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Intermediated Digitality: An Ethnographic Study of Digitalization, Health and Access to Healthcare in a Village of South 24 Parganas, West Bengal, India

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Research Article

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Abstract

India's Digital India programme, launched in 2015, and the Ayushman Bharat Digital Mission, introduced in 2021, aim to improve access to health information, entitlements and consultations among rural households. However, limited research has examined how digital health initiatives are experienced and mediated at the village level. This study employed a mixed-methods ethnographic approach in Moutala village, South 24 Parganas, West Bengal. Data were collected through a household survey covering all 272 households, comprising 1,200 individuals, supplemented by observations, interviews, focus group discussions and case studies involving residents, frontline health workers and cybercafé operators. The findings revealed that awareness of Digital India was relatively high (80.1%; 95% CI: 75.0–84.5), despite only 1.5% of households owning a computer. Awareness and uptake across 35 health programmes varied considerably. Uptake was nearly universal for the state health insurance scheme Swasthya Sathi (98.9%) and campaign-based disease programmes (approximately 95.6%), while maternal, child and nutrition programmes recorded moderate uptake (approximately 60–63%). Mental, eye and oral health programmes demonstrated a substantial gap between awareness and uptake, with uptake reported at only 1.5%. Furthermore, 98.2% of respondents were unfamiliar with Ayushman Bharat, which West Bengal implemented only in June 2026. Although digital registration helped reduce waiting times, most respondents continued to prefer physical queues. Respondents also associated mobile phone use with neck and back pain, eye strain and poor sleep. The findings suggest that digital health services reach rural communities primarily through human and institutional intermediaries rather than independent use of digital technologies. This study conceptualises this pattern as intermediated digitality and argues that rural digital health policies must recognise, strengthen and adequately resource the intermediaries who facilitate access to digital health services.

Keywords: Digital Health; Digital Divide; Rural India; Health Intermediaries; Telemedicine; Swasthya Sathi; Ayushman Bharat

Abbreviations

ABDM: Ayushman Bharat Digital Mission; MOHFW: Ministry of Health and Family Welfare; AB PM-JAY: Ayushman Bharat Pradhan Mantri Jan Arogya Yojana; IIPS: International Institute for Population Sciences; ANM: Auxiliary Nurse Midwife; ASHA: Accredited Social Health Activist.

Introduction

Few words have travelled through Indian public policy in the past decade as widely as "digital". Launched on 1 July 2015, the Digital India programme set out three pillars: digital infrastructure as a core utility to every citizen, governance and services on demand, and the digital empowerment of

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citizens through universal digital literacy [1]. In health, this vision has been built into a layered architecture that includes the eSanjeevani national telemedicine service, the Ayushman Bharat Digital Mission (ABDM) launched in September 2021 to create interoperable health identities and records, and specialised services such as the Tele-MANAS mental health helpline launched in October 2022 [2,3]. By September 2023, eSanjeevani alone had recorded more than 163 million consultations across all states and union territories, overwhelmingly through a provider-assisted model in which a health worker at a peripheral facility connects the patient to a remote doctor [3]. By December 2025 the platform had served more than 432 million patients, and 181,873 Ayushman Arogya Mandirs (formerly Health and Wellness Centres) were operational across the country (Ministry of Health and Family Welfare [MOHFW], 2026).

Such figures describe a national system. They say much less about the village as a lived setting in which devices are shared, connectivity is intermittent, literacy and language vary, and access to a doctor is negotiated through kin, neighbours, frontline workers and informal practitioners. Critical scholarship on digital health has long cautioned that technologies do not simply "deliver" care; they reorganise it, redistribute work and responsibility, and produce new inequalities alongside new possibilities [4-6]. In rural India in particular, research on mobile telephony has shown that new media are absorbed into existing social relations and hierarchies rather than replacing them [7,8].

West Bengal adds a distinctive institutional dimension. Between 2019 and mid-2026 the state did not participate in the central government's hospital insurance scheme, Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY), relying instead on its own smart-card scheme, Swasthya Sathi, launched on 30 December 2016 and extended to the entire state population from 1 December 2020 [9,10]. West Bengal signed a memorandum of understanding with the National Health Authority and became the 36th state or union territory to implement AB PM-JAY on 8 June 2026 [11]. Our fieldwork took place before this change, which makes the village a rare opportunity to observe how national digital health branding is (or is not) recognised where the corresponding entitlement is locally absent.

This article asks three questions. First, what is the material and social configuration of digital access in a village of South 24 Parganas? Second, how are public health programmes, many of which are now administered through digital platforms, known and used by households? Third, how do villagers themselves experience the effects of digitalization on healthcare and on their bodies? We argue that the answers converge on a single pattern: digital health in Moutala is overwhelmingly intermediated. Its benefits flow through frontline workers, government camps, cyber cafes and relatives far more than through individual, self-directed use of apps and portals. We call this pattern intermediated digitality and draw out its implications for anthropological theory and for health policy.

Literature Review and Theoretical Framework

From one Digital Divide to Three

Early research framed the digital divide as a binary between those with and without access to computers and the internet. This "first-level" framing was soon complemented by attention to differences in skills and patterns of use, the "second level" divide [12]. and later by attention to differences in the tangible outcomes people derive from being online, the "third level" divide [13]. synthesises these strands into a sequential model in which motivation, physical access, digital skills and usage successively filter who benefits from digital technologies. The model is useful for rural India, where national surveys show that access is itself deeply stratified. According to the fifth National Family Health Survey [14]. 57.1% of men and 33.3% of women aged 15–49 had ever used the internet, falling to 48.7% of rural men and 24.6% of rural women (International Institute for Population Sciences [IIPS] & ICF, 2021, as cited in Chandola, 2022). Studies of telemedicine adoption in rural India similarly identify the availability and affordability of devices as the most fundamental barrier, with lack of knowledge and awareness as its most visible effect [15].

Access to Care as a Relational Achievement

In health services research, access has been theorised as the fit between the characteristics of health systems and those of populations. Andersen's [16] behavioural model relates service use to predisposing, enabling and need factors, while Levesque et al. (2013) conceptualise access along five dimensions of services (approachability, acceptability, availability and accommodation, affordability, and appropriateness) matched by five corresponding abilities of people (to perceive, seek, reach, pay and engage). The latter framework is particularly apt for digital health, because a digital service can increase approachability (information arrives on the phone) while leaving the ability to reach or to engage unchanged, or even reduced for those without devices, skills or language. We therefore treat digital health not as a channel that either works or fails, but as one element in a chain of abilities and affordances through which care becomes accessible.

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Anthropological Perspectives on Digital Health and Mediation

Medical anthropology brings two further insights. The first concerns pluralism and meaning. Kleinman's [17]. account of the popular, folk and professional sectors of health care, and of the explanatory models through which people make sense of illness, reminds us that rural patients move between biomedical facilities, informal practitioners and household care. In rural West Bengal, informal providers without formal medical qualifications supply a very large share of primary care; recent qualitative work in Birbhum district notes that they provide up to 70% of primary care in many rural settings [18]. and a randomised trial in the state showed that training such providers improved case management [19]. Any account of digital health in the village must therefore situate it within this plural field.

The second insight concerns mediation. Ethnographies of new media have shown that people choose among an environment of media ("polymedia") according to social and emotional as well as technical considerations [20]. and that smartphones are domesticated into local moral worlds [21]. In a West Bengal village, Tenhunen (2018) described how mobile telephony was mediated through gender, kinship and class relations. Research in human–computer interaction has named a related phenomenon "intermediated technology use", in which a digitally skilled person operates a device on behalf of another [22]. Toyama generalises the point: technology amplifies existing human and institutional capacity rather than substituting for it. Anthropologists of infrastructure add that the systems through which services flow are social and political as well as technical and often become visible only when they break down [23,24].

Health Effects of Digital Technology Use

A separate literature addresses the effects of digital technology use on health itself. A widely cited review concluded that intensive internet use may affect attention, memory and social cognition, while noting that much of the evidence remains preliminary [25]. Studies from Kolkata report associations between smartphone addiction, daytime sleepiness and depressive symptoms among medical students [26]. and studies from other Asian settings associate internet addiction with lower health-related quality of life [27]. Almost all this work concerns urban students; rural adults' own accounts of the bodily effects of phone use are seldom documented.

Research Gap and Framework of this Study

Three gaps follow. National evaluations of Indian digital health measure scale but rarely examine how programmes are recognised and used within a single, fully enumerated village. Studies of the digital divide rarely link access and skills to the concrete public health entitlements that households receive. And studies of health effects rarely take rural people's own embodied experience as their starting point. Figure 1 summarises the framework that guides our analysis. It places intermediaries (frontline health workers, government camps, cyber cafes, kin and informal providers) between the three levels of the digital divide and the five dimensions of access to care and treats village-level health outcomes and embodied effects as the joint product of both. Source: authors.

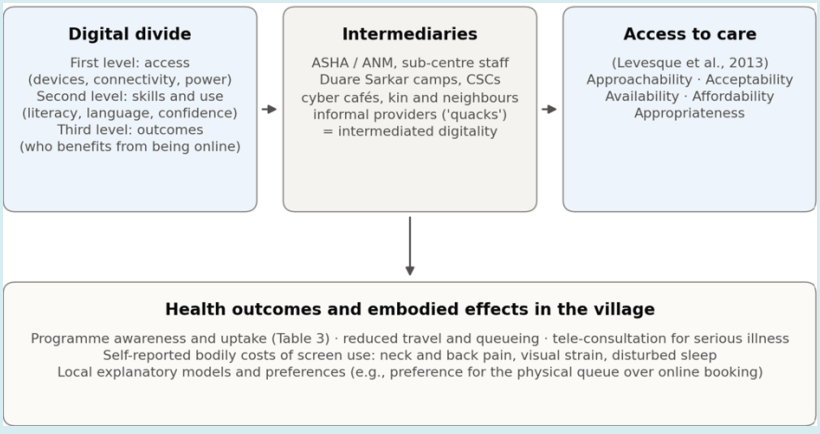

Figure 1: Conceptual framework: intermediaries link the layered digital divide to the dimensions of access to care.

Study Setting

Fieldwork was conducted in Mautala (locally, Moutala; Census location code 334000), a village within Brindakhali Gram Panchayat of Baruipur Community Development Block, South 24 Parganas district, West Bengal. Baruipur block covers 226.16 km^2 and comprises 19-gram panchayats, among them Brindakhali, Belegachhia and Hardhah, whose

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sub-centres serve the village, and 122 inhabited villages. At the 2011 Census the block had 433,119 residents, of whom 315,817 (72.9%) were rural. The sex ratio was 958 females per 1,000 males, and literacy was 76.46% (82.17% among males and 70.52% among females). Scheduled Castes formed 38.22% of the block population and Scheduled Tribes 0.26%; 62.86% of residents were Hindu and 34.96% Muslim. Among workers, 10.78% were cultivators, 22.00% agricultural labourers and 61.83% other workers, so most workers in the block depended on non-farm employment [28,29].

At the 2011 Census, Mautala covered 163.09 ha and had 248 households and 1,277 persons (658 males and 619 females; a sex ratio of 941), of whom 162 (12.7%) were aged 0–6 years. Of the 1,115 persons aged seven and above, 783 were literate (70.2%): 467 of 581 males (80.4%) and 316 of 534 females (59.2%). The gender gap in literacy in the village (21.2 percentage points) was therefore nearly twice that of the block (11.7 points), which matters for the gendered use of phones and digital services discussed below [30]. The village lies about 16 km from Baruipur town, the nearest statutory town, and about 48 km from the district headquarters at Alipore; the nearest railway station is Surjyapur. Because the village lies at a distance from urban centres, most administrative and developmental matters are handled through the gram panchayat.

Our enumeration recorded 272 households and 1,200 persons. Compared with 2011, this is 24 more households (+9.7%) but 77 fewer residents (−6.0%), and mean household size fell from 5.1 to 4.4 persons. Because the census and our survey differ in date and method, the comparison is indicative only.

These local figures sit within a fast-expanding state and national digital health system. By February 2025, 87.2 million people (8.72 crore) in 24.4 million families (2.44 crore) were enrolled in Swasthya Sathi, which had 2,914 empanelled hospitals [31]. Nationally, by December 2025, 839.4 million (83.94 crore) Ayushman Bharat Health Account (ABHA) numbers had been created and Ayushman Arogya Mandirs had recorded 419.3 million (41.93 crore) teleconsultations (MOHFW, 2026). West Bengal had 57.56 million wireless telephone subscribers in November 2025, when rural teledensity in India stood at 59.50 connections per 100 persons (Telecom Regulatory Authority of India [TRAI], 2025). In maternal health, the share of institutional births in West Bengal rose from 75.2% in NFHS-4 (2015–16) to 91.7% in NFHS-5 (2019–20) (IIPS, 2020).

The public health facilities serving the village include three sub-centres and a rural primary health centre within the gram panchayat, supplemented by private clinics, a charitable dispensary, a homoeopathic practitioner and two referral hospitals (Table 1). In addition, two informal practitioners (“quack doctors”) hold chambers near the village, and Mobile Medical Units and telemedicine services supported by the National Health Mission (NHM) operate in the area. Villagers used five cyber cafes: one inside the village with a single desktop computer, and four in neighbouring localities with several machines each, two of which offered low-cost computer training.

Facility	Type	Location	Distance from village
Brindakhali SC	Sub-centre (public)	Vill. & P.O. Brindakhali	2.5 km
Hardaha SC	Sub-centre (public)	Vill. Hardah, P.O. Chhayani	4 km
Belegachi SC	Sub-centre (public)	Vill. Ghola, P.O. Doltala Ghola	6 km
Brindakhali PHC	Rural primary health centre (public)	Vill. & P.O. Brindakhali	2 km
Basu Dev Bhaban	Clinic (private)	Dhopdhopi Rd, Ramnagar, WB 743387	4 km
G.M. Health Clinic	Clinic (private)	Betberia, WB 743363	7 km
Charitable Dispensary	Dispensary (charitable)	Daria, Canning, WB 743376	7.2 km
Homoeopathic practitioner, Ghutiari Sharif	Homoeopathy (private)	Banshra, WB 743363	7 km
Canning Hospital	Hospital (public)	Canning, WB 743376	14 km
Baruipur SD Hospital	Sub-divisional hospital (public)	Baruipur, WB 700144	18 km
Two informal practitioners	Informal (“quack”) chambers	Near the village	—

SC = sub-centre; PHC = primary health centre; SD = sub-divisional.
Table 1: Healthcare facilities serving Moutala village.

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Methodology

Research Design

The study used a convergent mixed-methods ethnographic design, in which a household survey and qualitative fieldwork were conducted in parallel and integrated at the stage of interpretation. The household survey was designed to establish the distribution of digital access and of programme awareness across the village; the qualitative component was designed to explain those distributions and to capture meanings that a schedule cannot. Fieldwork was carried out in Moutala and in its surrounding healthcare and digital-service catchment area, extending up to approximately 18 km from the village.

Sampling and Participants

The household schedule was administered to all 272 households in Moutala, comprising 1,200 persons (a mean of 4.4 persons per household), so that survey results constitute a complete enumeration of the village rather than a sample. Qualitative participants included residents across age and gender groups, the Accredited Social Health Activist (ASHA) and Auxiliary Nurse Midwife (ANM) serving the village, staff at nearby schools and the operators of the five cyber cafes and computer centres. During fieldwork in-depth interviews, focus group discussions and case studies were conducted.

Instruments and Procedures

The household schedule recorded household composition, education and occupation, ownership of mobile phones, smartphones and computers, internet access, awareness of the Digital India programme, and household awareness and use of 35 national and state health programmes. For each programme, the respondent was asked whether the household did not know the programme, had heard of it but never availed it, or knew of it and/or had availed it; these categories are retained verbatim in the analysis. Where possible, reported use of programmes was cross-checked with the local ASHA and ANM. Non-participant observation was conducted at nearby health centres and sub-centres, schools, cyber cafes and computer centres, and in households. Interviews and discussions were audio-recorded with consent and transcribed for analysis.

Analysis

Survey data were entered and tabulated in Microsoft Excel. For this article, all percentages were re-expressed as household counts (n = 272) and 95% confidence intervals were calculated using the Wilson score method, which performs well for proportions near 0% or 100%. Because the survey is a census of the village, these intervals are reported as indicative of uncertainty for inference to comparable villages rather than to Moutala itself. Programmes were grouped into tiers according to their response profiles. Qualitative transcripts and field notes were analysed using reflexive thematic analysis [32,33]. supported by narrative analysis of case studies. Codes were derived both deductively from the framework in Figure 1 and inductively from the data.

Data Quality Notes

Two features of the programme data require explanation for the reader. First, the 35 programmes produced only ten distinct response profiles; for example, eight programmes share the identical profile 2.2% / 2.2% / 95.6% and eight share 36.8% / 0.7% / 62.5%. This suggests that households answered at the level of the service through which several programmes reach them (for example, a door-to-door campaign or antenatal contact), rather than programme by programme. Second, for the Pulse Polio Programme the recorded values (2.2%, 2.2% and 100.0%) sum to 104.4%. Pending correction, Pulse Polio is reported as recorded and flagged.

Results

Household Profile

Table 2 summarises the socio-demographic and digital profile of the village. Where village-level survey data were not available, the most recent Census figures for the village or block are reported and marked as such.

Indicator	Value
Population	
Households enumerated	272
Persons	1,200
Mean household size	4.4
Sex ratio (females per 1,000 males)	941 (Census 2011)
Children aged 0–6 years (%)	12.7 (Census 2011)

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Literacy, male / female, aged 7+ (%)	80.4 / 59.2 (Census 2011)
Workforce composition (Baruipur block)	10.8% cultivators, 22.0% agricultural labourers, 61.8% other workers (Census 2011)
Social group composition	Not recorded
Digital access	
Households aware of Digital India	218 (80.1%)
Households with a personal computer	4 (1.5%)
Households with internet via smartphone	≈218 (≈80%)
Individuals with internet via smartphone	≈780 (≈65%)
Households owning any mobile phone	≈98%
Cyber cafes used by villagers	5 (1 in village)

Table 2: Socio-demographic and digital profile of Moutala households (n = 272 households; 1,200 persons).

Digital Access: Aware but Unequipped

Awareness of Digital India was widespread. Of the 272 households, 218 (80.1%; 95% CI 75.0–84.5) reported having heard of the programme, and 54 (19.9%) had not. The channels through which respondents first heard of the programme were not systematically recorded. Awareness, however, was not matched by equipment. Only four households (1.5%; 95% CI 0.6–3.7) owned a personal computer. Field records indicate that about 80% of households, and about 65% of individuals, had internet access through a smartphone. For comparison, rural teledensity in India was 59.50 connections per 100 persons in November 2025 (TRAI, 2025), and NFHS-5 found that 48.7% of rural men and 24.6% of rural women had ever used the internet (Section 2.1); teledensity counts subscriptions rather than users, so neither figure is directly comparable with the village estimate. The single cafe inside the village had only one desktop computer; the remaining four cafes, used for form filling, printing and online applications, lay outside the village, and computer training was available at only two of them. Most families relied on schools for digital education, but the schools struggled to provide adequate computer infrastructure.

At the first level of the digital divide, then, access in Moutala is almost entirely mobile and frequently shared; the computer, the device on which most portals and forms were originally designed, is effectively absent from households. At the second level, limited literacy and the dominance of non-Bengali languages in digital interfaces (Section 5.4.4) constrain independent use. Although the frequency of assistance by relatives, neighbours or cyber-cafe operators was not quantified, the qualitative evidence indicates that such intermediation is central to the village's experience of digital health.

Awareness and Uptake of Public Health Programmes

Table 3 and Figure 2 present household awareness and uptake of 35 public health programmes. For readability, programmes with identical response profiles are grouped; the full programme-by-programme data are given in Supplementary Table S1. Tier descriptions draw on the published design of each programme to interpret the patterns; the survey did not record the channel of access. Four tiers are evident.

Tier and programmes	No.	Don't know n (%)	Heard, never availed n (%)	Know and/or availed n (%)	95% CI
Tier I: near-universal uptake					
Swasthya Sathi (West Bengal health insurance)	1	0 (0.0)	3 (1.1)	269 (98.9)	96.8–99.6
National Health Mission (rural, urban)	1	11 (4.1)	11 (4.1)	250 (91.8)	88.1–94.6
NTEP, NLEP, NVBDCP, NACP, NVHCP, Rabies, NTCP, NP-NCD	8	6 (2.2)	6 (2.2)	260 (95.6)	92.4–97.5
Pulse Polio †	1	6 (2.2)	6 (2.2)	100.0 as recorded	—
Tier II: conditional uptake					
RBSK, UIP, Mission Indradhanush, JSY, PMSMA, LaQshya, PMNDP, NPHCE	8	100 (36.8)	2 (0.7)	170 (62.5)	56.6–68.0

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JSSK, NSSK, Family Planning, NPPCD	4	50 (18.4)	52 (19.1)	170 (62.5)	56.6–68.0
NIDDCP, MAA (IYCF), National Iron Plus Initiative	3	61 (22.4)	45 (16.6)	166 (61.0)	55.1–66.6
IDSP	1	100 (36.8)	8 (2.9)	164 (60.3)	54.4–65.9
Tier III: awareness without uptake					
Mental Health, NPCB&VI, Oral Health, NPPMBI, NPPCF, Occupational Diseases, AMR	7	164 (60.3)	104 (38.2)	4 (1.5)	0.6–3.7
Tier IV: institutional absence					
Ayushman Bharat (PM-JAY)	1	267 (98.2)	5 (1.8)	0 (0.0)	0.0–1.4

Table 3: Household awareness and uptake of public health programmes, grouped by response profile (n = 272 households).

Note. Counts are derived from the reported percentages (n = 272) and agree with them to one decimal place, except for the National Health Mission, where 11/11/250 households correspond to 4.0/4.0/91.9%. CI = Wilson 95% confidence interval for "know and/or availed". NTEP = National Tuberculosis Elimination Programme (formerly RNTCP, renamed in 2020); NP-NCD = National Programme for Prevention and Control of Non-Communicable Diseases (formerly NPCDCS). † Pulse Polio values as recorded sum to 104.4%; see Section 4.5.

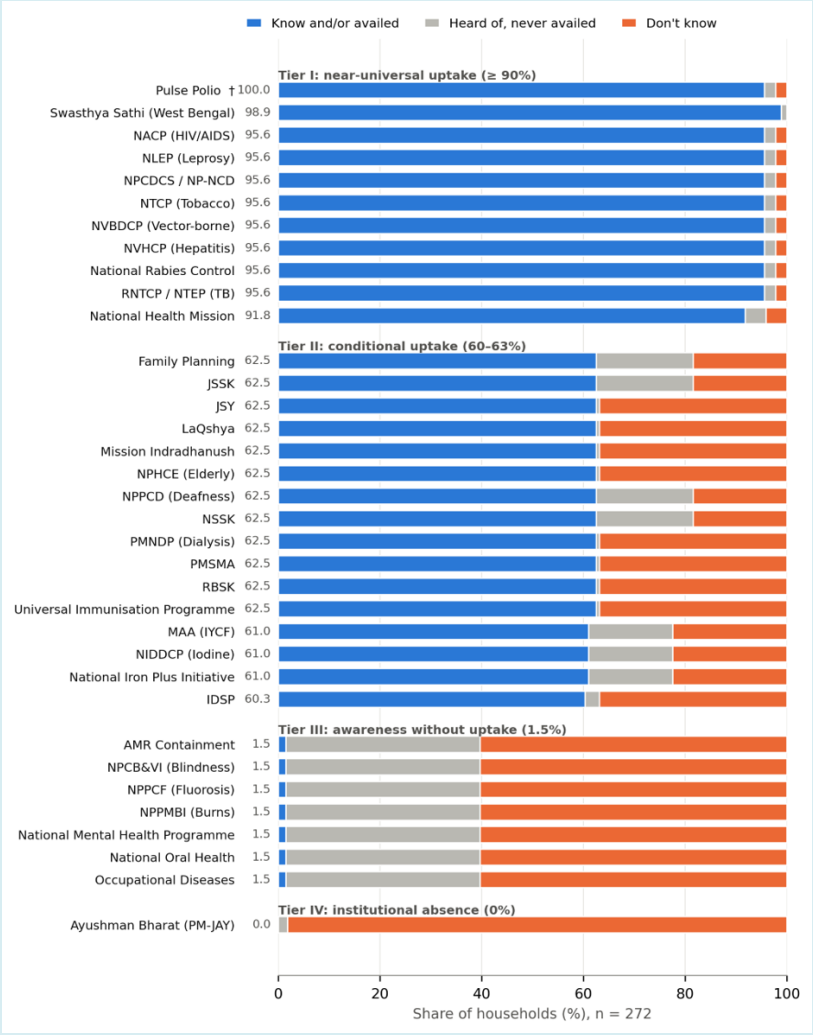

Figure 2: Household awareness and uptake of 35 public health programmes in Moutala, ordered by tier.

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Bars show the share of households that did not know the programme, had heard of it but never availed it, or knew of it and/or had availed it (n = 272). † Pulse Polio was recorded as 2.2% / 2.2% / 100.0% (sum 104.4%); the bar is drawn to 100%, and the label shows the recorded value. Source: household survey.

Tier I: near-universal uptake. Eleven programmes were known and/or availed by more than 90% of households. They include the state insurance scheme Swasthya Sathi (98.9%; 269 households), the National Health Mission as an umbrella (91.8%), and eight disease-control programmes, among them those for tuberculosis, leprosy, vector-borne diseases, HIV/AIDS, viral hepatitis, rabies, tobacco and non-communicable diseases (each 95.6%; 260 households), as well as Pulse Polio. What these programmes share is not a digital interface used by households but a delivery mode that comes to the household: door-to-door campaigns, screening drives and, in the case of Swasthya Sathi, enrolment at Duare Sarkar ("government at the doorstep") camps where officials capture photographs, biometrics and mobile numbers and issue a smart card on the spot (Chakraborty, 2020; Government of West Bengal, n.d.). Swasthya Sathi is, technically, one of the most thoroughly digital schemes in the village, being paperless, card-based and linked to online claims; but households experienced it as a card in the hand, obtained with the help of an official. The village figure matches the scheme's statewide reach: by February 2025, 87.2 million people in 24.4 million families had been enrolled ("Over 8.72 Crore People Enrolled," 2025).

Tier II: conditional uptake. Sixteen programmes, mainly those for reproductive, maternal, newborn and child health, nutrition, integrated disease surveillance, dialysis and the care of the elderly, were known and/or availed by 60–63% of households. Within this tier, two contrasting profiles stand out. For programmes such as the Janani Suraksha Yojana, immunisation and Mission Indradhanush (36.8% / 0.7% / 62.5%), almost no household had "heard but not availed": a household either used the service or did not know of it. For family planning, JSSK, NSSK and deafness control (18.4% / 19.1% / 62.5%), a fifth of households knew of the programme without having used it. The first pattern is consistent with services that become known only at the moment of contact with the ASHA or ANM, for example during pregnancy; the second with services that circulate as general knowledge. Because NFHS-5 recorded 91.7% of recent births in West Bengal as institutional [34]. the 62.5% figure for maternal programmes is unlikely to measure service coverage alone; it may instead reflect household eligibility or recall. Because eligibility denominators were not recorded, the 62.5% figure is interpreted as a household awareness or use response rather than as a coverage estimate.

Tier III: awareness without uptake. Seven programmes, for mental health, blindness and visual impairment, oral health, burns, fluorosis, occupational diseases and antimicrobial resistance, shared an identical profile: 60.3% of households did not know them, 38.2% had heard of them, and only 1.5% (four households) had used them. Mental health is notable here, because a national tele-mental-health service, Tele-MANAS, had been available by telephone since October 2022; its presence as a digital service had not translated into use.

Tier IV: institutional absence. Ayushman Bharat was unknown to 98.2% of households (267 of 272), five households had heard of it, and none had availed it. This result would be puzzling if read as a failure of digital outreach, given the scheme's national visibility. It becomes intelligible once the institutional context is considered: at the time of fieldwork, West Bengal was not implementing AB PM-JAY, and the functionally equivalent entitlement reached households as Swasthya Sathi (PIB, 2026). The contrast between Tier I and Tier IV is therefore an index of the state's institutional presence rather than of households' digital literacy. It also carries a methodological caution: the survey item "Ayushman Bharat" may have been understood as the insurance scheme rather than as the separate Ayushman Bharat Digital Mission, whose health accounts (ABHA) are being created across the country; 839.4 million ABHA numbers had been created nationally by December 2025 [35].

Digital Mediation of Care: Qualitative Findings

Four themes emerged from interviews, discussions and observation.

"Seeing the big doctor from here": tele-consultation for serious illness: The field material documents tele-consultation most clearly in relation to serious illness. The clearest instance was a household in which a family member had been diagnosed with cancer. After initial treatment, the family-maintained follow-up through tele-consultation with the Tata Memorial Hospital in Mumbai, on the other side of the country, receiving treatment guidance without repeated travel. The case shows digital care at its most valuable and at its most intermediated: the consultation depended on prior physical care-seeking, on a family member able to manage the digital interaction, and on documents carried between institutions.

The queue and its alternatives: Respondents consistently reported that digital registration had reduced waiting at out-patient departments of government and private hospitals, through online appointment and token systems. At the same time, field notes record that a majority of respondents preferred to stand in the physical queue rather than use

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online healthcare services. As this preference was not quantified by age, gender or literacy, it is reported here as a qualitative pattern.

Records, medicines and the invisible back office: Field observations indicate that digital health records are now used in both government and private facilities serving the area, and that digital tools support medicine inventory management, reducing stock-outs of essential and daily medicines. For residents, this digital back office was largely invisible; its effects were felt as the availability or non-availability of medicines and as the continuity of records when moving between facilities. Because frontline workers confirmed households' programme use for this study, they are an important human interface between households and this infrastructure.

Barriers named by villagers: Fieldwork identified six barriers to the use of digital health services: limited digital literacy; poor infrastructure, including unreliable connectivity and electricity; reluctance to adopt unfamiliar technologies; the dominance of English and Hindi over Bengali in digital interfaces; low general literacy; and lack of awareness and guidance. Underlying all of these was economic precarity. For most families a personal computer was unaffordable, training at computer centres was expensive relative to daily earnings, and many young people showed little interest in acquiring computer skills, which key informants attributed to insufficient awareness and a lack of guidance about the value of such skills. As the frequency of each barrier was not measured, these findings are reported as recurring qualitative themes rather than ranked quantitatively.

Embodied effects of digital technology use: Respondents associated prolonged use of mobile phones and other screens with a cluster of bodily complaints: neck pain, back pain, visual strain and disturbed sleep. These accounts are presented as self-reported perceptions, not clinical diagnoses. As no systematic denominator or recall period was recorded for these complaints, no prevalence estimate is reported. The findings are retained as qualitative evidence of how villagers themselves experience the embodied effects of digital-device use.

Discussion

Intermediated Digitality

The central finding of this study is that the digital health programmes most successfully reaching Moutala were those that did not require households to use digital technology themselves. Swasthya Sathi, the most digitised scheme in the village, achieved almost universal coverage, and its enrolment is designed to be brought to the doorstep and completed by officials. Disease-control programmes with near-universal awareness are delivered through campaigns and frontline workers whose own work is increasingly digitised. Conversely, programmes that depend on individuals recognising a need and seeking a service, such as mental health, eye and oral health, were barely used, even where a telephone or digital channel existed.

We describe this pattern as intermediated digitality: a configuration in which the digital layer of health care is real and consequential but is encountered by most people through a human or institutional intermediary rather than through their own device. The concept extends the notion of intermediated technology use [22]. from individual acts of assistance to the structural organisation of a health system. It resonates with account of the mediation of telephony in rural West Bengal, and with the finding that more than 93% of national eSanjeevani consultations are provider-assisted rather than direct [3]. with Ayushman Arogya Mandirs alone accounting for 419.3 million teleconsultations by December 2025 [35]. In the terms of [28]. intermediaries convert approachability, created by digital information and campaigns, into the abilities to seek, reach and engage that households lack on their own. In terms, technology in Moutala amplifies the capacity of the ASHA, the ANM and the camp official; where that human capacity is absent, as for mental health, it amplifies little.

This reading also sheds light on the third-level digital divide. Households that were most distant from digital access in the first-level sense (only 1.5% owned a computer) nonetheless obtained some of the most significant digital outcomes available to them, such as an insurance card and linkage to remote specialist advice, because intermediaries bridged the first two levels on their behalf. The distribution of digital health outcomes is thus shaped less by individual access and skill than by the reach, capacity and priorities of intermediaries [13]. This has a double edge. Intermediation extends benefits to people who would otherwise be excluded, but it also concentrates dependence and discretion in a small number of workers, and can make households' access contingent on the workload, goodwill and gatekeeping of others.

The Ayushman Bharat Paradox and the Politics of Infrastructure

The near-total unfamiliarity with Ayushman Bharat, set beside near-universal uptake of Swasthya Sathi, demonstrates that awareness of a digital health scheme is not only a matter of information campaigns or digital literacy. It is shaped by federal politics and by which level of government is institutionally present in the village. For villagers, "the card" was the state's card. Anthropologists of infrastructure have

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emphasised that infrastructures carry political meanings and make the state visible in particular ways [23]. Our data suggest that in digital health, the identity of the scheme that people know is an artefact of such infrastructural politics. With West Bengal's entry into AB PM-JAY in June 2026 and the planned coexistence of the two schemes (PIB, 2026), a follow-up study in the same village could observe directly how households come to recognise, confuse or combine two overlapping digital entitlements.

The Queue as a Social Institution

The co-existence of reduced waiting times and a stated preference for the physical queue need not be read as a contradiction or as "resistance to change". One plausible interpretation, to be tested against respondents' own stated reasons, is that for people with limited literacy and intermittent connectivity, an online booking is an unfamiliar promise whose reliability cannot be verified in advance, whereas the queue is a known institution that can be observed, negotiated and trusted. This is consistent with the polymedia argument that people choose among channels on social and moral as well as technical grounds [20]. and with care-theoretical arguments that the "logic of choice" embedded in many digital services may fit poorly with the collective, negotiated logic of care [5]. Designing digital booking systems so that they preserve the reassurance of the queue, for example through assisted registration at the facility and confirmation in Bengali, is likely to be more effective than urging villagers to abandon it.

Embodied Costs

Respondents' attribution of neck and back pain, eye strain and disturbed sleep to phone use is consistent with survey evidence linking smartphone overuse to daytime sleepiness and with emerging concerns about cognition [25,26]. Although our data cannot establish causation. The anthropological significance of these accounts is that villagers did not experience digitalization only as a set of services; they experienced it in and on their bodies. Health communication that promotes digital services without also addressing their bodily costs may therefore lose credibility with the very populations it seeks to reach.

Implications for Policy and Practice

Four implications follow for the design of digital health in rural India. First, frontline workers should be recognised and resourced as the primary interface of digital health rather than as data-entry staff. This includes adequate devices, data allowances, Bengali-language interfaces and time allocated for assisting patients [36]. Second, digital health programmes should build on existing high-coverage delivery modes, such as doorstep camps, which in Moutala achieved near-universal enrolment, rather than assuming self-service use. Third, low-uptake programmes in Tier III, particularly mental health, eye care and oral health, require active linkage through frontline workers and health and wellness centres, because the mere existence of a helpline or portal did not generate use. Fourth, public communication should acknowledge and address the bodily costs of prolonged device use, especially among children and adolescents. Village-level digital literacy programmes, investment in reliable connectivity and power, and community participation in the design of digital tools remain necessary [37]. but they are unlikely to be sufficient without these intermediary-centred measures.

Strengths and Limitations

The main strength of the study is the combination of a complete household enumeration of one village with sustained qualitative fieldwork, which allows programme-level patterns to be interpreted in context. Several limitations should be noted. The study concerns a single village, and its findings cannot be generalised statistically; they are offered as an analytically generalisable case. [38,39]. The programme data were self-reported at household level and appear to have been recorded by service cluster rather than by individual programme, which limits fine-grained comparison, and one programme (Pulse Polio) contains an unresolved recording inconsistency. Awareness and use were combined in a single response category, so that the two cannot be separated. The survey did not measure the channel through which each programme was accessed, so the association between programmes and digital platforms is inferred from programme design and qualitative data rather than measured directly. Health complaints were self-reported and cannot be interpreted clinically. Finally, fieldwork preceded West Bengal's implementation of AB PM-JAY in June 2026, so findings on Ayushman Bharat describe a situation that has since changed.

Conclusion

Digitalization in Moutala is neither the transformation promised by policy nor a mere illusion. Digital technologies have reduced waiting times, linked a family to specialist cancer care across the country, and underpinned the smart card through which almost every household holds health insurance. Yet these benefits have arrived chiefly through intermediaries: frontline health workers, government camps, cafe operators and relatives. Where such intermediaries were present, digital health reached nearly everyone; where they were absent, as for mental health and eye care, it reached almost no one. At the same time, villagers bore the bodily costs of digital life directly and without mediation.

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For anthropology, the case suggests that the unit of analysis for digital health in rural India should be the relationship between people and intermediaries, rather than the individual user and the device. For policy, it suggests that the fastest route to equitable digital health is not to bypass the human infrastructure of care but to recognise and invest in it. Future research should examine how intermediation differs by gender, age and caste within villages, how the arrival of AB PM-JAY alongside Swasthya Sathi reshapes households' understanding of their entitlements, and how the bodily effects of device use can be measured with validated instruments in rural populations.

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