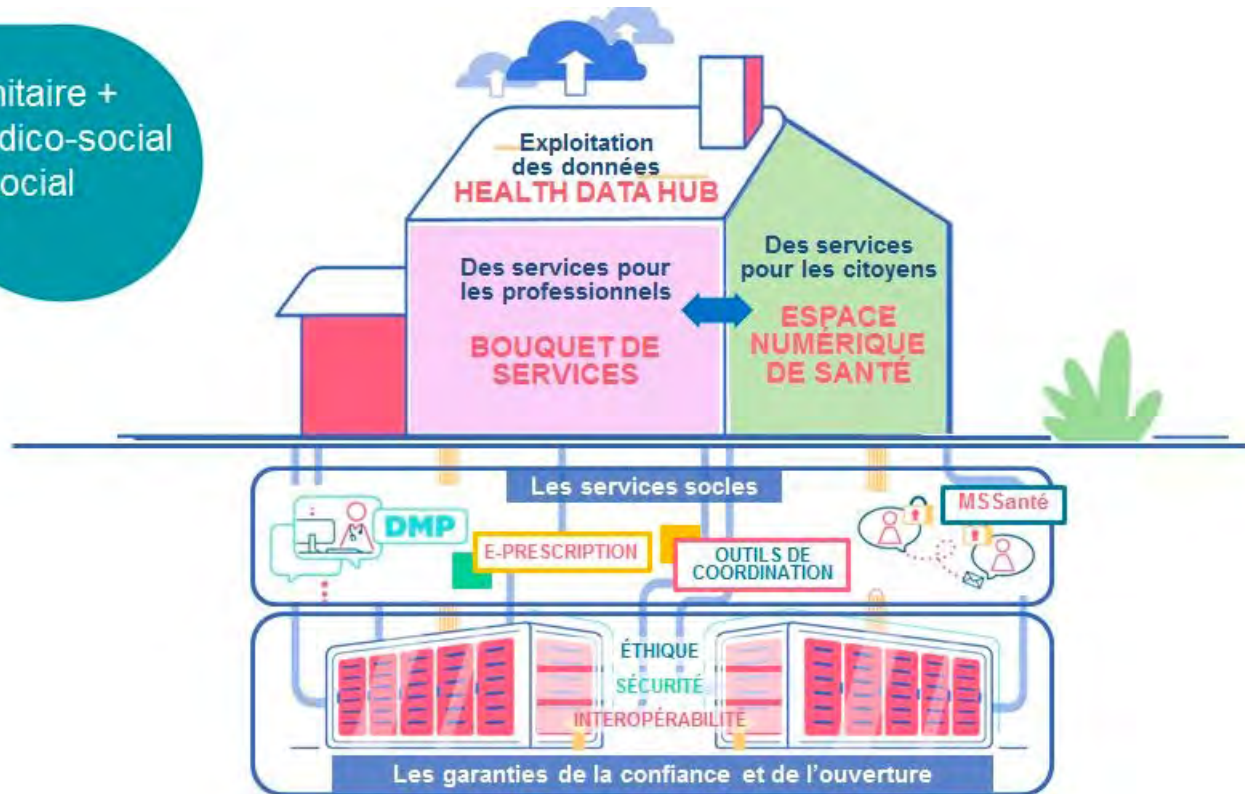
A national digital health strategy unclear to stakeholders and incomplete



Recommendations

- Define and promote a framework of values and an **ethical reference guide** for digital health that should guide all actions in the field of digital health
- Create a secure and personalized **Digital Health Space for each user** allowing them access their health data and services throughout their life
- Offer a **suite of services to healthcare professionals and institutions** to simplify access to the various digital services available, with the aim of improving care organization and quality
- Refocus public authorities on the development and the effective deployment of **standardized first-level tools**, enabling all ecosystem actors to innovate and develop high-value-added services for users and healthcare professionals
- **Stimulate innovation** and encourage the engagement of all e-health stakeholders
- Propose a comprehensive target **architecture for the Health Information System.**

sanitaire +
médico-social
+ social



2. First Digital Health Roadmap: 2019-2022

Building tools and infrastructures



Digital Health for software developers!

First digital health roadmap: 2019-2022

STRATÉGIE DE TRANSFORMATION
DU SYSTÈME DE SANTÉ

#MaSanté2022
La feuille de route du
numérique en santé

25 avril 2019

5 GRANDES ORIENTATIONS **26 ACTIONS**

1ÈRE ORIENTATION	2ÈME ORIENTATION	3ÈME ORIENTATION	4ÈME ORIENTATION	5ÈME ORIENTATION
Strengthen the governance of digital health	Promote ethics, security, and interoperability	Accelerate the deployment of core digital services	Deployment of national digital health platforms	Support innovation and promote actors engagement

ÉTAT D'AVANCEMENT DE LA FEUILLE DE ROUTE DU NUMÉRIQUE EN SANTÉ
Décembre 2019

2

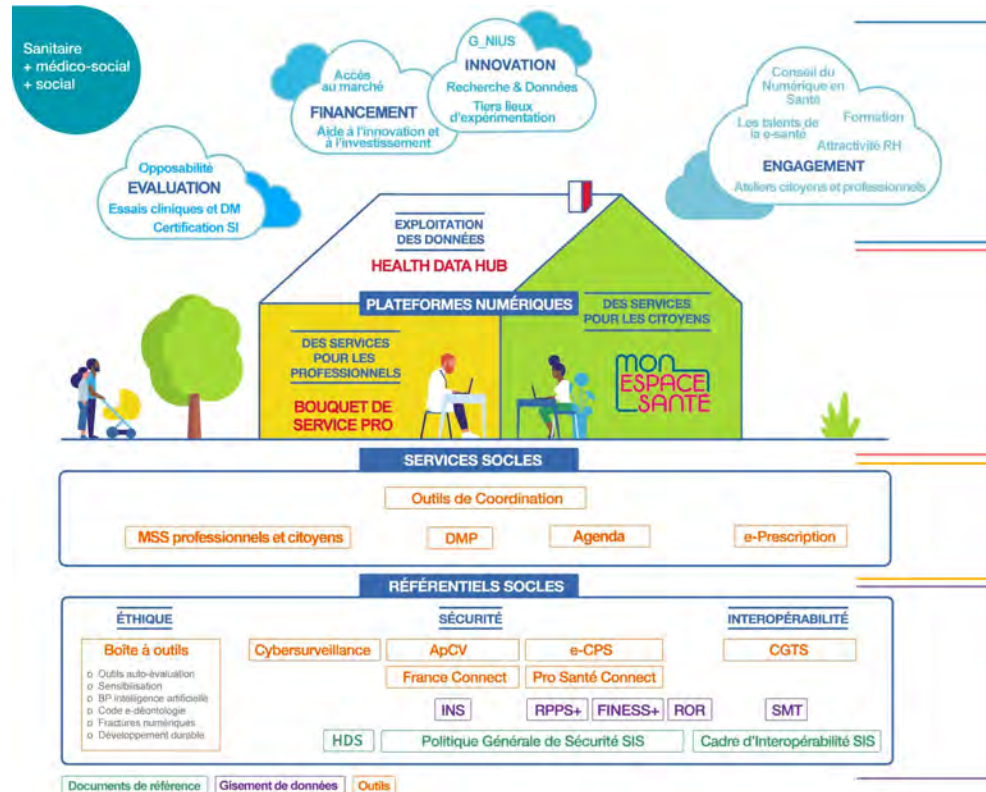
First digital health roadmap: 2019-2022

Support innovation and promote actors engagement

Deployment of national digital health platforms

Accelerate the deployment of core digital services

Promote ethics, security, and interoperability



ORIENTATION 5

SOUTENIR L'INNOVATION ET FAVORISER L'ENGAGEMENT DES ACTEURS



ORIENTATION 4

DÉPLOYER AU NIVEAU NATIONAL DES PLATEFORMES NUMÉRIQUES DE SANTÉ

ORIENTATION 3

ACCÉLÉRER LE DÉPLOIEMENT DES SERVICES NUMÉRIQUES SOCLES



ORIENTATION 2

INTENSIFIER LA SÉCURITÉ ET L'INTEROPÉRABILITÉ DU NUMÉRIQUE EN SANTÉ

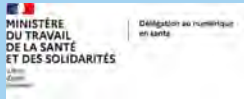


French Digital Health institutional key actors



Digital Health Delegation (DNS)

Oversees all **digital healthcare transformation projects** in France at the **national level**, based on three fundamental pillars: **ethics, security and interoperability**



National Digital Health Agency (ANS)

The agency is **supervised** by the DNS and acts as its “operational arm”. The ANS ensures the deployment and respect of **digital health standards and referentials**.



National Health Insurance Fund (CNAM)

Defines the **national health insurance policy**. Its role is to monitor, coordinate and advise actions of primary health insurance funds (CPAMs) and the 5 general social security funds.



Health Data Hub (HDH)

Unique gateway to facilitate **unified, transparent and secure access to health data** in order to improve the quality of care and support for patients.



18 Regional Health Agencies (ARS)

Provide **unified management** of health care in regions



15 Regional Groups for the Development of e-Health (GRADes)

Provide **digital health expertise for regions** and support healthcare professionals in the digital transition of their profession.



164 Organizations with complementary functions and areas of intervention

Carry out CNAM missions related to illness and professional risks at the local level.

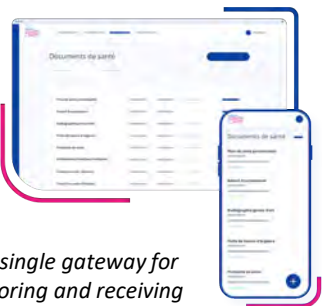


3. National programs to promote Digital Health

Mon Espace Santé (MES)

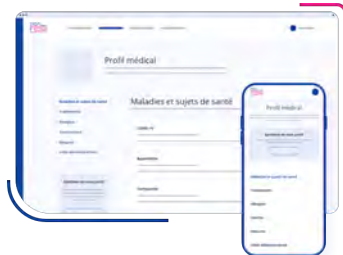
A secure personal digital health record for all French residents

A secure personal medical file (DMP) to find relevant health documents



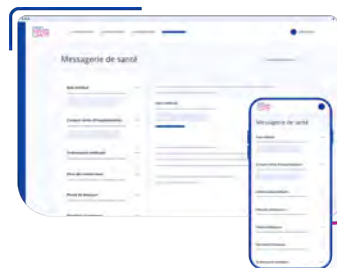
A single gateway for storing and receiving medical documents (prescriptions, reports, etc.)

A medical profile to share all the relevant information with healthcare professionals



A medical summary: treatments, allergies, other health measurements such as weight, height, etc.

Secure messaging to exchange data with healthcare professionals



The opening of the contact channel is at the initiative of the professional.

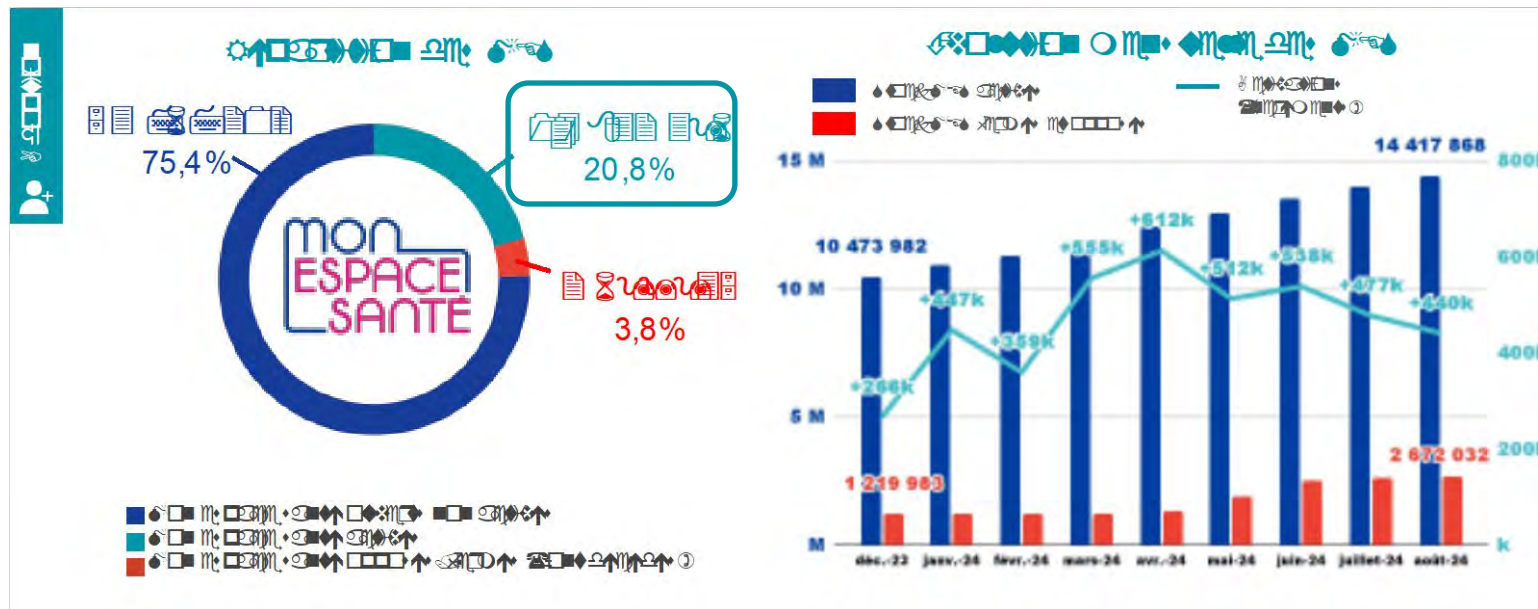
**Coming soon:
a medical calendar to centralize appointments and receive reminders**

mon
ESPACE
SANTÉ

- Three ways of managing MES invitation (national health insurance, opt out)
 - Chose to activate: MES is operational, health information is sent and available
 - Chose to non-activate: MES is not operational, health information is sent, not available
 - Chose to oppose: MES is destroyed
- Patients select the healthcare professionals that may access
- Patients decide to consent to emergency access
- Patients may decide to hide some information (no access to authorized healthcare professionals except referring physicians)
- Sensible information may be hidden to patients waiting for announcement consultation
- Any access to MES is traced and a journal of access is available to the patient

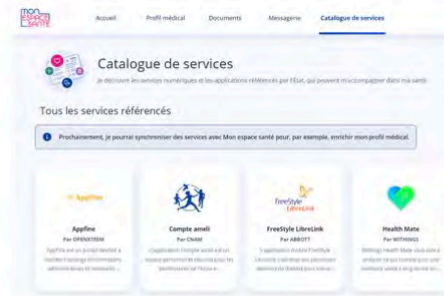
Semaine 38 : du 16/09 au 22/09

Publication : le 25 septembre 2024



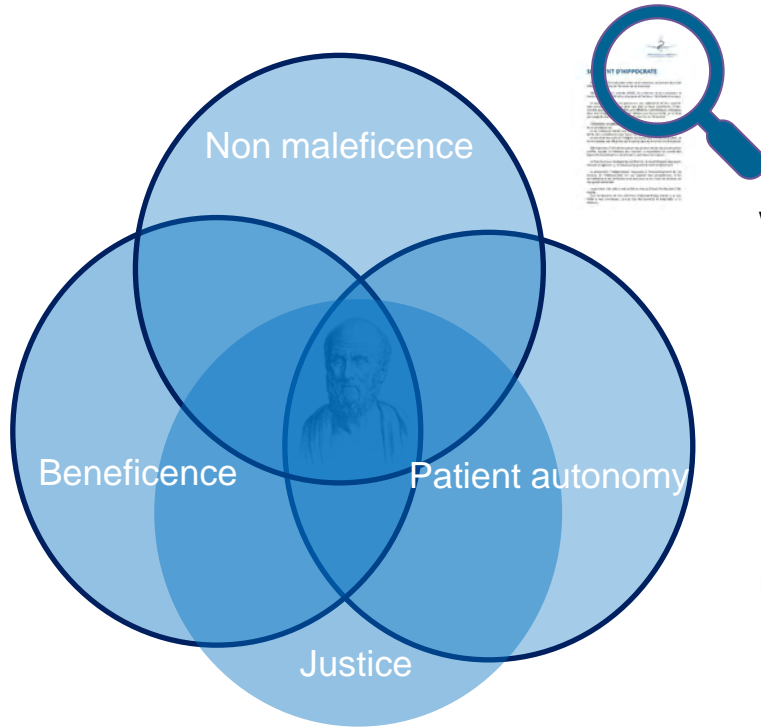
A catalogue of selected health applications for managing one's health

State-approved applications that check ethical, security and interoperability criteria



Ethical criteria of health applications

Medical ethics according to Hippocrates



« I will respect all individuals, their autonomy, and their will, **without any discrimination** based on their condition or beliefs.

I will intervene to **protect** them if they are weakened, vulnerable, or threatened in their integrity or dignity.

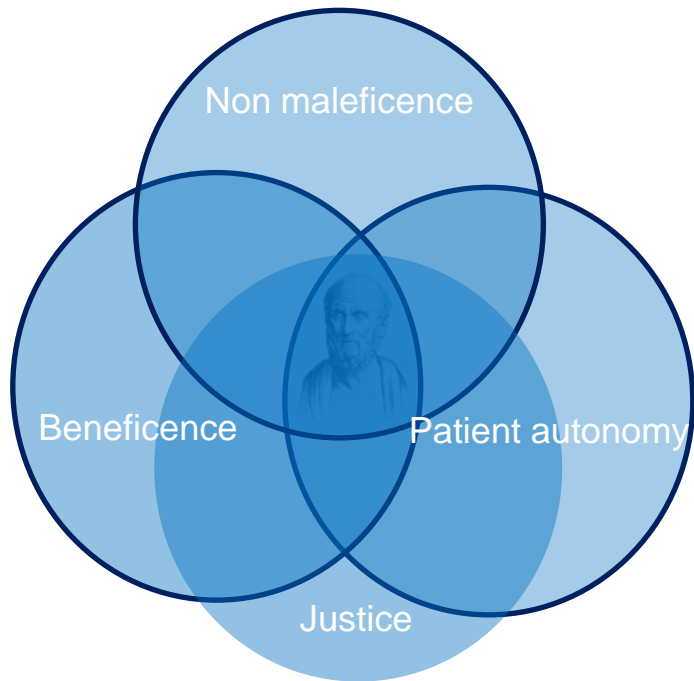
I will **inform** patients of the decisions considered, their reasons, and their consequences.

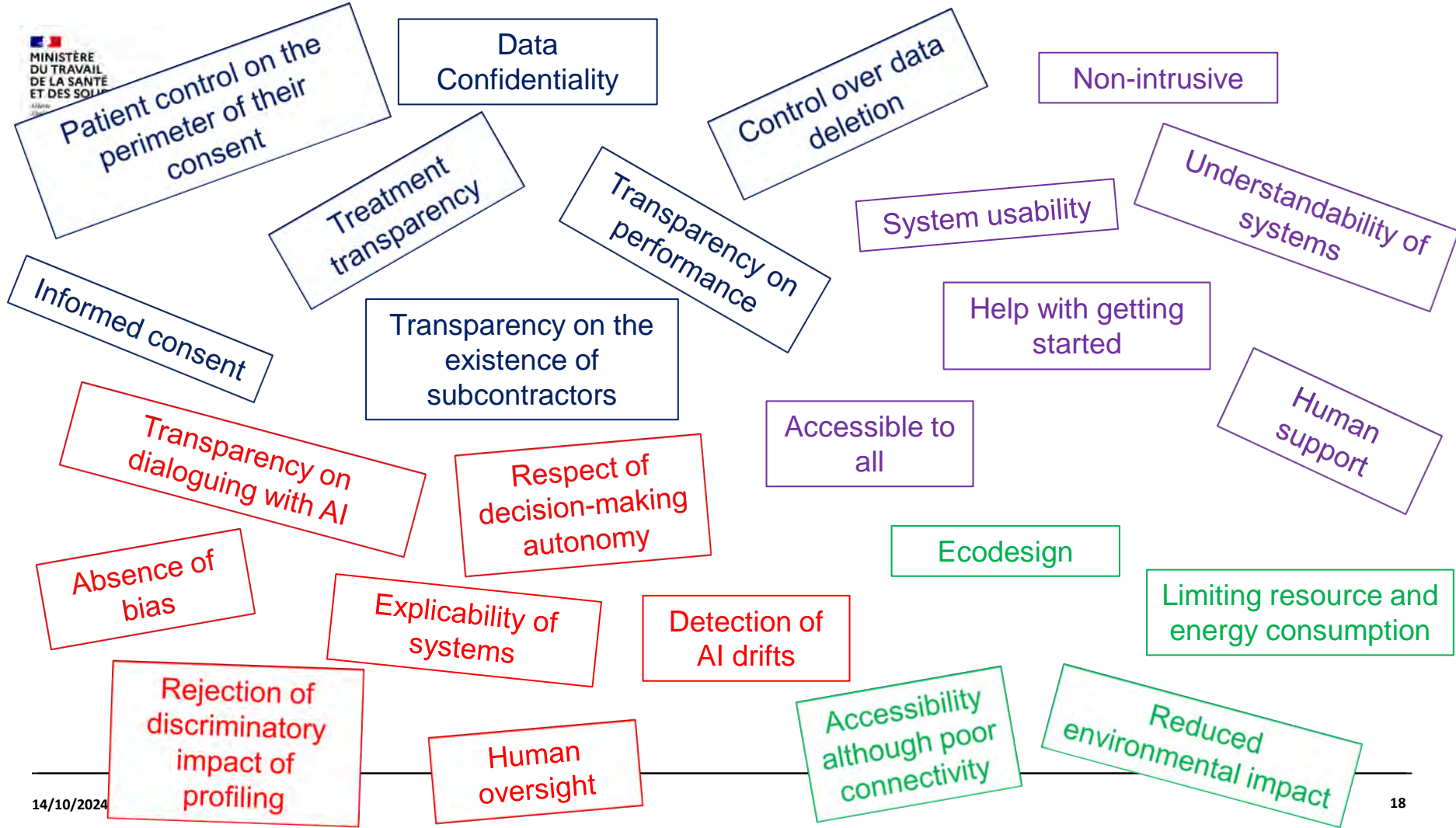
I will never betray their **trust** or exploit the power inherited from circumstances to coerce consciences. Granted access to people's privacy, I will keep the **secrets** entrusted to me. Invited into homes, I will respect the secrets of households... »

Medical ethics according to Hippocrates



Digital ethics





Patient control on the
person of their

Data
Confidentiality

Control over data
deletion

Non-intrusive

Transparency
*“à la carte” consent for data
processing that serve secondary
purposes*

Transparency on
performance

**Accessibility
(inclusive DH)**
*Access to a human support if
necessary*

Ability of

Inform

on the
of
subcontractors

Accessible to
all

Human
support

Transparenc
di

Aspect of
on-making
onomy

Artificial Intelligence
Explainability of AI outputs

Detection of
AI drifts

Eco-responsibility
*Calculate the environmental
footprint attached to the app
usage*

orce and
imp

Absen

Impact of
profiling

Human
oversight

Access
although
connectivity

Environmental impact

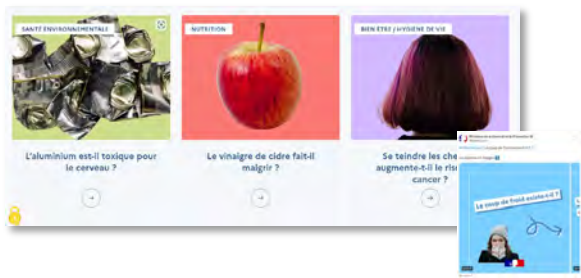
Publication of 16 European ethical principles for digital health at the very beginning of the French Presidency of the European Union Council



PRINCIPES EUROPÉENS POUR L'ÉTHIQUE DU NUMÉRIQUE EN SANTÉ EUROPEAN ETHICAL PRINCIPLES FOR DIGITAL HEALTH

Inscrire le numérique en santé dans un cadre de valeurs humanistes <i>Base Digital Health on humanistic values</i>	
1.	Le numérique en santé complète et optimise les pratiques de santé en effectuées en présentiel <i>Digital Health complements and optimizes face-to-face healthcare</i>
2.	Les personnes sont informées des bénéfices et des limites du numérique en santé <i>Individuals are informed about the benefits and limits of Digital Health</i>
3.	Les personnes sont informées des modalités de fonctionnement des services numériques en santé et peuvent facilement paramétrer leurs interactions avec ces outils <i>Individuals are informed about the functioning of Digital Health services and can easily customize interactions with them</i>
4.	Lorsqu'une intelligence artificielle est mise en œuvre, le maximum a été fait pour qu'elle soit explicable et sans biais discriminatoire <i>When artificial intelligence is used, all reasonable efforts are made to make it explainable and without discriminatory bias</i>
Donner la main aux personnes sur le numérique et sur leurs données de santé <i>Enable individuals to manage their Digital Health and data</i>	
5.	Les personnes ont un rôle actif dans l'élaboration des cadres européens et nationaux du numérique et des données de santé <i>Individuals are actively involved in shaping the European and national frameworks of Digital Health and data</i>
6.	Les personnes peuvent récupérer facilement et de manière fiable leurs données de santé dans un format couramment utilisé <i>Individuals can easily and reliably retrieve their health data in a commonly used format</i>
7.	Les personnes peuvent facilement obtenir des informations sur la manière dont leurs données de santé ont été ou peuvent être consultées et dans quel but <i>Individuals can easily get information on how their health data have been or may be accessed and for which purpose</i>
8.	Les personnes peuvent facilement et de manière fiable donner l'accès à leurs données de santé et exercer leurs droits, y compris leur droit d'opposition quand il est applicable <i>Individuals can easily and reliably grant access to their health data and exercise their rights, including objection when applicable</i>
Développer un numérique en santé inclusif <i>Make Digital Health inclusive</i>	
9.	Les services numériques en santé sont accessibles à tous, y compris aux personnes en situation de handicap ou avec un faible niveau de littératie <i>Digital Health services are accessible by all, including by people with disabilities or low levels of literacy</i>
10.	Les services du numérique en santé sont intuitifs et faciles à utiliser <i>Digital Health services are intuitive and easy to use</i>
11.	Les personnes ont accès à des formations sur le numérique en santé <i>Individuals have access to Digital Health training</i>
12.	Les services numériques en santé proposent une assistance humaine lorsqu'elle est nécessaire <i>Digital Health services include support through human communication when needed</i>
Mettre en œuvre un numérique en santé éco-responsable <i>Implement eco-responsible Digital Health</i>	
13.	Les impacts environnementaux du numérique en santé sont identifiés et mesurés <i>Environmental impacts of Digital Health are identified and measured</i>
14.	Les services numériques en santé sont développés dans le respect des bonnes pratiques d'éco-conception <i>Digital Health services are developed in compliance with eco-design best practices</i>
15.	La ré-utilisation et le recyclage des équipements informatiques en santé sont prévus <i>Re-use and recycling of Digital Health equipment is ensured</i>
16.	Les acteurs du numérique en santé s'engagent à réduire leur empreinte écologique <i>Digital Health stakeholders are committed to reducing their ecological footprint</i>

Fight against disinformation



3,4M

Visits per month

97%

Satisfaction rate on
Santé.fr Décryptage

13 000

Editorial content items
(articles, videos)

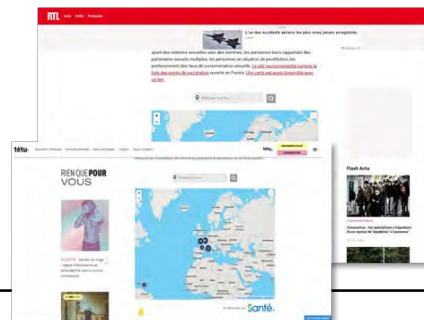
And facilitate access to the locations with healthcare delivery

Besoin de soins non-programmés ?
Avant de se rendre aux urgences, plusieurs alternatives existent

La carte des lieux de soins

Développée par le site du Gouvernement Santé.fr et adaptée avec le concours des agences régionales de santé (ARS) cette carte permet de trouver dans chaque région plusieurs alternatives de soins non programmés :

- Les centres de soins et maisons de soins d'urgence (MSU)
- Des maisons médicales de garde
- Des centres de soins non programmés
- Avoir que certains cabinets médicaux pour certains soins de soins week-end



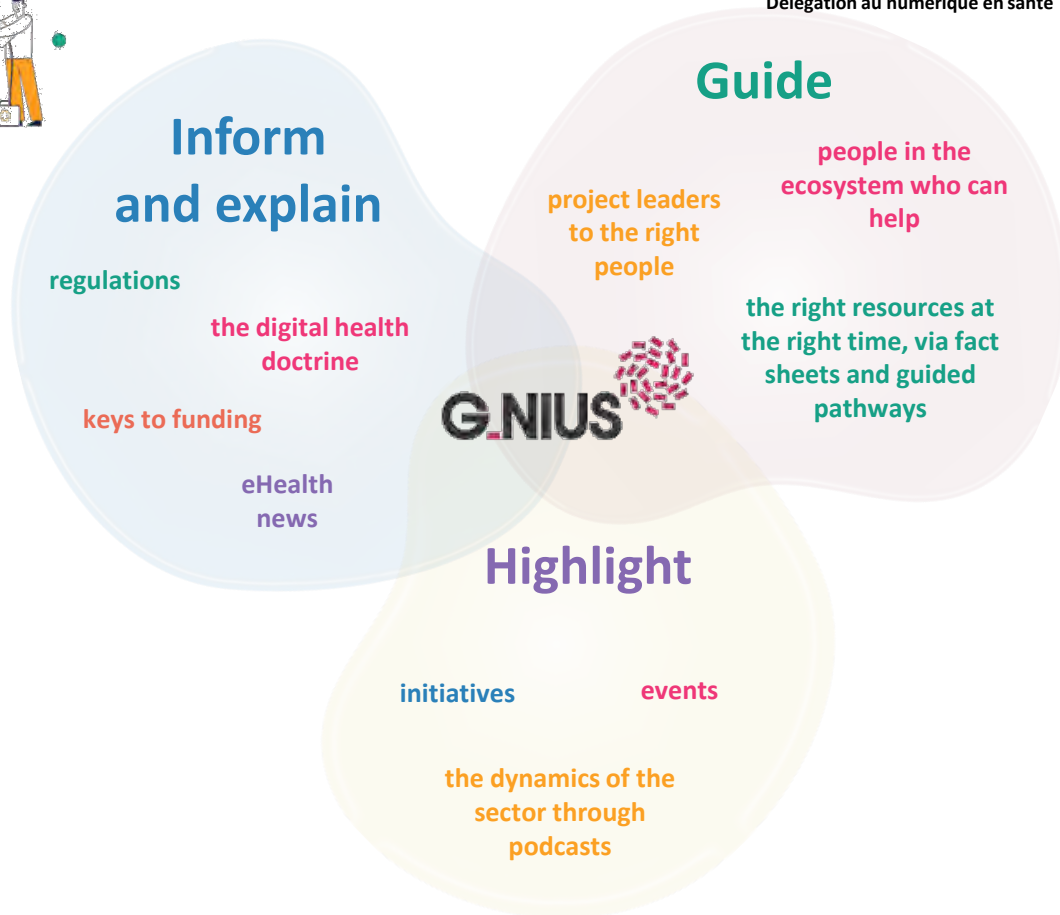
735,000

Entries in the directory
(professionals, facilities, ...)



“ Set up by the Ministry of Health, G_NIUS is the National Gateway for Digital Health Innovation

G_NIUS offers concrete services to support digital health entrepreneurs accelerate digital health solutions time-to-market





Financing

Directory of public and European fundings

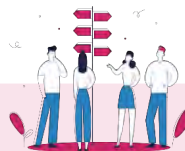
Obtaining reimbursement:
Remote monitoring, digital advance payment



Reglementation

Understanding digital medical devices

Diagnose the regulatory requirements of your project and be guided through the appropriate process



E-health actors

Who to contact, why and when ?

Decrypt international and French e-health processes



National programs

Discover the Digital Health Roadmap

Understand the Digital Health Acceleration Strategy



Stay informed

Follow the news and participate to the events

Listen to feedbacks with our podcast "100 days to succeed"

Digital Health Acceleration Strategy (SASN)

A strategy with € 708 M to support all levels of a digital health project cycle



Develop **stakeholder training**, stakeholder trust and professional attractiveness of the sector

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A strategy with € 708 M to support all levels of a digital health project cycle



Prepare the future generation of key digital health technologies and facilitate **rapid transfer mechanisms of research results**

Develop **stakeholder training**, stakeholder trust and professional attractiveness of the sector

Digital Health Acceleration Strategy (SASN)

A strategy with € 708 M to support all levels of a digital health project cycle



Support the **development** of structural projects to strengthen strategic territorial advantages

Prepare the future generation of key digital health technologies and facilitate **rapid transfer mechanisms of research results**

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Digital Health Acceleration Strategy (SASN)

A strategy with € 708 M to support all levels of a digital health project cycle



Sustain the implementation of **experimentations in real-life conditions** and **first industrial steps**

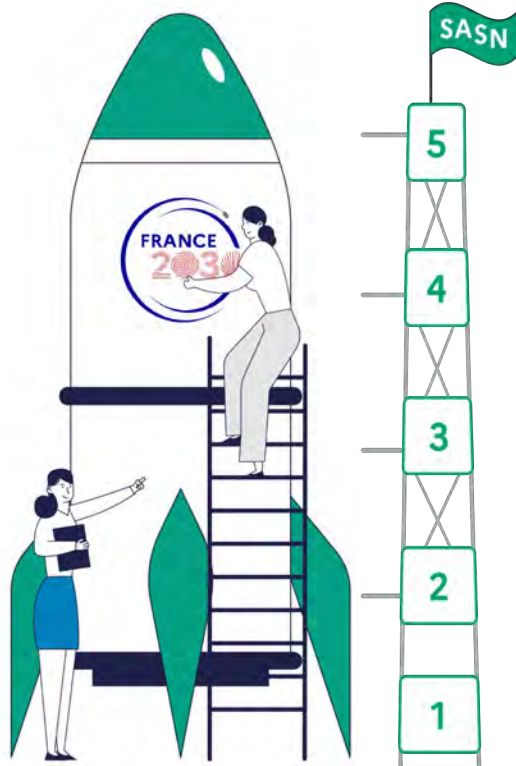
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Digital Health Acceleration Strategy (SASN)

A strategy with € 708 M to support all levels of a digital health project cycle



Foster the conditions for the **large-scale deployment** of successful digital health projects

Sustain the implementation of **experimentations in real-life conditions** and **first industrial steps**

Support the **development** of structural projects to strengthen strategic territorial advantages

Prepare the future generation of key digital health technologies and facilitate **rapid transfer mechanisms of research results**

Develop **stakeholder training**, stakeholder trust and professional attractiveness of the sector



SÉGUR
NUMÉRIQUE

Generalize the smooth and secure sharing of health data
between healthcare professionals and with the patient



Historic investment

2 billion euros

- **1.4 billion** for the sharing of health data (over 3 years)
- **600 million** dedicated to the medical-social sector (over 5 years)

100% funded by the European Recovery and Resilience Plan

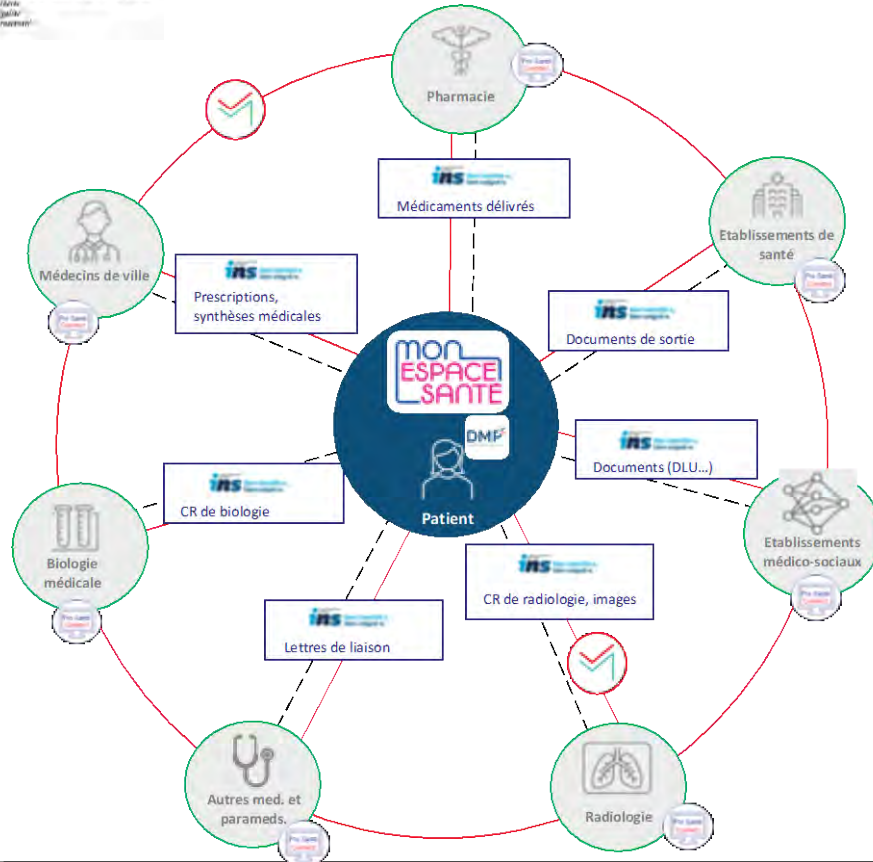


Disruptive ambition

Move from 10 million empty DMPs to **65 million systematically populated My Health Spaces**

- Increase from 6M to **250M** digital documents exchanged per year (x 40)
- Move from 0.1 document to **4 documents per person per year**

Priority actions focused on key documents of the care pathway



Hôpital

- ES publics et privés (MCO, SSR, Psy)
- Logiciels DPI, PFI, RI
- Docs : LDL / CRO / Prescription

Médecins de ville

- Médecins de toutes spécialités, en cabinet libéral / centre de santé / MSP / structure SOS
- Logiciel LGC
- Docs : VSM / Prescriptions / LDL / Certif / Demande TLM / ...

Biologie médicale

- LBM de ville et hospitaliers
- Logiciels SGL + transcodeurs LOINC
- Docs : CR biologie médicale

Imagerie

- Structures d'imagerie de ville et hospitalières
- Logiciels RIS + DrimBox
- Docs : CR imagerie

Pharmacie

- Officines de ville
- Logiciel LGO
- Docs : CR entretien pharma / Bilans / Vaccination

Autres pros de santé

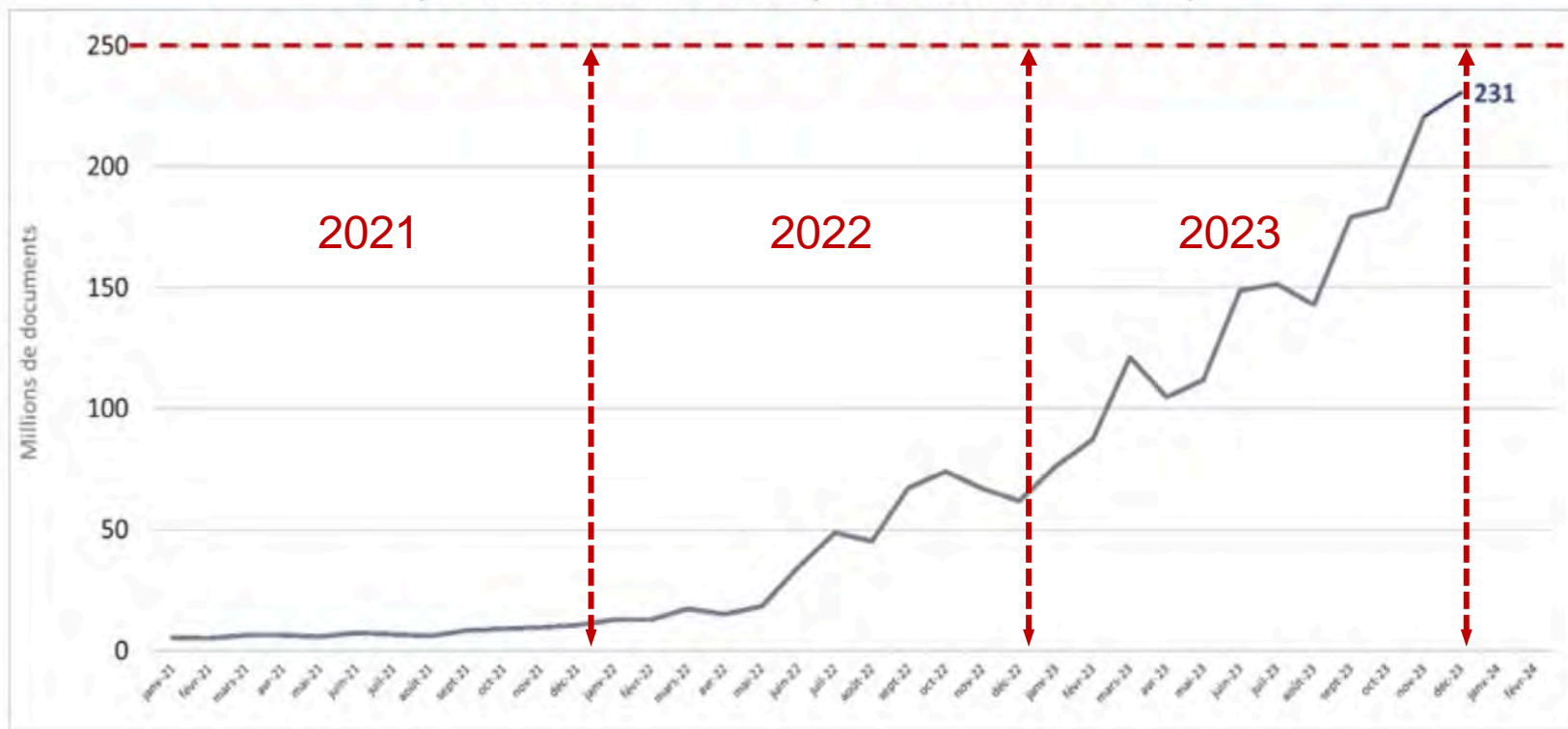
- SF, CF, IDE et autres paramédicaux en cabinet libéral / centre de santé / MSP
- Logiciel LGC
- Docs : XXX

Médico Social

- ESSMS PA, PH, Domicile, PDS, PDE
- Logiciel DUI
- Docs : PPA, DLU, ...

Rythme d'alimentation du DMP / Mon espace santé sur les 3 dernières années

(en millions de documents par an, flux mensuel x 12)



3 years later...



+ than **10** citizen workshops
 + than **4,400** people trained to help individuals on Mon Espace Santé

1 new remuneration standard for hospital digital profiles



A record investment in digital training for **350,000** health students

+ than **80%**

of healthcare facilities designated as Operators of Essential Services have enrolled in ANSSI's security programme



1 Multi-Terminology Server that already provides access to 12 terminologies and soon to SNOMED-CT (a standardised, multilingual vocabulary of clinical terminology)



1 laws
5 legislations
33 ordinances, decrees and orders



4 Tours de France

412 manufacturers have signed the "committed to eHealth" Charter

7 Digital Health Councils

+ than **150** press releases



1 eco-score imposed on Mon Espace Santé listing



1 secure citizen messaging system to exchange information with healthcare professionals



40 times + teleconsultations between 2019 and 2022 (142 times more at the peak of the pandemic)

SUMMARY

1 Draft Regulation for the European Health Data Space

16 European principles for the ethical standards of digital health

€2.7 billion Additional

2 times + as many people in the DNS and ANS, largely from insuring to replace consultants

More than **10 million** DMPs to approximately **65 million** Mon Espace Santé accounts

+ than **2.5 million** documents sent to DMPs each month, **four times more** than one year ago

+ than **1,600** healthcare facilities representing **70%** of the industry and more than **6,100** institutions. **15%** of the industry set to populate Mon Espace Santé and use secure messaging by the end of 2022

+ than **1 million** professionals in the RPPS, including nurses

The e-CPS app has already been adopted by nearly **300,000** professionals

Every month, **8 million** National Health IDs are recovered, **100 times more** than one year ago

1 Carte Vitale app is currently being deployed

1 national portal to help digital health entrepreneurs
9 calls for projects since the launch of the eHealth Acceleration Strategy

2 new sustainable ways for people to consult their healthcare bills digitally by the end of 2022



9 space suits



7 songs

SUMMARY



EU Digital COVID Certificate

+ than **20** digital Services created or adapted to combat COVID-19, including SI-DEP, which has collected more than 300 million real-time PCR and rapid lateral flow tests, peaking at several million per day.



50 Ségur listed software

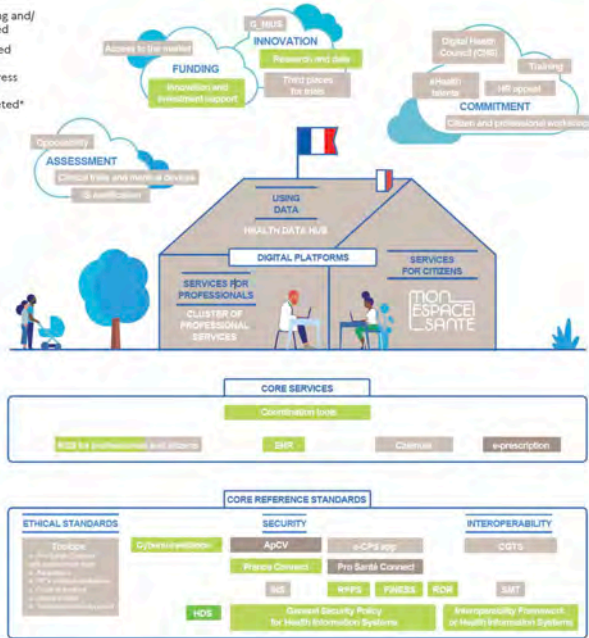
1 innovative funding model to roll out "Government as a platform" compliant software for all professionals



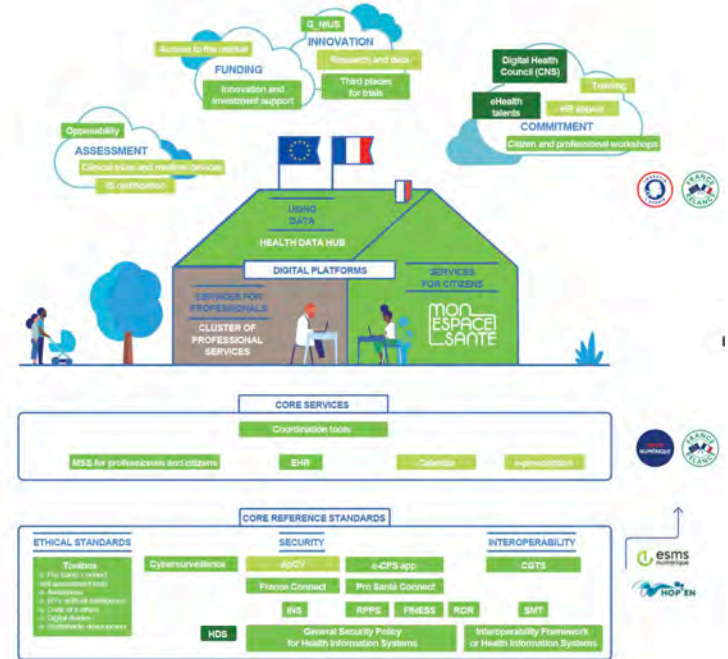
and lots more to come over the next few months!

3 years later

- Non-existent
- Emerging and/or stalled
- Launched
- In progress
- Completed*



*The developments in a digital product are never ending. But at this stage, we can assume that they are no longer substantial.



4. Second Digital Health Roadmap: 2023-2027

Building added-value digital services



Digital Health for healthcare professionals
and patients



2nd Digital Health Roadmap 2023-2027 : Supporting health through digital technology

- 4 focus areas
- 18 priorities
- 65 objectives

Based on **ethics, sovereignty and sustainability**

DIGITAL HEALTH ROADMAP 2023-2027 9

https://extranet.who.int/countryplanningcycles/sites/default/files/public_file_rep/FRA_France_Digital-Health-Roadmap_2023-2027.Pdf

Prevention



**Developing prevention
and giving everyone an
active role in their own
health**

5 priorities

20 objectives

- 1) Use Mon espace santé in everyday life to manage one's health
- 2) Develop personalized prevention
- 3) Give everyone an active role in their own health and control of their data
- 4) Help all citizens make use of digital health, especially those in the most precarious and vulnerable situations
- 5) Ensure that everyone actually benefits from digital health innovations

Patient care



**Freeing up time for
healthcare professionals
and improving patient
care thanks to digital
technology**

5 priorities

16 objectives

- 1) Enable professionals to access the health history of their patients
- 2) Improve both integration and ergonomics of core services in the tools healthcare professionals are using on a daily basis
- 3) Roll out the services package for professionals, the e-prescription and secure login methods for healthcare professionals
- 4) Simplify the tools for local coordination of healthcare programs
- 5) Improve digital health training of healthcare professionals, and medico-social care professionals

Access to healthcare



Improving access to information about where and which healthcare is delivered to people and professionals

4 priorities

11 objectives

- 1) Improve information of patients and professionals about health and healthcare provision in local authorities
- 2) Develop the use of telehealth within a regulated and ethical framework
- 3) Promote and interlink digital platforms for medical regulation and emergency care
- 4) Extensively promote the *Carte Vitale* application and the national Health ID (*INS*)

Building a supportive framework



Building a framework that supports the development of digital health solutions and the promotion of digital health innovation in healthcare

4 priorities

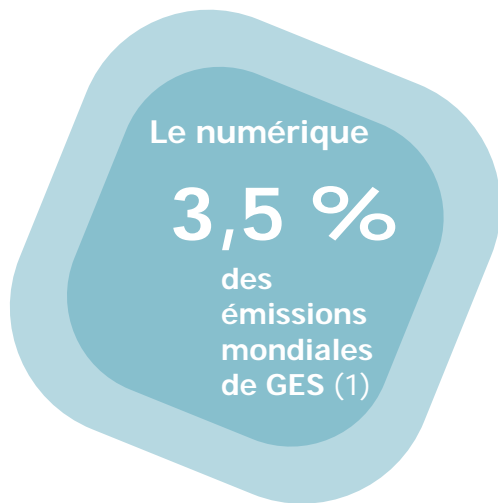
11 objectives

- 1) Majorly improve cyber in clinical settings, sovereignty on hosting and resilience to future health crises
- 2) Mainstream the co-construction of requirements and frameworks, sector by sector, and ensuring conformity of the solutions used by healthcare stakeholders
- 3) Attract digital talents into the healthcare sector
- 4) Develop health research and the secondary use of health data

5. Going forward

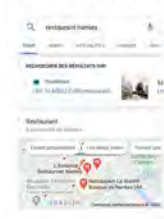
Conclusions

- Digital Ségur program
 - Allowed to finance software developers (improving software maturity) and healthcare professionals (feeding MES)
 - But, non-permanent financing, although allowed to launch new usages with the hope that they could become part of everyday practice
 - 2025 will be the last year
- Next step for MES, increasing usages
- Interoperability is not a key issue because of MES, however framework based on HL7 CDA R2 N3 and FHIR (to come)
- Cybersecurity : CaRe program (budget of 250 Meuros in 2024 and 2025, for a total budget of 750 Meuros up to 2027)
- Training of health and engineering students

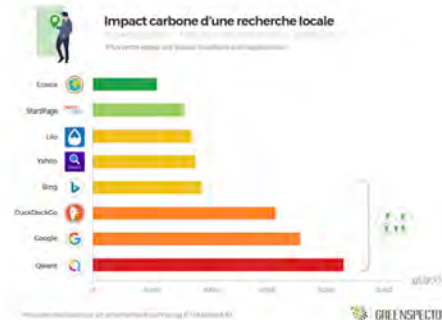


A Google search generates 7 grams of CO₂.
 10 Google searches > 1 km on a scooter (62 g).
 (Alex Wissner-Gross, professor at Harvard, Jul 18, 2022)

Recherche locale, l'impact carbone d'une carte interactive



Pour ce scénario, nous lançons une recherche locale aussi appelée « de proximité ». Les mots-clés « Restaurant Nantes » sont recherchés, la plupart des moteurs affichent alors une carte interactive avec une sélection de restaurants.



It is estimated that Google receives 80,000 queries per second, or 6.9 billion queries per day.
 Nearly 93% of all Internet traffic comes from search engines. (Source: *Blog du modérateur*).

(1) Le Shift Project « IMPACT ENVIRONNEMENTAL DU NUMÉRIQUE : TENDANCES À 5 ANS ET GOUVERNANCE DE LA 5G »
<https://theshiftproject.org/article/impact-environnemental-du-numerique-5g-nouvelle-etude-du-shift/>

Le numérique

3,5 %

des
émissions
mondiales
de GES (1)

LES CHIFFRES CHOCS DE LA POLLUTION NUMÉRIQUE

L'ORDINATEUR, UN POIDS LOURD ENVIRONNEMENTAL



240 kg de combustibles fossiles

22 kg de produits chimiques

1,5 tonne d'eau

VIDEO, MAIL, TÉLÉPHONE... UNE CONSOMMATION HYPER POLLUANTE

L'envoi d'un mail avec
pièce jointe



Une ampoule allumée
pendant 24 h

Les mails pro de 100
salarié.e.s pendant un an



13 allers-retours
Paris - New-York

INTERNET POLLUE AUTANT QU'UN GRAND PAYS INDUSTRIEL

Sixième plus gros pays
consommateur d'énergie

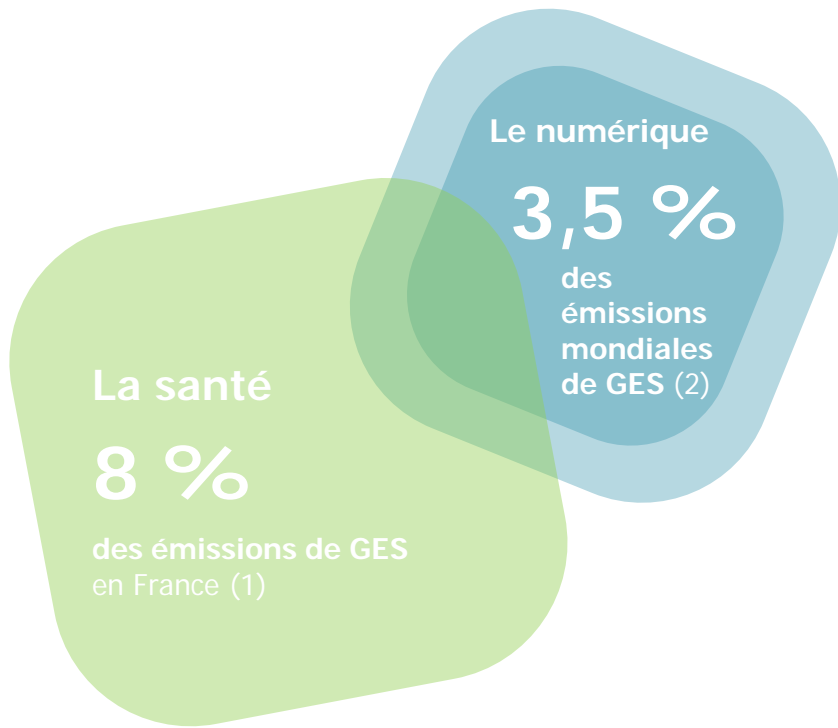


En 2019, le secteur numérique
polluera plus que l'aviation

Chaque heure, 10 milliards d'emails
sont envoyés



The challenge is to reconcile ecological emergency with large-scale deployment of digital health



The value of digital healthcare is linked to its deployment and adoption by professionals

Increased use of digital health mechanically increases the environmental footprint

+ 60% by 2040 representing almost 7% of the national carbon footprint (3)

Microsoft chooses infamous nuclear site for AI power

20 September 2024

Share ◀ Save +

Natalie Sherman
BBC News



America's Three Mile Island energy plant, the site of the worst nuclear accident in US history, is preparing to reopen as Microsoft looks for ways to satisfy its growing energy needs.

The tech giant said it had signed a [20-year deal](#) to purchase power from the Pennsylvania plant, which would reopen in 2028 after improvements.

WINDOWS 11 LOOMING: E-WASTE AVALANCHE OR OPPORTUNITY FOR CHANGE?



The digital revolution has become the defining feature of our era, with sleek screens and a hyper-connected world woven into the fabric of our lives. But beneath the glow of progress lurks a growing shadow: the impending obsolescence of nearly 1 billion Windows 10 devices in 2025. This looming crisis raises a stark question: is the ICT sector truly aware of the environmental consequences of its tech advancements?

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