

The Digital Transformation of Healthcare in Kerala: Assessing the Adoption and Impact of the Unique Health Identifier (UHID)

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ABSTRACT

UHID stands for Unique Health Identification, or an identifier number, which is a cornerstone of digital health transformation in India. UHID consist of 14 digits, assigned to patients by hospitals or national health systems, designed to improve the interoperability of patient data, continuity of care, and health system efficiency. While its implementation metrics are tracked, a complete understanding of its implementation and utilisation processes within a complex public health system remains under explored. The study aims to analyse the functioning of UHID within Kerala's healthcare sector and to evaluate its technical administration, and the integration of various human factors that shape its effectiveness. The study employs a qualitative research design and methodological triangulation to ensure depth and credibility.

Data for the study is synthesised from three complementary sources: 1) real-time operational data and policy documents from the official Kerala eHealth portal 2) aggregated administrative, performance and public health datasets from the Directorate of Health Service (DHS) portal and (3) scholarly analysis and contextual interpretation from the peer-reviewed article "An analysis of eHealth adoption and utilisation in Kerala" by Jaman et al.(2025). Thematic analysis is also used in the study to extract insights across technical, operational, and human dimensions. The scholarly lens highlights critical human factors, including variable clinician engagement and the influence of Kerala's existing digital health culture on UHID integration. The findings offer transferable insights for other regions pursuing similar digital health identity initiatives.

Keywords: UHID, E-Health, Healthcare, Health Data, Online Consultation, Kerala

INTRODUCTION

The Government of India launched various digital health programs to ensure equitable access to healthcare for all. The adoption of the Unique Health Identification (UHID) number under the Ayushman Bharat Digital Mission (ABDM) is one of the most significant initiatives of the project. Patients can store and retrieve their entire medical history digitally using a unique 14-digit identifier, the ABHA Health ID (PIB, 2024). When a patient is first registered at the hospital, a 14-digit UHID is generated at random. The number serves as a digital key consist of all our health-related data. One of the primary assurances of UHID is its ability to develop a long-term health record, thereby transforming doctor-patient engagement to an informed discussion grounded in a historical context (Patel, 2024).

A carefully curated timeline of the patient's health is available to them. This includes past laboratory results, known allergies, medication adherence, and diagnosis. It shifts the

complicated clinical conversations in which we often interrogate patients' faulty memories to a collaborative health biography. The implementation of UHID has a very humanising effect, especially for people with complex, chronic conditions (Walia, K., 2023). The UHID removes the cognitive and practical strain of carrying physical files and of frequently sharing complex medical histories, especially for older patients seeing several doctors, pregnant women, or families organising a child's care. It can avoid medical errors and promote a sense of security and continuity. UHID can provide people with greater control over their data through health lockers or connected health records (PHRs) (E-Health Kerala, 2025). They are free to decide what to share, with whom, and for how long. And it can reduce the likelihood of widespread data breaches and give users solid control over their private data by decentralising data storage.

Initially, hospitals used different Unique Health IDs, leading to data fragmentation and significant confusion about patients' data. So the government suggested linking UHID with Aadhar to address these inequalities. Therefore, it provided consolidated access to medical records from different hospitals and rapid retrieval of UHID numbers via Aadhar. Moreover, it simplifies data sharing and this feature is very crucial for patients who receive care at multiple medical facilities or have forgotten their Unique Health ID, especially helpful in emergency situations when a patient cannot explain their condition properly. UHIDs provide access to patients' medical history and also helpful in emergencies, especially when a patient is unable to communicate their problem correctly.

Personal Health Record (PHR)

The Personal Health Record (PHR) empowers individuals by placing them at the centre of their care narrative and represents a transformative shift in health information management. It serves as a secure repository that integrates diagnoses, treatment, test results, and hospital summaries into a unified, accessible platform. This amalgamation facilitates a more collaborative partnership between patients and providers, and it enhances the variability and continuity of care. PHR enables individuals to participate actively in their health care decisions, leading to more informed choices and contributing to more efficient and effective health outcomes.

Global Typologies of UHID Systems

WHO's Global Strategy on Digital Health (2020-2025) advocates for patient identification as a core component.

United States: Uses Social Security Number (SSN) and Medical record numbers.

European Union: European Health Data Space (EHDS) regulation proposes a European Health Identifier for cross-border care

UK: NHS Number

Australia: Individual Healthcare Identifier (IHI)

Canada: Provincial Health Number (PHN)

Sweden: Personal Identity Number (PIN)

Estonia: Personal Identification Code (PIC)

Ghana: Biometric national ID for health.

How Does UHID Work?

Kerala has a prominent position in India's healthcare transformation, and it began early and thoroughly with eHealth initiatives launched in 2015. The eHealth system makes it easier for patients to book hospital appointments from home. They can also see their records and test through it. This system helps eliminate paper and streamline processes, from the patient register to hospital discharge. It upholds the principle of "One Patient, One Record," guaranteeing that a reliable, continuous medical history is available across healthcare facilities. In this integrated ecosystem, patients can generate their UHID/ABHA number. If they have this number, they can manage their healthcare on the eHealth Kerala website and can also make appointments to view lab reports directly through the portal. UHID can empower patients and health organisations with unparalleled control and convenience.

Who Needs UHID Registration?

In literal terms, everyone needs to create a UHID. Generating a UHID is the first step in a patient's journey in a modernised healthcare system. It is typically required for individuals during their initial registration at a healthcare facility. It is for those enrolling in the Ayushman Bharat Digital Mission to create an ABHA ID, as well as for any patient embarking on long-term or follow-up care. In most government and major private hospitals, obtaining a UHID is now a standard procedure. It is highly apparent in complex care situations, where it seamlessly consolidates a patient's information across multiple clinical departments and specialist consultations. It will ensure continuity and coherence in their treatment narrative.

OBJECTIVES OF THE STUDY

1. To analyse the adoption and utilisation rates of the UHID in Kerala
2. To analyse the impact of UHID on healthcare service delivery efficiency
3. To investigate the perceived benefits, challenges, and barriers of UHID
4. To determine the influence of the UHID on public health management and policy

METHODOLOGY

The study uses a qualitative design to analyse the application, operation, and perceived impact of the UHID in Kerala and the study triangulates data from three districts, complementary sources: the official eHealth portal of the government of Kerala, public administrative data from the Directorate of Health Services (DHS) and a research article titled 'An analysis of eHealth adoption and utilisation in Kerala' by *Mohammed Asharu Jaman, Bhavya Fernandez, N. Mahesh & Jithesh Veetilakath*.. It includes real-time operational data, aggregated administrative and public health data and scholarly analysis of eHealth initiatives in Kerala. The integration of data from these primary and secondary sources helps for a holistic evaluation encompassing technical, operational, and human dimensions.

ANALYSIS

The introduction of the UHID card is a vital step towards reforming healthcare across Kerala. The eHealth project introduced the UHID, which serves as an Aadhar-based unique identifier for every individual. It allows people to access the medical records and viewing prescriptions

and lab results via OTP-based authentication. This project provides patients with lifelong Aadhaar-linked health records. UHID are the fundamental component of a contemporary, integrated, and effective healthcare system. It establishes a single, ongoing health record for a person across all visits and medical facilities in a network. This solves the issues of medical recordkeeping. Doctors may make better decisions; avoid harmful drug interactions, and unnecessary testing when they have access to a comprehensive medical history of a patient that includes past diagnoses, allergies, prescriptions, and lab results. UHID helps patients take control of their health data. They can now seek care at any affiliated facility and are not limited to a single hospital's record systems. Removing unnecessary diagnostic tests lowers medical costs and expedites the registration procedure for follow-up visits.

UHID registrations in Kerala are 93,931,700 as of 17 November 2025. The program has achieved significant scale, with facilities covered and patients served. However, alongside the operational barriers, the high rate of temporary registrations relative to permanent UHID adoption remains important challenge to the program's overall execution.

Table 1: Permanent UHID Registrations
(Source: e-health Kerala, State Digital Health Mission, 2025)

District	Through Institutions	Web Portal	Total
THIRUVANANTHAPURAM	2207181	185006	2392187
KOLLAM	1596913	81498	1678411
PATHANAMTHITTA	1055891	11947	1067838
ALAPPUZHA	1684925	30606	1715531
KOTTAYAM	1584540	69181	1653721
IDUKKI	767494	16904	784398
ERNAKULAM	2200160	69524	2269684
THRISSUR	2145791	89078	2234869
PALAKKAD	2334565	56194	2390759
MALAPPURAM	3725995	81271	3807266
KOZHIKODE	2353904	205596	2559500
WAYANAD	742071	24459	766530
KANNUR	1911015	33064	1944079
KASARAGOD	1054628	53987	1108615
Others	0	13530	13530
Total	25365073	1021845	2,63,86,918

There were 26.3 million (2.63 crore) permanent UHID registrations in Kerala. This data indicates that the state's e-Health initiatives have achieved significant scale in building a digital health infrastructure. However, it accounts for only 28.09% of total UHID registrations in the state. A large portion of the state's population has yet to be integrated into the centralised digital health record system.

The distribution of permanent UHID (Unique Health ID) coverage shows a notable variation in how different districts have implemented and adopted the initiative. Thiruvananthapuram

district has high total of UHID count of 23, 87, 542, which indicates its strong institutional performance and this may reflect the district's high population density and better healthcare infrastructure. Another districts such as Malappuram, Palakkad and Thrissur are showing strong performance, each surpassing two million total UHIDs.

Districts such as **Kollam, Kottayam, Ernakulam**, and **Kozhikode** also show remarkable totals, with Kozhikode's considerable web portal figures (2, 04,154) indicating a positive trend toward digital adoption. On the other hand, **hilly districts like Idukki and Wayanad** show relatively lower total numbers: 7, 83,854 and 7, 65,642, respectively. The figures emphasise Kerala's admirable development in institutional UHID implementation, but also highlight the need for targeted interventions in remote districts to confirm reasonable and universal health identity coverage across the state.

Table 2: Temporary UHID Registrations
(Source: e-health Kerala, State Digital Health Mission, 2025)

District	Count
ALAPPUZHA	7349538
ERNAKULAM	12563997
IDUKKI	1631500
KANNUR	7260086
KASARAGOD	3893866
KOLLAM	7994984
KOTTAYAM	9323353
KOZHIKODE	14234584
MALAPPURAM	15892785
PALAKKAD	4941443
PATHANAMTHITTA	1980932
THIRUVANANTHAPURAM	50616360
THRISSUR	12410529
WAYANAD	3283932
Total	6,75,44,782

As of November 17, 2025, there were more than 67.5 million (6.75 crores) temporary UHID registrations, accounting for 71.91% of all registrations. It shows a low conversion rate to a permanent UHID, resulting in incomplete medical data. Several factors contribute to the high number of temporary registrations. To obtain a permanent UHID, a patient must have an Aadhaar card and an active mobile number for OTP verification. Aged people who do not know their Aadhaar details or do not have a mobile with them cannot get a permanent UHID. The software issues, the lengthy online registration process, patient rush, the shortage of hospital staff, and patients' and their caregivers' impatience force hospital employees to issue temporary IDs to shorten patient wait times or reduce their workload. Furthermore, people can register multiple times with different phone numbers, increasing the number of temporary registrations.

A new temporary ID is frequently issued for each hospital visit or at various locations when a permanent UHID is unavailable. This scatters a patient's medical history across unrelated records in the healthcare system, including prior diagnoses, treatments, and test results (E Health Kerala, 2025). When a patient is not able to discuss their medical history in an emergency, this becomes critical. The lack of a permanent UHID makes it difficult for patients to receive seamless treatment. So they must carry physical documents or memorise multiple UHID numbers for different institutions, which can be easily lost or forgotten among the elderly.

The considerable operational inadequacies and financial costs associated with the low adoption of permanent UHIDs are evident in the healthcare system. Healthcare workers spend significant time managing multiple temporary IDs, correcting entry errors, and manually retrieving old records, rather than focusing on direct patient care (Jaman, Fernandez, N, et al., 2025). Moreover, it leads to administrative burden and other related expenses. A centralised, permanent UHID requires a vital state health information system, and the failure to utilise digital infrastructure prevents the healthcare system from fully benefiting from digitisation.

Hospital Visits with UHID

There were 20,511,7751 patient visits reported in Kerala after the implementation of UHID. Among these, only 51,597,060 have a permanent UHID. It only accounts for 25.15% of the total. 15, 35, 20, 692 (74.85%) patients who visited had only temporary UHIDs, despite the ehealth system in Kerala having been operational for years. As per the data, people in Kerala are willing to adopt eHealth services. Rationalising the registration process and providing clear guidance to improve participation are essential. Reducing barriers and simplifying these procedures could enhance the user experience and encourage more people to embrace the benefits of eHealth services. For example, Kerala's eHealth system enables UHID generation via Aadhaar-based authentication, but issuing temporary health IDs to patients without Aadhaar cards results in fragmented records.

EHealth initiatives, such as online appointment booking, for hospital visits rather than consultations, are primarily used by people. It shows the wide digital health adoption gap. Although platforms are used as digital directories and appointment schedulers, their primary purpose for online consulting remains underutilised. Some specific causes of this phenomenon include a lack of understanding, a lack of trust, gaps in digital literacy, platform constraints, unreliable infrastructure, fragmented systems, medical reluctance, limited-service scope, and data privacy concerns. People might consider eHealth platforms as booking tools. Most of them are unaware of the possibility of online consultations. Many physicians and patients prefer the certainty of a physical examination. They do not think a virtual conversation can correctly identify an issue. Also, using video calls or chat-based interfaces for delicate issues like health can pose a comfort barrier for older adults.

The user interfaces of e-health platforms are often difficult to use for consultations. Clicking the book appointment button is usually easier than going through a telemedicine portal. Sometimes, smooth video consultations can be challenging due to insufficient internet

connectivity, particularly in rural or isolated areas. Doctors must switch between systems if the eHealth app is not integrated with the hospital's primary records, such as the UHID, which makes the process ineffective. Due to unpredictable schedules, a lack of dedicated time for telemedicine, or inadequate payment for online consultations, doctors may be reluctant to use telemedicine. Also, eHealth may be marketed primarily for follow-up, non-urgent consultations. Patients are typically referred for a physical visit for new or complicated health conditions. Users who do not fully trust a platform with their data may be reluctant to discuss sensitive health matters.

Online consultations help people save time and money. However, it may lead to gaps in continuity of care. Online consultations require post-discharge check-ups and follow-up care. If patients neglect to do so, it may result in worse health outcomes. People also need to travel for physical consultations if the problem cannot be identified or treated online. The goal of a unified system like UHID is undermined when the entire patient's journey, from initial consultation to diagnosis, treatment, and follow-up, is not recorded in a single digital thread.

Hospitals continue to be overloaded with patients who do not physically need to be there. It places a significant strain on staff and infrastructure due to wasteful resource utilisation. It results in the underuse of the sophisticated capabilities of eHealth platforms, with the substantial investment falling short of their full potential. The development of an integrated digital health ecosystem has stalled. The platform does not help create a comprehensive digital health record if it is used solely to book physical consultation appointments. Planning and research in public health are limited by incomplete health data, which primarily reflect hospital visits rather than the full range of services.

Health Related Services works with UHID

UHID serves as a central key to facilitate a streamlined, data-informed pre-checkup process within an integrated healthcare framework. The process is initiated when an individual provides their UHID during appointment scheduling through a digital portal such as eHealth Kerala or during in-person registration. This identifier facilitates the system to spontaneously save the patient's demographic information and link the forthcoming clinical encounter to their merged health record. During any hospitalisation, the patient can present their UHID at the reception or nursing station, authorising staff to access their electronic file and record new clinical data. During the pre-checkup periods, vital signs- including blood pressure, weight, and temperature are measured and entered directly into the digital health information system. These data are attached to the patient's UHID, and initial assessments of medical history, allergies, and current medications can be verified and updated within the existing record, eliminating the need to recreate a patient's medical history at each visit.

The assimilation of UHID into the pre-check-up process considerably enriches clinical efficiency and patient safety. By providing the health authority with immediate access to a patient's historical vitals and documented conditions, UHID enables a more nuanced clinical assessment. These administrative procedures eliminate the need to repeatedly complete paper forms for each visit and mitigate the risk of errors in recording personal and medical information. It provides doctors with a comprehensive longitudinal health record of

patients'health history, facilitating more informed and accurate diagnoses beyond the limitations of a single periodic visit.

The integration of Unique Health Identification (UHID) improves the accuracy and precision of diagnoses. It helps doctors and other medical authorities to access a patient's complete timeline encompassing prior diagnoses, imaging studies through the UHID-linked ecosystem, and laboratory results (Canvas Chrome, 2025). The depth of information supports more subtle clinical assessments, and the continuity of data empowers clinicians to distinguish evolving disease patterns and trends across healthcare encounters (Raj et al., 2023). Moreover, it helps to identify chronic conditions earlier and manage them more effectively. So, UHID provides a more informed, proactive and patient-centric diagnostic approach.

UHID Usage in Medical Colleges

As per the reports of eHealth performance of medical colleges in Kerala, released in September 2025, the report provides data on UHID registration percentages across 12 government medical colleges. The data indicate significant inequalities in UHID registration rates, ranging from 52.40% at the Government Medical College, Kollam, to 7.76% at the Government Medical College, Wayanad. This difference indicates that the eHealth Kerala UHID system has not been implemented uniformly across all tertiary healthcare institutions in the state. The average adoption rate across all colleges is approximately 28.6%, indicating that many patients are not yet included in the digital registration system.

Table 3: UHID usage at Medical Colleges in Kerala (Source: e-health Kerala, Medical College eHealth performance report September 2025)

Medical College	UHID%
Govt. Medical College, Thiruvananthapuram	32.68%
Govt. Medical College, Kollam	52.40%
Govt. Medical College, Alappuzha	28.05%
Govt. Medical College, Konni	31.61%
Govt. Medical College, Kottayam	42.55%
Govt. Medical College, Ernakulam	23.61%
Govt. Medical College, Thrissur	8.88%
Govt. Medical College, Palakkad	33.32%
Govt. Medical College, Manjeri	18.73%
Govt. Medical College, Kozhikode	33.36%
Govt. Medical College, Kannur	22.26%
Govt. Medical College, Wayanad	7.76%

The government medical colleges in Kollam and Kottayam have high adoption rates of over 40 per cent. These institutions may have benefited from early or more intensive pilot programs, stronger internal advocacy, or dedicated digital health cells. Thiruvananthapuram (32.68%), Konni (31.61%), Palakkad (33.32%), Kozhikode (33.36%), and Alappuzha (28.05%) medical colleges have moderate adoption rates. This suggests a baseline level of implementation but highlights a substantial gap (nearly 60-70% of patients) yet to be onboarded. Surprisingly, the government medical college in Thrissur, a major, long-established institution in the state's cultural capital, has an adoption rate of only 8.88%, which makes intervention critical – the Govt. Medical College, Wayanad (7.76%) has the lowest

UHID usage among major medical colleges in the state, which may be due to infrastructural or demographic challenges. Manjeri (18.73%), Ernakulam (23.61%), and Kannur (22.26%) also fall concerningly below the average.

Digital literacy, internet connectivity, and the effectiveness of the assisted registration model may be potential factors associated with disparities affecting these regions. The differences may stem from the hospital administration's and IT staff's commitment and efficiency in promoting and integrating UHID into daily work flows. Cities like Thiruvanthapuram and Kozhikode might find it more challenging to achieve high registration percentages than smaller colleges, but Kollam disproves this as the sole factor.

It is essential to investigate positive deviants, such as conducting a case study of the Government Medical College, Kollam, to identify and document best practices in training, process integration, and patient communication that can be replicated in other institutions. The government need to design specific support for low-performing colleges in Thrissur, Wayanad, and Manjeri. This could include augmented on-ground teams, dedicated digital literacy camps, and infrastructure audits. Develop and enforce a standard operating procedure (SOP) for UHID registration at all outpatient and inpatient entry points to reduce institutional-level variability. Palakkad and Kozhikode Medical Colleges in the 30-33% range are near a potential tipping point. Focused campaigns could push them into the high-adoption tier. It is also good to include UHID registration rates in hospital performance dashboards and administrative reviews to incentivise leadership.

Trend in using UHID

The medical college's e-Health performance report for September 2025, published by the Kerala State Digital Health Mission, indicates a clear, consistent positive growth trend in UHID adoption. It is rising from 13.72% in June 2024 to 27.65% in September 2025. There is an average monthly increase of ~0.87 percentage points. This represents a net increase of approximately 13.93 percentage points over 16 months, equivalent to a 100.8% relative increase from the starting value. The trend is not merely incremental but demonstrates accelerating momentum in particular phases.

In the initial stages from June 2024 to September 2024, we see a slow, steady increase in UHID adoption (~13.72% to 15.21%). The initial months may have involved technical integration with Hospital Information Systems (HIS), which slowed growth. Post-integration, enrolment likely became routine, but it enhanced percentages. The acceleration phase, experienced from October 2024 to March 2025, in which the growth rate increased noticeably from 16.41% to 23.77%. The maximum monthly increase of 2.65 percentage has happened in January 2025, from 18.65% to 21.30%. The growth is at a slightly moderated but sustained pace (~24.59% to 27.65%), with near-peak adoption happening from April to September this year.

The adoption route of UHID in Kerala's medical colleges reflects a successful technology rollout within a complex health system. The consistent growth trend signals promote effective policy implementation and growing institutional acceptance. However, two-thirds of patients

are still outside this e-Health mechanism. Targeted strategies are also required to reach the remaining majority of patients in the adoption list. This case inspires other Indian states to adopt a phased approach to digital health integration. Increased training for hospital staff, IT personnel, and clinicians on UHID procedures could help reduce operational barriers and increase enrolment rates. Public health campaigns encouraging patients to adopt and use Ayushman Bharat Health Account (ABHA) IDs may have increased voluntary adoption. As more departments and hospitals within the ecosystem adopt UHID, it can create a positive impact on the healthcare system.

Potential Implications

- Increasing UHID usage empowers continuous sharing of patient records across departments and facilities, which can reduce duplication of tests and improve clinical decision-making.
- Unique identification reduces misidentification mistakes, duplicate records and prescription mismatches, specifically critical in chronic disease management and elderly people care.
- If UHID is linked to state health schemes, increased adoption could improve access to subsidised care for vulnerable populations. By linking UHID to Karunya Arogya Suraksha Padhathi (KASP) and other insurance schemes, it prevents identity fraud and duplicate claims and ensures benefits to genuine beneficiaries.
- UHID aids syndromic surveillance by tracking and identifying various symptoms, diagnoses, and outbreaks geographically (e.g., dengue in Ernakulam, H1N1 in Kozhikode) with patient-to-patient level connection over time.
- Combined, longitudinal patient data can reinforce disease monitoring and enable the creation of updated non-communicable disease (NCD) registries for hypertension, diabetes, cancer, etc., aiding in targeted interventions and policy planning.
- The major UHID barriers may include digital literacy, infrastructural issues in rural areas, and patient privacy concerns.
- Marginalised groups such as the elderly, tribal communities, migrant labourers, etc., may face exclusion due to a lack of digital literacy or documentation, potentially intensifying health inequities in the system.

Long-Term Strategic Implications for Kerala

- Ground-breaking a Model of Digital Health State: Kerala's high literacy rate and decentralised governance to become India's first fully integrated digital health ecosystem.
- Evidence-Based Policy Making: Rational drug policy, infrastructure planning, and human resource allocation in health can access through UHID-enabled data
- Climate Health Resilience: UHID-linked data can identify climate-sensitive diseases (e.g., leptospirosis, waterborne illnesses) in Kerala, which is a climate-vulnerable state and guide adaptive public health responses.
- Research and Academic Advancement: Using de-identified UHID-linked data for population health studies, Medical colleges in Kerala can lead in health informatics research,

RECOMMENDATIONS

1. Continue training, streamline enrolment processes (e.g., at registration counters), and coordinating UHID with outpatient, inpatient, and laboratory systems.
2. To ensure equitable adoption focus on rural and peripheral hospitals within college networks
3. Implement UHID registration in all sectors, like pharmacy, lab, billing, and implement queue management integration
4. In underserved areas and school-based registration, conduct monthly "UHID Sahayam" camps through parent-teacher meetings. Industry partnerships can be done for worker registration.
5. Allow alternative IDs (ration card, voter ID) for those without Aadhaar.
6. Among ASHA worker protocols, train nursing students, incorporate UHID registration during community postings and engage NSS/NCC/SPC volunteers for outreach
7. Special Focus Initiatives for Vulnerable Populations -
 - a. Tribal Communities: Mobile registration vans with tribal language facilitators
 - b. -Elderly: Home visits by ASHA workers with tablet-based registration
 - c. Migrant Workers: Registration at worksites with employer partnerships
 - d. Persons with Disabilities: Accessible registration centres with sign language support
8. Ensure UHID is linked to clinically meaningful data, not just identity tokens.
9. Qualitative studies on barriers among non-users, and impact analysis on health outcomes due to UHID integration.

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