



Public value and guiding values of national digital health strategy in France

Simon Luca Lewerenz

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Henrique Manuel Gil Martins

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Abstracts

English

Digital health can enhance health outcomes and has become an even more important priority on health agendas. In Europe, more than 4 out of 5 states have a national digital health strategy (NDHS) or policy. Still, challenges persist in their adequate formulation and execution. This research aims to contribute to understanding if and how a NDHS can be enhanced using a “public value” lens. It does so by exploring different stakeholders’ perceptions of guiding values within the French NDHS. The study thematically analysed three focus group discussions involving 19 participants (n=19) from different backgrounds. Findings highlight persisting technical and cultural issues in France and uncover digital health-specific aspects of “public value”. Whilst public clients, health professionals, and private sector align on the necessity of ethics, interoperability, pragmatic considerations, patient-centricity, and coproduction, disparities arise regarding ethics, cultural change, and data. Hence, findings confirm the plurality of perceptions of “public value” among different stakeholders. With this, a framework of public values is developed to guide digital health policymakers, implementers, and developers. The main novel argument developed is the dual interplay of democratic and managerial value classes, in a context where digital health’s successful implementation and adoption are seen as hinging on adequate management and culture and the underlying values. This thesis proposed that the two value classes can respectively foster trust and performance, two complementary and measurable values. Ultimately, the “public value” lens appears well-tailored for further research in digital health strategy, and useful to guide adequate digital health implementation and adoption.

Author: Simon Luca Lewerenz

Keywords: public value; values; strategy; public policy; digital health; ehealth; health; healthcare.

Português

A saúde digital pode melhorar os resultados em saúde e é cada vez mais uma prioridade nas agendas da saúde. Na Europa, mais de 4 em cada 5 Estados têm uma estratégia nacional de saúde digital (NDHS), mas persistem desafios na sua formulação e execução. Este trabalho visa contribuir para a compreensão se e como uma NDHS pode melhorar pelo uso de uma perspectiva de "valor público", explorando as diferentes percepções de stakeholders sobre os valores orientadores da NDHS francesa. O estudo utilizou técnica de *focus group* envolvendo 19 participantes (n=19). Os resultados destacam questões técnicas e culturais persistentes e revelam aspetos específicos de "valor público" na saúde digital. Enquanto clientes públicos, profissionais de saúde e setor privado estão alinhados sobre a necessidade de ética, interoperabilidade, pragmatismo, centralidade no paciente e coprodução, mas divergem em relação alguns aspetos éticos, sobre mudança cultural e dados. Os resultados confirmam a pluralidade de percepções de "valor público" entre os diferentes stakeholders. É desenvolvida uma *framework* de "valor público" para orientar os formuladores e executores de políticas de saúde digital. O principal argumento inovador desenvolvido é a dupla interação entre classes de valor democráticos e de gestão. Esta tese propôs que as duas classes de valor podem, respetivamente, fomentar a confiança e o desempenho, dois valores complementares e mensuráveis. Em última análise, a lente do "valor público" parece bem adaptada para pesquisas futuras em estratégia de saúde digital, e útil para orientar a implementação e adoção adequadas de saúde digital.

Autor: Simon Luca Lewerenz

Palavras-chave: valor público; valores; estratégia; políticas públicas; saúde digital; saúde.

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List of abbreviations

AI	Artificial Intelligence
DH	Digital Health
DHS	Digital Health System
DMP	Dossier Médical Partagé
EHDS	EU Health Data Space
EHR	Electronic Health Record
EU	European Union
FG	Focus Group
FHIR	Fast Healthcare Interoperability Resources
GaaP	Government as a Platform
GDPR	General Data Protection Regulation
HL7	Health Level Seven
HP	Health Professionals
ICT	Information and Communications Technologies
IT	Information Technology
MSS	Messageries Sécurisées de Santé
NDHS	National Digital Health strategy
NOC	Networks of Care
NHS	National Health Service
OECD	Organisation for Economic Co-operation and Development
PBC	Public Clients
PRV	Private Sector
RQ	Research Question
UHC	Universal Health Coverage
UK	United Kingdom
WHO	World Health Organization

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“Digital health research will create most value [...] by helping health systems to anticipate and understand the person-centred effects of technology changes and by advocating strongly for the autonomy, rights and safety of consumers in a healthcare landscape in which technology will play an ever-greater role.”

–Huckvale et al. (2019, p.3).

1. Introduction

Digital health can help health systems shift towards preventing adverse health conditions instead of solely curing them (Goujard, 2018; Isaac, 2014; Martins, 2020). Precisely, it has “proven potential to enhance health outcomes by improving medical diagnosis, data-based treatment decisions, digital therapeutics, clinical trials, self-management of care and person-centred care as well as creating more evidence-based knowledge, skills and competence for professionals to support health care” (World Health Organization, 2021, p.8).

In a post-pandemic era, digital health has become an even more important priority on national and global health agendas (World Health Organization, 2023; World Health Assembly, 2018). In Europe, more than 4 out of 5 states have a national digital health policy or strategy (World Health Organization, 2023, p.9). Digital health also interests actors of economic cooperation such as the Organisation for Economic Co-operation and Development (OECD, 2023a).

According to the World Health Organization (WHO), digital health refers to “the field of knowledge and practice associated with the development and use of digital technologies to improve health [, expanding] the concept of eHealth to include digital consumers, with a wider range of smart and connected devices [and] other uses of digital technologies for health such as the Internet of Things, advanced computing, big data analytics, artificial intelligence including machine learning, and robotics” (World Health Organization, 2021, p.11). EHealth is “the application of information and communications technologies (ICT) across the whole range of functions that affect healthcare, from diagnosis to follow-up” (Silber, 2003); MHealth is “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants, and other wireless devices” (Ryu, 2012). In this research, the term “digital health” (DH) is used as encompassing both eHealth and mHealth (Chan, 2021).

Countries are progressively integrating digital health systems (DHS). These are models redefining traditional healthcare, fundamentally shifting toward minimising the need for care using digital tools and citizen engagement, emphasising prevention, patient empowerment, and data security (Martins, 2020). Transforming health systems is challenging and requires

orchestrating dedicated initiatives¹. “A genuine health transformation powered by health data and digital tools is a political choice”, asserts the OECD (2023b), stressing the critical role of decisionmakers. Examples of policies and strategies published in recent years are the WHO’s (2021) *Global Strategy on Digital Health 2020-2025*, the WHO Regional Committee for Europe’s (2022) *Regional Digital Health Action Plan 2023–2030*, and the European Union’s (EU) eHealth Network². Collaborative efforts such as those led by the WHO or the EU drive international harmonisation. Nevertheless, it is governments’ responsibility to formulate and execute national strategies, and many countries still require support to do so (World Health Organization, 2021, p.8).

France has a history of embracing digital solutions for healthcare, formally adopting electronic health records (EHR)³ in 2004⁴. French political decision-makers have turned to digital technologies for their perceived cost-saving benefits, and as balancing tools between political risk and policy pursuit (Bérut & Saurugger, 2023). However, until recently, DH was only briefly mentioned in subsections of the broader National Health Strategy (Ministère des Solidarités et de la Santé, 2018). Today, France has a dedicated strategy: the *Digital Health Roadmap 2023-2027* (Ministère de la Santé et de la Prévention, 2023)⁵.

Countries having adopted a national digital health strategy (NDHS) need to continuously optimise its execution and effectiveness: a strategy is not a one-time application, and its implementation is as important as its development. Until today, France encountered several problems relating among others to interoperability, security, and culture (Bourret, 2018; Manard et al., 2019). There are grounds to investigate if issues persist within the current NDHS and how to address them. This research aims to contribute to understanding if and how NDHSs, in particular the French, can be enhanced using a public value perspective (Moore, 1995).

Exploring perceptions of public values within the NDHS could prove valuable for policymakers to enhance strategy implementation, evaluation and refinement by aligning with stakeholder needs. Additionally, uncovering digital health-specific aspects of public value

¹ See the *National eHealth Strategy Toolkit* by the WHO & International Telecommunication Union (2012).

² See Directive 2011/24/EU, Article 14 (European Parliament, 2011).

³ EHRs are digitalised records that store patients' health information (Gunter & Terry, 2005).

⁴ Law n°2004-810 (Loi n° 2004-810 du 13 août 2004 relative à l'assurance maladie, 2004).

⁵ Also see the Digital Health Doctrine (Agence du Numérique en Santé, 2023).

could open new research avenues. This research aims at producing a framework of public values useful for the analysis of a NDHS. It is guided by the following research questions (RQs):

RQ1. What are different stakeholders' perceptions about the French NDHS's guiding values?

RQ2. Can public value analysis be used to enhance the NDHS?

2. Background

Information is provided for understanding this research's background and theoretical approach. Public strategy is defined, a relevant framework is presented, before reviewing the concept of public values. The French context is then discussed, and guiding values of the French NDHS are identified. Finally, the working model delimiting the boundaries of the study is outlined.

2.1. Public strategy

We consider strategy from when it expanded into the contemporary private sector, from the mid-20th century onwards (Ansoff, 1965). Distinguishing strategy from a simple goal, Rumelt (2017) describes it as “a coherent set of analyses, concepts, policies, arguments, and actions that respond to a high-stakes challenge” (p.7). Strategic management approaches were argued to have significance in modern public organisations (Ferlie and Ongaro, 2022). Since the 1970s, efforts have been made to transfer private sector strategy theories to the public sector. The New Public Management model (Hood, 1991) has been a prominent example, but various models describing strategic management exist (David, 2011; Gamble & Thompson, 2009 ; Wheelen & Hunger, 2002).

We understand public strategy as "a concrete approach to aligning the aspirations and capabilities of public organizations or other entities to achieve goals and create public value" (Bryson & George, 2020, p.3). This definition introduces the idea of public value (Moore, 1995). Whilst public value was first misunderstood as a public sector counterpart to private sector's shareholder value, Van Dijck et al. (2018) define it as “the value that an organization contributes to society to benefit the common good” (p.22). Government is seen as an active shaper of the public sphere across political, economic, social, and cultural dimensions (Benington & Moore, 2011; Harvard Kennedy School Executive Education, 2019). The primary goal of public administration is argued to be to address the different issues that are of greatest concern to the public (Kelly et al., 2002). Various conceptualisations of public value were developed, for instance based on psychological constructs, demonstrating the wide range of possible approaches (Meynhardt, 2009).

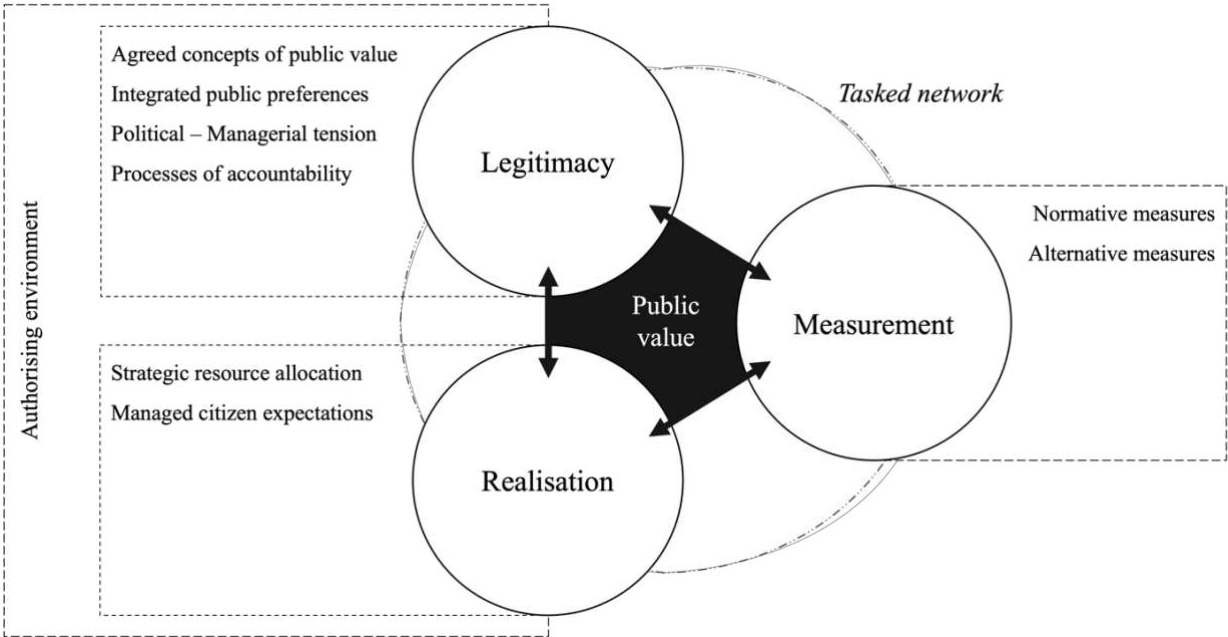
2.2. Relevant public value framework

Recognising public sector’s unique characteristics, it has been argued that the public value paradigm offers the most suitable foundation for studying public sector strategy (Stoker, 2006; Alford and Greve, 2017). DHS are, inherently, networks (Pasha & Shah, 2018). Additionally, there exists a notion of Networks of Care (NOC) that was developed with similarities to the public value framework (Carmone et al., 2020). Hence, the public value paradigm is highly relevant in DHS-related contexts. In fact, early on, United Kingdom's (UK) public organisations related public value to eHealth (Bend, 2004). Recently, it was used to examine the National Health Service (NHS)’ data (Wilson et al., 2020).

We find useful to consider Horner & Hutton’s (2011) framework. It considers the public value paradigm in contemporary networked environments where stakeholder participation is significant. Note the amendment performed: the collaborating organisations striving to realise public value are referred to as the “tasked network”. This results in the adapted strategic triangle shown in Figure 2.1.

Figure 2.1

The Public Value Realisation Dynamic for Tasked Networks



Source: Adapted from Horner & Hutton (2011, p.120)

In this framework, the legitimacy of the tasked network is established when the actors within the authorising environment reach consensus on the definition of the public value to be realised.. Tension can arise between political mandates and managerial constraints. Additionally, legitimacy is when accountability mechanisms are in place. Resources, which can be public or private, are managerial tools empowering network members with strategic responsibilities.

In health systems, operational capabilities encompass the abilities of those organisations responsible for the administration and execution of healthcare services, and extend to resources within the private sector, healthcare professionals, and the broader population (Tritter, 2011). Using the case of the UK's NHS, Tritter (2011) concluded that public reforms, restructuring, and health policies that engage patients in influencing public organisations and health delivery must involve defining a common "value mission", which he defined as "the production of better health for users" (p.160).

2.3. Public values

Scholars like Warner et al. (2021) argue that public value conceptualisation includes diverse perspectives from various publics rather than a single unified conception, thereby acknowledging the existence of multiple public values. Fukumoto and Bozeman (2019) affirm that public values should define government policies, recognising that public decisions should align with the values and interests of public's stakeholders (Kelly et al., 2002).

Albeit difficult to perfectly encapsulate in a definition, for our context we will see in *public values*, or in *a value*, "a mode of behaviour, either a way of doing things or an attribute of a way of doing things, that is held to be right" by people and organisations (Bannister & Connolly 2014). Bannister & Connolly (2014) distinguish between values, ethics and principles. Ethics primarily deals with matters of morality, concerning questions of right and wrong. Principles have a more comprehensive scope, encompassing foundational beliefs and fundamental rules. Values go beyond traditional ethics, in a broader understanding of what is considered "right". The two authors illustrate by the expectation for public servants to be efficient, which is a matter of practicality rather than morality, hence, a matter of value rather than ethics. For our context, we will understand values by relation to either matters of management or matters of ethics, (see Section 2.5), where ethics are the continuation of democratic principles (Bonina & Cordella, 2009).

“[Public values] are the very stakes in the struggle over the organization of platform societies around the globe.” –Van Dijck et al. (2018).

Public values can carry complexity. They are held by individuals within a public, whether individually or collectively (Witesman, 2016). They carry aspects of subjectivity, multiplicity, and conflicts between oneself and one-another (Van der Wal & Van Hout, 2009). Their definitions vary over time and context (Kerkhoff, 2016). They might imply tensions, compromises, and tradeoffs, both individually and inter-values (Lerzynski, 2021; Tran & Nguyen, 2021).

In health systems, public values are increasingly considered for strategic decision-making such as priority setting and resource allocation (Baker et al., 2021). In healthcare policymaking, using public value evaluation and including a broad range of values can prove beneficial (Jones, 2022). In practice, aligning guiding values was deemed crucial in developing DH strategies, demonstrating the relevance of public values (Cohen et al. 2022).

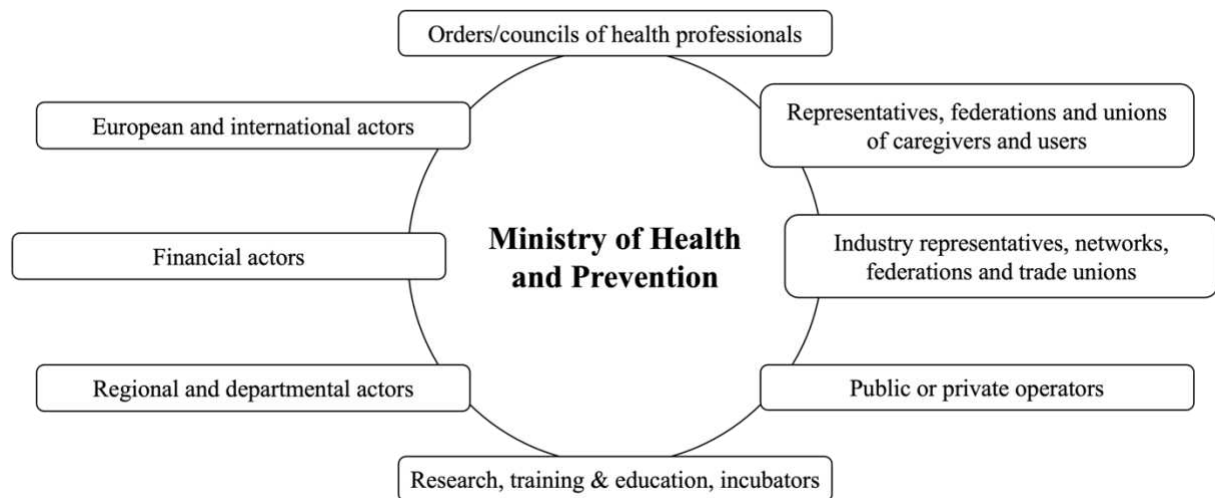
2.4. The French public value context

France is an especially fertile ground for studying public value: the concept of common interest is grounded in its history, politics, and law and is considered the ultimate goal of public action (Even, 2014; Pénigaud de Mourgues, 2017). Whilst public value models have mainly been practiced in Westminster systems, there is an opportunity to study its applicability in different political settings such as the French semi-presidential regime (Elgie, 2003).

France has integrated the concept of Government as a Platform (GaaP) into its DH strategy (Agence du Numérique en Santé, 2023). GaaP represents an approach to public governance inspired by the "lean start-up" model, considering market needs rather than imposing products/services onto it (O'Reilly, 2011). France's adoption of GaaP within its NDHS provides a valuable context for studying it from the public value perspective (Cordella & Paletti, 2019).

Figure 2.2

The Authorising Environment of the French Digital Health Strategy



Source: Agence Du Numérique En Santé (n.d.).

There is a hierarchy among organisations collaborating for public value creation (Tritter, 2011). In France, the lead organisation is the Ministry of Health and Prevention, responsible for defining the national strategy and assigning implementation responsibilities. The ministry collaborates with a myriad of partners, as shown in Figure 2.2 (also see Appendix 1). Dedicated bodies include the Ministerial Delegation for Digital Health (DNS)⁶, with a strategic planning role, and the national Digital Health Agency (ANS)⁷, focusing on operational aspects.

During its Presidency of the Council of the European Union in 2022, France led the adoption of European ethical principles for digital health, highlighting the political relevance given to such values (Ministère de la Santé et de la Prévention, 2022).

2.5. Guiding values of the French national digital health strategy

For the purpose of this study, five guiding values were identified from the French NDHS policy documents. They are: ethics, sustainability, interoperability, security, sovereignty. These are non-exhaustive. We understand values by relation to either matters of management or matters of democracy (Bonina & Cordella, 2009). At first sight, sustainability, interoperability,

⁶ Délégation ministérielle au Numérique en Santé

⁷ Agence du Numérique en Santé

security, and sovereignty seem to be associated rather with management practices, while ethics represents democratic moral principles.

Ethics

“Freedom is the ontological condition of ethics. But ethics is the considered form that freedom takes when it is informed by reflection” –Foucault (1997).

Ethics are a democratic societal concern, defining and regulating acceptable moral behavior. They prove highly relevant in management practice, as unethical behavior can have severe consequences (Morahan, 2015). Promoting ethical practices in DH is important for supporting its inclusive development and wider acceptance (Landers et al., 2023). Particularly, incorporating ethics in DH strategy can realise public value by ensuring fairness, access, informed consent, and protection of data (Brall et al., 2019).

Sustainability

Sustainability refers to the ability to create long-lasting outcomes benefitting society (Moore, 2013). Many DH projects have failed to translate into routine services, highlighting the complexities of implementation and the need for a focus on durability (McCool et al., 2020). Sustaining DH solutions is purported to require a shift in thinking and practice, focusing on their integration into the delivery of healthcare services (Cripps & Scarbrough, 2022). This accent on hands-on integration justifies classifying sustainability as a managerial value.

Interoperability

DH bear characteristics which require interoperability and demand for defragmentation in health information system landscapes (Scheplitz, 2023). Interoperability refers to the ability of different systems and formats to exchange and use data seamlessly, enabling a connected and efficient healthcare ecosystem (Seneviratne, 2023). In Europe, the lack of adherence to well-known standards and guidelines by different products and solutions in the market is barring the way to interoperability (Kouroubali & Katehakis, 2022). Interoperability’s operational dimension explain its classification as a managerial value.

Security

The prominence taken by health data comes in pair with security risks. For example, DH solutions for remote patient monitoring and health record-keeping require access control and encryption management to protect the privacy and authenticity of patient data (Tahir, 2023). Security in the context of DH translates to measures taken to protect healthcare organisations

and systems from cyberattacks and ensure the safety and security of patient data. It is purported to be a value creation lever, not only a source of costs (Alami et al., 2019). It is argued that health organisations must embrace a culture of security by developing strategies that incorporate legal requirements and industry standards to protect patient information (Loumbas & Peters, 2022). The technicalities inherent to security explain its classification as a managerial value.

Sovereignty

In a similar vein, DH raises sovereignty concerns for data, e.g., in innovation or research. Sovereignty in the context of DH refers to the control and ownership of personal health data by individuals or healthcare systems (Pierri & Herlo, 2021). Whilst the EU information security policy recognizes the importance of digital sovereignty, it limits “Westphalian” (state) sovereignty within the framework of an integration structure for certain uses (Zinovieva & Bulva, 2021). In DH, data fundamentalism raises concerns about transparency and patient engagement (Pierri & Herlo, 2021). State sovereignty and links to data justify its classification under managerial values.

2.6. Mapping the French public

We consider that the target of the French NDHS is the French public⁸. A public is a group of people brought together by organisations in government, markets, or by shared values (Crouch, 2011). The French public is a standalone polity given the collective identity of its members, the presence of institutionalised social connections and collective resource mobilisation (Ferguson & Mansbach, 1996).

Since investigating public values often result in preference heterogeneity, or what Baker et al. (2021) labelled “plurality”, different stakeholders should be studied separately rather than collectively. This allows uncovering perspectives that might not surface in a combined setting. This is crucial to ensure strategies are tailored to stakeholder needs and adaptive.

Inside the French public, there exist numerous stakeholders, as exemplified with Figure 2.2. For the sake of this research, three sub-groups were identified. The first is public clients,

⁸ In our context, *the French public* is not limited to individuals with French nationality given that the French NDHS impacts anyone, including non-French citizens, who accesses health services influenced by it.

using Alford's (2002; 2009) work on the concept. Public clients are individuals who interact with public organisations, receiving services or benefits from them. They can be either paying customers, or beneficiaries not directly paying for services. Alford (2002) argues that public administrators need to be responsive to public clients even if they are not paying customers, to foster desired contributions and provide public value. This includes meeting both material and intangible needs. Public clients exclude individuals who do not cooperate with public organisations under a social exchange dynamic.

Under *public clients*, we distinguish two sub-groups, *health professionals* and *private sector*, based on professional practice. The idea of defining groups based on practice can be traced back to Wenger's (1999; 2000) idea of "communities of practice". These consist of individuals adhering to common norms, interacting with each other, and sharing resources to achieve common objectives (Li et al., 2009). Communities of practice naturally appealed to the healthcare sector: with the rise of social media, healthcare professionals have created virtual communities of practice (Ranmuthugala et al., 2011; Rolls et al. 2016; Shaw et al., 2022). They were identified in the UK's NHS (Bate & Robert, 2002). At European level, they promote international cooperation such as with the HL7-powered FHIR⁹.

Similarly, sub-group *private sector* includes businesspeople with a common interest in DH and characteristics of collective learning and shared repertoire of resources (Wenger, 2011). Given their crucial role, engaging the private sector has been embraced by international bodies (World Health Assembly, 2016). In France, the DH private sector is represented by industry advocacy initiatives such as "Numeum" or "France Digitale".

For our purpose, all *health professionals* and *private sector* members are public clients, but all members of *public clients* are not *healthcare professionals* nor *private sector*. Considering these groups forms a simplified proxy for representing the French public's structure.

⁹ HL7 is a global standards initiative for health data exchange; FHIR being one of such standards (see <https://www.hospitalsonfhir.eu/home>).

2.7. Working model

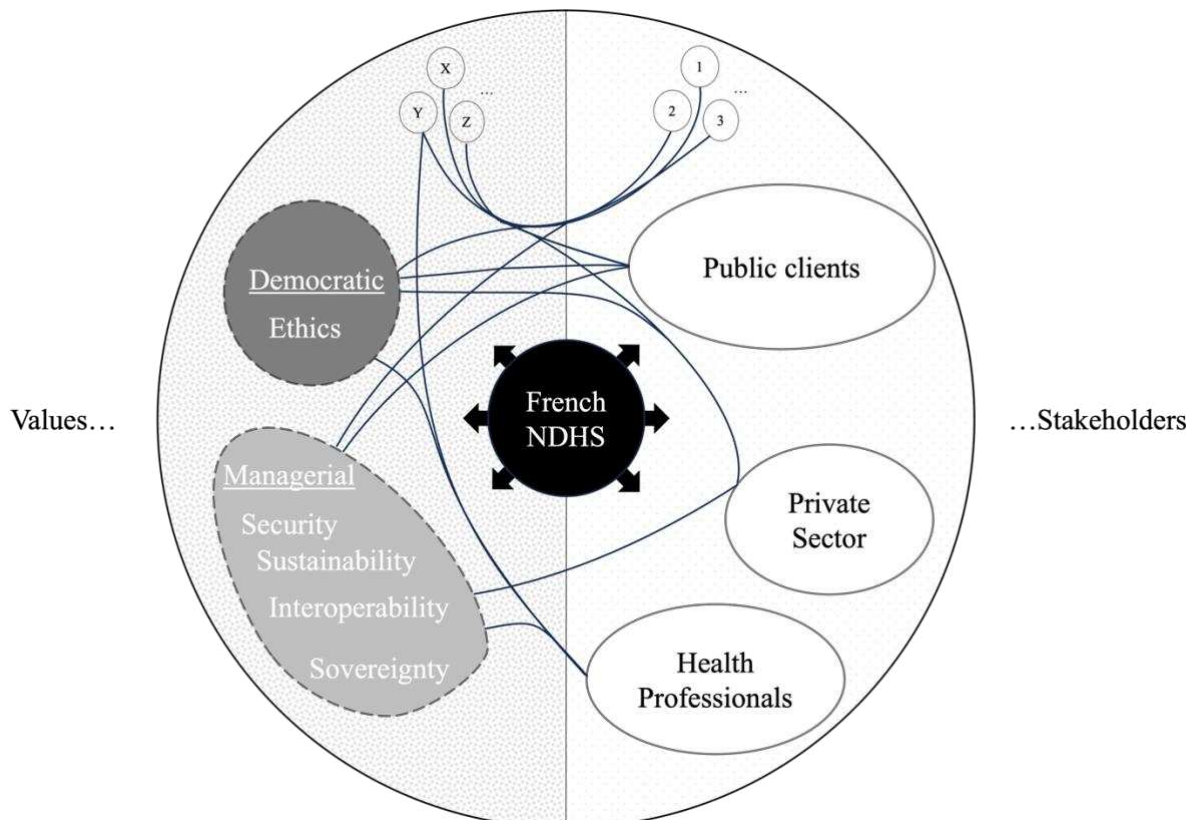
The background presented above leads to this research's working model. It is illustrated in Figure 2.3. It functions as the theoretical foundation for the study to ultimately produce an empirically based contextual framework of public values.

To understand public value further, it is necessary to deep dive into the public values that compose it. This working model dives deeper into the core of the framework presented in section 2.2 (see Figure 2.1) which depicts the environment enabling public value realisation and is used as our model's prerequisite.

In this theoretical model, the French NDHS targets the French public, encompassing stakeholders and public values. These are interrelated, since stakeholders have diverse perceptions of values, and values influence stakeholders back. The model maps stakeholders into three main groups (public clients; health professionals; private sector), and values into two main classes (democratic; managerial). Note that a myriad of values probably exist, and stakeholders could be divided into further groups, as seen in Figure 2.2, but for the sake of our purpose this model suffices.

Figure 2.3

Working Model: The French National Digital Health Public Values Environment



3. Methodology

The methodological approach followed by this research is outlined, including study design, study sample, content of focus groups, data collection, data analysis, addressing potential biases, and ethical considerations.

3.1. Study design

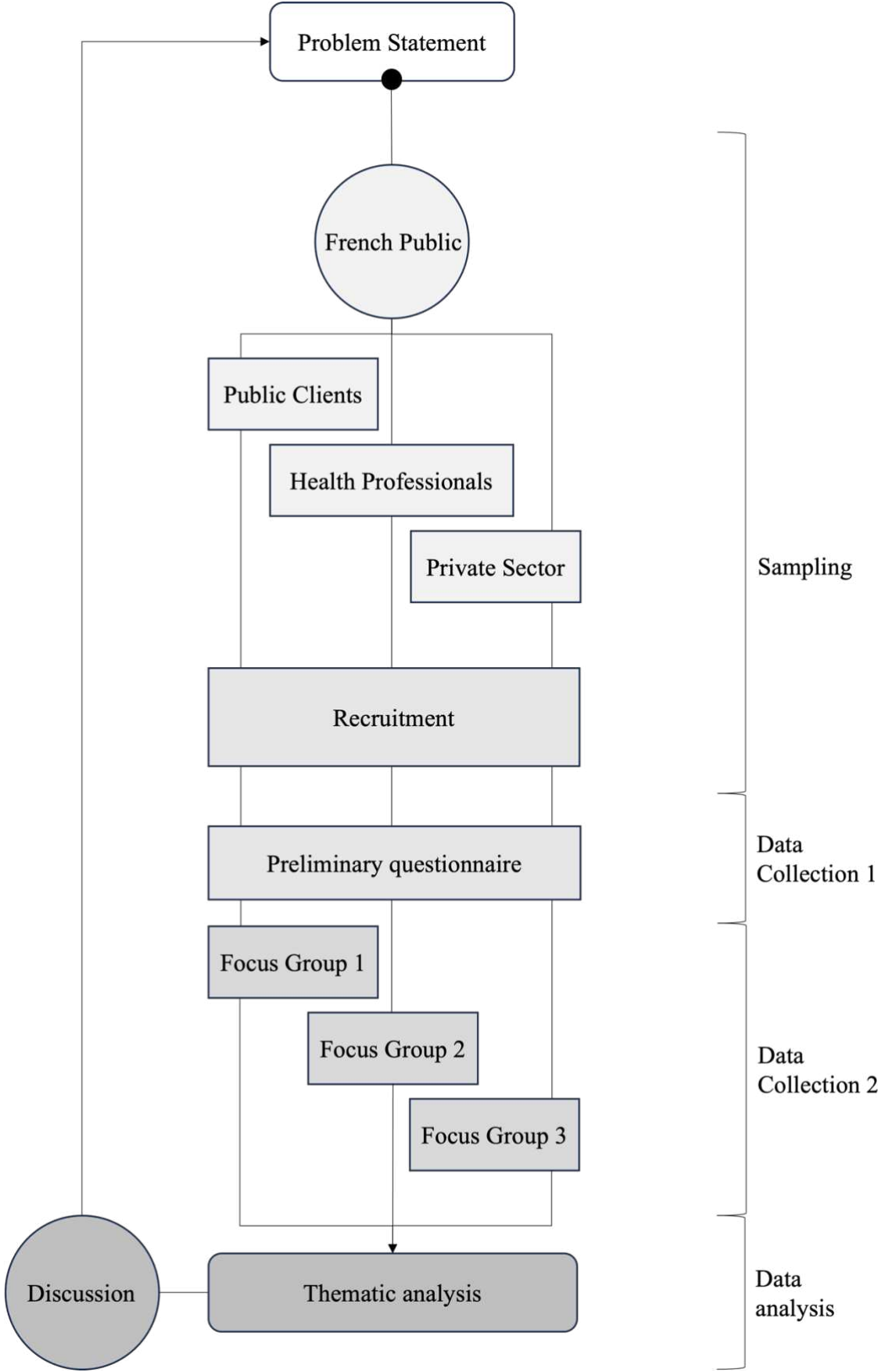
An overview of the study design is provided with Figure 3.1. The overall study approach was qualitative, with attention to trustworthiness (Guba, 1981). Study design, data collection and analysis were refined throughout, adapting to the data collected (Agius, 2013). A detailed checklist of consolidated criteria for reporting qualitative research can be found in Appendix 4 (Tong et al., 2007). Quantitative data was collected but served descriptive purposes mainly and was not subjected to significant statistical analysis.

This research used focus groups, allowing for both quantitative and qualitative data collection, respectively through live polling and interactive discussion. Surveying and discourse analysis are recognised methods to understand the values held by a public (Horner & Hutton, 2011). Prior to conducting the focus groups, a preliminary survey questionnaire collected informed consent and additional relevant data from participants.

Focus groups are semi-structured group discussions aiming to explore a given set of issues (Tong et al., 2007). In addition to voicing individual opinions, participants are also encouraged to engage with one another, producing guided group interactions (Krueger, 2014; Morgan, 1996a). This helps delve deeper into both their individual and shared perspectives regarding a particular matter (Morgan, 1996b). Contrary to surveys that aim to achieve statistical representation, focus groups tend to be of a smaller scale, sometimes consisting of as few as four participants (Tong et al., 2007). On average, two-to-three focus groups are likely to uncover 80% of themes on a topic (Guest et al., 2017). Conducting more could reduce efficiency and lead to theme saturation.

Focus groups are commonly conducted in health-related research to examine different stakeholders' perspectives (Tausch & Menold, 2016). They provide valuable evidence for decision-making in public health and can help anticipate responses to policy options, connecting them to underlying, contextual issues (Kahan, 2001; Willis et al., 2009).

Figure 3.1
Study Design Overview



3.2. Study sample

This study identified different stakeholder groups inside the French public: public clients (PBC), health professionals (HP), and private sector (PRV). Their inclusion and exclusion criteria are shown in Table 3.1. Each Focus Group (FG) was attributed a code name: “FG_PBC” refers to the FG with only participants from the PBC group, and so on. Kahan (2001) argued that, in research involving policy considerations, it is advantageous to enlist the services of informants. From elected representatives to family physicians, they have significant expertise in the subject matter and are capable of conveying the viewpoints of a larger public. Strategic recruitment of informants ensures the inclusion of a diverse array of perspectives and experiences in the ensuing discussions and can partly mitigate the reduced statistical representativeness of small sample sizes. This tactic was used for this study, with purposive sampling judging individuals’ fitness to the study and attempting to build a sample which could result in discovering most variations in findings (Guba, 1981; Moser & Korstjens, 2018; Strauss & Corbin, 1998).

Table 3.1

Inclusion and exclusion criteria of focus groups

Focus group code	Inclusion criteria	Exclusion criteria
FG_PBC	Individuals who access health services influenced by the French NDHS. Aged 18 and above. Validated ethical consideration measures put in place.	Not susceptible of being engaged by DH in France. Under the age of 18. Unable to validate ethical consideration measures put in place.
FG_HP	HP active in France (e.g., doctors, nurses, hospital managers etc.). Validated ethical consideration measures put in place.	Not active in France. Unable to validate ethical consideration measures put in place.
FG_PRV	Individuals working in the PRV in DH-or related-industries. Susceptible of engaging with DH in France. Validated ethical consideration measures put in place.	Not involved in the PRV or DH-related-industries. Not susceptible of engaging with DH in France. Unable to validate ethical consideration measures put in place.

Participant recruitment involved indirect and direct enquiry. Indirect enquiry involved sharing invitations to associations and federations who would forward them to their members. Paid advertising was not employed.

Direct enquiry involved extending invitations by LinkedIn direct message or email. The contact information of targeted recipients was obtained through public sources exclusively. Direct enquiry via LinkedIn used LinkedIn Recruiter Lite to target individuals which were deemed as having better chances of accepting to take part in the study. This approach carried some risk of bias due to specific interests in DH and risk of groupthink¹⁰ was recognised. Hence, an additional distribution list was built with email addresses from public sources, selected systematically (each “nth” address picked from sources) as a mitigation mechanism for aforementioned bias. It was expected to have a lower response rate.

In the first message of invitation, the recipients received essential information about the upcoming FG discussion. The content was fine-tuned progressively, but a representative message can be found in Appendix 2. It included the aim of the FG, expectations from participants, the possible dates of the FG, and extended an invitation to an optional preliminary interview. Where possible, a follow-up message was sent if there had been no response to the first inquiry.

Table 3.2 shows the numbers from the recruitment process. In total, 2 174 individuals were invited, out of which 518 were PBC, 1 602 were HP, and 54 were PRV. In turn, 32 total manifestations of interest were received, 23 of which became acceptances. Ultimately, 19 individuals ended up effectively taking part in the study. FG_PBC included 7 participants, FG_HP included 8, and FG_PRV included 4. The mean number of participants was 6,3 per group.

¹⁰ “Groupthink” is a phenomenon where a group’s desire for harmony or conformity leads to irrational decision-making processes that can suppress dissenting opinions or critical thinking, resulting in flawed or suboptimal outcomes (Janis, 1972).

Table 3.2*Focus Group Recruitment Figures*

	Invited ¹¹	Result			
		Not Interested ¹²	Interested	Accepted	Participants
PBC	518	506	12	9	7
HP	1 602	1 590	14	10	8
PRV	54	44	6	4	4
<i>Total</i>	<i>2 174</i>	<i>2 140</i>	<i>32</i>	<i>23</i>	<i>19</i>

In FG_PBC, the 7 participants were users and patients representatives of social and medical fragilities from disability and diabetes to specific conditions: inflammatory liver and biliary tract diseases, laryngectomy, and paediatric neurosurgery in France's leading paediatric hospital¹³.

In FG_HP, the 8 participants comprised roles of: general practitioner, emergency physician, anaesthetist and intensivist, dentist and DH expert, doctor and project manager coordinator, hospital director and healthcare executive.

In FG_PRV, the 4 participants spanned across DH-related activities: start-ups, hospitals, consulting, and IT systems.

Below, from Figure 3.2 to Figure 3.7, the aggregated demographics and other relevant data collected for the study are reported. The sample achieved to be satisfyingly varied across age groups¹⁴ and geographies. However, it was dominantly male gendered with a ratio of 3-to-1. One third of the sample had experienced discrimination in healthcare settings. While all 19 participants had experienced some form of DH, only 58% were familiar with one or more of the French NDHS policy documents.

¹¹ Individuals assumed to have received the invitation. An additional 423 emails resulted in delivery failure (PBC: 83; HP: 340; PRV: 0).

¹² Includes recipients who did not reply and those who forwarded the invitation to further individuals without interest in the study themselves.

¹³ Necker-Enfants Malades Hospital.

¹⁴ Average age group: 50-59; Median: 40-49; Range: 18-29 to 70+.

Figure 3.2

Sample Age Groups

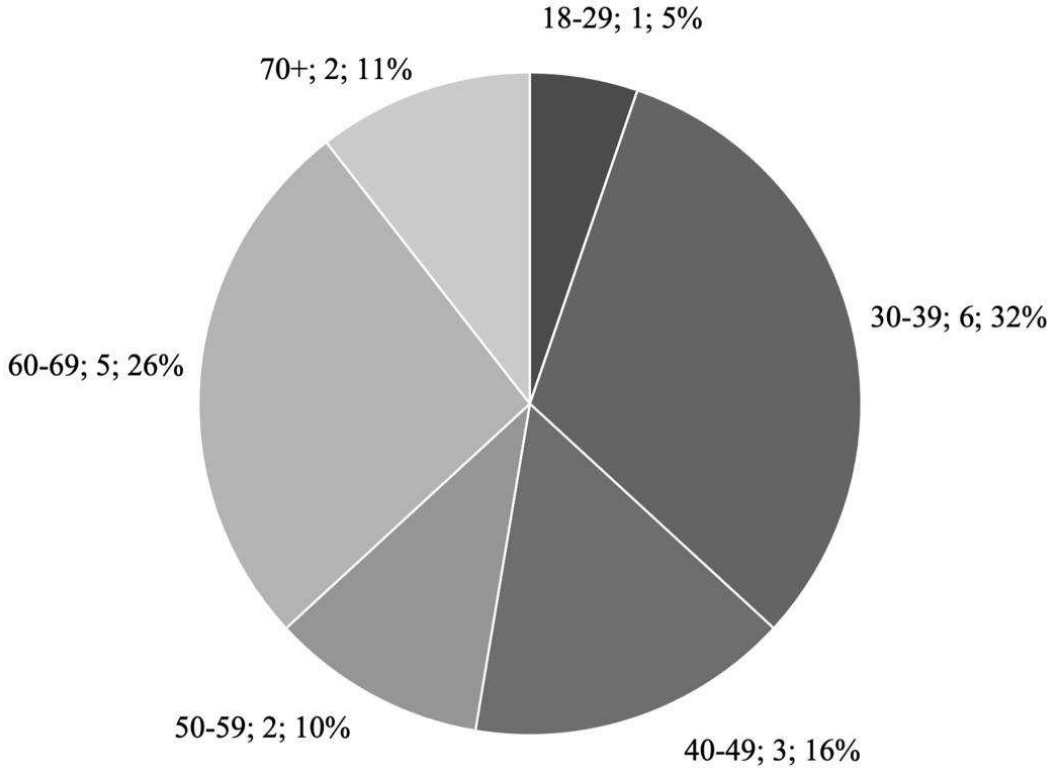


Figure 3.3

Sample Gender Distribution.

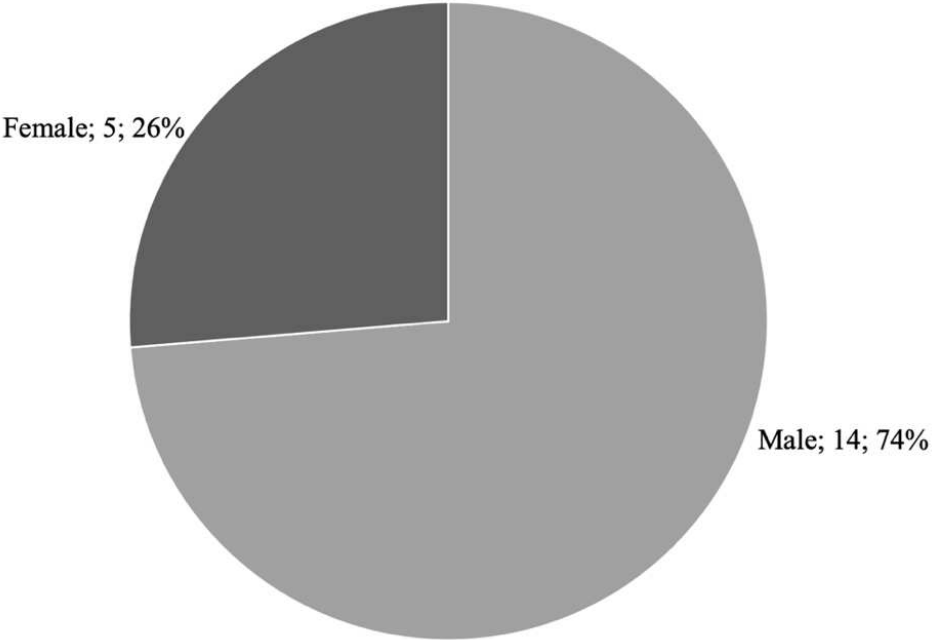


Figure 3.4

Sample Geographical Distribution

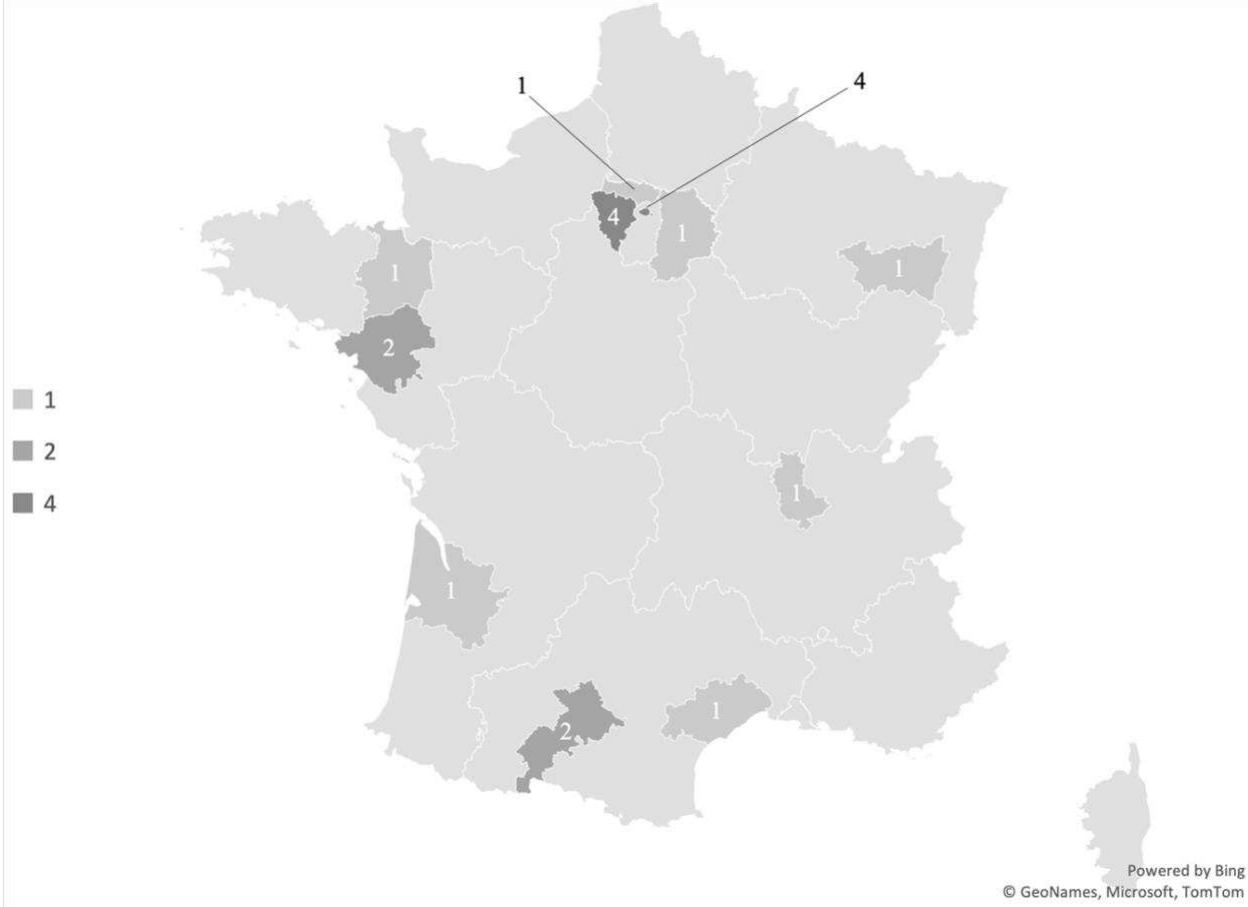


Figure 3.5

Sample Perception Bias: Discrimination in Healthcare Settings

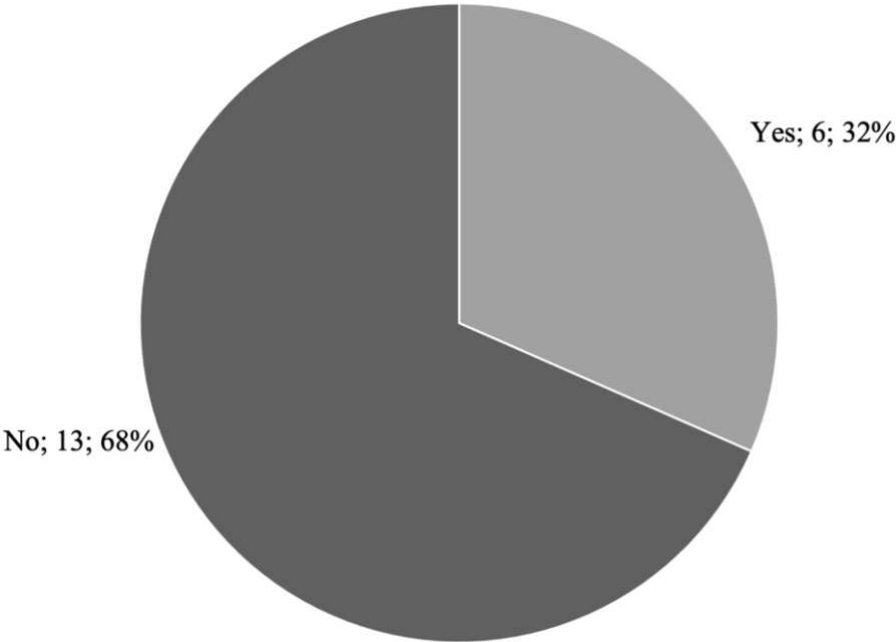


Figure 3.6

Sample Experience of Digital Health

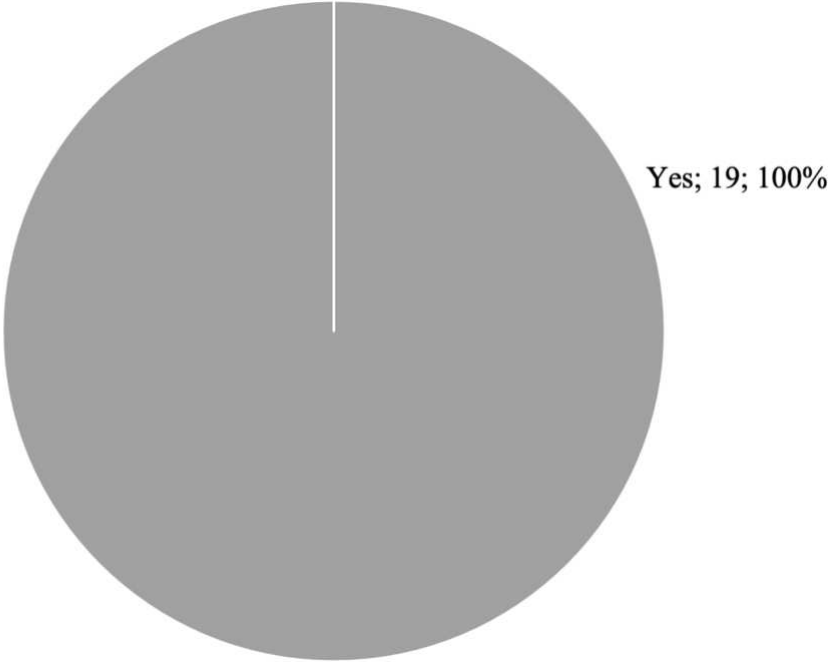
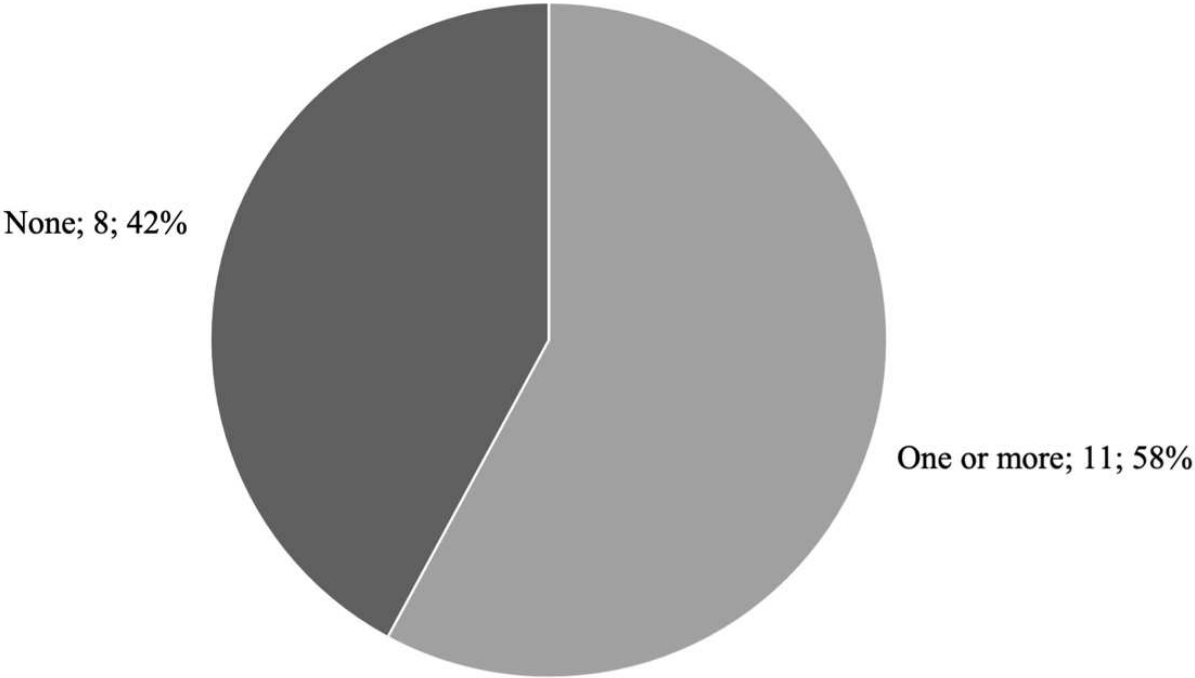


Figure 3.7

Sample Familiarity With National Digital Health Strategy Policy Documents



3.3. Content of focus groups

FGs followed a general-to-particular approach (Tong et al., 2007). During the opening minutes, the moderator introduced himself, let participants introduce themselves, explained the research’s objective, and defined key terms (see Appendix 3). Next, participants were asked to rate each value’s importance and feasibility, producing a relative graphical mapping of the values by these dimensions, introducing the group’s perceptions. The core discussion was based on guiding statements, as shown in Table 3.3. These were presented for the first time to the participants during the FGs, not before. For each statement, participants were asked to evaluate to which extent they agreed. First the statements about Ethics were shown, evaluated and discussed, then the statement about Sustainability, and so on. Towards the end of the FGs, time was allowed for further discussion about topics not directly covered before. The study being conducted in French, special care was put on the choice of wording throughout, in particular when translating terms that were central to the topic at stake¹⁵.

Table 3.3

Guiding Statements for Focus Groups

Guiding value	Statement
Ethics	A. Ensuring ethical practices in digital health is essential to favour the development and acceptance of these services. (Landers et al., 2023)
	B. Ethics in the NDHS guarantees fairness, access, informed consent and data protection. (Brall et al., 2019)
Sustainability	C. Sustainable implementation of digital health requires a shift in mentality and practice in the delivery of health services. (Manard et al., 2019)
Interoperability	D. Digital health bears characteristics which require the decompartmentalisation of health information systems. (Scheplitz, 2023)
Interoperability	E. The lack of adherence to well-established common standards and guidelines is a barrier to interoperability. (Kouroubali & Katehakis, 2022)
Security	F. Health organisations must adopt a culture of security to protect patient information. (Loumbas & Peters, 2022)

¹⁵ For example, the term “defragmentation” employed in English literature can result in misinterpretation when translated. Relevant French taxonomy uses a specific term for the same purpose: “décloisonnement”, which translates back to “decompartmentalisation”. It was deemed better fitting.

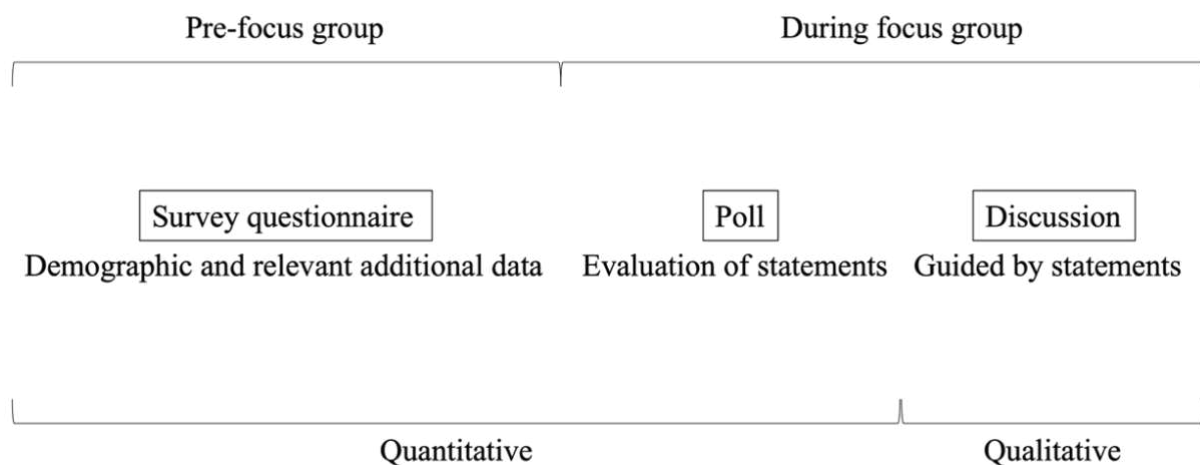
Security	G. Cybersecurity is a value creation lever, not only a source of costs / a constraint. (Alami et al., 2019)
Sovereignty	H. Health data should be shared between states (e.g. inside the EU). (Zinovieva & Bulva, 2021)
	I. The collection, use, and ownership of health data is not sufficiently transparent and does not sufficiently involve patients. (Pierri & Herlo, 2021)

3.4. Data collection

The data collection procedure is shown in Figure 3.8. Although a select literature review was conducted to inform the study’s background, it is not data collected for examination. Informed consent, demographic, and relevant additional data were collected prior to the FG via an online questionnaire shared via email or LinkedIn message, using surveying tool Qualtrics (<https://www.qualtrics.com/>). The FGs were run online using Google Meet, with a Google workspace service account created with a university student email address, or Microsoft Teams, with university student account. The meetings were audio-recorded to allow *a posteriori* discourse analysis. In addition to qualitative data from the discussions, quantitative data was collected during the FGs using live polling tool Menti (<https://www.mentimeter.com/>). Responses were measured using 1-to-10 Likert-scales. This data was collected to echo qualitative data and allow triangulation (Guba, 1981). Occasionally, in case they left early, some participants were recontacted after the FG with a request to provide more information or clarity about their opinions in writing. The results from data collection are presented in section 4 “Results”.

Figure 3.8

Data Collection Procedure



3.5. Data analysis

The quantitative data obtained through the preliminary survey and the live polling was transcribed, examined, and illustrated using software Microsoft Excel. The qualitative data derived from the recorded FG discussions was transcribed in written form and encoded *at verbatim*. Thematic analysis was conducted based on the identified stakeholder groups, guiding values of the French NDHS, and related literature to organise the encoded data meaningfully. Care was taken to ensure that the analysis considered personal viewpoints, experiences, and beliefs of participants, as well as interactions between them, recognising patterns of agreement or disagreement (Willis et al., 2009). Findings resulting were triangulated with the quantitative data from polling results to enhance analysis (Guba, 1981).

3.6. Addressing potential bias

The research accounted for biases and risk mitigation. Participants had no prior personal connection to the researcher before the study, ensuring a neutral starting point. The pre-FG questionnaire asked participants to disclose previous experiences of discrimination in healthcare settings, previous experience of DH, and familiarity with French NDHS policy documents. These factors could introduce potential bias to criticise or align with the study's focus. The voluntary nature of participation could carry positive bias towards DH, individuals with contrary, radical opinions possibly preferring to opt out, when they could bring pivotal contributions to discussions¹⁶.

Certain aspects of the study or researcher might dissuade individuals from participating. For instance, during recruitment invitees were informed about the researcher's universities affiliations (see Appendix 2). One held a religious connotation, possibly deterring some from participating, particularly in a laic republic like France.

It seemed the majority of participants held higher education. This may omit crucial viewpoints from others impacted by the French NDHS with different educational backgrounds. Geographical bias was also acknowledged, especially considering France's centralised structure. Predominant representation from specific regions could overlook regional variations

¹⁶ An instance occurred were an individual refused to participate due to the perception of health being "political and lobbyist". Another stated that technology is wrongfully seen as the saviour of health, recommending to focus on behavioural science instead.

in the perception of the French NDHS. Lastly, the possibility of social desirability bias was identified, where participants might tailor their responses to conform to socially accepted norms instead of expressing their true opinions. To mitigate this bias, the moderator encouraged diverse perspectives during discussions. Importance was given to inclusivity by individually engaging each participant. Importantly, the moderator refrained from sharing personal views to prevent any influence on the discussion.

3.7. Ethical considerations

In adherence to ethical considerations, this study applied measures to safeguard participants' rights and privacy. It collected an informed consent form, voluntarily agreed to by participants (see Appendix 5). To ensure transparency, they were provided with a comprehensive overview of the study's purpose and their rights, including the option to withdraw from participation at any point. They were guaranteed that no personally identifiable information be linked to their answers. Additionally, in alignment with data privacy measures, the recordings of the FGs were stored locally and destroyed following the completion of the study. The study obtained ethical approval from the Universidade Católica Portuguesa's (UCP) Ethics Committee in Technology, Social Sciences and Humanities (CETCH). The official recommendation can be found in Appendix 6.

4. Results

The results from focus groups are presented by stakeholder group: public clients, health professionals, private sector. Quantitative data is reported before qualitative results. A summary of quantitative data is provided, including aggregated figures. Since this is how the discussions unravelled (c.f. Table 3.3), for each group we order the data by values and the associated statements.

4.1. Quantitative results

The polls asked participants to evaluate to what extent they agreed with each statement on a Likert scale from 1 to 10, a rating of 1 meaning they did not agree at all, 10 meaning they completely agreed. Ratings around 5 are assumed to reflect mitigated views or no particular opinion. Respective meanings of ratings are listed in Table 4.1.

Table 4.1

Likert-Scale Meaning of Values

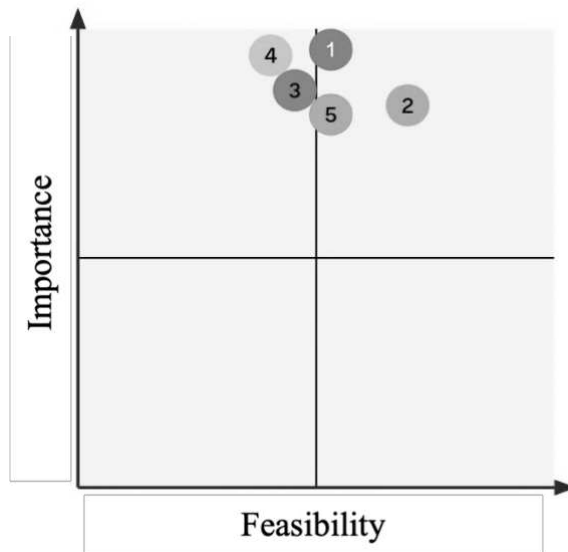
Rating	Meaning attributed (extent of agreement with statements)
0	Complete Disagreement.
1-2	Strong Disagreement.
3-4	Moderate Disagreement.
5	Neutral (neither agree nor disagree).
6-7	Moderate Agreement.
8-9	Strong Agreement.
10	Complete Agreement.

4.1.1. Public clients

The answer rate for FG_PBC was 93% in average, for 7 participants, as one left earlier and could not answer Statements F, G, H, and I. Figure 4.1 shows the group's perception of values' importance and feasibility. The high ratings for importance across values demonstrate their relevance among the PBC participants. Their feasibility ratings reveal little variations, except for value Sustainability, on average rated slightly more feasible than the others. Table 4.2 details the results of the PBC group's live polls.

Figure 4.1

Mapping of Guiding Values by Importance and Feasibility (PBC group)



Legend: 1-Ethics, 2- Sustainability, 3- Interoperability, 4-Security, 5- Sovereignty.

Table 4.2

Focus Group Polls Results (PBC)

Guiding Value	Statement	Poll Ratings
Ethics	A. Ensuring ethical practices in digital health is essential to favour the development and acceptance of these services.	Four participants completely agreed, three agreed strongly. “10” n=4, “9” n=2, “8” n=1. Mean = 9,4; Median =10.
	B. Ethics in the NDHS guarantees fairness, access, informed consent and data protection.	Two participants completely agreed, two agreed strongly. Two were neutral, one moderately disagreed. “10” n=2, “8” n=2, “5” n=2, “4” n=1. Mean = 7,1; Median = 8.
Sustainability	C. Sustainable implementation of digital health requires a shift in mentality and practice in the delivery of health services.	Three participants completely agreed, three agreed strongly. One remained neutral. “10” n=3, “9” n=2, “8” n=1, “5” n=1. Mean = 8,7; Median = 9.

Interoperability	D. Innovation in digital health bear characteristics which require the decompartmentalisation of health information systems.	Three participants completely agreed, two agreed strongly. Three moderately agreed. “10” n=3, “9” n=2, “7” n=2. Mean = 8,9; Median = 9.
	E. The lack of adherence to well-established common standards and guidelines is a barrier to interoperability.	Two participants completely agreed, two agreed strongly. Three moderately agreed. “10” n=2, “9” n=2, “7” n=3. Mean = 8,4; Median = 9.
Security	F. Health organisations must adopt a culture of security to protect patient information.	Four participants completely agreed, one agreed strongly, one moderately agreed. “10” n=4, “9” n=1, “7” n=1. Mean = 9,3; Median = 10.
	G. Cybersecurity is a value creation lever, not only a source of costs / a constraint.	One participant completely agreed, two agreed strongly. One moderately agreed, one moderately disagreed, one strongly disagreed. “10” n=1, “9” n=1, “8” n=1, “6” n=1, “3” n=1, “2” n=1. Mean = 6,3; Median = 7.
Sovereignty	H. Health data should be shared between states (e.g. inside the EU).	Two participants completely agreed, one agreed moderately. One remained neutral, two strongly disagreed. “10” n=2, “6” n=1, “5” n=1, “2” n=1, “1” n=1. Mean = 5,7; Median = 5,5.
	I. The collection, use, and ownership of health data is not sufficiently transparent and does not sufficiently involve patients.	Two participants completely agreed, one agreed strongly, one moderately agreed. One

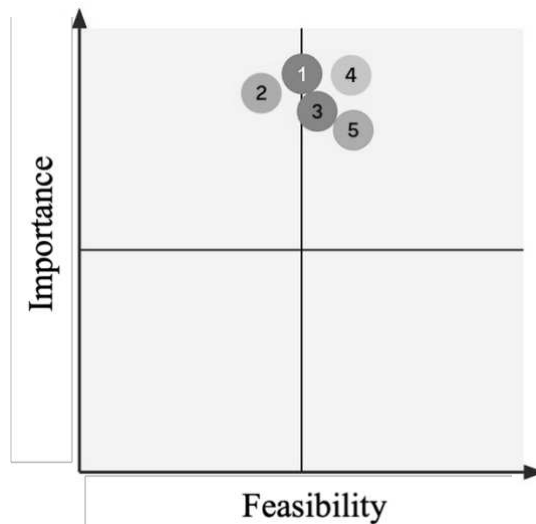
		<p>remained neutral, one moderately disagreed.</p> <p>“10” n=2, “9” n=1, “6” n=1, “5” n=1, “4” n=1.</p> <p>Mean = 7,3; Median = 7,5.</p>
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4.1.2. Health professionals

The answer rate in percentage for FG_HP was 100%, for 8 participants. Figure 4.2 shows the group’s perception of values’ importance and feasibility. The high ratings for importance across values demonstrate their relevance among the HP participants. Feasibility ratings were medium and similar across values. Table 4.3 details the results of the PBC group’s live polls.

Figure 4.2

Mapping of Guiding Values by Importance and Feasibility (HP group)



Legend: 1-Ethics, 2- Sustainability, 3- Interoperability, 4-Security, 5- Sovereignty

Table 4.3*Focus Group Polls Results (HP)*

Guiding Value	Statement	Poll Ratings
Ethics	A. Ensuring ethical practices in digital health is essential to favour the development and acceptance of these services.	Four participants completely agreed, four agreed strongly. “10” n=4, “9” n=4. Mean = 9,5; Median = 9,5.
	B. Ethics in the NDHS guarantees fairness, access, informed consent and data protection.	Two participants strongly agreed, four agreed moderately. One moderately disagreed, one disagreed completely. “8” n=2, “7” n=1, “6” n=3, “4” n=1, “0” n=1. Mean = 5,6; Median = 6.
Sustainability	C. Sustainable implementation of digital health requires a shift in mentality and practice in the delivery of health services.	Two participants completely agreed, five agreed strongly. One moderately agreed. “10” n=2, “9” n=2, “8” n=3, “7” n=1. Mean = 8,6; Median = 8,5.
Interoperability	D. Innovation in digital health bear characteristics which require the decompartmentalisation of health information systems.	Five participants completely agreed, two agreed strongly. One remained neutral. “10” n=5, “8” n=2, “5” n=1. Mean = 8,9; Median = 10.
	E. The lack of adherence to well-established common standards and guidelines is a barrier to interoperability.	Four participants completely agreed, two agreed strongly. Two moderately agreed. “10” n=4, “9” n=2, “7” n=2. Mean = 9; Median = 9,5.
Security	F. Health organisations must adopt a culture of security to protect patient information.	Four participants completely agreed, three agreed strongly. One moderately agreed.

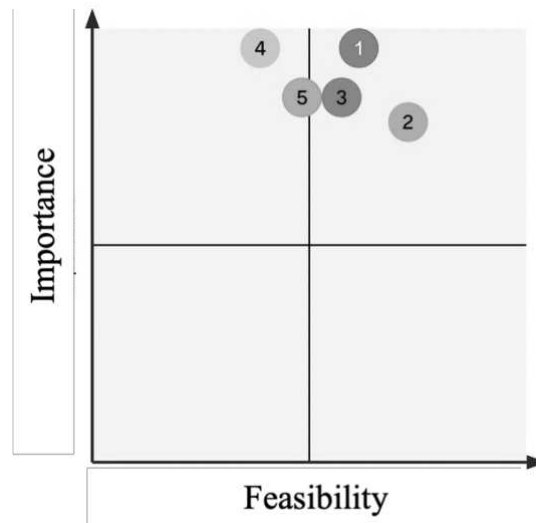
		<p>“10” n=4, “9” n=2, “8” n=1, “7” n=1.</p> <p>Mean = 9,1; Median = 9,5.</p>
	G. Cybersecurity is a value creation lever, not only a source of costs / a constraint.	<p>Two participants completely agreed, two agreed strongly. One moderately agreed. Two remained neutral, one strongly disagreed.</p> <p>“10” n=2, “9” n=1, “8” n=1, “7” n=1, “5” n=2, “1” n=1.</p> <p>Mean = 6,9; Median = 7,5.</p>
Sovereignty	H. Health data should be shared between states (e.g. inside the EU).	<p>Two participants completely agreed, one agreed strongly. One moderately agreed, one remained neutral. One moderately disagreed.</p> <p>“10” n=2, “7” n=1, “6” n=1, “5” n=1, “3” n=1, “2” n=1, “0” n=1.</p> <p>Mean = 5,4; Median = 5,5.</p>
	I. The collection, use, and ownership of health data is not sufficiently transparent and does not sufficiently involve patients.	<p>Four participants completely agreed, one agreed strongly, one moderately agreed. One remained neutral, one disagreed completely.</p> <p>“10” n=4, “7” n=1, “6” n=1, “5” n=1, “0” n=1.</p> <p>Mean = 7,3; Median = 8,5.</p>

4.1.3. Private sector

The answer rate in percentage for the FG_PRV was 100%, for 4 participants. Figure 4.3 shows the group’s perception of values’ importance and feasibility. The high ratings for importance across values demonstrate their relevance among the PRV participants. Feasibility ratings varied slightly: Security was rated the less feasible, inversely to Sustainability, rated the most feasible. Table 4.4 details the results of the PBC group’s live polls.

Figure 4.3

Mapping of Guiding Values by Importance and Feasibility (PRV group)



Legend: 1-Ethics, 2- Sustainability, 3- Interoperability, 4-Security, 5- Sovereignty.

Table 4.4

Focus Group Polls Results (PRV)

Guiding Value	Statement	Poll Ratings
Ethics	A. Ensuring ethical practices in digital health is essential to favour the development and acceptance of these services.	One participant completely agreed, three agreed strongly. “10” n=1, “9” n=2, “8” n=1. Mean = 9; Median = 9.
	B. Ethics in the NDHS guarantees fairness, access, informed consent and data protection.	One participant completely agreed, one agreed strongly. One remained neutral, one disagreed strongly. “10” n=1, “8” n=1, “5” n=1, “2” n=1. Mean = 6,3; Median = 6,5.
Sustainability	C. Sustainable implementation of digital health requires a shift in mentality and practice in the delivery of health services.	Two participants completely agreed, two agreed moderately. “10” n=2, “7” n=1, “6” n=1. Mean = 8,3; Median = 8,5.
Interoperability	D. Innovation in digital health bear characteristics which require the	One participant completely agreed, one agreed strongly.

	decompartmentalisation of health information systems.	One moderately agreed, one remained neutral. “10” n=1, “8” n=1, “7” n=1, “5” n=1. Mean = 7,5; Median = 7,5.
	E. The lack of adherence to well-established common standards and guidelines is a barrier to interoperability.	Two participants completely agreed, one agreed strongly. One remained neutral. 10” n=2, “8” n=1, “5” n=1. Mean = 8,3; Median = 9.
Security	F. Health organisations must adopt a culture of security to protect patient information.	Three participants completely agreed, one agreed strongly. “10” n=3, “9” n=1. Mean = 5; Median = 4,5.
	G. Cybersecurity is a value creation lever, not only a source of costs / a constraint.	One participant completely agreed, one remained neutral. One moderately disagreed, one disagreed strongly. “10” n=1, “5” n=1, “4” n=1, “1” n=1. Mean = 9,8; Median = 10.
Sovereignty	H. Health data should be shared between states (e.g. inside the EU).	One participant strongly agreed, one agreed moderately. Two strongly disagreed. “9” n=1, “7” n=1, “2” n=1, “1” n=1. Mean = 4,8; Median = 4,5.
	I. The collection, use, and ownership of health data is not sufficiently transparent and does not sufficiently involve patients.	One participant completely agreed, one agreed moderately. One remained neutral, one disagreed moderately. “10” n=1, “6” n=1, “5” n=1, “4” n=1. Mean = 6,3; Median = 5,5.

4.1.4. Summary of quantitative results

Figures Figure 4.4, Figure 4.5, and Figure 4.6 summarise the results of the FG polls, respectively of PBC, HP, and PRV. The three groups' data was aggregated and is summarised in Figure 4.7.

Figure 4.4

Summarised Focus Group Polls Results (PBC)

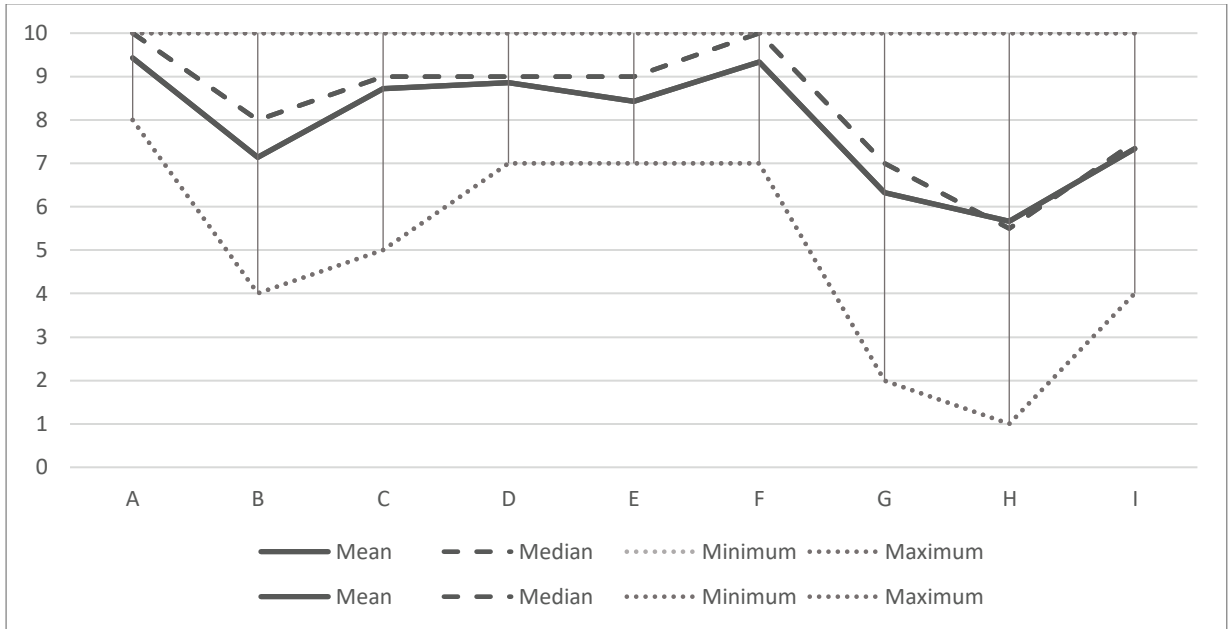


Figure 4.5

Summarised Focus Group Polls Results (HP)

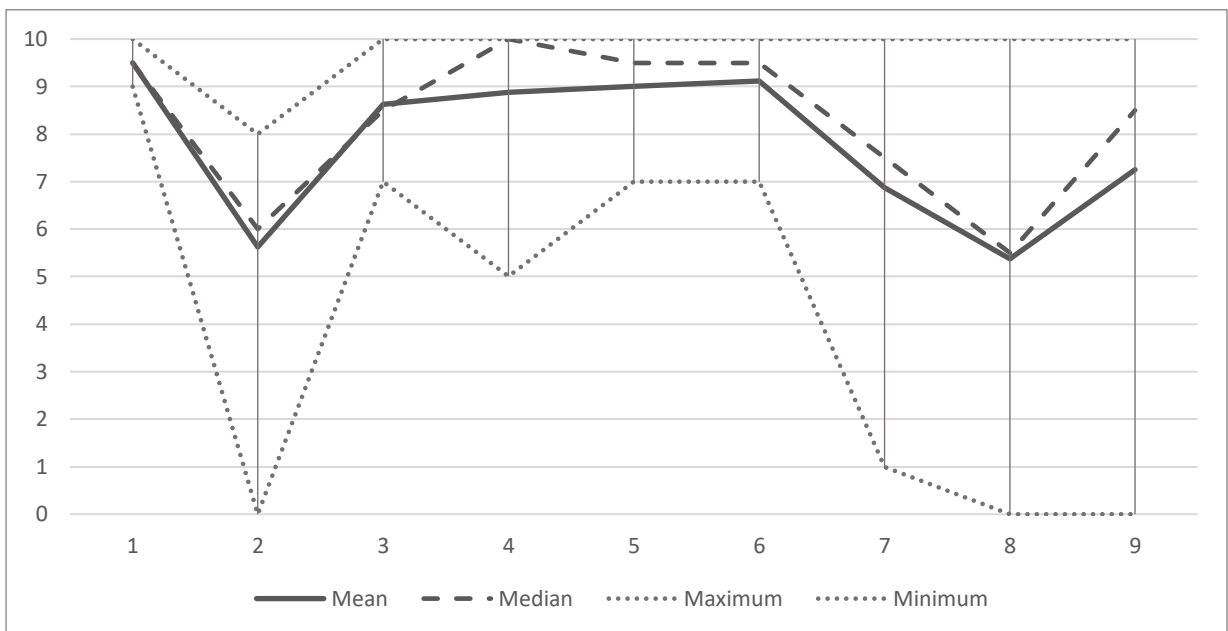


Figure 4.6

Summarised Focus Group Polls Results (HP)

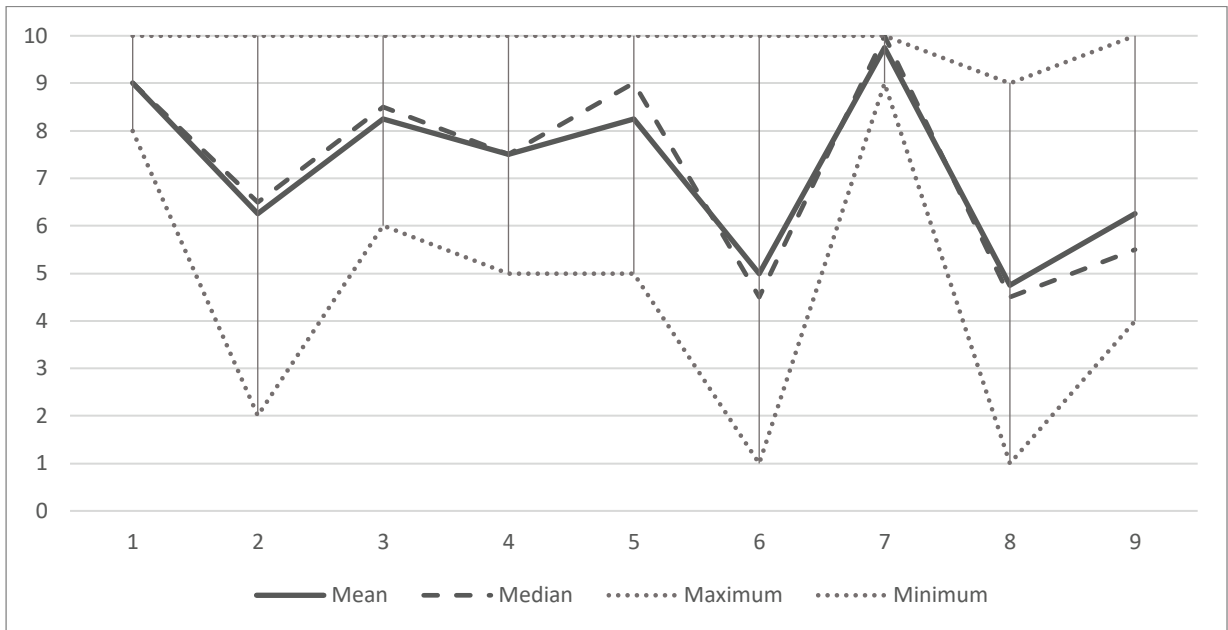
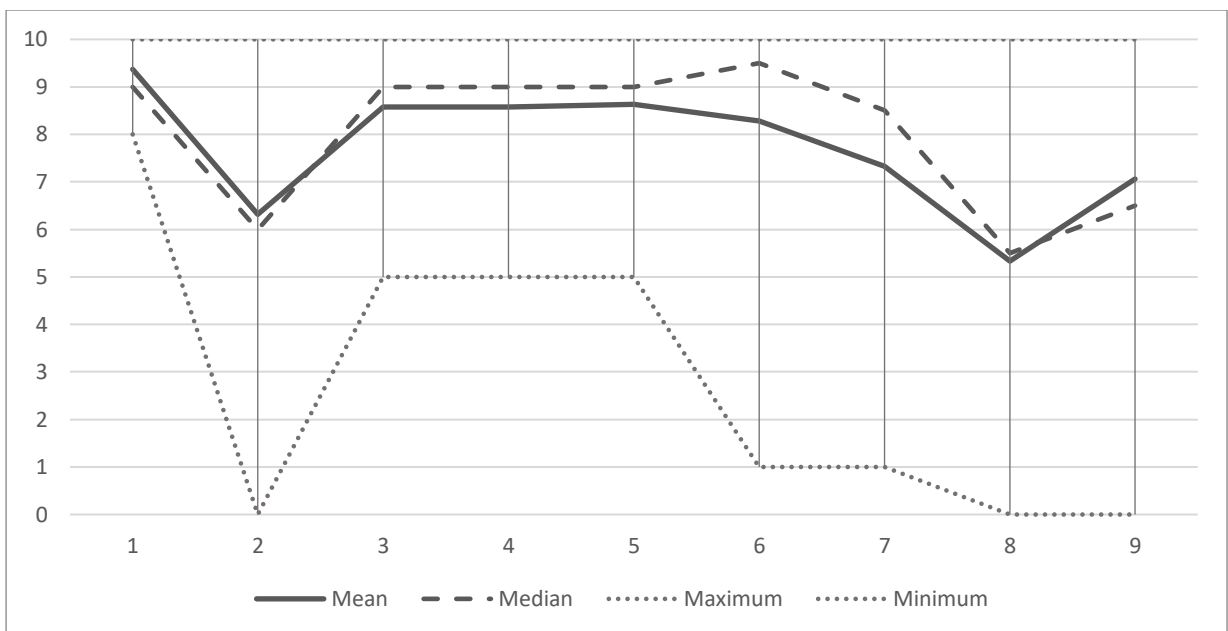


Figure 4.7

Summarised Focus Group Polls Results (Aggregated)



4.2. Qualitative results

The results are presented by FG, then by guiding value. They remain a reproduction of the participants' perceptions and are reported with care to ensure their trustworthiness (Guba, 1981).

4.2.1. Public clients

Ethics

During FG_PBC, recognising the importance of ethics was undisputed. Some related ethical considerations to the use of health data: “patients or users are often worried about the use of data that affects their privacy”. Concerns were raised regarding the accuracy and privacy of healthcare databases.

HPs were perceived as not taking the time to explain their actions sufficiently, thus hindering ethical aspects of care. While technical issues due to geographies were cited as reducing access to DH (no internet in remote areas), teleconsultation was seen as useful, e.g., cases of rare pathologies lacking the proximity of healthcare specialists.

Sustainability

Participants strongly agreed for the need for cultural changes. One key observation was the perceived resistance to embrace DH solutions within a portion of the medical profession. This was attributed to technology being seen as a threat to the traditional doctor-patient relationship rather than a complementary tool. It was said that while patients may require a change in mindset regarding DH, health professionals need an even greater shift. Additionally, DH was purported to help transform the culture of “the doctor, by definition, [being] an individualist”, towards networks of close collaboration between HPs and peer-reviewing, improving health outcomes.

“Be careful when you entrust your health to a single individual, [...] they are not *Deus ex machina*”. –PBC participant

The discussion asserted the need for further shifting towards patient-centred care. DH was perceived to carry potential to continue support this trend. Next, barriers to long-lasting adoption other than culture were discussed. Adoption was said to rely on simplicity and tangible benefits of solutions; tools too complex becoming ineffective and abandoned by users.

Increasing digital literacy through education was cited to accelerate adoption. One voice stressed that “people need to understand that it is not because you have low digital literacy that you cannot adhere to MonEspaceSanté”. The group concluded that while DH needs to start from and adapt to users, users also need to adjust to it.

Interoperability

One participant identified three related issues: data exchange being hindered by the presence of “walls” (or the absence of bridging connexions) between systems, differing data languages, and the quality of data. Participants perceived a lack of interoperability in France, as well as in the EU, and said that security measures can impede the exchange of information. It was then argued that interoperability issues in France are mainly rooted in historic and maybe technical grounds before security reasons. An issue highlighted was the lack of “a general schema of health data to be collected for all purposes to cover all needs”. Finally, all participant saluted the universality of MonEspaceSanté and its importance for health outcomes. Still, they recognised that solutions cannot all be universal because of how disparate needs are.

Security

All participants declared being very conscious of cybersecurity’s importance. One participant preferred not using teleconsultation where possible. Others asserted it should be used anytime possible, declaring benefits outweigh risks. They agreed that, where there is the choice, it comes down to personal preference.

“I have a hard time buying into this constant paranoia about data.” –PBC

Participant

The perception emerged of a lack of adherence to security practices by HPs due to complexity and unfitness to their work methods, compromising patient data security. It was reminded that security problems already existed before digital technology, for example in hospitals when information is uncarefully shared on paper or by voice, breaching confidentiality.

“On a computer screen, there is the password taped”. –PBC Participant

Sovereignty

Regarding statement H, one participant said that “for research and statistics, it would be very interesting to exchange data between European states” but held doubts “from security and anonymity points of view”. It was concluded that, for sharing it, there needs to be identified data types for different finalities, implying different characteristics and security. Types of data mentioned were symptoms, genetics, blood analysis, neurological data; use cases were to compare between countries, clinical trials, biological research, and evaluating public health policies’ efficacy. An example was given where patients could need to access and use their data when traveling in the EU but also further, e.g., the UK. About the EU, lack of transparency was feared about where data is processed since information exchange is facilitated between member states. Additional fears surfaced about EU regulations where French data might face different national legal requisites if processed in different member states, potentially conflicting with French legislation.

Other

The perception emerged that “there is sometimes a gulf between the declaration of intent in a state policy and its implementation”.

4.2.2. Health professionals

Ethics

HP participants commonly agreed that ensuring ethical practices in DH is essential, in particular to ensure comfort for users and avoiding a “two-tier health system”. Still, practical considerations were seen as challenging, especially in understanding and integrating ethical concepts. They were deemed “abstract” and “philosophical”. The notion was found hard to articulate with the reality of the field, and other, operational or more urgent issues. Still, the importance of ethics was commonly acknowledged in recognition of some very real impacts. One participant argued that having a NDHS should result in guarantees of equity, access, consent, and data protection for all, but that this is not the case currently. Others mentioned seeing inequalities of access and digital divide persist in practice.

Sustainability

Participants agreed to a great extent that sustainable implementation of DH requires shifts in mentality and practice in the delivery of health services. Emphasis was put on the need

for changes at collective and organisational levels, which were deemed more difficult to implement than individual changes (which are powered by external factors) and linked to technical aspects of data sharing. It was added that mentalities should stop prioritising the economical dimension and aim at reducing health inequalities. Issues of adoption of Healthcare Professional Cards¹⁷ and digital literacy affecting the use of Electronic Patient Records¹⁸ were reported, with the suggestion that coercive measures be taken to ensure their use. This was opposed to and responded by other with the alternative of developing education instead, training health professionals and others on DH and its benefits.

Interoperability

Experiences of challenges in data sharing among different healthcare entities led to acknowledgement of the need for interoperability. There was a common desire between HP for universal platforms and centralisation to reduce the complexity and requirements of current solutions. However, this was deemed “utopic” because going against the incentives of the private sector actors. Participants noted that existing norms are not always applied in practice.

Security

The group agreed about the importance of security. The point was made that a culture of security is first and foremost an issue of technicality. The main challenge identified was striking a balance between security and simplicity in usage while protecting patient data. As opposed to the constraining view of security measures, the empowerment of patients to manage their data securely was advocated for and argued to hold the potential to become a source of value creation.

Sovereignty

Voices strongly advocated for the sovereignty of patients over their health data. Lack of information and sensibilisation of patients about health data was reported. Concerns emerged about the financialisation of health, and the importance that private corporations take. It was suggested that this related back to ethical considerations, which must be ensured across public and private sectors. It was argued that the public sector is competing with the private sector in developing DH solutions, and it was feared that the public is lagging behind in this matter,

¹⁷ Carte de Professionnel de Santé (CPS).

¹⁸ Dossier Patient Informatisé (DPI).

bearing sovereignty risks at state and patient levels. In another form of sovereignty, it was strongly agreed that DH tools and the overall health system should be co-produced with more involvement of patients. This both respects their sovereignty and improves the long-lasting adoption of such tools among patients.

Other

After the scheduled time limit, three participants voluntarily extended the discussion. Here, challenges in aligning DH projects with user needs and expectations were recognised, resulting in the reassertion of the importance of ongoing user consultation throughout projects development and management. “The first question to ask when developing a digital health program must be ‘why are we doing it?’ and definitely not ‘how do we do it?’.” The bottom-up approach was discussed. It was suggested that an “easy win” for DH solutions would be to replicate the user-friendliness of successful digital tools such as famous social media messaging apps.

4.2.3. Private sector

Ethics

PRV participants agreed about ethics being the foundational. Concerns were shared about the digital divide across age groups and the necessity for inclusive solutions. They underscored the importance of aligning ethical views among stakeholders. This was illustrated with an example in the context of the DMP¹⁹ (“Shared Medical Record”) where doctors were said to hold divergent ethical views, some assuming that their patients’ data was their own when morale should acknowledge patient ownership of their data. The importance of adhering to ethical rules was underscored, beginning with the General Data Protection Regulation (GDPR).

Mostly, ethics was related to matters of data ownership and security. Ethics was seen as constraining due to security considerations. An example of an experience with the Messageries

¹⁹ The Dossier Médical Partagé (DMP) is a French public service of shared electronic health record that operated from 2011 to 2021 before MonEspaceSanté was introduced in early 2022.

Sécurisées de Santé (MSS; “Secure Health Messaging”²⁰) was given, where solutions were not adopted due to ethical considerations resulting in overly restricting rules.

Tension between short-term utility and long-term ethical considerations was highlighted. The efficacy of ethics as a standalone value was questioned, with the assertion that coupling it with values like sustainability, interoperability, and security is essential for ethical considerations such as fairness, access, informed consent, and data protection to effectively realise.

Sustainability

It was argued that sustainability requires tailored shifts in cultures and mentalities of health professionals, patients, government, and society overall. Different levels of tech-savviness requiring distinct approaches. Participants stressed the importance of consistency in government approaches over political mandates to foster ownership of DH.

Participants suggested that long-lasting adoption of DH solutions depends on perceived ease of use and performance. Security concerns emerged as obstacles to performance and thus adoption, exemplified by inefficiencies in the MSS, which failed to comprehensively index relevant professionals, resulting in limited usage: “in practice, doctors used Gmail”—PRV Participant.

Interoperability

Participants stressed the importance of interoperability to reduce the current fragmentation of systems. “Breaking barriers down” was deemed crucial to reach the national shared EHR (DMP¹⁹) initiative’s full potential. Achieving interoperability was argued to require common standards, particularly for decompartmentalisation. One participant argued that start-ups innovate without fully breaking down existing compartments. There were also concerns raised about the potential risks, especially in terms of security, associated with interoperability. Despite this, the group believed that they were justified by the benefits.

“The safety risk must be accepted because better care is essential and that means breaking down barriers.—PRV Participant.

²⁰ The MSS is a publicly supported system of secure data sharing solutions available to healthcare professionals, commenced in 2014.

Security

PRV participants related security to cybersecurity²¹. Cybersecurity was argued to be anchored in risk management, underscoring the concept of opportunity cost, emphasising the need to account for potential adverse events and additional costs in the future if cybersecurity is not adequately addressed in the present. Protecting patient information and meeting data control standards were presented as critical to attract investor funding, where adherence to cybersecurity norms is a basic condition and a value creation lever. Others saw in cybersecurity a costly constraint, not solely financial: influencing systems design, presenting challenges that can lead to future costs if unaddressed. In the end, the discussion led to a common agreement:

“To sum up, cybersecurity is a necessary evil”—PRV Participant.

Sovereignty

Sovereignty was related to data use and ownership. Two data types were identified: personal and public health data. Participants showcased a strong inclination towards sharing public health data, with a perceived better feasibility-to-outcomes ratio, especially concerning data analytics and AI training. They emphasised that sharing health data at the EU level counterbalances the influence of large multinational companies, enhancing Europe’s sovereignty. In contrast, there was a more cautious stance regarding sharing personal health data, except for specific instances. The low priority assigned to personal health data sharing stemmed from concerns about foreign health systems and societal maturity. Irrespective of the data type, participants highlighted the overarching requirement for international data sharing to adhere to common standards and guidelines. It was acknowledged that this practice is already in place and improving within the EU. Concerns surfaced about the perceived insufficiency in transparency and patient engagement, particularly in the context of data for AI. While emphasising the need for some transparency, participants struggled with determining the optimal degree of openness without hindering DH advancements, as this subject was recognised delicate and relating to ethical values.

²¹ Cybersecurity is the protection of computer systems and networks from malicious attacks that can lead to unauthorised exposure, theft, or damage of hardware, software, data, and disruptions to provided services (Schatz et al., 2017).

Other

At the end of the FG, emphasis was put on the value of efficiency, emphasising the importance of ensuring alignment with organisational requirements and user needs.

4.2.4. Summary of qualitative results

Key qualitative results from FGs are summarised in Table 4.5.

Table 4.5

Summary Table of Qualitative Results

Stakeholder Group	Public Clients	Health Professionals	Private Sector
Guiding Value	<i>perceived that... [guiding value]...</i>		
Ethics	<p>Is foundational.</p> <p>Is data related.</p>	<p>Is essential.</p> <p>Is abstract.</p> <p>Is insufficient.</p>	<p>Is a necessary framework.</p> <p>Is data related.</p>
Sustainability	<p>Requires patient-centricity.</p> <p>Requires doctors' culture to change.</p> <p>Requires simplicity and tangible benefits.</p>	<p>Requires cultural shifts (individual; collective).</p> <p>Hinges on digital literacy.</p> <p>Requires ease of use.</p>	<p>Requires tailored cultural shifts (stakeholder groups).</p> <p>Involves other values.</p>
Interoperability	<p>Should aim for universal solutions.</p> <p>Stems from issues of inter-system connexion, common language, and data quality.</p>	<p>Is important.</p> <p>Should aim for centralisation.</p> <p>Is utopic.</p>	<p>Is necessary.</p> <p>Requires common standards.</p> <p>Entails security considerations.</p>
Security	<p>Is essential.</p> <p>Is insufficiently adhered to by HPs.</p> <p>Level of security is a personal choice.</p>	<p>Has technical nature.</p> <p>Must be balanced with simplicity of use.</p>	<p>Entails risk management.</p> <p>Is a constraint, a "necessary evil".</p>
Sovereignty	<p>In data-sharing has different types for different finalities.</p> <p>Holds transparency and regulatory risks.</p>	<p>Needs patients' data to be their own.</p> <p>Requires coproduction with patients.</p> <p>Is threatened by the financialisation of health.</p>	<p>Differs between personal or public health data.</p> <p>For public health data sharing requires anonymisation.</p> <p>Must balance transparency and DH advancements.</p>

5. Discussion

Main findings are analysed: are discussed first shared perceptions among stakeholders, then their distinctive views. Findings are summarised, before discussing the produced framework of public values, reviewing study limitations, and recommendations for practice.

5.1. Analysis

5.1.1. Shared perceptions

Findings reveal a unanimous sentiment across stakeholder groups emphasising the fundamental role of ethics in NDHS. This aligns with existing literature on the subject (Brall et al., 2019; Davis, 2020). Ethics are foundational across various aspects of human endeavours; Therefore, this consensus could have been expected. This study operated within a normative societal setting, where the significance of ethics is deeply entrenched, making it difficult to oppose to this norm. This collective viewpoint showcases a shared sentiment that ethics is the upmost guiding principle integral to how we approach DH initiatives.

Stakeholder collaboration surfaced in several discussions, echoing international bodies' recommendations (World Health Assembly, 2016). The PBC supported involving patients more, seeking greater autonomy in managing their health. This aligns with the idea that DH offers opportunities of patient-centricity and rebalancing healthcare relationships (Williatte, 2023). Surprisingly, HPs explicitly discussed coproduction²² with patients, defying the stereotype of HPs as individualistic and time-constrained, which could have foreseen resistance against patient empowerment. This may stem from the characteristics of the engaged HP participants, particularly knowledgeable and passionate about DH. The advocate for coproduction also held a role in therapeutic patient education, possibly determining their perspective. This aligns with much of the literature suggesting that there is increased interest in coproduction for healthcare (Fusco et al., 2020), asserting that coproduction can be key in creating public value (Loeffler & Bovaird, 2021) and that public value in health systems should be co-produced (Tritter, 2011).

²² In public settings, coproduction “the voluntary or involuntary involvement of public service users in any of the design, management, delivery and/or evaluation of public services” (Osborne et al., 2016, p. 640).

Another crucial finding is the importance given by stakeholders to pragmatic considerations: PBC valued simplicity and tangible benefits, as did HPs. Both are end-users of DH solutions seeking simplicity of usage, to seamlessly integrate DH in their day-to-day routine with minimum friction. The PRV also understood that sustainable adoption of DH relies on ease of use. This finding echoes previous studies demonstrating the significant role of perceived ease of use and perceived usefulness in users' adoption of DH (Zhao et al., 2019).

The need for more interoperability was mentioned by all stakeholders. In particular, the requirement for standardisation such as common languages between systems was mentioned by PBC and the PRV. The need for decompartmentalisation, or “breaking down barriers”, was also noted. These shared viewpoints align with the existing knowledge, which asserts that DH inherently requires interoperability in its technological aspects but also across its dimension of collaborative networks involving people. (Mouttham et al., 2012). The situation in Europe still meets challenges, e.g., deisolating data silos, confirming our finding (Bruthans, 2020; Kouroubali & Katehakis, 2022). One promising avenue could be facilitating patient-driven interoperability using blockchain technology (Gordon & Catalini, 2018). Our findings strengthen the existing knowledge and emphasise the relevance of interoperability across stakeholder groups.

Our findings suggest that all stakeholders understand the cruciality of data, aligning with long-time understanding that data is and will be the cornerstone of DH (Lang, 2011; Hussein et al., 2023). Data-related security and privacy risks emerged, echoing regulatory discussions in France (Gruson, 2019). Data sovereignty was discussed much in relation to patients' sovereignty over their data and perceived as a fundamental right. Progress can be made: in 2019, France developed a universal platform for health data, the Health Data Hub (HDH), but interoperability, compartmentalisation, and access issues persist for legal and technical reasons (Or et al., 2023). Data quality issues, mentioned by the HP group, still hinder big data's full potential: in the words of the OECD (2023a), “countries are ‘data rich and insights poor’” (p.56).

5.1.2. Distinctive views

Describing ethics proved more complex than agreeing about its importance. The PRV group related ethics primarily to matters of data, reflecting its utmost importance in DH business settings. The group might have focused on the financial value of data. Inversely, the

HP group held a broader perspective of ethics, referring to the societal mission of healthcare professionals to assist patients ethically and considering the common good. In fact, the literature does not limit ethics to data issues, rather extending it to broader societal implications. Vayena et al. (2018) reviewed ethical challenges in DH policy to include privacy and security, trust, and accountability. They suggested that ethical elements in DH are made of multiple levels of sub-elements, e.g.: “trust cannot only be built through achieving just one element, but rather through a concerted effort to promote all of its elements” (p.4) which include transparency, accountability, benefit sharing and clarity about data use and ownership.

A subsequent finding is the difficulty of HPs to understand practical implications of ethics compared to the other stakeholder groups. The term ethics was deemed too abstract. It might need to be explicitly broken down to enable field actors to put it in practice. While medical ethics education is discussed in the literature and integrated in medical studies curriculums, it was found that the “hidden curriculum”²³ holds a great deal of importance, potentially hindering such efforts (Carrese et al., 2015). One suggestion to bridge current gaps in ethics education for HPs is using LLMs²⁴ (Rahimzadeh et al., 2023). In France, HPs were found to not support EHRs (Manard et al., 2019). A potential parallel with their difficulty in understanding ethics could be the object of further investigation.

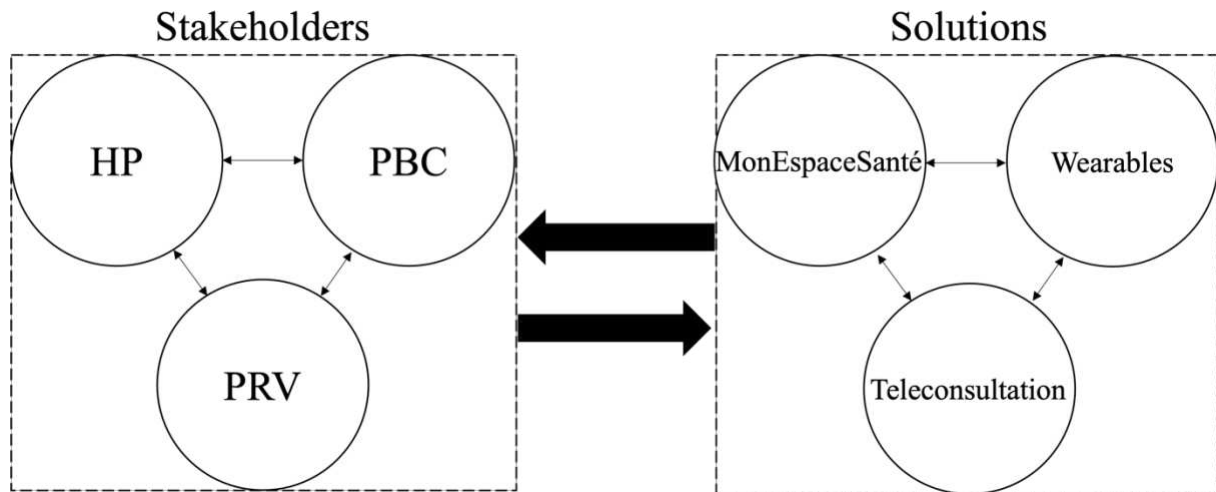
Findings support the need for cultural and mentality changes, aligning with previous research (Cripps & Scarbrough, 2022; Manard et al., 2019). While PBC mainly pointed to doctors’ mentalities, mentioning their lack of adherence to ethical and security practices, HPs and PRV distinguished different types of culture shifts. HPs differentiated between individual and collective cultures whilst the PRV identified different stakeholder groups (patients, HPs, government). The former saw collective changes as more difficult to realise but achievable through public action. This finding suggests that culture shifts are indeed needed, but that they should be approached with enough detail to contextually tailor change management strategies to differing needs. All-in-all, it appears that the need for adaptation is multi-sided among stakeholders, among solutions, and between the two (example in Figure 5.1).

²³ Refers to the implicit lessons and norms conveyed in educational settings, impacting students' beliefs and behaviors beyond the formal curriculum (Hafferty & Franks, 1994).

²⁴ Large Language Models—an example of which is ChatGPT.

Figure 5.1

Example Digital health Multi-Sided Adaptation



Interestingly, despite recognising that sustainable adoption of DH relies on user-friendliness, the PRV perceived a trade-off between short-term solution efficacy and longer-term ethical and security implications. They evaluated the potential costs of repairing ethical concerns later as more expensive than addressing them right away, e.g., with increased security. This aligns with the idea that unethical behavior can have severe and unpredictable consequences for businesses (Morahan, 2015). The PRV viewed security as more imposed than willingly embraced, a source of financial burden and additional system design requirements. They further concluded that DH's development is worth the expense of moral values like transparency. While through risk assessment the PRV prefer preventing ethical issues early, profit-driven priorities evidently shape the group's needs and its willingness to comply to ethical and security guidelines. Cultural factors can probably explain these perspectives (Mihet, 2013).

Whilst the topic of data as central to DH was evident among stakeholders, understandings of the nature and role of data were diverse. The PBC and PRV identified different types of data holding different characteristics, causing different approaches depending on finalities. The PRV separated personal from public health data. Personal health data refers to a single individual's data, useful throughout their patient journey, thus needing to be linked to personal information such as identity. Public health data refers to "big data", meaning large amounts of data, often anonymised, analysed for trend-identification and decision-making. Whilst the PBC implicitly understood the same, more exhaustive data types and data use cases were discussed: from simple symptoms and blood analysis to genetics and neurological data;

use cases were cross-countries comparison, clinical trials, biological research, and evaluating public health policies' efficacy. HPs did not specify data types or use cases. Existing literature corroborates the existence of different types of health data, from patient-generated data to genomics (Mikk et al., 2017). This finding correspondingly supports that data is granular and should be approached as such. Encouragingly, this is currently how the European political sphere approaches the development of the EU Health Data Space (EHDS) (European Parliament, 2023).

An additional particularity was the PBC and HPs both strongly arguing that patients' health data is their own, whilst the PRV did not particularly support this. This could align with the PRV's industry culture and profit-driven mentality, resulting in less explicit advocacy for discrete data ownership. The HP's stance could be surprising due to traditional mentalities, but again may stem from the additional patient education role held by the participant. This same voice convinced the group that patient sovereignty in owning and using their own data is positive for individual health outcomes, a perception shared by the PBC. This view is discussed fairly little in literature but could be noteworthy (Rathbone et al., 2023).

5.2. Summary of main findings

Findings suggest that the French NDHS stakeholders align on the need for strategy to cover aspects such as ethics, the importance of interoperability, pragmatic considerations, patient-centricity, and coproduction. It appears there is a perceived gap between policies and field needs. Despite common perspectives, crucial distinctions in perceptions arise about ethics, approaching cultural change, and data.

In summary, findings confirm the perceived importance of coproduction, patient centricity and ethical considerations within DH stakeholders. These can thus be inferred to be prominent issues to consider within a NDHS. Findings also confirm that different perceptions of public values arise when studying different stakeholder groups. It appears that not accounting for stakeholder-specific perceptions could hinder NDHS's effectiveness and restrain public value creation. Finally, findings confirm the need for culture shifts, newly suggesting that they should be tailored to stakeholder-specific needs.

The main new insight is the weight given to democratic considerations in the face of its managerial counterpart. Whilst findings corroborate the importance of practical values for DH

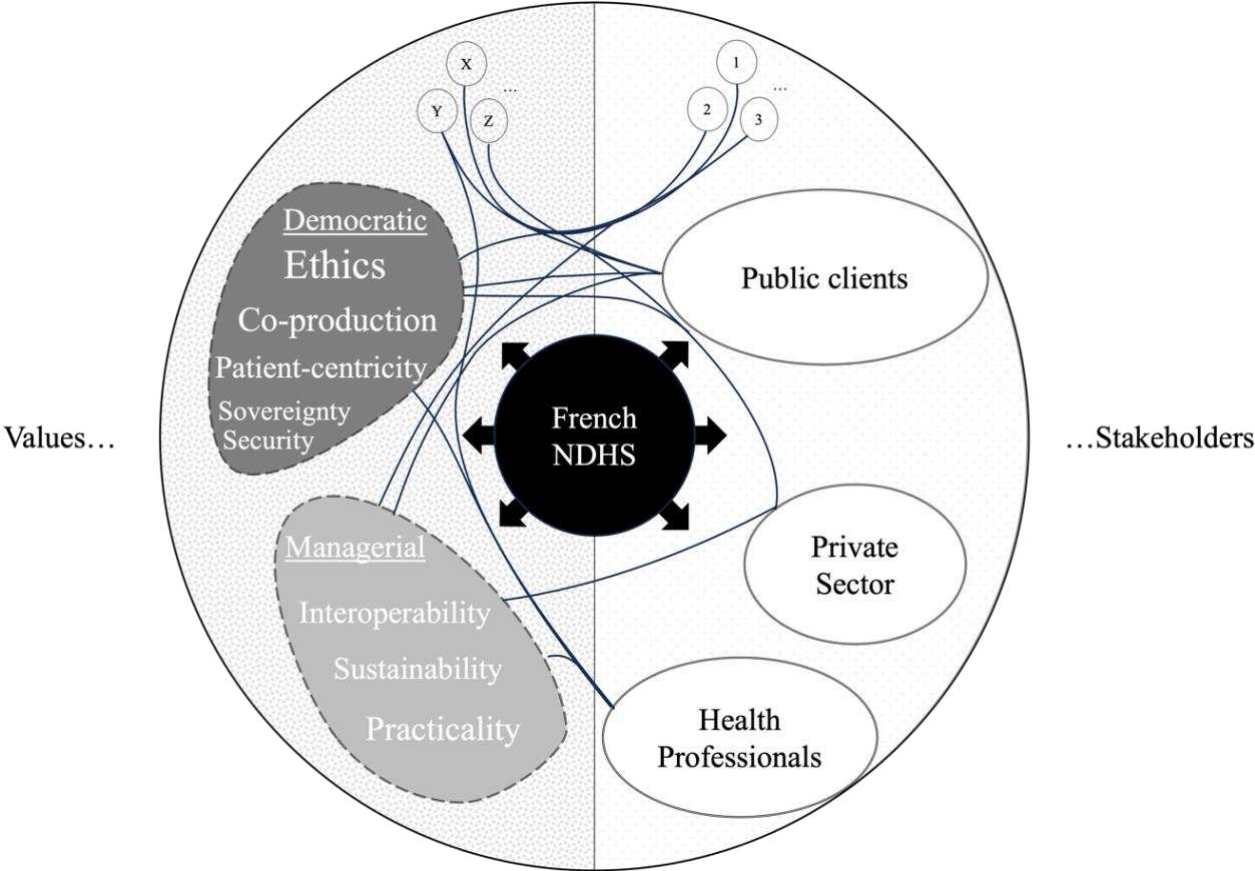
implementation, they bring to light that democratic values are perceived at least equally important by stakeholders. This new idea is discussed in the next section with the production of related framework.

5.3. Framework of public values for national digital health strategy

From this study’s findings, a framework of public values is produced to the attention of NDHS administrators, depicted in Figure 5.2. This framework finds its root in public value theory, as presented in the section 2 “Background”. We argue that to understand public value further, it is necessary to deep dive into the public values that compose it. Results confirmed the relevance the values discussed and their perceived importance to stakeholders.

Figure 5.2

Framework of Public Values in National Digital Health Strategy



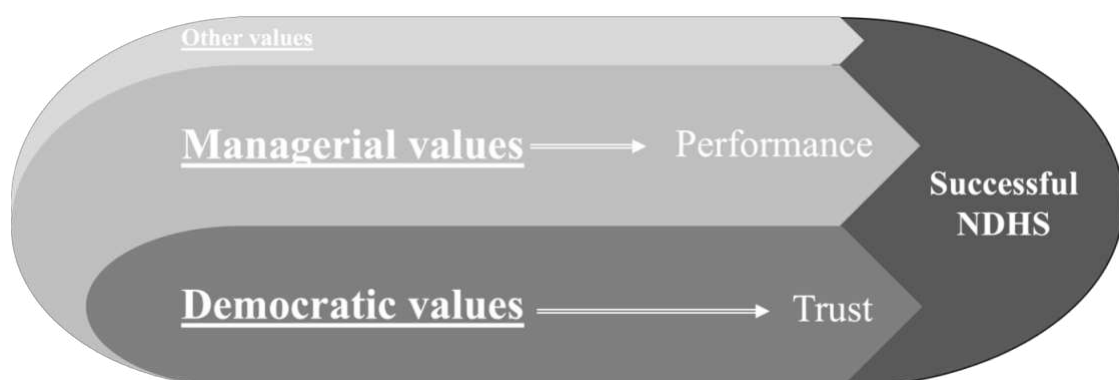
The significance of culture in driving DH transformation seems evident from findings. We understand culture as an aggregation of public values. Two avenues emerge which require attention: democratic and managerial culture. Democratic culture encompasses values linked to ethical perspectives and societal needs, whereas managerial culture involves values associated with practical technological considerations for service and product delivery. These two cultures can be perceived as representing respectively demand and supply sides of DH culture. We consider the equilibrium point to be where public value is established.

This dual classification emerges from our findings and aligns with previous work (Bonina & Cordella, 2009). The first class was named “democratic” to include more than ethics, encompassing broader social considerations. Values include: ethics, security, sovereignty, co-production, and patient-centricity. We suggest that they are components of public trust. The second class could have been named “technical” but “managerial” was preferred since this framework is mainly directed to NDHS administrators. Values include practicality, sustainability, and interoperability. We suggest that they contribute to the NDHS’ performance. Security and sovereignty were perceived public rights, thus classified as democratic. Interoperability was seen as technical in nature, and sustainability relating to change management, thus classified as managerial.

The dynamic discussed is illustrated in Figure 5.3. We contend that performance and trust are two factors of successful public value creation within a NDHS. A NDHS can be trusted without being performant in its delivery of DH, or performant in its delivery of DH without being trusted. In these cases, we judge it unsuccessful. Inversely, realising both managerial and democratic values, the NDHS results trusted and performant. In this case, we contend that public value is created, and consider the NDHS successful all-round.

Figure 5.3

Values Dynamic of Successful National Digital Health Strategy



5.4. Study limitations

This study bears certain bias towards DH, from participants and from the researcher. However, our aim was to deep dive into perceptions about DH within the French NDHS, accepting and even necessitating this bias from the start, to involve individuals who possessed the correct characteristics to enable answering our research questions (Agius, 2013). This research was also exploratory, as to the best of my knowledge, no other has previously investigated public values specifically within a NDHS nor to the attention of NDHS administrators.

Even though results supported their perceived importance to participants (see Figures Figure 4.1, Figure 4.2, Figure 4.3), the selection of specific values derived from French DNHS policy documents could bear some limits as they resulted from prior policymaker decisions. This limitation was attempted to be mitigated by the moderator asking about additional values not mentioned.

5.5. Recommendations

Recommendations are formulated for policymakers, DH strategy implementers, public policy researchers, and DH/medical informatics, to enhance public value creation.

5.5.1. For policymakers

Findings stress the need for DH strategies to give increased weight to democratic considerations. Ensuring democratic values are represented in DH policies is of paramount importance to achieve strategies that are not only performant in delivering digital health, but also trusted. The optimal balance between democratic and managerial considerations can be established by coproducing DH policies. The framework developed hereby can guide the process of establishing the optimal balance of weight given to democratic and to managerial considerations.

5.5.2. For implementers

In implementing DH, it is crucial to consider the differences in stakeholder perceptions about values and their motivations to develop and use DH. It is suggested to constantly survey different stakeholder groups using a “public value” lens, a process which can be guided and structured by the framework developed in this thesis.

Education surfaced as a welcomed tool for managing cultural change and stakeholder expectations. Addressing varying levels of technological proficiency across stakeholders and fostering shared, modern ethical perspectives among healthcare professionals are top priorities.

Keeping everything as simple as possible is crucial: strategy, policy, but most and foremost solutions. This facilitates their understanding and usage by stakeholders. Findings and literature align on the importance of practical considerations such as ease-of-use for DH adoption. Platforms should aim at being universal, but systems need to optimise for specific use cases.

5.5.3. For public policy researchers

Findings show that public value analysis is highly relevant within the French NDHS. Hence studying public perceptions of values among different stakeholders appears promising and should be brought further. More broadly, public value research should take interest in DH, as values hold potential to guide its future development and implementation.

Forthcoming research could expand towards including more values and stakeholder groups. We suggest adopting the framework proposed in this research and adapting it according to new findings. Inversely, studies could focus on individual values or stakeholder groups. Methods-wise, running data through multiple coders (researchers) could reinforce findings (Agius, 2013).

Despite its potential in DH, coproduction-related studies seem to focus on single initiatives (Papoutsi et al., 2021) or smaller scales (Botti & Monda, 2020). They do not encompass the extensive scope of a NDHS. Findings confirmed the value of coproduction and additional research is suggested around its governance and processes.

5.5.4. For digital health developers/medical informatics

Coproduction in the development of DH solutions appears crucial for their eventual adoption. End-users need to be involved comprehensively in the research and development process. A common perceived mistake is to involve users at the beginning of the process, and at its end, missing the core of the process. Coproduction could help achieve optimal levels of ethical considerations, security, interoperability, whilst keeping pragmatic considerations simple and promoting ease-of-use.

6. Conclusion

Findings highlight persisting technical and cultural issues within France's current NDHS. They reveal shared perceptions between stakeholder groups—public clients, health professionals, and private sector—but also distinctive views which could hinder NDHS's effectiveness, restraining public value creation, if misalignment is not properly accounted for and managed. Stakeholders aligned on the fundamental need for ethics and interoperability, and the importance of pragmatic considerations, patient-centricity, and coproduction. Crucial distinctions in perceptions arose about defining ethics, approaching cultural change, and data. Hence, findings confirm the plurality of perceptions of public values among different stakeholders.

A framework of public values was developed to guide digital health policymakers, implementers, and developers, as well as future research. The main novel argument proposed is the dual interplay of democratic and managerial values for successful DH implementation. It is suggested that democratic and managerial values respectively foster trust and performance within a NDHS, two complementary and measurable values in achieving successful DH implementation. In conclusion, the public value paradigm appears highly relevant in DH contexts, and able to guide and enhance implementation strategies, fostering adequate adoption.

It is important to investigate the matter of public value in DH context further to keep up with rapid technological and societal changes, and to help address health-related challenges at all scales. In this, political command stands as the principal decider.

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Appendices

Appendix 1: List of Partners in the French National Digital Health Strategy (Non-Exhaustive)

Actors	Level	Task	Affiliated
Ministry of Health	National	Lead digital transformation Define strategy Provide resources	Ministerial Delegation for Digital Health (DNS) Directorate General of Healthcare Provision (DGOS) Directorate of Social Security (DSS) Directorate General of Health (DGS) Directorate General of Social Cohesion (DGCS) Directorate of Research, Studies, Evaluation, and Statistics (DREES)
Orders/councils of health professionals	National	Ensure professionalism, medical ethics, and quality of care.	National Council of Physiotherapists National Council of Midwives National Council of Physicians National Order of Pharmacists National Order of Nurses National Order of Dentists National Order of Chiropodists-Podiatrists
Representatives, federations and unions of caregivers and users	National	Defend their respective interests	France Assos Santé French Hospital Federation (FHF) Federation of Non-Profit Private Healthcare and Home Assistance Establishments (FEHAP) Federation of Private Hospitalization (FHP) National Union of Healthcare Professionals (UNPS) Unicancer National Interfederal Union of Non-Profit Health and Social Organizations (UNIOPSS) AVECSanté Assistance Publique-Hôpitaux de Paris (AP-HP) National Federation of Home Hospitalization Establishments (FNEHAD) National Union of ADMR Associations (Home Care in Rural Areas) Patient Associations Union of Senior Management, Doctors, Dentists, and Pharmacists in Public and Private Healthcare and Social Facilities (SYNCASS-CFDT) Clinical Research Companies (AFCROs) France digitale

<p>Industry representatives, networks, federations and trade unions</p>	<p>National</p>	<p>Defend their respective interests</p>	<p>Interop'santé Numeum French Society for Laboratory Informatics (SFIL) Telemedicine Enterprises (LET) Association of Autonomous Public Hospital IT Structures (ASINHPA) French Association of Accredited Health Data Hosts (AFHADS) Federation of Outpatient Medical and Paramedical IT Publishers (FEIMA) National Union of Medical Technology Industries (SNITEM) Pharmaceutical Companies (Leem) SATT Network Competitiveness Clusters France eHealthTech Companies in Health and Social Information Systems (LESISS) Federation of Electrical, Electronic, and Communication Industries (FIEEC) French Association of Software and Internet Solutions Publishers (AFDEL) Electronic Industries Grouping (GIXEL) Acsiel Electronic Alliance French Federation of Health Industries (FEFIS)</p>
<p>Public or private operators</p>	<p>National</p>	<p>Carry the digital transformation of the health system</p>	<p><u>Agencies and Public Interest Groups</u> Digital Health Agency (ANS) National Agency for Support to Performance (ANAP) National Housing Agency (Anah) National Agency for the Safety of Medicines and Health Products (ANSM) Public Health France (Santé Publique France) Technical Agency for Hospital Information (ATIH) Biomedicine Agency (ABM) National Agency for the Security of Information Systems (ANSSI) General Agency for Equipment and Health Products (AGEPS) National Agency for Food, Environmental and Occupational Health Safety (Anses) Health Data Hub SESAM-Vitale Economic Interest Group (GIE SESAM-Vitale)</p>

		<p><u>Associations and federations</u></p> <p>French Standardization Association (AFNOR)</p> <p>French Healthcare Association</p> <p>French Association of Personal Data Protection Correspondents (AFDCP)</p> <p>French Association of System Engineering (AFIS)</p> <p><u>Centres, institutes and observatories</u></p> <p>National Center for Deposits and Approvals (CNDA)</p> <p>Digital Service Center of the Health Service of the Armed Forces (SSA)</p> <p>National Center for the Management of Hospital Practitioners (CNG)</p> <p>National Center for Hospital Expertise (CNEH)</p> <p>National Institute for Prevention and Health Education (INPES)</p> <p>National Institute for Health Surveillance (INVS)</p> <p>National Observatory for Demographics of Health Professions (ONDPS)</p> <p>National Cancer Institute (INCa)</p> <p>National Institute for Young Blind People (INJA)</p> <p>National Institute for Young Deaf People (INJS)</p> <p>National Observatory for Child Protection (ONPE)</p> <p>Technical Center for Provident Institutes (CTIP)</p> <p><u>Commissions, councils and committees</u></p> <p>Economic Committee for Health Products (CEPS)</p> <p>National Council for Quality and Coordination of Care (CNQCS)</p> <p>Commission for the Organization of Emergency Care (COPS)</p> <p>High Council for the Future of Health Insurance (HCAAM)</p> <p><u>Independent public and administrative authorities</u></p> <p>French National Authority for Health (HAS)</p> <p>National Commission for Information Technology and Civil Liberties (CNIL)</p> <p>Regulatory Authority for Insurance and Mutual Insurance</p>
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Regional and departmental actors	Regional/Local	Accompany terrain actors at regional/departmental scale	Regional Support Groups for e-Health Development (GRADEs) Regional Health Agencies (ARS) Regional Union of Healthcare Professionals (URPS) Regional Health Insurance Funds (CRAM) Regional delegations Regional Health Observatories (ORS) Regional Emergency Observatories (ORU) Regional Health Identity Surveillance Group (GRIVES) Regional Council for Quality and Coordination of Care (CRQCS) Territories Bank
Research, training & education, incubators	National/Local	Research, educate, train and accelerate digital health innovation	Ministry of Higher Education, Research, and Innovation National Center for Scientific Research (CNRS) National Institute for Research in Digital Science and Technology (Inria) National Institute of Health and Medical Research (Inserm) Institute of Research and Information on Economics of Health (Irdes) National Institute of Statistics and Economic Studies (Insee) School of Public Health (EHESP) National Association for the Continuous Training of Hospital Personnel (ANFH) Center for Advanced Studies in Hospital Economics and Management (CESEGH) National College of Teaching General Practitioners (CNGE) Montaigne Institute National Federation of Health Education Committees (FNES) National School of Social Security (EN3S) PariSanté Campus Living Labs in Health and Autonomy (LLSA)

Financial actors	National	Provide financial resources for practice and entrepreneurship in digital health	<p>National Health Insurance Fund (CNAM)</p> <p>National Fund for Solidarity and Autonomy (CNSA)</p> <p>Supplementary insurance companies</p> <p>Health insurance mutuals</p> <p>BPI France</p> <p>Retirement and pension funds</p> <p>National Federation of French Mutual Insurance (FNMFI)</p> <p>Union of National Social Security Funds (UCANSS)</p> <p>National Office for Compensation of Medical Accidents (ONIAM)</p> <p>National Health Insurance Fund for Salaried Workers (CNAMTS)</p> <p>French Insurance Federation (FFA)</p> <p>Primary Health Insurance Funds (CPAM)</p> <p>Central Agency for Social Security Organizations (ACOSS)</p> <p>European and International Social Security Liaison Center (CLEISS)</p> <p>National Family Allowance Fund (CNAF)</p> <p>National Old Age Insurance Fund for Salaried Workers (CNAVTS)</p> <p>Agricultural Social Mutual Insurance (MSA)</p>
European and international actors	International	Enable interoperability of systems across borders and a global digital health market	<p>European Medicines Agency (EMA)</p> <p>World Health Organization (WHO)</p> <p>European Commission</p> <p>European Federation for Medical Informatics (EFMI)</p> <p>World Medical Association (WMA)</p> <p>Healthcare Information and Management Systems Society (HIMSS)</p> <p>The G20 Health & Development Partnership (G20 HDP)</p> <p>Hope (The European Hospital and Healthcare Federations)</p>

Source: Agence Du Numérique En Santé, n.d.

Appendix 2: Sample Message Used for Focus Groups Recruitment (in French)

Objet : Thèse de Master : Invitation à l'Étude des Valeurs Directrices de la Stratégie Nationale du Numérique en Santé.

Très cher/chère Amassadeur, Responsable, Docteur, bonjour,

J'espère que ce message vous trouve en pleine forme.

Je me présente : Simon Lewerenz, étudiant à l'Université Catholique Portugaise et ancien élève de l'ESCP. Dans le cadre de ma thèse de Master en Stratégie, je mène une étude à propos de la stratégie nationale du numérique en santé développée par le Ministère de la Santé et de la Prévention avec la Délégation Ministérielle au Numérique en Santé (DNS).

Je suis à la recherche de professionnels de la santé pour participer à une réunion de discussion en ligne. En une heure et demie de votre temps, vous contribuerez à potentiellement améliorer le futur système de santé français.

Ma thèse s'intitule « Valeur publique et valeurs directrices de la stratégie nationale de santé numérique en France ».

Objectif : Explorer comment les **valeurs directrices de la Stratégie Nationale du Numérique en Santé française** sont perçues par le public français, dans notre cas par les professionnels de santé, pour améliorer la transition numérique de notre système de santé.

Dates : Les groupes de discussion prennent place selon vos disponibilités **jusqu'à la mi-décembre 2023.**

Entretien Préliminaire : Nous pouvons échanger durant un rapide entretien informel qui ne fera pas partie de l'étude, afin de répondre à vos questions.

Pour manifester votre intérêt, je vous prie de répondre à cette invitation à l'adresse suivante : [REDACTED] ou par téléphone au [REDACTED].

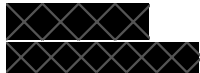
Votre considération est grandement appréciée. Vous avez l'occasion d'apporter un soutien inestimable à l'étudiant que je suis.

Je vous remercie de recevoir mon invitation, et espère pouvoir vous compter parmi nous.

Sincèrement,
Simon



Simon Lewerenz



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Appendix 3: Table of key terms as defined in this research's context

Key term (English)	Definition (English)
Santé numérique (Digital health)	Le domaine des connaissances et pratiques liées au développement et à l'utilisation des technologies numériques pour améliorer la santé, au-delà du concept d'e-santé pour inclure les utilisateurs numériques, avec une plus grande variété d'appareils intelligents et connectés, ainsi que d'autres utilisations des technologies numériques pour la santé, comme l'Internet des objets, l'informatique avancée, l'analyse de "big data", l'intelligence artificielle, y compris le machine learning, et autre robotique. <i>(The field of knowledge and practices related to the development and use of digital technologies to improve health, beyond the concept of e-health to include digital users, with a wider variety of smart and connected devices, as well as other uses of digital technologies for health, such as the Internet of Things, advanced computing, big data analytics, artificial intelligence, including machine learning, and other robotics.)</i>
Stratégie nationale du numérique en santé (National digital health strategy)	Un ensemble de documents de politique publique, de services et d'actions entreprises afin de déployer le numérique en santé en France. <i>(A set of public policy documents, services and actions undertaken to deploy digital health in France.)</i>
La valeur publique (The public value)	La valeur apportée par une organisation à la société au profit du bien commun. <i>(The value that an organisation brings to society for the benefit of the common good.)</i>
Une valeur publique (A public value)	Un mode de comportement, que ce soit une manière de faire les choses ou une caractéristique d'une manière de faire les choses, qui est considéré comme juste. <i>(A pattern of behaviour, whether it is a way of doing things or a characteristic of a way of doing things, that is considered right.)</i>
Ethique (Ethics)	Une préoccupation démocratique de la société, définissant et régulant le comportement moral acceptable. <i>(A democratic concern of society, defining and regulating acceptable moral behavior.)</i>
Durabilité (Sustainability)	La capacité à créer des résultats sur le long terme. <i>(The ability to create long-lasting results.)</i>
Interopérabilité (Interoperability)	La capacité de différents systèmes à échanger et à utiliser des données de manière transparente et efficace, permettant un écosystème de soins de santé connecté. <i>(The ability of different systems to exchange and use data seamlessly and efficiently, enabling a connected healthcare ecosystem.)</i>
Sécurité (Security)	La protection des systèmes et organisations de santé contre les cyberattaques et la garantie de la sécurité des données des patients. <i>(The protection of healthcare systems and organisations from cyberattacks and ensuring the security of patient data.)</i>
Souveraineté (Sovereignty)	Le contrôle et la propriété des données de santé par les individus ou les systèmes de santé. <i>(The control and ownership of health data by individuals or health systems.)</i>

Appendix 4: Consolidated Criteria for Reporting Qualitative Studies (COREQ): 32-Item Checklist

N°.	Item	Answer
Domain 1: Research team and reflexivity		
Personal Characteristics		
1.	Interviewer/facilitator	Simon Lewerenz
2.	Credentials	M.Sc. student
3.	Occupation	Student
4.	Gender	Male.
5.	Experience and training	No experience with focus groups; Experience with interviews during B.Sc. thesis.
Relationship with participants		
6.	Relationship established	Some participants engaged in a preliminary informal interview by telephone.
7.	Participant knowledge of the interviewer	None, except for aim of the research and LinkedIn profile.
8.	Interviewer characteristics	Positive bias towards digital tools in health care and prevention. Previous professional experience in the pharmaceutical industry.
Domain 2: study design		
Theoretical framework		
9.	Methodological orientation and Theory	Thematic analysis.
Participant selection		
10.	Sampling	Purposive.
11.	Method of approach	Posting on online forums, direct enquiry by email or LinkedIn message.
12.	Sample size	19 final participants.
13.	Non-participation	13 interested individuals did not participate, either losing interest or due to incompatible time schedules.
Setting		
14.	Setting of data collection	Google Meet; Microsoft Teams; Mentimeter.com
15.	Presence of non-participants	None.
16.	Description of sample	Patients association & advocacy and user representatives; Health professionals, doctors and executives; Private sector professionals involved in digital health.
Data collection		
17.	Interview guide	Statements, thought-provoking prompts.
18.	Repeat interviews	Not Applicable (N/A).
19.	Audio/visual recording	Audio recording of meetings.
20.	Field notes	N/A.
21.	Duration	1 hour 30 minutes to 2 hours.
22.	Data saturation	Yes (see section 3.1).
23.	Transcripts returned	N/A.
Domain 3: analysis and findings		
Data analysis		
24.	Number of data coders	N/A.
25.	Description of the coding tree	N/A.
26.	Derivation of themes	In advance from background research.
27.	Software	Microsoft Office suite.
28.	Participant checking	In some instance, e.g., when participants left earlier, yes.
Reporting		
29.	Quotations presented	Yes, without identification.
30.	Data and findings consistent	Yes.
31.	Clarity of major themes	Yes.
32.	Clarity of minor themes	Yes.

Source: Adapted from Tong et al., 2007.

Appendix 5: Study participation informed consent form.

English	<p>Thank you for participating in this survey.</p> <p>This is a central element of an academic research project aiming to explore the role played by the guiding values of the National Digital Health Strategy (NDHS) in its objective of creating value for the common good.</p> <p>This brief survey (< 3 min) is designed to collect the minimum data necessary for the analysis of our discussions' results.</p> <p>By selecting the "Yes, I agree" option, you acknowledge that:</p> <ul style="list-style-type: none">• Your participation in the survey is voluntary.• You are 18 years or older.• You consider yourself part of the French public.• You can freely terminate your participation at any time.• You have read, understood, and accepted the provided content. <p>Confidentiality Guarantee: Your participation in this survey is entirely anonymous, and your responses will remain strictly confidential. No personal information will be linked to your answers to ensure your privacy throughout the survey process. Our online discussion will be recorded for debate analysis; however, no copies of these recordings will be retained once the analysis is completed.</p> <p>For any concerns, contact the survey administrator: [email address].</p>
French	<p>Je vous remercie de participer à cette enquête.</p> <p>Elle est un élément central de ce projet de recherche académique visant à explorer le rôle joué par les valeurs directrices de la Stratégie nationale du numérique en santé (SNNS) dans son objectif de création de valeur au profit du bien commun.</p> <p>Ce sondage rapide (< 2 min) sert à collecter les données minimales nécessaires à l'analyse des résultats de nos discussions.</p> <p>En sélectionnant l'option "Oui, je suis d'accord", vous reconnaissez que :</p> <ul style="list-style-type: none">• Votre participation à l'enquête est volontaire.• Vous avez 18 ans ou plus.• Vous vous considérez partie prenante du public français.• Vous pouvez librement mettre fin à votre participation à tout moment.• Vous avez lu, compris et accepté le contenu fourni. <p>Garantie de Confidentialité: Votre participation à cette enquête est entièrement anonyme, et vos réponses resteront strictement confidentielles. Aucune information personnelle ne sera liée à vos réponses afin de garantir votre vie privée tout au long du processus d'enquête. Notre discussion en ligne sera enregistrée afin de permettre l'analyse des débats; cependant aucune copie desdits enregistrements ne sera conservée une fois l'analyse effectuée.</p> <p>Pour toute préoccupation, contactez l'administrateur de l'enquête : [adresse email].</p>

Appendix 6: Deliberation of the Ethics Committee for Technology, Social Sciences and Humanities concerning the research study



Deliberação da Comissão de Ética em Tecnologia, Ciências Sociais e Humanidades sobre o estudo

Deliberation of the Ethics Committee for Technology, Social Sciences and Humanities concerning the research study

Determining Public Value: An investigation into guiding values of France's National Digital Health Strategy

Com base nos elementos apresentados pelo investigador Simon Lewerenz no Mestrado em Management com especialização em Estratégia, Empreendedorismo e Impacto da Universidade Católica Portuguesa, relativos ao projeto de investigação intitulado “*Determining Public Value: An investigation into guiding values of France's National Digital Health Strategy*”, a Comissão de Ética em Tecnologias, Ciências Sociais e Humanidades (CETCH), considerou estarem reunidas as informações necessárias para poder avaliar o processo, tendo deliberado dar parecer ético favorável, ao pedido submetido em 24 de outubro de 2023 sob o nº CETCH2023-60.

Considering the elements presented by the researcher Simon Lewerenz, from Masters in Management with specialization in Strategy, Entrepreneurship, and Impact at Universidade Católica Portuguesa, regarding the research project entitled "Determining Public Value: An investigation into guiding values of France's National Digital Health Strategy", the Ethics Committee in Technology, Social Sciences and Humanities (CETCH), considered that the required elements were present in order to evaluate the process, and decided to favorably recommend the ethical approval of the request submitted on 24th of October 2023 under number CETCH2023-60.

15 de dezembro 2023

A Presidente da CETCH | *The President of CETCH*



(Célia Manaia)

Appendix 7: Declaration of originality



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DECLARATION OF ORIGINALITY AND INTEGRITY

I Simon Luca Lewerenz hereby declare that, to the best of my knowledge and ability, the written thesis document I am submitting to the Católica Lisbon School of Business and Economics, constitutes original work and properly acknowledges all third party intellectual contributions.

I thereby certify that:

- (1) The written text forming the body of this work is my own with the exception of explicit quotes from others and the corrections proposed by my thesis supervisor.
- (2) The information derived from other published and unpublished works, introduced into any part of this thesis, is duly identified by citation in the text and with its source fully identified in the references.
- (3) Any persons who, through past communication either in person or through any other means, have substantially contributed toward the intellectual development of this work are also explicitly acknowledged.
- (4) This work is original and has never been subject to prior presentation or publication. Whenever the thesis was written under the auspices of other research projects, this is fully stated and described in the thesis.

I understand that the thesis will be fully checked for originality upon submission.

Simon Luca Lewerenz
(Signature)

Cesana Torinese (IT), 2 January 2024
(Place and date)

Public value and guiding values of national digital health strategy in France
(Title of the thesis)



Appendix 8: Advisor declaration



Achieve Greatness

Location Lisbon , Date 30/12/2023

I, Professor

(Prof. name) Prof. Henrique Gil Martins

hereby confirm that I have supervised the MSc thesis of the student named:

(Std name) Simon Luca Lewerenz

With the **dissertation titled:**

(dissertation title) Public value and guiding values of national digital health strategy in France

The above-mentioned thesis is the final version and therefore completed so that it can be submitted for public defense.

Sincerely,

HENRIQUE MANUEL
GIL MARTINS

Assinado de forma digital por
HENRIQUE MANUEL GIL MARTINS
Dados: 2024.01.02 17:01:35 Z

(Prof. signature*) _____

* Obligatory signature types: handwritten signature or legal signature, NOT typed signatures.

Disclaimer:

MSc students (including Double Degree stds) must have an advisor throughout the development of the dissertation. The advisor must review and approve the final version of the thesis; only then can the student deliver it.

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