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DATAFICATION, POWER, AND PUBLICS IN INDIA'S NATIONAL DIGITAL HEALTH ECOSYSTEM

Ramya Chandrasekhar[*]

Abstract: While evident for a long time, the COVID-19 pandemic starkly illustrated the need to strengthen India's public healthcare system. But since 2017, the solution to India's public health woes takes the shape of the National Digital Health Ecosystem (NDHE) – a digital system for the generation, use, and 'frictionless' circulation of health data across healthcare actors through the use of artefacts such as health IDs, electronic health records, data standards, and federated computing architectures. These artefacts are not neutral technological systems. Rather, together with social practices, they constitute a "data infrastructure". Seeing the NDHE as a data infrastructure allows us to visibilise the regulatory effects of the NDHE, i.e., the ways in which the NDHE creates "communities of the affected" whose access to public health is now mediated by affordances granted by the NDHE. This, in turn, shapes law and regulation of the NDHE, where legal frameworks for (health) data protection are not weakened by accident, but weakened by design. At the same time, the regulatory effects of the NDHE can and should be regulated by law, by channelling law's commitment to the creation of healthy public spheres to ensure the vitality of a democracy. Accordingly, this paper makes three contributions – one, it provides a brief overview of the political economy and the regulatory effects of the NDHE; two, it analyses the ways in which the regulatory effects of the NDHE shape legal frameworks for health data to disempower individuals and communities who are the generators of this data; and three, it outlines research and policy suggestions for how the law can intervene in limiting the exclusionary data-politics of the NDHE.

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I. INTRODUCTION

While evident for a long time, the COVID-19 pandemic starkly illustrated the need to strengthen India's public healthcare systems—to ensure equitable access to healthcare services; timely health data management for disease surveillance, healthcare delivery, and research; and due protection of healthcare workers.[1] But since 2017, the National Digital Health Ecosystem ('NDHE') is pitched as "the" solution to these problems.[2] The initiative was formally launched on 27 September 2021, by Prime Minister Narendra Modi

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[1] See generally, N Ravichandran, 'Post COVID-19: Modernizing India's Healthcare Infrastructure' (Center for the Advanced Study of India 2021) <https://casi.sas.upenn.edu/sites/default/files/upiasi/N.%20Ravichandran%20paper.pdf> accessed 8 February 2021; Suchi Kedia and Harshita Agarwal, 'How India can improve urban public health with lessons from COVID-19' (*World Economic Forum*, 8 February 2021) <https://www.weforum.org/agenda/2021/02/how-india-can-improve-urban-health-with-post-COVID-lessons/> accessed March 21 2024; Neetu Chandra Sharma, 'India needs a sustainable healthcare system post pandemic too: AIIMS director' (*Mint,* 23 October 2020) <https://www.livemint.com/science/health/india-needs-a-sustainable-healthcare-system-post-pandemic-too-aiims-director-11603462213343.html> accessed March 21 2024.

[2] Ministry of Health and Family Welfare, 'National Digital Health Blueprint' (Government of India 2020) 7 <https://abdm.gov.in:8081/uploads/ndhb_1_56ec695bc8.pdf> accessed 12 February 2021 (NDH Blueprint).

under the moniker "Ayushman Bharat Digital Mission,"[3] at a time when the COVID-19 pandemic was still in effect in the country. Since its launch, there has been a tenfold increase in its budget allocation—from 30 crores in 2020 to 340 crores in 2023.[4]

Central to the NDHE is the generation, use, and sharing of digital data. The NDHE is comprised of data artefacts such as unique health identifiers, electronic health records, data standards, and technologies like federated computing and application programming interfaces (APIs)—collectively oriented towards the "frictionless" generation and circulation of health data across healthcare actors. India's public health needs and aspirations are sought to be addressed by "harnessing" the economic value of data.[5] This is most evident in the choice to divert funds and regulatory attention (almost completely) to data-driven systems for public health.[6] To mitigate the socio-economic complexities of ensuring public health at scale, access to public health is now mediated by the affordances granted by a set of data-driven systems—a narrative arc reminiscent of Aadhaar being pitched as "the" solution for public welfare delivery.[7]

If we "see" the NDHE not as a set of neutral technological artefacts, but as an infrastructure (as understood in Science and Technology Studies[8]), we can visibilise the politics of the NDHE—a politics of power that creates "communities of the affected" or what is referred to as "infrastructural publics" in this paper. Who are these publics whose access to public healthcare is improved, who is missed out, and who decides? And if we agree that some level of datafication is necessary for better public health—especially in the context of disease management and research—how do we ensure datafication

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[3] Roughly translates to a "digital mission for a healthy and prosperous India."

[4] RTI reply from the National Health Authority dated August 16, 2023, on file with author.

[5] Apar Gupta, 'Brave New India : An overview of Digital Health Policies and Initiatives during the COVID-19 Pandemic' (2022) SSRN 1, 10 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4146111> accessed 31 July 2024 (who refers to this as the "market-driven visions" underpinning the NDHE). Also voiced by Akhila Vasan in a semi-structured interview given to the author on 4 August 2023.

[6] NDH Blueprint (n 2) 1 ("The National Health Policy (NHP) 2017 had defined the vision of 'health and wellbeing for all at all ages'… Citizen centricity, quality of care, better access, universal health coverage, and inclusiveness are some of the key principles on which the NHP is founded. All these aspirations can be realized principally by leveraging the power of the digital technologies. In the Indian context, due to its size and diversity, this mammoth task requires that a holistic, comprehensive and interoperable digital architecture is crafted and adopted by all the stakeholders.")

[7] See generally, Ashish Rajadhyaksha (ed), *In the wake of Aadhaar: The Digital Ecosystem of Governance in India* (Centre for Study of Culture and Society, Bangalore 2013).

[8] US National Science Foundation, 'Science and Technology Studies' (*NSF*) <https://new.nsf.gov/funding/opportunities/science-technology-studies-st> accessed 5 August 2024; The National Science Foundation defines STS as "an interdisciplinary field that investigates the conceptual foundations, historical developments and social contexts of science, technology, engineering and mathematics (STEM), including medical science."

in the service of, and not at the cost of, universal health coverage? And in both respects—what is the role of the law? These are the questions sought to be answered in this paper.

Section II provides a brief overview of the NDHE and legal frameworks applicable to data generated and circulated within the NDHE. Section III outlines the concept of infrastructures, infrastructural publics, and the regulatory effects of infrastructures that evidence the politics of infrastructures. Section IV describes the extractive political economy of the NDHE, and illustrates the ways in which the politics of the NDHE has shaped legal and regulatory frameworks for health data in its image. Section V discusses the role of the law in regulating the exclusionary politics of data infrastructures like the NDHE. Section VI zooms in on the spatial tensions between the infrastructure-user-public of the NDHE and legal publics entitled to public healthcare, and provides suggestions for how constitutional and legislative frameworks can intervene in resolving these spatial tensions. Section VII concludes.

II. WHAT IS THE NDHE?

In its 2017 National Health Policy, the Ministry of Health and Family Welfare ('MoHFW') called for strengthening the role of the government in all aspects of public health, in line with the Sustainable Development Goals. One recommended policy action was the creation of a digital health ecosystem, which leverages Aadhaar for identification and establishes a federated national health information architecture to link health systems across public and private sectors, and state and national levels.[9] Subsequently, the MoHFW created an expert committee under the chairmanship of J Satyanarayana (who was also the former chairman of the Unique Identification Authority of India). In 2020, this committee issued the National Digital Health Strategy ('NDH Blueprint'), which serves as the formal genesis of the NDHE.[10]

A. Technical Components of the NDHE

The NDH Blueprint identifies 35 modular building blocks of the NDHE—a combination of data records, repositories, dashboards, portals, standards, and APIs that will create a federated architecture where data is not centralised, but health data flows are enabled by and between semi-autonomous systems.[11] Four objectives are outlined—unique identification and electronic record keeping, control by citizens over data sharing, mobile-first service delivery,

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[9] Ministry of Health and Family Welfare, 'National Health Policy 2017' (Government of India 2017) para 23 <https://mohfw.gov.in/sites/default/files/9147562941489753121.pdf> accessed 13 February 2021 (NHP).

[10] NDH Blueprint (n 2) 7.

[11] ibid 13.

and interoperability.[12] The NDH Blueprint also identifies a set of principles that should guide the development of the NDHE's building blocks—such as user-centricity and ease of innovation.[13]

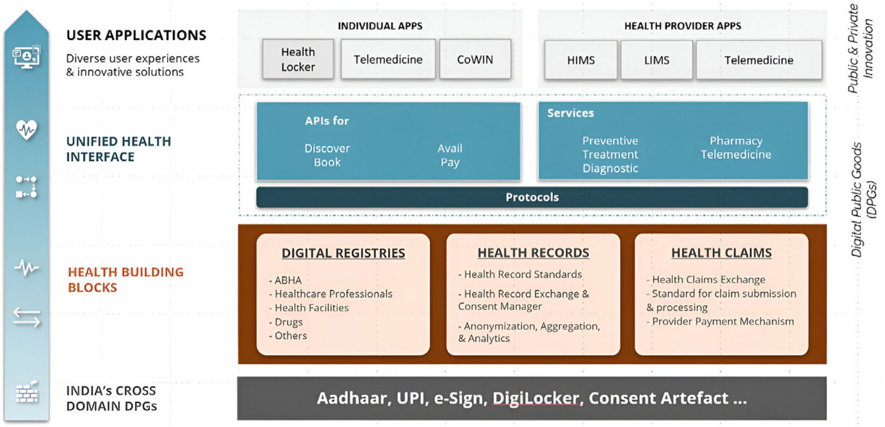

Figure 1: Infographic Displaying the Building Blocks of the NDHE

Source: National Health Authority, 'ABDM Components: Architecture' <https://abdm.gov.in:8081/uploads/Architecture_db6e165997.jpg> accessed 24 March 2024.

The MoHFW created a new public body—the National Health Authority ('NHA')—to oversee the design and implementation of the NDHE.[14] State governments are tasked with two sets of responsibilities—to provide support for the adoption of the NDHE in their respective states, and to contribute in the NDHE as a healthcare provider with regard to state healthcare facilities, educational institutions, and labs.[15] But the regulatory frameworks for the NDHe are not as clearly delineated as its technical components.

B. Regulatory Frameworks for the NDHE

At the outset, it is important to note that there is no umbrella legislative framework for data management within the NDHE. Instead, the NHA has issued a set of policies such as the Health Data Management Policy,[16] which

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[12] ibid 2-3.

[13] ibid 9-10.

[14] National Health Authority, 'A brief guide on Ayushman Bharat Health Mission and its various building blocks' (Government of India 2021) 7 <https://abdm.gov.in:8081/uploads/ABDM_Building_Blocks_v8_3_External_Version_eabbc5c0f3_4_a96f40c645_5716a684de_b344369144.pdf> accessed 5 July 2023 (ABDM Handbook).

[15] ibid 8.

[16] National Health Authority, 'National Digital Health Mission: Health Data Management Policy' (Government of India 2020) <https://abdm.gov.in:8081/uploads/health_data_management_policy_455613409c.pdf> accessed 1 August 2024 (Health Data Management Policy).

serves as the *de facto* regulatory framework for the NDHE. Further, India's central data protection law—the Digital Personal Data Protection Act ('DPDP Act')—was passed in 2023, and is yet to be implemented in full. While the DPDP Act applies to the NDHE, various components of the NDHE have been developed, piloted, and rolled out prior to the passage of the DPDP Act.[17] This in itself is concerning—that a system for generation and sharing of sensitive health data at population-scale has been rolled out by the state and its private sector partners in the absence of democratic oversight through law.[18] To make sense of this regulatory oversight, an analysis of the NDHE as a data infrastructure is useful, as illustrated in the sections below.

III. THE PUBLICS AND POLITICS OF INFRASTRUCTURES

A. Data Infrastructures and Infrastructural Thinking

This paper considers the NDHE as a data infrastructure. I borrow the term "data infrastructures" from Angelina Fisher and Thomas Streinz to mean infrastructures for the generation, use, and sharing of digital data.[19] According to Susan Leigh Star and Karen Ruhleder, an infrastructure is not merely a neutral artefact (or a set of artefacts) on which forces such as the law or markets or social norms act, but a techno-social assemblage which goes through the process of becoming an infrastructure.[20] An infrastructure, therefore, involves complex interactions by and between the technical, the social, and the organisational.[21] The technical refers to computational and engineered hardware and software components; the social refers to the intricate ways in which the human and non-human actants intersect; and the organisational refers to the form and manner of regulation, governance, financing, constitution, etc.[22]

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[17] See, for e.g., Shivangi Rai and Shefali Malhotra, 'India is piloting ambitious digital health initiatives while neglecting data safeguards' (*Scroll*, 31 October 2023) <https://scroll.in/article/1057716/india-is-piloting-ambitious-digital-health-initiatives-while-neglecting-data-safeguards> accessed 1 August 2024.

[18] For instance, the Supreme Court has recognised that administrative orders or executive instructions in the absence of statutory backing are lowest in the hierarchy of laws. See *Ispat Industries Limited v Commissioner of Customs Mumbai* (2006) 12 SCC 583 [28].

[19] Angelina Fisher and Thomas Streinz, 'Confronting Data Inequality' (2022) 60(3) Columbia Journal of Transnational Law 829, 831.

[20] Susan Leigh Star and Karen Ruhleder, 'Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces' (1996) 7(1) Information Systems Research 111.

[21] Paul N Edwards, Steven J Jackson, Geoffrey C Bowker, and Cory P Knobel, 'Understanding Infrastructure: Dynamics, Tensions, and Design: Report of a Workshop on 'History & Theory of Infrastructure: Lessons for New Scientific Cyberinfrastructures' (2007) University of Michigan Library 6 <https://deepblue.lib.umich.edu/bitstream/handle/2027.42/49353/UnderstandingInfrastructure2007.pdf > accessed 6 February 2024; Paul Dourish and Genevieve Bell, *Divining a Digital Future: Mess and Mythology in Ubiquitous Computing* (MIT Press 2011); Benedict Kingsbury, 'Infrastructure and InfraReg: on rousing the international law 'Wizards of Is''(2019) 8(2) Cambridge International Law Journal 171, 179.

[22] Kingsbury (n 21) 179.

For Star and Ruhleder, the question is not "what is an infrastructure", but "*when* is an infrastructure".[23] They posit that infrastructures are a "fundamentally relational concept", given meaning by and within organised practices.[24] An artefact becomes an infrastructure when it standardises local practices at a large scale.[25]

Infrastructural thinking means to "see"[26] infrastructures as:

> ecologies or complex adaptive systems [that] consist of numerous systems, each with unique origins and goals, which are made to interoperate by means of standards, socket layers, social practices, norms, and individual behaviours that smooth out the connections among them. This adaptive process is continuous, as individual elements change and new ones are introduced — and it is not necessarily always successful.[27]

Star and Ruhleder outline certain characteristics of infrastructures,[28] two of which are particularly important for this paper. First, while a data infrastructure does have physical bases that evinces its materiality (such as server rooms, physical hard drives, and fibre optic cables for transfer of electrical signals), a data infrastructure is not a naturally bounded object or set of artefacts.[29] What "makes" a data infrastructure is the interactions between and among its material and non-material components.[30] The second characteristic is the relationality of a data infrastructure. Science and Technology Studies scholars have long pointed out that an infrastructure creates, maintains, and destroys social, technical, and socio-technical relations.[31] The relationality of an

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[23] Star and Ruhleder (n 20) 112-114 (emphasis added).

[24] ibid 113.

[25] ibid 114.

[26] By "seeing", I mean an epistemology that considers knowledge as partial, perspectival, and situated. See generally, Donna J Haraway, *Simians, Cyborgs and Women: The Reinvention of Nature*. (1st edn, Routledge 1991) ch 9; Sandra Harding, 'Feminist Standpoint Epistemology' in Muriel Lederman and Ingrid Bartsch (eds) *The Gender and Science Reader* (Routledge 2000).

[27] Paul N Edwards and others, 'Knowledge Infrastructures: Intellectual Frameworks and Research Challenges' (2013) University of Michigan Library <https://deepblue.lib.umich.edu/bitstream/handle/2027.42/97552/Edwards_etal_2013_Knowledge_Infrastructures.pdf> accessed 19 November 2023.

[28] Star and Ruhleder (n 20) 113.

[29] ibid 112-114. See also Carolyn Marvin, *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century* (Oxford University Press 1988) 4-8.

[30] See also Rob Kitchin, *The Data Revolution* (Sage 2014) 32, 54-57 (Kitchin argues that data is intricately interconnected with a set of social, legal, political, economic and technical "apparatuses" and "elements", and these interconnections constitute a data assemblage); Rob Kitchin and Tracey P. Lauriault, 'Toward Critical Data Studies: Charting and Unpacking Data Assemblages and Their Work' in Jim Thatcher, Josef Eckert, and Andrew Shears (eds) *Thinking Big Data in Geography* (University of Nebraska Press 2018).

[31] See generally, Star and Ruhleder (n 20) 112; Kingsbury (n 21) 179; Geoffrey C. Bowker and Susan Leigh Star, *Sorting Things Out: Classification and its* Consequences (1st edn, MIT

infrastructure is also evident in the fact that an infrastructure can be direct or indirect effects of other infrastructures or institutions.[32]

B. Infrastructural Publics

Because of its materialities and its relationality, infrastructures engender an ordering of society at the level of collectives.[33] But this ordering is not merely the gathering of individuals into a group. Rather, as Langdon Winner notes, this ordering implies the existence of "some form of power relation impinging upon people's chances of making decisions they should have been able to make,"[34] or what Noortje Marres refers to as "communities of the affected" that are constituted and gather around an infrastructure of shared relevance.[35] Benedict Kingsbury and Nahuel Maisley argue that the collectives brought into existence (as also wiped out of existence) by infrastructures can be conceptualised as "infrastructural publics," i.e., as "groups of people subject to power relations [of an infrastructure] that may significantly affect their autonomy."[36]

When infrastructures become the modalities by which vital resources are distributed/made accessible to populations, they become sites for political negotiations between public bodies and these populations. In other words, infrastructures structure political participation by/of its collectives.[37] It is this political participation that can be studied through the analytical frame of "publics."

Press 2000); Benedict Kingsbury and Nahuel Maisley, 'Infrastructures and Laws: Publics and Publicness' (2021) 17(1) Annual Review of Law and Social Science 1, 7.

[32] Kingsbury and Maisley (n 31) 7-8.

[33] See generally, John Law, 'Notes on the theory of the actor-network: Ordering, strategy, and heterogeneity' (1992) 5 Systems Practice 379, 379–393.

[34] ibid 19; See also, CA Le Dantec, *Designing Publics* (1st edn, MIT Press 2016); Christopher A Le Dantec and Carl DiSalvo, 'Infrastructuring and the formation of publics in participatory design' (2013) 43(2) Social Studies of Science 241, 241–64.

[35] Noortje Marres, *Material Participation: Technology, the Environment and Everyday Publics* (1st edn, Springer 2015) 33-37.

[36] Kingsbury and Maisley (n 31) 18 (emphasis added).

[37] Marres (n 35) 33-37. See also Nikhil Anand, 'A Public Matter: Water, Hydraulics, Biopolitics' in Nikhil Anand, Akhil Gupta & Hannah Appel (eds), *The Promise of Infrastructure* (Duke University Press 2018) (Anand uses the moniker "hydraulic publics" to describe the ways in which the materialities and technologies of water distribution infrastructure in Mumbai bring into being "communities of the affected", i.e., communities whose political participation regarding access to and use of water is structured by as well as shapes the water distribution infrastructure); Jannie Møller Hartley, Jannick Kirk Sørensen, and David Mathieu, *DataPublics: The Construction of Publics in Datafied Democracies* (Bristol University Press 2023) (using the concept of "publics" to illustrate the overlaps between audiences of the media, and collectives that engage in civic engagement and citizen deliberation); danah boyd, 'Social network sites as networked publics: Affordances, dynamics, and implications' in Zizi Papacharissi (ed), *Networked Self: Identity, Community, and Culture on Social Network Sites* (Routledge 2010) 39–58 (boyd uses the concept of "networked publics" to study how communities of users gather through social media, as well as the ways in which social media technologies structure how these communities come into as well as fall out of existence).

Jeff Weintraub and Krishnan Kumar identify four usages of "public" in social and political theory—(i) as public goods, distinct from private goods that are good distributed by the market economy, (ii) as a political community such as the Habermasian public sphere[38] or Nancy Fraser's counterpublics,[39] (iii) as a realm of sociability, and (iv) as a gendered category demarcating the divide between the "family" as the private sphere, and the "political" as the public sphere.[40] In this paper, I zoom in on the second usage of "public" as a political community, and "publics" as the plural form, to unearth the ways in which "communities of the affected" participate in the governance of infrastructures as well as contest the politics of infrastructures.

This concept of "publics" acquires more relevance in the context of infrastructures created in public interest, such as roadways and railways or data infrastructures for health, banking, and taxation. Historically these infrastructures were created by the state for what was traditionally understood as a "unified" singular public—the public imagined in official documents, policies, and laws or the public of the social contract that set up the state.[41] But growing recognition of the plurality of infrastructural publics combined with a breakdown of the traditional binary between state-owned-and-operated "public" infrastructures and market-driven "private" infrastructures are yielding new insights into infrastructural publics. In this context, infrastructural thinking serves as a rich analytical method to answer questions of who are the "publics" imagined and served by data infrastructures such as India's NDHE, who are the publics that are missed out, and who are the publics that contest the politics of such infrastructures?

C. Regulatory Effects of Infrastructures

These questions are crucial as they illustrate the regulatory effects of infrastructures—which this paper understands as "regulatory functions that increasingly constitute the scaffolding of human and social life."[42] It can be

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[38] Jurgen Habermas, *The Structural Transformation of the Public Sphere* (1st edn, MIT Press 1991).

[39] Nancy Fraser, 'Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy' in Craig J Calhoun (ed) *Habermas And The Public Sphere* (MIT Press 1992).

[40] See generally, Jeff Weintraub and Krishnan Kumar (eds), *Public and Private in Thought and Practice* (University of Chicago Press 1997).

[41] Stephen J Collier, James Christopher Mizes, and Antina von Schnitzler, 'Preface' in Stephen J Collier, James Christopher Mizes, and Antina von Schnitzler (eds), *Public Infrastructures/ Infrastructural Publics* (Limn 2016) <https://limn.it/articles/preface-public-infrastructures-infrastructural-publics/> accessed 2 August 2024.

[42] Stefania Milan, Michael Veale, Linnet Taylor, and Seda Gürses, 'Promises Made to Be Broken: Performance and Performativity in Digital Vaccine and Immunity Certification' (2021) 12(2) European Journal of Risk Regulation 382. See also, Kingsbury and Maisley (n 31); Léa Stiefel and others, 'Preface: Governance by Infrastructure' (2024) 29(2) First Monday <https://hal.science/hal-04468480> accessed 2 August 2024; Dmitry Epstein, Christian Katzenbach, and Francesca Musiani, 'Doing internet governance: practices, controversies, infrastructures, and

argued that community-developed knowledge infrastructures such as open access databases or data sharing initiatives yield positive regulatory effects, such as instilling values of care and sharing for the production of knowledge.[43] On the other hand, numerous researchers and activists have pointed to the negative regulatory effects of Aadhaar which creates a new category of "legible citizens" that excludes many people from access to welfare benefits.[44]

It is also important to note that while infrastructures can have positive regulatory effects, this is often not the case—in large part due to the political economy of these infrastructures. For example, research on the political economy of data capitalism draws attention to the ways in which big data-driven algorithmic systems convert the sum of human existence into a predictable formula, which then becomes the basis to determine eligibility of individuals for welfare.[45] A group of journalists and researchers recently reported on how an algorithmic system for determining welfare eligibility in Telangana incorrectly tagged a claimant's husband as a car owner.[46] This incorrect data led to the claimant being denied food rations, even though the claimant repeatedly provided proof to the contrary.[47]

By mediating access to healthcare through a set of data-driven affordances such as the presence of a unique (and in many cases, Aadhaar-linked) health ID and possession of electronic health records, the NDHE could (similar to Aadhaar) create a new category of "legible" beneficiaries of public

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institutions' (2016) 5(3) Internet Policy Review <https://policyreview.info/articles/analysis/doing-internet-governance-practices-controversies-infrastructures-and-institutions> accessed 15 July 2024 (both looking at governance *by* internet infrastructures, where norms are set not only by institutional actors, but also by practices and designs of these infrastructures); Lawrence Lessig, *Code and Other Laws of Cyberspace* (Basic Books 1999) (arguing that computer code developed primarily in the Silicon Valley is as much a "regulator" of cyberspace as law, markets, and norms). See also, Jeffery Alan Johnson, 'From Open Data to Information Justice' (2014) 16 Ethics and Information Technology 263-274 (on open data infrastructures as "disciplinary systems" in the Foucauldian sense).

[43] See, for e.g., SalusCoop in Barcelona. SalusCoop is a citizen-designed data cooperative based in Barcelona, where cooperative members pool their health data to create aggregated datasets, collectively determine the entities with which these datasets can be shared and the purposes for which the datasets can be used, and bind data recipients to their collectively-agreed decisions through the use of blockchain-based data sharing licenses.

[44] Ranjit Singh and Steven Jackson, 'Seeing Like an Infrastructure: Low-resolution Citizens and the Aadhaar Identification Project' (2021) 5 Proceedings of the ACM on Human-Computer Interaction 1, 17 (Singh and Jackson use the concept of resolution to analyse the ways in which Aadhaar converts thick identity categories into thin demographic and biometric markers, through which a new category of citizenship is created. High resolution citizens have more legibility, while low resolution citizens face costly consequences for their lives and deaths).

[45] See generally, Julie Cohen, *Between Truth and Power* (Oxford University Press 2019).

[46] Tapasya, Kumar Sambhav and Divij Joshi, 'How an algorithm denied food to thousands of poor in India's Telangana' (Al Jazeera, 24 January 2024) <https://www.aljazeera.com/economy/2024/1/24/how-an-algorithm-denied-food-to-thousands-of-poor-in-indias-telangana> accessed 26 February 2024.

[47] ibid.

healthcare—addressing the resource allocation problem by excluding vast sets of beneficiaries. This, in turn, has significant consequences for the lives and deaths of these infrastructural publics.

These regulatory effects of infrastructures are also evident in the interactions between law and infrastructures. Law does not always *act on* infrastructures, but as Angelina Fisher and Thomas Streinz argue, "[l]aw co-constitutes, shapes, enables, and is symbiotically intertwined with data infrastructures."[48] In this regard, Nayantara Ranganathan traces the different ways in which the actors involved in Aadhaar and the politics of making data "market-ready" shaped legal and regulatory frameworks for Aadhaar.[49] She identified three types of "regulatory practice" that indicate the ways in which law and regulation become beholden to the values of the technology they seek to regulate.[50] The three regulatory practices she identifies are (i) regulation as public relations and marketing for the technology (where regulation serves as public buy-in for the technology), (ii) regulation itself as a technology product (where the involvement of the private sector in the development of the technology rendered data protection itself into a "product, feature and layer"), and (iii) regulation as optimisation (where regulatory priorities and regulatory logics are aligned to those within the industry).[51] Drawing inspiration from this framing, the next section will historicise the NDHE to make visible its political economy, and explicate the ways in which the NDHE shapes law and regulation in the image of this political economy.

IV. THE POLITICAL ECONOMY OF THE NDHE AND ITS IMPACT ON LAW AND REGULATION

A. Critically Interrogating the Ecosystemic Perspective of the NDHE

A defining feature of the NDHE is its self-proclamation as an "ecosystem," i.e., as something that is not built but evolves—in contradistinction to a "system" which is built and bounded.[52] Bernard J Mohr and Ezra Dessers argue that socio-technical approaches for "ecosystem design" are more suitable for (health) care, since "actors co-create shared purpose across new constellations and new ways of working among ecosystem actors, thus enhancing the viability of the whole ecosystem."[53] Central to a healthcare

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[48] Fisher and Streinz (n 19) 955.

[49] Nayantara Ranganathan, 'The Economy (and Regulatory Practice) That Biometrics Inspires: A Study of the Aadhaar Project' in Amba Kak (ed), *Regulating Biometrics: Global Approaches and Urgent Questions* (AI Now Institute 2020) 59-61.

[50] ibid.

[51] ibid.

[52] NDH Blueprint (n 2) 2.

[53] Ezra Dessers and Bernard J Mohr, 'Integrated Care Ecosystems' in Bernard J Mohr and Ezra

ecosystem is the notion that the purpose or "vision" of such an ecosystem is co-created through bottom-up processes of collaboration and competition. The NDHE, however, does not (at least at present) enable co-creation of shared visions of public health. Rather, it has a "core" vision—a market-oriented vision that prioritises value extraction from data in pursuit of market returns, both through the commodification of data and through data-driven innovation.

This market-oriented vision of the NDHE can be traced back to its genesis in a policy document issued by NITI Aayog (the think tank arm of the Indian government), which called for the creation of a Health Stack. In its consultation paper, the NITI Aayog defines the Health Stack as a collection of modular digital systems and components that generate and store data, where all this data can be seamlessly shared between different actors in the health ecosystem on account of standards and interoperability protocols.[54] The NITI Aayog goes on to note that the Health Stack will allow faster "go-to-market" for health innovations.[55]

Going one more step back, the Health Stack was inspired by India Stack—a set of APIs known as "digital public goods" built on top of Aadhaar, that allow governments, businesses, start-ups, and developers to "unlock the economic primitives of identity, data, and payments at population scale".[56] India Stack has four "stacks"[57]—the presence-less and paper-less stacks (now made possible through Aadhaar), the cashless stack (now made possible through India's digital payment infrastructure known as the Universal Payments Interface or UPI), and the consent stack (for frictionless sharing of personal data through the use of consent tokens).[58] India Stack has received significant public funding and regulatory support for its implementation from the National Democratic Alliance and is now pitched as a success story of

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Dessers (eds), *Designing Integrated Care Ecosystems* (Springer 2019) 22 (emphasis added).

[54] NITI Aayog, 'National Health Stack: Strategy and Approach' (Government of India 2018) 17 <https://abdm.gov.in:8081/uploads/NHS_Strategy_and_Approach_1_89e2dd8f87.pdf> accessed 3 February 2024.

[55] ibid.

[56] IndiaStack, 'Index' <https://indiastack.org/index.html> accessed 15 December 2021; See also Aaryaman Vir and Rahul Sanghi, 'The Internet Country' (*TigerFeathers*, 14 January 2021) <https://tigerfeathers.substack.com/p/the-internet-country> accessed 15 December 2021.

[57] The concept of a "stack" is from the software industry. It used to refer to the modular architecture of software systems where discrete software modules are built for distinct functions in a work flow, but their modularity allows them to be "stacked" on top of one another to newly create computational technologies at low cost-to-market. Benjamin Bratton (controversially) extends the metaphor of the "stack" to conceptualise the digitised world of the 21st century with its computational technologies of smart grids, cloud computers, smart cities, etc. as "The Stack," which in turn produces a governing architecture that subsumes the natural, the technological, and the human. See Benjamin Bratton, *The Stack: On Software and Sovereignty* (1st edn, MIT Press 2016).

[58] IndiaStack (n 56).

a "digital public infrastructure" generating a large amount of geopolitical leadership for the Bhartiya Janata Party.[59]

Central to the embedding of the logic, design, and politic aspirations of India Stack and the Health Stack into the NDHE is one particular actor—iSPIRT (an abbreviation for the Indian Software Product Industry Roundtable). iSPIRT defines itself as a "think tank" and came into existence in 2013. Its genesis lies in a particular brand of digital postcolonial sovereignty—where instead of the benefits of the Indian software industry accruing solely to the West through export of software products, these benefits must (also) be realised by and within India "[t]o transform India into a hub for new generation software products."[60] Its original founders were 30 product companies and individuals that "represent the most active and successful players in the product industry in India,"[61] and many of its volunteers were central in building and promoting Aadhaar, as well as holding governmental positions in the UIDAI (the national authority for Aadhaar). iSPIRT is now involved in developing the NDHE, which offers a starting point for analysing the regulatory effects of the NDHE.

B. Regulatory Effects of the NDHE's market-orineted vision

As mentioned earlier in this paper, there is no umbrella legal framework specifically for the NDHE.[62] Rather, a whole range of policy documents issued by governmental bodies like the Ministry of Health and Family Welfare, the Ministry of Electronics and Information Technology, and the National Healtlh Authority constitute the *de facto* regulatory framework for the NDHE.[63] In August 2023, India's new Digital Personal Data Protection Act ('DPDP Act') was notified, but its provisions are yet to be brought into effect. The DPDP Act now constitutes an umbrella legal framework for personal data (which includes personal health data) within the NDHE. Thus, the analysis presented

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[59] Digital Public Infrastructure and IndiaStack occupied a central position in the G20 discussions held in India during its presidency of the G20 in 2023. See, for e.g., United Nations Development Programme, 'The DPI Approach: A Playbook' (2023) <https://www.undp.org/publications/dpi-approach-playbook> accessed 12 March 2024.

[60] See also, Kavita Dattani, 'Spectrally shape-shifting: biometrics, fintech and the corporate-state in India' (2023) 17(4) Journal of Cultural Economy 470.

[61] 'FAQ' (*iSPIRT*) <https://iSPIRT.in/who-we-are/faq/> accessed 2 August 2024.

[62] The newly passed data protection law will apply to the NDHE, once the law is fully notified. A detailed analysis of this law in terms of its protections for health data is set out in Section VI below.

[63] It is important to note that this trajectory is similar to Aadhaar. As Vrinda Bhandari and Renuka Sane note, the Aadhaar project was rolled out from 2010 onwards, without any legislative backing, until 2016. It was only in March 2016, that the central government passed the Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits, and Services) Act, 2016. A series of delegated regulations were issued by the UIDAI subsequently. See Vrinda Bhandari and Renuka Sane, 'A Critique of Aadhaar Framework' (2019) 31(1) National Law School of India Review 72, 76-78.

in this section is based on the *de facto* regulatory framework for the NDHE and the new DPDP Act.

1. Regulation as Public Relations and Marketing, Enabling Faster "Go-to-Market"

Policy documents like the NDH Blueprint adopt jargon popularised by the software and technology start-up industry that constitute iSPIRT—"state-of-the-art health systems", "single source of truth", "federated architecture", and "interoperable digital architecture."[64] This illustrates the ways in which the policy documents themselves serve as "advertisements" for the NDHE and through it, as advertisements for the private sector representatives that constitute or collaborate with iSPIRT and hope to benefit from market uptake of systems within the NDHE. In fact, in a webinar held by iSPIRT on 4 July 2020, six private sector entities were identified as "example-setters" for the NDHE.[65] Among these is Swasth Alliance—a collaborative initiative launched in 2020 in the middle of the COVID-19 pandemic, comprising representatives from health-tech companies, hospitals, diagnostic labs, insurance companies, tech companies, and venture capital firms, and backed by UIDAI proponents such as Nandan Nilenkani and Kris Gopalkrishnan.[66] Swasth Alliance works closely with iSPIRT to build health data exchange protocols for data interoperability,[67] as well as a health data consent-manager application.[68] The NHA issued a press release clarifying that this consent-manager application is *not* the "reference architecture" for the NDHE, but only an innovative product that resulted from experimentation within the NDHE's regulatory sandboxes.[69] Nonetheless, there is a first-movers advantage for the entities and start-ups that constitute the Swasth Alliance, enabling these entities to swiftly launch their health data monetisation products into the market with de-facto regulatory approval.

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[64] NDH Blueprint (n 2) 7-8.

[65] Trisha Jalan, 'Swasth Alliance, LiveHealth, and others build on the Health Stack, iSpirt key in Swasth projects' (*MediaNama*, 9 July 2020) <https://www.medianama.com/2020/07/223-health-stack-swasth-alliance-livehealth-iSpirt/> accessed 18 November 2023.

[66] Saritha Rai, 'Billionaires, startups team up to fix broken Indian health care' (*Economic Times*, 23 June 2020) <https://economictimes.indiatimes.com/small-biz/startups/newsbuzz/billionaires-startups-team-up-to-fix-broken-indian-health-care/articleshow/76522594.cms> accessed 23 October 2023; Nileena MS, 'Is India privatising governance through partnerships in public digital infrastructure?' (*Caravan*, 20 October 2020) <https://caravanmagazine-in-nalsar.knimbus.com/policy/is-india-privatising-governance-through-partnerships-public-digital-infrastructure> accessed 22 October 2023.

[67] Jalan (n 65); Suprita Anupam, 'National Health Stack: iSpirt's Attempt To Replicate India Stack (Deja Vu Anyone?)' (*Inc 42,* 18 July 2020) <https://inc42.com/features/national-health-stack-iSpirts-attempt-to-replicate-india-stack-deja-vu/> accessed 30 June 2023. For more info on the protocol – see <https://hcxprotocol.io/>.

[68] Nileena (n 66).

[69] National Health Authority, 'Response from NHA to The Ken' (ABDM, 24 September 2020), <inhttps://abdm.gov.in:8081/uploads/950e7bb54fafc537c9577510bb4cbfb8_a197303f76.pdf> accessed 14 August 2023.

Thus, the jargon used in the NDHE policy documents shows that the primary focus of the *de facto* regulatory frameworks for the NDHE is to enable monetisation of health data-driven innovations by private sector actors. Radhika Radhakrishnan, for instance, analyses how the NDHE's *de facto* regulatory framework enables collaborations between insurance companies and manufacturers of wearables.[70] In these cases, health data generated through the wearable is automatically shared with the insurance company and used by the latter to create hyper-individualised and often discrimination insurance packages for the user of the wearable.[71]

2. Regulation as a Techno-Legal Innovation

If we look deeper into the *de facto* regulatory framework for the NDHE, two more points emerge. First, lawmakers have made the choice to effect regulation through a set of executive documents as opposed to legislative frameworks. From a procedural perspective, the use of executive policies allows the central government to circumvent the issue of legislative competency, since public health is a state subject as per the Seventh Schedule of the Indian Constitution.[72] Further, the use of executive rulemaking in place of formal legislation allows public bodies like the MoHFW to circumvent established procedural processes for lawmaking such as a minimum 30-day period for public consultation on the draft law,[73] the ability of citizens to read the draft law and provide feedback in regional languages,[74] and publicising the consultation[75]. There have been judicial attempts to extend these procuredural processes to executive rule-making, but with little concrete success.[76] Finally,

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[70] Radhika Radhakrishnan, 'Your Health Data is Others' Wealth' (*Heinrich Böll Stiftung*, 2 November 2021) <https://in.boell.org/en/2021/11/02/your-health-data-others-wealth> accessed 30 December 2023.

[71] ibid.

[72] This has been noted by the Indian Medical Association as well. See Indian Medical Association, 'IMA Opinion on NDHM Ecosystem' (*IMA*, 21 September 2020) <https://ima-india.org/ima/pdfdata/IMA-Opinion-on-NDHM-Ecosystem.pdf> accessed 30 December 2023.

[73] Ministry of Law and Justice, 'Policy on Pre-Legislative Consultation' (5 February 2014), <https://cdnbbsr.s3waas.gov.in/s380537a945c7aaa788ccfcdf1b99b5d8f/uploads/2023/02/2023021333.pdf >

[74] *Vikrant Tongad v Union of India* (2020) SCC Online Del 2552.

[75] *United Conservation Movement Welfare and Charitable Trust v Union of India* WP(C) No 8632/2020 (PIL) (High Court of Karnataka).

[76] For instance, a writ petition was filed before the Delhi High Court in September 2020, challenging the process adopted for public consultation of the Draft Health Data Management Policy for the NDHE. In particular, the petitioner took issue with the 15-day public consultation period originally proposed for this policy. The petitioner also argued that all executive actions should be subject to reasonable public consultation to ensure legitimacy. The court directed the Ministry of Health and Family Welfare and the National Health Authority to consider the petitioner's requests regarding the public consultation—including increasing the time period for responses, allowing responses in regional languages, and implementing accessibility features. The court did not rule on other issues raised in the petition (*Dr Satendra Singh v Union of India and Ors* WP(C) No 5959 of 2020 (High Court

central legislation such as the DPDP Act were passed after the NDHE was already rolled out, and is yet to be implemented in full. As a result, while actors within the NDHE are bound by the DPDP Act, at present the NDHE continues to be rolled out while many provisions of the DPDP are yet to come into effect. This increases the chances of future legal challenges to the NDHE being ruled *fait accompli* as opposed to being considered on their merit.[77]

Second, from a substantive perspective, the provisions contained within the *de facto* regulatory framework for the NDHE—such as the Health Data Management Policy—also enable the commodification and monetisation of health data. Consider, for instance, the consent conundrum—a central issue in data protection. If consent is one of the legal grounds under which data processors can obtain and use personal data, how is this consent to be obtained to ensure it remains free, informed, and revocable?[78] This issue acquires even more significance in the context of health data, given than consent is central to participation of individuals in treatments and research. In fact, the practice of "informed consent" in healthcare has itself been critiqued in medicine and bioethics; in particular, its reliance on rational choice theory as opposed to more situated approaches.[79] There is growing recognition of the need to understand and account for what Solon Barocas and Helen Nissenbaum describe as the background social tapestry of rights, obligations, and expectations within which consent functions, the need to make this social background more inclusive, and to extend these learnings from healthcare to data protection.[80]

For the NDHE, the consent conundrum is sought to be addressed through the use of a techno-legal solution—the use of intermediaries known as "consent managers."[81] These consent managers will collect consent from individuals for the generation and sharing of their personal data, tokenise consent into a software artefact, and share these consent tokens on behalf of

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of Delhi).

[77] Some lawyers have argued that the Aadhaar judgment (*KS Puttaswamy (Aadhaar-5J) v Union of India* (2019) 1 SCC 1) is an example of *fait accompli*. See Amba Kak, 'Indian Supreme Court rules on Aadhaar: Delayed scrutiny' (*Mozilla,* 1 October 2018) <https://blog.mozilla.org/netpolicy/2018/10/01/indian-supreme-court-rules-on-aadhaar-delayed-scrutiny/> accessed 7 September 2024.

[78] See generally, Daniel J Solove, 'Privacy Self-Management and the Consent Dilemma' (2013) 126 Harvard Law Review 1880.

[79] See generally, Neil C Manson and Onora O'Neill, *Rethinking Informed Consent in Bioethics* (Cambridge University Press 2012); Jessica Berg, 'The E-Health Revolution and the Necessary Evolution of Informed Consent' (2014) 11 Indiana Health Law Review 589; Amar Jesani, 'About student research and blanket consent from patients' (2009) 6(4) Indian Journal of Medical Ethics 216.

[80] Solon Barocas and Helen Nissenbaum, 'Big Data's End Run around Anonymity and Consent' in Julia Lane, Victoria Stodden, Stefan Bender, and Helen Nissenbaum (eds), *Privacy, Big Data, and the Public Good* (Cambridge University Press 2014) 64-65.

[81] Health Data Management Policy (n 16) clauses 4(e), 12; ABDM Handbook (n 14) ch 6. See also, The Digital Personal Data Protection Act 2023, ss 2(g), 6(7)–6(10).

the individuals with data processors. In other words, the process of obtaining consent (and all the complexities this entails) is sought to be automated. Such automation of consent is recognised and valorised by legal frameworks like the Health Data Management Policy as well as the DPDP Act.

3. Regulation as Optimisation

Finally, one of the central pillars of policies for the NDHE is "think big, start small, scale fast." This translates to a practice of "rolling out" different components of the NDHE swiftly, and enabling "agile" regulation.[82] In fact, most of the NDHE has been developed and implemented on the basis of policies, without the backing of formal legislation. The motto of iSPIRT reflects a similar sentiment—"[s]ince the stakes are high and industry is moving very fast, a reactive ivory tower approach cannot succeed. In addition to top-down policy recommendations, the hive mind of the industry must be leveraged to support conversations for grassroots involvement and actions."[83] These positionings reinforce the false binary between regulation and technological innovation, where either regulation is always "behind" innovation or where regulation hinders innovation by "overregulating," and the solution to both is to extend neoliberal logics of innovation (such as agility, optimisation and prediction) to regulation. It echoes what Ari Waldman calls the "second wave of privacy law" in the US, which is focused on data protection compliance through managerial-style governance sustained by neoliberal logics.[84] In this Indian context, this was evident in demands made by start-ups, foreign technology companies, and industry bodies to "simplify" earlier proposals of the DPDP Act. In line with these demands, the DPDP Act is a skeletal law that leaves many aspects to executive rule making.[85] This is also evident in the mushrooming of digital systems as part of COVID-19 responses, which remained self-regulated in the absence of central legislation for teleconsultation platforms and COVID-19 self-reporting applications.[86]

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[82] National Health Authority, 'National Digital Health Mission: Strategy Overview' (Government of India, July 2020) ch 3 <https://www.niti.gov.in/sites/default/files/2023-02/ndhm_strategy_overview.pdf> accessed 17 March 2024.

[83] 'Who We Are' (*iSPIRT*) <https://iSPIRT.in/who-we-are/> accessed 2 August 2024.

[84] Ari Ezra Waldman, 'The New Privacy Law' (2021) 55 UC Davis Law Review Online 19 <https://lawreview.law.ucdavis.edu/archives/55/online/new-privacy-law> accessed 17 March 2024.

[85] This has been flagged by the Standing Parliamentary Committee as well. See Standing Committee on Communications and Information Technology, 'Forty-Eighth Report On The Subject "Citizens' Data Security And Privacy" Relating To The Ministry Of Electronics And Information Technology' (Lok Sabha Secretariat, 1 August 2023) <https://eparlib.nic.in/handle/123456789/2505169> accessed 7 March 2024.

[86] See generally, Chithira Vijayakumar and Tanisha Ranjit, 'Virus detected: A profile of India's emergent ecosystem of networked technologies to tackle COVID-19' (*Internet Democracy Project*, 31 May 2021) <https://internetdemocracy.in/reports/virus-detected#aarogya-setu> accessed 6 March 2024.

Ulrike Felt and others call for health data infrastructures to be understood as "visioneering efforts," since these infrastructures not only create new public spaces where groups of people can meet and discuss issues relating to health data and health care, but these infrastructure also contribute to changing understandings of care itself.[87] They go on to note that such "visioneering" creates "new kinds of responsibilities, both for the infrastructure builders—as their visions have tangible impacts on how potential futures might look—and for the citizens who are expected to care for keeping their data bodies in shape."[88] The iSPIRT-led vision of the NDHE is one that only seeks to unlock the economic value of health data, choosing a market-oriented vision in place of recognising the inherently social nature of health data and empowering the people who constitute and embody this data. As the section below elaborates, this vision shapes legal frameworks for data to enable the continuous generation and circulation of data from data bodies, with little to no autonomy provided to the individuals and communities who constitute these data bodies.

V. REGULATING DATA INFRASTRUCTURES THROUGH LAW

The NDHE therefore, exerts regulatory effects by determining which publics should benefit from public healthcare, and translates this normative vision into the legal and regulatory frameworks for the NDHE. What then is the role of law? *Should* law intervene in the negative regulatory effects of data infrastructures, and if yes, *how can* the law intervene?

A. Should the Law Intervene in Data Infrastructures?

Critical science and technology studies as well as other disciplines in social sciences tell us that infrastructures (including data infrastructures) are socially-situated.[89] As discussed above, infrastructures serve as sites for political negotiation. Critical legal studies tells us that the law is also socially situated.[90] The law also structures political participation by binding groups of people to certain commands as well as vesting groups of people with certain

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[87] Ulrike Felt, Susanne Öchsner, and Robin Rae, 'The Making of Digital Health: Between Visions and Realizations' in Judith Fritz and Nino Tomaschek (eds) *Digitaler Humanismus* (Waxmann 2020) 89, 98.

[88] ibid.

[89] Refer Section III of this paper.

[90] See, for e.g., Frances Olsen, 'The Family and the Market: A Study of Ideology and Legal Reform' (1983) 96 Harvard Law Review 1497; Ann Scales, 'The Emergence of Jurisprudence: An Essay' (1986) 95 Yale Law Journal 1373; Ratna Kapur and Brenda Crossman, *Subversive Sites: Feminist Engagement with Law in India* (SAGE Publications 1996); Aparna Chandra, Jhuma Sen, and Rachna Choudhary, 'Introduction: the Indian feminist judgements project' (2021) 5(3) Indian Law Review 261; Amy Kapczynski, 'The Law of Informational Capitalism' (2020) 129 Yale Law Review 1460, 1489-1492.

rights/entitlements.[91] Kingsbury and Maisley go on to note that the law also regulates two kinds of relationships—intra-public relations where multiple laws in a pluralist legal order define multiple overlapping publics, and inter-public relations where laws regulate the relations among the publics.[92] These concepts—plural legal subjects and legally-ordered publics—are understood collectively as "legal publics" in this paper.

The emerging discipline of critical data studies reveals the complex dependent relationship between law and infrastructure.[93] Given the similarity between law and infrastructure in that they both bear regulatory effects, we can then identify the tensions between/among these regulatory effects, or place them in proximity to each other without necessarily establishing causality. Here, the concept of "publics" can be mobilised.

Both infrastructural and legal publics can be conceptualised spatially, i.e., as imaginary "realms" or "spaces" where people come together to identify and discuss societal problems, and thereby influence law and public policy.[94] A democracy's commitment to inclusivity can be evaluated against the health of the public sphere(s), i.e., how well the public sphere(s) functions as what Iris Marion Young calls "a space of opposition and accountability, on the one hand, and policy influence, on the other."[95] In the Indian context, for instance, Salmoli Choudhuri visualises the national legal public as a "differentiated unity"—a collective of communities with caste-based, religion-based, gender, class, and historical differences.[96]

We can analyse the ways in which legal publics and infrastructural publics interact with each other by teasing out the spatial tensions between these publics.[97] The long journey of advocacy and litigation against the Narmada Valley dam project serves as a telling example.[98] One set of spatial tensions emerged between the infrastructural public of water-users who were divided

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[91] Kingsbury and Maisley (n 31) 12-13.

[92] ibid.

[93] See generally, Kitchin (n 30); Craig Dalton, Linnet Taylor, Jim Thatcher, 'Critical Data Studies: A dialog on data and space' (2016) 3(1) Big Data & Society <https://journals.sagepub.com/doi/10.1177/2053951716648346> accessed 5 August 2024.

[94] Kingsbury and Maisley (n 31) 20; Jurgen Habermas, *Between Fact and Norms* (MIT Press 1996) 360; Iris Marion Young, *Inclusion and Democracy* (Oxford University Press 2000) 167-180.

[95] Young (n 94) 173-174.

[96] Salmoli Choudhuri, 'Where is the Public in the Republic of India?' (*The NLS Blog,* 16 February 2024) <https://www.nls.ac.in/blog/where-is-the-public-in-the-republic-of-india/> accessed 25 March 2024.

[97] As also temporal tensions, but this paper focuses on only spatial tensions.

[98] See generally, Smita Narula, 'The Story of Narmada Bachao Andolan: Human Rights in the Global Economy and the Struggle Against the World Bank' in Deena R Hurwitz, Margaret L Satterthwaite, and Douglas B Ford (eds), *Human Rights Advocacy Stories* (Foundation Press 2009); Sanjay Sangvai, *The River and Life: People's Struggle in the Narmada Valley* (Earthcare Books 2000).

across three states (Madhya Pradesh, Gujarat, and Maharashtra) and the state-based legal publics exercising their respective claims to the Narmada under the Interstate Water Disputes Act of 1956.[99] These spatial tensions were the subject of adjudication by the Narmada Water Disputes Tribunal ('Tribunal') set up in 1969. Another set of spatial tensions, one that now occupies tremendous space in public memory, relates to the displacement of tens of thousands of individuals on account of the dam project.

The Tribunal adjudicated on this issue (as did the Supreme Court in later proceedings) in proceedings against the state of Gujarat and required the Gujarat government to compensate displaced individuals with land.[100] Here, the infrastructural public of the displaced was, to a limited extent, recognised as a legal public entitled to protection and compensation from the state when the state exercises eminent domain.[101] The Tribunal and the Supreme Court required compensation in the form of land and money to be provided to the displaced, but displaced communities faced numerous challenges in establishing legal recognition of indigenous community claims over land—claims that do not bear the form or substance of common law claims over land.[102]

But the difference between law and infrastructure is that law also serves as a vessel for normativity. Law's legitimacy itself depends on the existence of healthy publics. As Jeremy Waldron notes, law is not merely a set of commands, but also a set of norms that are representative of the whole society or as a set of norms that address issues of concern/relevance to society and not just to the individuals involved in drafting a particular law.[103] As a result, where a data infrastructure which is in the interest of the public, such as a data infrastructure for public health, creates "communities of the affected" who do not have a say in the workings of or the governance of the infrastructure, these infrastructural publics do not constitute healthy publics.[104] The law must

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[99] Narula (n 98); Armin Rosencranz and Kathleen D Yurchak, 'Progress on the Environmental Front: The Regulation of Industry and Development in India' (1996) 19 Hastings International Comparative Law Review 489, 512.

[100] John R Wood, 'India's Narmada River Dams: Sardar Sarovar under Siege' (1993) 33 Asian Survey 968, 975.

[101] See generally, Rajagopal Balakrishnan, 'The Role of Law in Counter-hegemonic Globalization and Global Legal Pluralism: Lessons from the Narmada Valley Struggle in India' (2005) 18 Leiden International Law Journal 345, 355.

[102] Narula (n 98) 355.

[103] Jeremy Waldron, 'Can There Be a Democratic Jurisprudence?' (2009) 58 Emory Law Journal 675, 705. See also, John Dewey, *The Public and Its Problems* (1st edn, Holt 1927) (on the need for publics in a democratic state, and methods to enable organisation of publics); Fraser (n 39) (on the existence of multiple, conflictual publics in a democracy, the creation of subaltern counterpublics, and the use of subaltern counterpublics as both an analytical method as well as normative principle for participatory democracy).

[104] On the relationship between publics of data infrastructures and democracy, see generally, Lina Dencik, Arne Hintz, Joanna Redden, and Emiliano Trere, *Data Justice* (Sage Publications 2022).

intervene here, to restore health to these publics based on its functionalist role, as well as to reinforce its own legitimacy as a vessel for normativity. Why? Because the law already orders interactions between and among its own plural publics.[105] But also because the law can enable the creation of a "public of publics"—a meta-public sphere that coalesces multiple publics, engenders certain norms to the interactions between these publics, and thereby sustains a vibrant inclusive democracy.[106] Kingsbury and Maisley identify three specific norms—publicness as accessibility (all actions undertaken in a public space that affect a collective should be accessible and scrutinisable by this collective), publicness as exposure (events and expressions within a public space should be exposed to its plurality of views), and publicness as consideration (actors in a public space should accommodate their actions to the fact that others are around).[107] These normative imperatives can serve as guideposts for the development of law (constitutional, legislative, and executive) that can stimulate an inclusive politics of data infrastructures.

B. How can the Law Intervene in Data Infrastructures?

Translating the normative argument above into practice entails two aspects. First, adopting infrastructural thinking means recognising that neither data infrastructures nor the law are neutral. Laws are shaped by the values and politics of data infrastructures, and the law is an instrument, institution, and phenomenon of power. As a result, advocacy and policymaking cannot simply make demands for the creation of, for instance, a data protection law to address the issues of datafication brought on by the NDHE. In addition to asking for such a law, there also needs to be sustained engagement with how this law is being implemented and what is being missed out, as well as sustained critical research on the gaps between text and practice of this law.[108] Ethnographic approaches to legal research and policymaking could be insightful in this regard.[109] This is especially relevant, for instance, in

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[105] Kingsbury and Maisley (n 31) 12-13.

[106] ibid. See also, Anushka Mittal, 'Constitutionalism to Decolonize Global Data Law Development' (2024) Technology and Regulation 19 <https://doi.org/10.26116/techreg.2024.003> accessed 7 August 2024 (referring to the ways in which constitutions order infrastructural relations).

[107] Kingsbury and Maisley (n 31) 20-23. See also, Linnet Taylor, 'What is Data Justice? The case for Connecting Digital Rights and Freedoms Globally' (2017) 4(2) Big Data and Society 1 (where Taylor presents the concept of "data justice" as the orientation to be adopted to address harms arising from predictive big-data enabled technologies, including digital systems for welfare distribution. She identifies three pillars of data justice – visibility, engagement with technology and non-discrimination. These three pillars should guide not only what kinds of individuals rights are vested in individuals, but also how the law responds to the growing political economy of data capitalism).

[108] See generally, Susan S. Silbey, 'The Every Day Work of Studying the Law in Everyday Life' (2019) 15 Annual Review of Law and Social Sciences 1.

[109] ibid. See also, Nayanika Mathur, *Paper Tiger: Law, Bureaucracy and the Developmental State in Himalayan India* (Cambridge University Press 2015).

analysing how consent managers ensure free, informed, meaningful, and revocable consent for (health) data generation and sharing in a country with extremely fragmented digital literacy rates. As researchers and journalists note, often the sick-poor are coerced by their circumstances to become subjects of experimental treatments or data sources for the development of health technologies like AI-enabled x-rays/imaging.[110] Having legal provisions on consent in the DPDP Act cannot, on its own, address this issue.

Further, the false binary between law and technology should also be debunked. At present, a common refrain is either than law lags behind technology, or that law overregulates technological innovations. By contrast, there is growing research on applying information theory and systems thinking to the study of law as a "system" to analyse how the law receives and emits information with and among other "systems" (including technological systems). This type of research could hold valuable insights on how to design as well as implement laws that engage more ciritcally with technological innovations, outside of the traditional binary described above.[111]

In a related vein, lawmakers should also recognise the limits of law. Certain harmful aspects of a data infrastructure can be addressed through non-legal efforts, such as participative design practices and organisational governance. For instance, there is growing research on the use of dark patterns—deceptive design practices for platforms/devices that have the substantial effect of subverting or altering a user's autonomy, decision-making, or choice—and the need to devise design-based strategies and practices to combat such use.[112]

Second, in terms of the substance of laws themselves, often the demands for a data protection law are articulated in the language of individual rights—that individuals should have the right to be notified of what data is being processed by whom and for what purposes, the ability to consent or not consent to such data processing, the right to access their personal data, the right to seek modification and/or deletion of their personal data etc. But the harms of data activities—such as algorithmic discrimination—affect both individuals (where an individual is wrongfully denied of a service) as well

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[110] See, for e.g., Purendra Prasad, 'Medicine, Power and Social Legitimacy: A Socio-Historical Appraisal of Health Systems in Contemporary India' (2007) 42(34) Economic and Political Weekly 3491; Radhika Radhakrishnan, 'Experiments with Social Good: Feminist Critiques of Artificial Intelligence in Healthcare in India' (2021) 7(2) Catalyst: Feminism, Theory, Technoscience 1.

[111] See generally, Lessig (n 42); Melanie Dulong de Rosnay, 'Peer-to-peer as a Design Principle for Law: Distribute the Law' (2015) 6 Journal of Peer Production, Disruption and the Law 1; Bhumika Billa, 'Law As Code: Exploring Information, Communication and Power in Legal Systems' (2024) 2(1) Journal of Cross-Disciplinary Research in Computational Law 1.

[112] See, for e.g., Marie Potel-Saville and Fabien Lechevalier, 'Comment les dark patterns manipulent nos usages mobiles ? Proposition de régulation pour un digital durable et centré sur l'humain. (How Do Dark Patterns Manipulate Our Mobile Uses? Regulation Proposal for Sustainable and Human-centered Digital.)' <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4652956> accessed 8 August 2024.

as communities (where impoverished communities are collectively and more adversely impacted by Big-data enabled predictive technologies or algorithmic discrimination).[113] Equally, decision-making about what data is generated, by whom, and for what purposes requires participation from individuals (with regard to their individual personal data) as well as from communities (with regard to data that either relates to a community such as indigenous data or data that is intended to be used for the benefit of a community).[114]

In this regard, the substantive protections sought from and guaranteed by laws cannot be limited to neoliberal privacy(-like) rights.[115] While individual rights are necessary, laws for data management or data governance must also ensure that there is transparency, accountability, and collective decision-making at each and every stage of designing, developing, operationalising, maintaining, and destroying data infrastructures like the NDHE. The law needs to open up spaces (i.e., meta-publics)[116] where people have a say in what becomes data, what is done with this data, and for whose benefit. This means, for instance, lobbying for legal mandates for: (i) public consultations and community impact assessments of a data infrastructure through the lifecycle of designing, developing, implementing, and maintaining this infrastructure—building on (but significantly strengthening) similar obligations in environmental law;[117] and (ii) increased independent third-party audits to enable regulatory oversight combined with legal obligations for heightened transparency.

The Digital Infrastructure Strategic Framework prepared for Toronto's Smart City initiative could serve as a useful example.[118] This Framework is a "living document" prepared by the municipal authority in consultation with local communities and private sector infrastructure vendors, outlining shared values, core principles, implementation strategies, and a process for continuous community consultation to keep updating the plan itself. This Framework

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[113] See, for e.g., Linnet Taylor, Luciano Floridim and Bart van der Sloot (eds), *Group Privacy: New Challenges of Data Technologies* (Springer 2018); Anita Gurumurthy and Nandini Chami, 'Governing the Resource of Data: To What End and for Whom? Conceptual Building Blocks of a Semi-Commons Approach' (*Data Governance Network*, January 2022) <https://itforchange.net/governing-resource-of-data-to-what-end-and-for-whom-conceptual-building-blocks-of-a-semi-commons> accessed 14 March 2024.

[114] Taylor and others (n 113).

[115] See Salomé Viljoen, 'Data as Property?' (*Phenomenal World,* 16 October 2020) <https://www.phenomenalworld.org/analysis/data-as-property/> accessed 15 March 2024.

[116] See also, Salomé Viljoen, 'A Relational Theory of Data Governance' (2021) 131(2) Yale Law Journal 370; Commons Network and Open Future, 'Generative Interoperability' (*NGI Forward,* March 2022) <https://www.commonsnetwork.org/product/generative-interoperability-building-online-public-and-civic-spaces/> accessed 15 March 2024.

[117] See, for e.g., Jacob Metcalf and others, 'Algorithmic Impact Assessments and Accountability: The Co-construction of Impacts' (2021) ACM Conference on Fairness, Accountability, and Transparency, 3–10 March 2021 <https://dl.acm.org/doi/pdf/10.1145/3442188.3445935> accessed 29 January 2024.

[118] City of Toronto, 'Digital Infrastructure Strategic Framework' (2022) <https://www.toronto.ca/wp-content/uploads/2022/03/9728-DISFAcc2.pdf> accessed 29 January 2024.

recognises the importance of privacy and security, but also recognises the importance of other principles of data governance. A legal obligation on the NHA to create a similar framework for the NDHE could aid in the creation of "meta-publics"—spaces for participative deliberation on the practices of datafication within the NDHE.

VI. RESOLVING TENSIONS BETWEEN INFRASTRUCTURAL AND LEGAL PUBLICS OF THE NDHE

In this final section, I zoom in on a particular set of publics of the NDHE—its users. I illustrate some of the tensions between the publics entitled to public health, the infrastructure-user publics whose access to public health is mediated by a set of data-driven affordances, and legal publics, i.e., the collective set of rights-holders. The infrastructure-user publics are brought into existence through two sets of data artefacts—unique health identifiers in the form of 14-digit numerical strings known as "ABHAs" for every individual, and the creation of electronic health and medical records linked to these ABHAs.[119]

A. Zooming in on the Unique Health ID

At the outset, it is important to revisit the stated purpose of ABHAs. Per the ABHA Handbook, only those individuals who wish to participate in the NDHE are required to obtain an ABHA.[120] This ABHA will enable such individuals to create, access and share their health data as well as have an "identity"[121] in the digital health ecosystem that will allow them to avail services such as booking appointments or requesting medical prescriptions.[122] To this extent, ABHA seems to mirror Aadhaar (i.e., the identity layer of India Stack)—a claim made plausible given the heightened involvement of iSPIRT in the NDHE and the genesis of the NDHE in the Health Stack. Prima facie, the creation of a new unique identifier for individuals in the NDHE offsets criticisms typically levied against the use of Aadhaar for identity verification in other infrastructures (such as payments, banking, and taxation systems). But the underlying logic of ABHA, i.e., the adoption of the idea of "uniqueness" to determine who should and should not have access to public health, is telling of the influence of the logic and politics of Aadhaar on imagining the infrastructure-user publics of the NDHE.

First, a policy of disaster opportunism was adopted. In 2021, reports began to surface of individuals noticing the inclusion of an "ABHA number"

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[119] 'Ayushman Bharat Digital Mission Components' (*National Health Authority*) <https://abdm.gov.in/abdm-components> accessed 29 January 2024.

[120] ABDM Handbook (n 14) 18.

[121] On the conflations between identity and identification in the context of Aadhaar, see Nishant Shah, 'Identity and Identification: The Individual in the Time of Networked Governance' (2015) 11(2) Socio-Legal Review 22.

[122] ibid.

in their COVID-19 vaccination certificates when accessing these certificates through the CoWIN app.[123] These ABHAs were issued on an experimental basis, *without* notifying individuals or obtaining their consent and in the absence of legal safeguards for the use and storage of the ABHAs (which constitute personal data, akin to a person's social security number or credit card number). But these ABHAs continue to be valid.

Second, despite the stated voluntariness of the NDHE and the ABHA on paper, such as in the ABDM Handbook, the practice on the ground reveals a different story.[124] Health workers in Chandigarh were issued messages from the Health Department stating that ABHAs for all citizens are mandatory and requiring health workers to notify patients of the need to obtain an ABHA.[125]

Third, ABHAs became closely-integrated with Aadhaar itself. Per the ABDM Handbook, when an individual registers for an ABHA, the individual is required to "verify" their identity using either their Aadhaar number (and thereby allow the NHA to ping the Aadhaar database) or their driver's license.[126] In practice, however, the Aadhaar demographic database was leveraged to verify the identity of individuals who registered on CoWIN using their Aadhaar, to issue ABHAs to such individuals "in the background."[127]

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[123] Chahat Rana, 'COVID-19 vaccine beneficiaries were assigned unique health IDs without their consent' (*Caravan,* 1 October 2021) <https://caravanmagazine.in/health/COVID-19-vaccine-beneficiaries-were-assigned-unique-health-ids-without-their-consent> accessed 26 April 2022.

[124] See, for e.g., a press release issued by the Railways authority referring to "successful integration" of the hospital information management systems for healthcare facilities reserved for Railway employees and pensioners with the NDHE. RailTel Corporation of India Limited, 'Press Release' (29 January 2022) <https://www.railtelindia.com/images/news/ENGLISH%20HMIS%20ABDM%20Press%20Release%20RailTel.pdf > accessed 29 January 2024.

[125] Radhika Radhakrishnan, 'Health Data as Wealth: Understanding Patient Rights in India within a Digital Ecosystem through a Feminist Approach' (2021) Data Governance Network Working Paper 19 <https://cdn.internetdemocracy.in/idp/assets/downloads/reports/health-data-as-wealth/Radhakrishnan-Health-Data-as-Wealth.pdf> accessed 29 January 2024.

[126] ABDM Handbook (n 14) 21.

[127] Abantika Ghosh, 'Used Aadhaar for COVID vaccine? Modi govt created your digital health ID without asking you' (*The Print*, 1 October 2021) <https://theprint.in/health/used-aadhaar-for-COVID-vaccine-modi-govt-created-your-digital-health-id-without-asking-you/742958/> accessed 26 April 2022; Sarthak Dogra, 'Took COVID vaccine using Aadhaar? Your National Health ID has been created without your permission' (*India Today*, 24 May 2021) <https://www.indiatoday.in/technology/features/story/took-COVID-vaccine-using-aadhaar-your-national-health-id-has-been-created-without-your-permission-1806470-2021-05-24> accessed 26 April 2022. In 2021, a petition was filed before the Supreme Court, where the petitioner challenged the mandatory use of Aadhaar to create an account on the CoWIN platform for registering for COVID-19 vaccines. In response to this petition, the Ministry of Health and Family Welfare filed an affidavit stating that Aadhaar card was not a mandatory ID for COVID-19 vaccine registration and thereafter drew the court's attention to vaccination of 8,700,000 individuals who did not possess any ID documents. The court relied on this affidavit to dismiss the petition. (*Siddharthshankar Sharma v Union of India and Ors* WP(C) 656/2021 (Supreme Court of India) Order delivered on 7 February 2022). Four months after the issuance of this dismissal order, new reports continued to report that vaccination

These three aspects point to the gap between the law on paper (where executive policies for the NDHE such as the ABDM Handbook recognise the voluntariness of ABHAs for access to public health) and the practice of the data infrastructure (which makes ABHA a *de facto* mandatory requirement for access to public health). Design practices such as the scan-and-share feature further widen this gap. The NHA introduced a QR code-based system, where an individual could scan a unique QR code using any health application of their choice (ranging from government-operated apps such as Aarogya Setu to privately-created apps), and share their ABHA-linked health data directly with a hospital information management system to speed up the outpatient ('OPD') registration process at a hospital.[128] As of June 2024, a news report notes that this scan-and-share feature has been adopted in over 5000 health facilities in India across 35 states and union territories.[129] Further, regulatory bodies are mandating ABHAs for access to a range of affiliated health services, such as health insurance policies.[130]

The Indian Supreme Court has reiterated the inclusion of health in various fundamental rights, such as the right to life and dignity.[131] The Indian Constitution also imposes on the state certain obligations (albeit not strictly enforceable) to ensure the realisation of health.[132] But the NDHE reshapes these publics in the image of the infrastructure-user public, as a public whose access to health is mediated by the affordances granted to it by the data infrastructure. The NDHE imagines its users as a collective of "unique" citizens and it enacts this imagination into reality through the design choices and

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centres insisted on Aadhaar cards for authentication of individuals; see, Sreedevi Jayarajan, 'No such rule, but many vaccination centres are insisting on Aadhaar as proof' (*The News Minute*, 4 June 2021) <https://www.thenewsminute.com/article/no-such-rule-many-vaccination-centres-are-insisting-aadhaar-proof-COVID150080> accessed 29 January 2024; News reports also point to the differential design of CoWIN itself—where authentication of beneficiary identity against Aadhaar was built in as the "default" setting and therefore built in a more "usable" manner, which authentication against other IDs was designed in a much more complicated and cumbersome manner; see Rana (n 123).

[128] Ministry of Health and Family Welfare, 'Ayushman Bharat Digital Mission facilitating Quick OPD registration in hospitals through Scan and Share service' (*Press Information Bureau,* 21 December 2022) <https://pib.gov.in/PressReleasePage.aspx?PRID=1885310> accessed 28 June 2023.

[129] Online Bureau, 'ABHA's scan and share service facilitates 3 crore OPD registrations across India' (*Economic Times*, 7 June 2024) <https://government.economictimes.indiatimes.com/news/healthcare/abhas-scan-and-share-service-facilitates-3-crore-opd-registrations-across-india/110781343 > accessed 7 September 2024.

[130] Navneet Dubey, 'Policyholders will soon require ABHA ID to buy or renew insurance policies. Here's how you can create one' (*Business Insider*, 13 June 2023) <https://www.businesstoday.in/personal-finance/insurance/story/policyholders-will-soon-require-abha-id-to-buy-or-renew-insurance-policies-heres-how-you-can-create-one-385438-2023-06-13> accessed 28 June 2023.

[131] See, for e.g., *Paschim Banga Khet Mazdoor Samity v State of West Bengal* (1996) 4 SCC 37 (concerning the unavailability of healthcare facilities in a government-run primary healthcare centre to treat serious injuries).

[132] Constitution of India 1950, arts 38, 39(e), 41, 47. See also, *Bandhua Mukti Morcha v Union of India* (1984) 3 SCC 161 (on enforceability of Directive Principles of State Policy).

practices of the NDHE. The public that can access public health is "uniquely" identified, either through an ABHA (which is the identity layer of the Health Stack) or through an Aadhaar-linked ABHA (where the identity layer of India Stack is integrated into the Health Stack). This calls into question the broader rationale of the NDHE itself, similar to the ways in which Aadhaar called into question the broader shift in public welfare distribution. Aadhaar recast the last-mile problem of public welfare delivery as a problem of identity—where instead of placing the burden on the state to ensure that all recipients of public welfare actually receive these benefits, the equation was reversed and claimants had to prove that they were indeed unique and therefore entitled to welfare. ABHA similarly recasts public healthcare delivery as a problem of identity—where socio-economic aspects of resource allocation for meeting a diverse and constantly evolving set of health needs is replaced with a healthcare delivery model where recipients must "prove" their uniqueness in order to be able to access healthcare services.

Sometimes though, an infrastructure-user public is recognised as a legal public, and through such legal recognition, the affordances of the data infrastructure mediating the infrastructure-user public's access to public health can be effectively regulated—often through the use of constitutional law. In the Indian context, the reliance on "transformative" interpretations of fundamental rights relating to equality, non-discrimination, and the right to life combined with judicial processes like public interest litigation has resulted in courts intervening in the exclusionary practices of infrastructures.[133] For instance, in the Aadhar case, the Supreme Court struck down the mandatory use of Aadhaar for identity verification when availing public services (such as opening a bank account) as well as private services (such as obtaining a mobile sim card).[134]

Another example relates to the use of the CoWIN platform during the COVID-19 pandemic. This digital platform was rolled out as the default setting for individuals to register for COVID-19 vaccinations, and its use required a smartphone and stable internet connectivity. [135] In a suo-motu petition recognised by the Supreme Court in 2021, the court noted that "only digital registration and booking of appointment on CoWIN, coupled with the current scarcity of vaccines, will ultimately ensure that initially all vaccines, whether free or paid, are first availed by the economically privileged sections of the society."[136] Viewed differently, the court recognised the concerns with

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[133] See, for e.g., Gautam Bhatia, *The Transformative Constitution* (HarperCollins 2019) 327-348 (discussing transformative constitutionalism in the context of the Supreme Court cases against Aadhaar); Madhav Khosla, *India's Founding Moment: The Constitution of a Most Surprising Democracy* (Harvard University Press 2020).

[134] *KS Puttaswamy (Aadhaar-5J) v Union of India* (2019) 1 SCC 1.

[135] CoWIN has now been integrated into the NDHE. 'Frequently Asked Questions' (*Ayushman Bharat Digital Mission*) <https://abdm.gov.in/faq> accessed 29 January 2024.

[136] *In Re: Distribution Of Essential Supplies And Services During Pandemic*, (2021) SCC OnLine SC 411, 793.

the creation of an infrastructure-user public as a collective of economically privileged individuals, and the consequences this would have on access to vaccines. The court then relied on the fundamental right to equality and non-discrimination and the right to life to reshape this infrastructure-user public to encompass the plural legal public recognised as rights-bearers under the Indian Constitution. The court directed the Union Government to factor this into their plan to ensure equitable access to and distribution of vaccines.[137] Post this intervention, vaccine registrations were permitted either through the CoWIN platform or physical alternatives.[138] Further, the beneficiary registration stack of CoWIN was expanded to allow Common Service Centres to register beneficiaries.[139]

Therefore, constitutional law can play an important role in regulating exclusionary politics of data infrastructures—drawing from, for example, normative commitments enshrined in Part III of the Indian Constitution as well as from socio-historic accounts of the making of the Indian Constitution itself.[140] Such transformative readings of the constitution can open up more spaces for the use of constitutional law as a legal mechanism for the recognition and empowerment of "communities of the affected" in the context of a data infrastructure like the NDHE.

B. Electronic Health and Medical Records

In addition to ABHAs, the NDH Blueprint also envisages the creation of electronic health and medical records in accordance with health data standards for interoperability and portability. The NDH Blueprint defines an Electronic Medical Record ('EMR') as a digital record "relating to an episode or a set of episodes relating to a patient" that is maintained at the facility level.[141] An Electronic Health Record ('EHR') is a longitudinal record of a particular patient across several facilities, maintained as a collection of links to each EMR of the patient.[142]

To incentivise the generation of EHRs in a manner that facilitates their ease of sharing and interoperability across different information management systems, two interesting manoeuvres were adopted. The first manoeuvre was

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[137] ibid 798.

[138] See Keyzom Massally, 'Building Digital Public Goods: takeaways from India's COVID-19 vaccine implementation programme' (*UNDP*, 1 February 2022) <https://www.undp.org/digital/blog/building-digital-public-goods-takeaways-indias-covid-19-vaccine-implementation-programme> accessed 29 January 2024.

[139] Common Service Centres are public-private partnerships that function as internet-enabled front-end delivery points for a range of government-to-citizen and business-to-consumer services across India, such as health, banking, and welfare services. See 'CSC-Postal Parcel Franchise Portal' available at <https://cowin.csccloud.in/> accessed 29 January 2024.

[140] Choudhuri (n 96); Mittal (n 106); Ornit Shani, 'The People and the Making of India's Constitution' (2022) 65(4) The Historical Journal 1102.

[141] NDH Blueprint (n 2) 17.

[142] ibid.

the harmonisation of health data standards and protocols. Since 2013, the MoHFW, together with associated bodies such as the Medical Council of India and the Pharmacy Council of India, has issued standards for electronic health records, which cover data format, data entry stipulations, and data interchange.[143] The NDH Blueprint consolidated these national standards with international standards for different aspects of health information management systems.[144] For instance, the NDH Blueprint recommends the adoption of the ISO standard on consent management of health data, together with a national standard issued by the Ministry of Electronics and Information Technology for electronic consents.[145] Further, it recommends standards for technical, syntactic, and semantic interoperability of health records.[146] In continuation, the National Resource Centre for EHR Standards—a government-nominated R&D centre—issued a set of set of health data specifications for the ABDM, with prescriptions on terminologies and data artefacts that need to be included in EHRs.[147]

The second manoeuvre was the launch of a financial incentive scheme called the "Digital Health Incentive Scheme ('DHIS') for ABDM adoption" in January 2023.[148] Under this DHIS, certain hospitals (such as those having 10 or more beds offering in-patient diagnostic services), labs, and pharmacies performing a specified number of "transactions" are entitled to a cash reward. The DHIS also extends financial incentives to "digital solutions companies," i.e., software providers that have functionalities compatible with the ABDM.[149] A "transaction" is defined as the "creation of any ABHA/ABHA address linked health record."[150] The DHIS is in effect until 30 June 2025, as of now.[151] Further, a dashboard has been created by the NHA, which displays aggregated data on the number of "transactions" performed by eligible hospitals, labs, and

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[143] See 'EHR Standards for India' (*National Resource Centre for EHR Standards*) <https://www.nrces.in/standards/ehr-standards-for-india#introduction> accessed 12 September 2023.

[144] NDH Blueprint (n 2) 31-38.

[145] ibid 32.

[146] ibid 32-34.

[147] 'FHIR Profiles for ABDM Health Data Interchange' (*National Resource Centre for EHR Standards*) <https://nrces.in/ndhm/fhir/r4/index.html> accessed 12 September 2023.

[148] National Health Authority, 'Digital Health Incentive Scheme (DHIS) for ABDM adoption' (Government of India, 7 December 2022) <https://abdm.gov.in:8081/uploads/Financial_Incentive_Policy_DHIS_e96a62fd28.pdf> accessed 12 September 2023.

[149] ibid.

[150] ibid 4; National Health Authority, 'Corrigendum to Digital Health Incentive Scheme (DHIS) for ABDM adoption' (Government of India, 16 March 2023) <https://abdm.gov.in:8081/uploads/Corrigendum_to_Digital_Health_Incentive_Scheme_vf_e4f1ca0b19.pdf> accessed 12 September 2023; National Health Authority, 'Corrigendum 2 to Digital Health Incentive Scheme (DHIS) for ABDM adoption' (Government of India, 29 July 2023) <https://abdm.gov.in:8081/uploads/Corrigendum_2_to_Digital_Health_Incentive_Scheme_vf20230729_d6789a791a.pdf> accessed 12 September 2023.

[151] National Health Authority, 'Corrigendum 4 to Digital Health Incentive Scheme (DHIS) for ABDM adoption' (Government of India, 11 June 2024) <https://abdm.gov.in:8081/uploads/Corrigendum4_11062024_vf_4d37d5408c_01ee 0141a6.pdf> accessed 7 September 2024.

digital solutions companies, and the amount of financial incentives received by these entities. As of September 2024, upwards of INR 29 crores has been disbursed to hospitals and diagnostic labs combined, and upwards of INR 9 crores has been disbursed to digital solutions companies.[152]

These two manoeuvres illustrate the ways in which the NDHE imagines and brings into existence its infrastructure-user public—a public of data bodies that constantly generate and contribute data to the health data economy. Fieldwork conducted by the Internet Democracy Project, for instance, reveals the interest of non-clinical stakeholders such as health insurers in monetising the inherently embodied nature of health data, and the ways in which the NDHE facilitates easy "frictionless" access to this data for such stakeholders.[153] Consider a new law regulating consumer health data introduced in the US in Washington State in 2023—the My Health My Data Act—which prohibits any sale of consumer health data unless such sale is preceded by valid consent from consumers.[154] In India, a similar provision is not incorporated either in the DPDP Act or any healthcare-related law. Instead, the actors involved in the NDHE and the politics of the NDHE shape into existence a weakened legislative framework for health data management—weakened not by accident but *by design*. This can be discerned from the current data protection framework for consent and for processing sensitive personal data.

1. Automating Consent

At the outset, there is the reconfiguration of consent into a techno-legal innovation through law, as discussed in Section IV above. The concept of "consent managers" in both the Health Data Management Policy and the DPDP Act traces its genesis back to the Data Empowerment and Protection Architecture ('DEPA')[155]—"a techno-legal solution that allows individuals to operationalize their data rights through a consent-based data-sharing system."[156] DEPA was first implemented in the financial sector, with a set of intermediaries known as "account aggregators" serving the role of consent managers, and is now being integrated into the NDHE. But DEPA itself was a creation of iSPIRT, which has now been regulatorily adopted across sectors as "the" model for consent and data portability.[157]

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[152] National Health Authority, 'ABDM Insight' (*Government of India*) <https://dashboard.abdm.gov.in/abdm/> accessed 12 September 2023.

[153] Radhakrishnan (n 125).

[154] Washington My Health My Data Act 2023, s 19.373.070.

[155] NITI Aayog, 'Data Empowerment And Protection Architecture – Draft for Discussion' (Government of India, August 2020) <https://www.niti.gov.in/sites/default/files/2023-03/Data-Empowerment-and-Protection-Architecture-A-Secure-Consent-Based.pdf> accessed 12 September 2023.

[156] Siddharth Tiwari, Frank Packer, and Rahul Matthan, 'Data by People, for People' (*IMF*, March 2023) <https://www.imf.org/en/Publications/fandd/issues/2023/03/data-by-people-for-people-tiwari-packer-matthan> accessed 16 July 2023.

[157] See Smriti Parsheera, 'An Analysis of India's New Data Empowerment Architecture' in Swati

All these iterations of the consent manager model construct the problem of data protection as the problem of consent, where consent is understood simplistically as the act of obtaining a "consent token" or a "yes/no" from an individual for collection and sharing of their personal data. This was made particularly clear in a semi-structured interview conducted by the author with an iSPIRT volunteer who was a healthcare professional. When asked about the use of consent managers, the volunteer recognised that while it would be difficult to operationalise the electronic consent framework with a heterogenous population in India, a digital and automated consent framework was the best safeguard against unethical data use.[158]

The DPDP Act also recognises the concept of consent managers, giving more teeth to the iSPIRT-led vision of data protection as "consent-driven data flows."[159] The DPDP Act recognizes consent as one of two legal bases for processing of personal data. Entities that seek to collect and/or process personal data can rely on consent as the legal basis for such activity and can obtain this consent either directly from the data subject or through an intermediary known as a consent manager. As a single point of contact, a consent manager's role is to "enable a [data subject] to give, manage, review and withdraw her consent through an accessible, transparent and interoperable platform."[160] The DPDP Act goes on to prescribe certain obligations for consent managers[161]—(i) they need to be registered with the new federal data protection authority to be set up;[162] (ii) they need to act on behalf of the data subject who has availed of their services;[163] and (iii) they need to respond to any grievances raised by the data subject in respect of any act or omission alleged to be committed by them.[164] Additional detail on the registration of consent managers and their obligations will be provided by way of rules to be issued by the Ministry of Electronics and Information Technology. As of June 2024, these rules are still being drafted and there is no clarity on when they will be released for public consultation.[165]

Punia, Shashank Mohan, Jhalak M Kakkar, and Vrinda Bhandari (eds) *Emerging Trends in Data Governance* (Centre for Communication Governance 2021).

[158] Interview conducted by author on 6 July 2023 with a health data volunteer at iSpirit. Interview transcript on file with author.

[159] Digital Personal Data Protection Act 2023, ss 2(g), 6(7)–6(10).

[160] Digital Personal Data Protection Act 2023, s 2(g).

[161] In 2022, the NHA issued a revised draft of the Health Data Management Policy, but this draft is yet to be notified. See National Health Authority, 'Ayushman Bharat Digital Mission: Draft Health Data Management Policy' (Government of India, April 2022) <https://www.medianama.com/wp-content/uploads/2022/06/Draft_HDM_Policy_April2022_e38c82eee5.pdf> accessed 12 September 2023. This draft contained similar provisions on consent managers as in the DPDP Act.

[162] Digital Personal Data Protection Act 2023, s 6(9).

[163] Digital Personal Data Protection Act 2023, s 6(8).

[164] Digital Personal Data Protection Act 2023, s 13(1).

[165] Ronendra Singh, 'Digital personal data protection Act draft rules in advanced stage: Vaishnaw' (*The Hindu BusinessLine*, 15 June 2024) <https://www.thehindubusinessline.com/info-tech/digital-personal-data-protection-act-draft-rules-in-advanced-stage-vaishnaw/

However, as Smriti Parsheera notes, the consent conundrum is much more complicated, and addressing it requires a multi-faceted approach encompassing trust, accountability, and transparency.[166] A techno-legal architecture such as DEPA, with APIs and standards for data sharing, is definitely one component, but is not "the only" solution to the consent conundrum.[167] Particularly in the context of health data (which constitutes sensitive personal data in many jurisdictions in the world and therefore to be handled with more care), generation and sharing of health data requires not only consent from individual patients, but also heightened obligations and practices relating to trust, data security, and accountability from the different actors handling this data, and strong data rights such as the right to access and the right to seek deletion.[168] In this regard, the Internet Democracy Project outlined suggestions for implementing a feminist approach to consent[169] in the design and development of data technologies—such as replacing vague language in consent notices like "processing for other reasonable purposes" with more specific purposes for which consent is sought.[170] Even the consent manager framework should be reoriented to move away from a techno-legal innovation that enables "frictionless" data collection, to a structure that introduces some friction to enable collective decision-making over the pooling and sharing of data—such as through the use of data cooperatives.[171] For instance, Aapti Institute's work on women-run data cooperatives in India

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article68293763.ece> accessed 7 September 2024.

[166] Parsheera (n 157) 13-15.

[167] ibid 18-19.

[168] See, for e.g., Dipika Jain, 'Regulation of Digital Healthcare in India: Ethical and Legal Challenges' (2023) 11(6) Healthcare (Basel) 911; Sheetal Ranganatha, 'Towards a holistic digital health ecosystem in India' (*ORF,* 24 May 2023) <https://www.orfonline.org/research/towards-a-holistic-digital-health-ecosystem-in-india-63993?amp> accessed 06 March 2024; Gianclaudio Malgieri and Giovanni Comandé, 'Sensitive-By-Distance: Quasi-Health Data in the Algorithmic Era' (2017) 26(3) Informations & Communications Technology Law 229.

[169] An approach that sees consent as socially situated, as opposed to consent obtained through principles of rational choice theory. See for e.g., Paz Peña and Joana Varon, 'Consent to our Data Bodies: lessons from feminist theories to enforce data protection' (*Coding Rights,* 8 March 2019), <https://codingrights.org/docs/ConsentToOurDataBodies.pdf>; Joana Varon and Paz Peña, 'Artificial intelligence and consent: a feminist anti-colonial critique' (2021) 10(4) Internet Policy Review, <https://policyreview.info/articles/analysis/artificial-intelligence-and-consent-feminist-anti-colonial-critique>

[170] Anja Kovacs and Tripti Jain, 'Informed consent—Said who? A feminist perspective on principles of consent in the age of embodied data—A policy brief' (*Data Governance Network,* 22 March 2021) <https://internetdemocracy.in/policy/informed-consent-said-who-a-feminist-perspective-on-principles-of-consent-in-the-age-of-embodied-data-a-policy-brief#lessons-from-feminist-perspectives-on-consent-for-data-protection> accessed 12 March 2024.

[171] See generally, Alexander Fink, 'Data Cooperative' (*Internet Policy Review,* 4 April 2024), <https://policyreview.info/glossary/data-cooperative> accessed 5 April 2024. Generally, on the concept of "friction" in regulation, see Brett M Frischmann and Susan Benesch, 'Friction-In-Design Regulation as 21st Century Time, Place and Manner Restriction' (2023) 25 Yale Journal of Law and Technology 376.

can provide useful insights on creating empowering structures for data and consent management.[172]

2. Other Legal Rights and Obligations with regard to Sensitive Personal Data

Beyond consent, other substantive provisions in executive rules such as the Health Data Management Policy and legislation like the DPDP Act also remain weak. The Health Data Management Policy suggests that instead of obtaining consent separately for each instance of processing of health data, a data processor can obtain a single broad consent at the first instance of collection/processing. Subsequent consent must only be obtained if there is a change in the privacy policy of the data processor or for collection/processing for other purposes not originally specified to the individual.[173] Further, while the policy states that consent can be revoked by an individual at any time, the NHA has not issued subsequent guidance on how such revocations are to be issued.[174]

The DPDP Act also remains weak in its ability to regulate the generation and sharing of sensitive data such as health data. Pursuant to the constitution of the Srikrishna Committee in 2017, four drafts of the personal data protection bill have been prepared. Of these, the bills introduced in 2018, 2019, and 2021 incorporated many globally-accepted principles of data protection such as heightened protection for certain sensitive categories of personal data like health and biometric data, clearly-defined purposes for processing of personal data, and the right to data portability.[175] The 2022 bill, which has become law, does not contain any references to sensitive data or to a right to data portability. Instead, the DPDP Act applies generally to "personal data" and does not prescribe specific obligations for sensitive categories of personal data

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[172] Aapti Institute partners with Megha, a women farmer's cooperative in Gujarat. The project sought to add a data layer to the cooperative, i.e., to enable cooperative members to pools their data share this data with financial institutions for accessing creditworthiness. Decision-making structures inherent to cooperatives were integrated into the data layer, to enable both collective as well as rights-respecting decision-making over data sharing. See Aapti Institute, 'Exploring the value of adding a data layer to cooperatives: Megha farmer cooperative case study' (*Medium*, 2 November 2022) <https://aapti.medium.com/exploring-the-value-of-adding-a-data-layer-to-cooperatives-megha-farmer-cooperative-case-study-1c4fcfd08635> accessed 14 March 2024. See also, Ernst Hafen and others, 'Health Data Cooperatives – Citizen Empowerment' (2014) 53(2) Methods of Information in Medicine 82.

[173] Health Data Management Policy (n 16) clauses 9 and 10; National Health Authority, 'National Digital Health Mission: Model Privacy Notice' (Government of India) <https://abdm.gov.in:8081/uploads/model_privacy_notice_7ee5198211.pdf> accessed 5 April 2024; National Health Authority, 'National Digital Health Mission: Model Informed Consent Form' (Government of India) <https://abdm.gov.in:8081/uploads/consentform_c6062dffc6.pdf> accessed 5 April 2024.

[174] Health Data Management Policy (n 16) clauses 9.2, 15.6.

[175] For an overview, see Anirudh Burman, 'Understanding India's new Data Protection Law' (*Carnegie India,* 3 October 2023) <https://carnegieindia.org/2023/10/03/understanding-india-s-new-data-protection-law-pub-90624> accessed 5 March 2024.

such as health data, genetic data, or biometric data.[176] Further, in terms of the legal bases under which data can be provided—the DPDP Act prescribes consent as one legal basis, and another set of "exceptions" in respect of which personal data can be processed without consent. In this regard, the DPDP Act provides more leeway to government actors to collect and process personal data without consent, in the context of provision of public services.[177] This particular provision continues to be criticised, with commentators fearing that this exception to the rule might become the norm itself—feeding extractive datafication under the guise of providing public services.[178]

A specific bill relating to data protection and data security for health data was released for public comments by the MoHFW in 2018. This bill, known as the Draft Digital Information Security in Healthcare Act ('DISHA'), sought to enable the exercise of individual control over health data, while also enabling the creation of intermediaries to facilitate trusted sharing of health data.[179] In 2019, however, the MoHFW issued a press release, stating that DISHA would be subsumed under the draft data protection law, but this was not done.[180]

Where health-data-specific laws do exist, they do not offer much guidance on decision-making over data generation and sharing or even data security. For instance, in 2020, the central government released a set of guidelines for telemedicine.[181] But these guidelines relegate data minimisation to the discretion of the registered medical practitioner providing teleconsultation services, instead of outlining even an illustrative list of data that can be considered proportional for collection.[182] The regulations also apply to technology

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[176] Digital Personal Data Protection Act 2023, ss 2(h), 2(t), 3 (While Section 43A of the Information Technology Act of 2000 did prescribe security practices in relation to sensitive data and the Ministry of Electronics and Information Technology issued rules further elaborating these security practices, both Section 43A and its associated rules have now been overruled by Section 44(2) the DPDP Act).

[177] Digital Personal Data Protection Act 2023, s 9.

[178] Sarvesh Mathi, 'India's Digital Personal Data Protection Bill, 2023 gives the government powers to exempt itself from the Bill, block content, and more' (*Medianama,* 3 August 2023), <https://www.medianama.com/2023/08/223-dpdp-bill-2023-government-exemptions/> accessed 4 March 2024; Sarvesh Mathi, 'Response to Rajeev Chandrasekhar's Comments on the Data Protection Act' (*Medianama,* 17 August 2023) <https://www.medianama.com/2023/08/223-response-rajeev-chandrasekhar-comments-dpdp-act-2023/> accessed 4 March 2024.

[179] 'Draft Digital Information Security in Healthcare Act' (*Ministry of Health and Family Welfare*, 21 March 2018) <https://archive.org/details/draftdishaact > accessed 4 March 2024. See also, Jain (n 168).

[180] Ministry of Health and Family Welfare, 'Data Transfer of Digital Health Records' (*Press Information Bureau*, 16 July 2019) <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1578929> accessed 4 March 2024.

[181] Board of Governors, 'Telemedicine Practice Guidelines: Enabling Registered Medical Practitioners to Provide Healthcare Using Telemedicine' (Government of India, 25 March 2020) <https://esanjeevani.mohfw.gov.in/assets/guidelines/Telemedicine_Practice_Guidelines.pdf> accessed 4 March 2024.

[182] ibid 31.

platforms used by registered medical practitioners for teleconsultations. However, technology platforms are only required to ensure that no AI or machine learning software is used to provide consultations to consumers, and that such technologies only serve as support functions for registered medical practitioners.[183] And finally, even standards which serve as quasi-regulations are created with the vision of enabling frictionless sharing of health records across healthcare systems.[184] There is little to no public consultation in the creation of these standards, and process by which these standards are created, approved, and implemented remains opaque.

One regulatory development that could hold potential relates to non-personal data. In 2019, the Central Government constituted an expert committee whose mandate was to recommend a regulatory framework for non-personal data. This committee released two draft frameworks for sharing of non-personal data.[185] The committee recognised both individual claims over non-personal data (such as ownership of databases as intellectual property) as well as "community rights" over non-personal data (conceptualised as a form of beneficial ownership, where data either relates to a community or is to be used for the benefit of a community).[186] The committee went on to recommend the creation of data trusts as an institutional structure to facilitate non-personal data sharing that respects both individual and community rights over such data, enabled by a new set of actors known as data trustees and data custodians.[187] The committee also recommended the creation of "high value datasets" (which includes datasets relating to healthcare)—where these datasets are considered a public resource—and data trustees enabling easy and trusted sharing and re-use of these datasets.[188] While the recommendations of this expert committee have not been translated into law, they serve as interesting starting points to conceptualise data governance frameworks for

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[183] ibid 33.

[184] On standards as another form of regulation, see generally, Jorge Contreras (ed), *The Cambridge Handbook of Technical Standardization Law: Further Intersections of Public and Private Law* (Cambridge University Press 2019); Jean-Christophe Graz, *The Power of Standards* (Cambridge University Press 2019); Aayush Rathi, Gurshabad Grover, and Sunil Abraham, 'Regulating the Internet: The Government of India & Standards Development at the IETF' (*Centre for Internet and Society*, 30 November 2018) <https://cis-india.org/internet-governance/blog/regulating-the-internet-the-government-of-india-standards-development-at-the-ietf> accessed 13 March 2024.

[185] Ministry of Electronics and Information Technology, 'Report by the Committee of Experts on Non-Personal Data Governance Framework' (Government of India, 13 July 2020), <https://ourgovdotin.wordpress.com/wp-content/uploads/2020/07/kris-gopalakrishnan-committee-report-on-non-personal-data-governance-framework.pdf> accessed 11 January 2024; Ministry of Electronics and Information Technology, '(Revised) Report by the Committee of Experts on Non-Personal Data Governance Framework' (Government of India, 16 December 2020) <https://ourgovdotin.wordpress.com/wp-content/uploads/2020/12/revised-report-kris-gopalakrishnan-committee-report-on-non-personal-data-governance-framework.pdf> accessed 11 January 2024.

[186] 13 July Report (n 185) 23; 16 December Report (n 185) 16.

[187] 13 July Report (n 185) 20-22; 16 December Report (n 185) 18.

[188] 13 July Report (n 185) 57; 16 December Report (n 185) 18.

India that account for both individual rights over data as well as community interests.

In terms of legal policy, what is needed at this stage is a sustained orientation towards law's imperatives for publicness, as identified by Kingsbury and Maisley and discussed in Section V above. First is publicness as asscessibility, i.e., that all actions in a public space should be accessible and scrutinisable by the collective. Here, the demand for more laws—either a revamped DPDP Act more in-line with globally-accepted data protection principles, or a health data-specific law, or a data governance law more broadly conceived—should be accompanied with demands for the incorporation of these laws into the design of data infrastructures from the planning stage itself. Here, standard-setting is also important, in particular the ways in which standards serve as *de-facto* regulatory frameworks and consequently, the need for increased public participation in the creation of standards. This is crucial to break the binary between statist visions of standards and private industry-led monopoly over standard setting.

Laws must also include strong mandates for transparency from both public and private sector actors involved in the NDHE. For the public sector, India's regulatory framework for open government data should be strengthened to include release of digital infrastructure procurement and design data as open data.[189] Further, frameworks for public procurement can also be revised, especially when availing private sector assistance for cloud services, software services, and internet connectivity. In particular, tender documents and contracts can include contractual clauses that require the bidder to release all data generated in the course of providing the required service as open data.[190]

Second is publicness as exposure, i.e., the exposure of expressions within a public space to plurality of views. In this regard, laws for data protection or data governance should contain strong mandates for public consultation, and perhaps even an obligation on the NHA to create a living document in the form of a "Digital Infrastructure Plan" akin to the framework adopted by the City of Toronto for its smart city endeavours (discussed in Section V above).

Last is publicness as consideration, i.e., actors in a public space must be accommodating of other in this space. In this regard, regulatory bodies should be set up such as the data protection authority under the DPDP Act, and made independent to ensure that they do not privilege some voices over others.

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[189] Ministry of Electronics and Information Technology, 'India Data Accessibility and Use Policy' (Government of India, February 2022) <https://www.meity.gov.in/writereaddata/files/India%20Data%20Accessibility%20and%20Use%20Policy.pdf> accessed 4 March 2024.

[190] This can be based on the inclusion of similar clauses in Barcelona City's contract with Vodafone for telecommunication services. See Fernando Monge, Sarah Barns, Rainer Kattel, and Francesca Bria, 'A new data deal: the case of Barcelona' (2022) UCL Institute for Innovation and Public Purpose Working Paper WP 2022/02 <https://www.ucl.ac.uk/bartlett/public-purpose/sites/bartlett_public_purpose/files/new_data_deal_barcelona_fernando_barns_kattel_and_bria.pdf> accessed 4 March 2024.

Infrastructural publics of the NDHE can also be empowered through constitutional litigation against the NDHE. In 2017, the Supreme Court recognised a broad fundamental right to privacy, which includes autonomy and data protection.[191] Any state action that interefers with this fundamental right must satisfy a multi-part proportionality test to be constitutionally valid.[192] Strategic constitutional litigation with regard to the different components of the NDHE that prioritises a transformative reading of the Indian Constitution could serve as another useful way in which constitutional law can empower infrastructural publics of the NDHE. For instance, the broad language used in the Health Data Management Policy that enables disproportionate generation and sharing of sensitive personal data as part of providing public healthcare could be challenged as violating the proportionality test.[193] In this way, a commitment to law's normative imperatives of publicness can guide both legislative and constitutional law to empower the infrastructural publics of the NDHE.

VII. CONCLUSION

This paper has sought to advance two claims. First, the NDHE is not a neutral set of data artefacts or data-driven systems but is an infrastructure that bears and engenders a politics of exclusion by creating "infrastructural publics", i.e., collectives whose ability to contest the data infrastructure that brought them into existence is limited. This politics shapes legal frameworks for the NDHE in its image. Infrastructural thinking is a rich analytical method to unearth these politics, without falling prey to either legal or technological

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[191] *KS Puttaswamy (Privacy-9J) v Union of India* (2017) 10 SCC 1.

[192] ibid [310]-[311], [325] (Chandrachud, J.), [638]-[640] (Kaul, J.) read with *Puttaswamy (II) v Union of India* (2019) 1 SCC 1; *Gujarat Mazdoor Sabha v State of Gujarat* (2020) 10 SCC 459; *Ramesh Chandra Sharma v State of UP* (2024) 5 SCC 217. It can be argued that there is general judicial consensus on the proportionality test being a four-part test – any restriction of the right to privacy must have a legitimate state aim; suitability of the restriction to the legitimate state aim; necessity of the restriction in achieving the legitimate aim (including the least restrictive method test), and balancing *stricto senso* between achieving the stated purpose/objectives and the social importance of preventing a limitation of a constitutional right. (See generally, Aparna Chandra, 'Proportionality in India: A Bridge to Nowhere?' (2020) 3(2) University of Oxford Human Rights Hub Journal 55). Some legal scholars have argued that the Supreme Court has introduced a fifth-prong to the proportionality test – i.e., that the state must provide sufficient safeguards against abuse of the rights-infringing restriction. (See for e.g., Gautam Bhatia, 'Proportionality's Fifth Prong' (*Indian Constitutional Law and Philosophy,* 23 February 2023) <https://indconlawphil.wordpress.com/2023/02/23/proportionalitys-fifth-prong/> accessed 14 March 2024; c.f., Rudrakash Lakra, 'Proportionality's Fifth Prong–A Reassessment' (*Indian Constitutional Law and Philosophy*, 7 March 2023) <https://indconlawphil.wordpress.com/2023/03/07/guest-post-proportionalitys-fifth-prong-a-reassessment/> accessed 14 March 2024.)

[193] See, for e.g., Abhigyan Tripathi and Rishabh Chhabaria, 'The Health Data Management Policy: A Counterproductive Step towards Healthcare Digitisation? (Part-II)' (*Law and Other Things*, 24 November 2020) <https://lawandotherthings.com/the-health-data-management-policy-a-counterproductive-step-towards-healthcare-digitisation-part-ii/> accessed 7 September 2024.

determinism. Second, despite the ways in which law at present is shaped by the politics of the NDHE, the law nonetheless has a normative imperative towards publicness. The law must empower infrastructural publics by discharging its normative imperative to create health public sphere(s) to ensure the vitality of democracy. To translate this normative imperative into practice, this paper proposes some suggestions with respect to constitutional law and well as law-making by the Parliament.

While the delivery of large-scale social welfare services like public health require some degree of datafication and standardisation, the pursuit of scale should not completely displace local practices. In fact, going back to the conceptual definition of an "infrastructure," an infrastructure arises at the stage when *local* practices become standardised by data systems. Infrastructural thinking can visibilise these local practices, and enable critical inquiry into what practices become standardised, what don't, and the "real" consequences of these standardisations. For instance, the NHA launched a regulatory sandbox which largely caters to private companies and start-ups to enable such entities "to judge consumer and market reactions" to digital health products that are "compatible with NDHM standards."[194] By contrast, the Channapatna Health Library is an initiative designed and maintained outside this regulatory sandbox, which illustrates how a data infrastructure for public health can be co-designed with the community and can adopt non-neoliberal values.[195] This initiative is a community-driven decentralised digital infrastructure that enables local communities to autonomously maintain a repository of lived experiences of health and wellbeing. Infrastructural thinking can aid in putting the "local" back into focus, which in turn can shape policy and advocacy in the context of the NDHE. These are but a few steps; much more concerted efforts are required to *intentionally* build inclusive data infrastructures for public services.

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[194] 'National Digital Health Mission, 'NDHM Sandbox: Enabling Framework v1.0' (Government of India, 18 August 2020) <https://abdm.gov.in:8081/uploads/sandbox_guidelines_b39bcce23e.pdf> accessed 4 March 2024.

[195] See 'Channapatna Health Library' <https://designbeku.in/Channapatna-Health-Library-dc06f345f869428ca9cb9f78b456f04d> accessed 4 March 2024; 'Channapatna Health Library' <https://llncolab.notion.site/Channapatna-Health-Library-4b72a31fea8241b79c2f75a6b9d302b6> accessed 4 March 2024.