

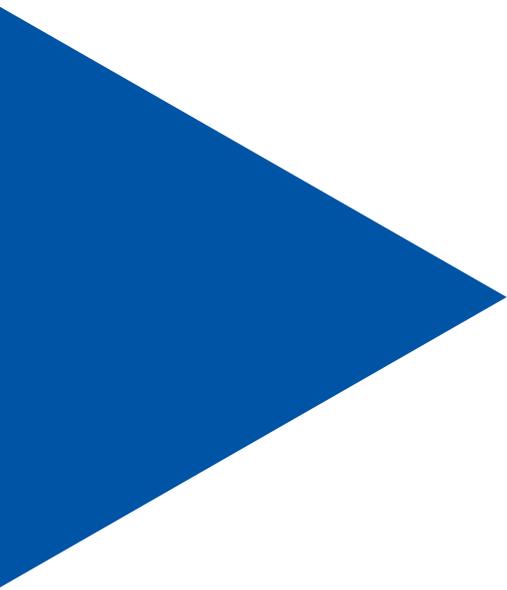


International
Labour
Organization

Digital Innovations in Social Health Protection for India

Technical Resource Document







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Preface

Countries across the world have been advancing towards Universal Health Coverage over the last few decades. Institutions of Social Health Insurance (SHI) have led the way in realizing the Sustainable Development Goal (SDG) 3 - “Ensure healthy lives and promote well-being for all at all ages”.

The International Labour Organization (ILO) focuses on social health protection as part of its larger goal of developing strong social protection systems to increase resilience, contribute to preventing poverty, unemployment, and informality. The ILO lays special emphasis on the financial protection of vulnerable working populations accessing health services. We have been working with governments in combining health interventions with social protection measures so that they can respond effectively to a crisis such as COVID-19. This is indeed a core pillar of our response to the health and economic hardship emerging from this pandemic. We believe that countries with a large informal economy should provide protection to people not yet covered at the centre of their policy efforts.

As part of the ILO project, *“Technical support to Employees’ State Insurance Scheme (ESIS) for improving and expanding access to health care services in India – A transition to formality”*, in partnership with the Bill & Melinda Gates Foundation, the ILO has been supporting the Employees’ State Insurance Corporation (ESIC) in India to strengthen its health services while increasing coverage and financial protection of working people in India.

While focusing on fundamental matters of health financing, service delivery and governance, through the present report, the ILO is bringing in successful best practices of deploying innovative digital technologies for improving core business processes of SHI. This report entitled **‘Digital Innovations in Social Health Protection for India’** is aimed at providing the latest information and lessons learnt from countries across the world to support the ESIC’s ongoing digital initiatives. This report should be seen more as a repository of relevant knowledge than a prescriptive document. I trust it will be a source of inspiration to ESIC as well as other institutions and stakeholders working in this field.

This report has been authored by Michael Stahl and edited by Nina Siegert (Chief Technical Advisor, ILO) and Vaibhav Raaj (National Project Coordinator, ILO). The ILO is grateful to the ESIC for their inputs and cooperation.

Dagmar Walter

Director

ILO DWT for South Asia and Country Office for India

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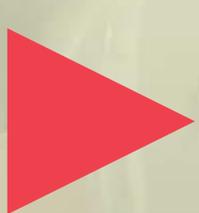
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▶ Abbreviations

API	Application Programming Interface
CRVS	Civil Registration and Vital Statistics
CSMBS	Civil Servants' Medical Benefits Scheme
ESI	Employee State Insurance
GIZ	Gesellschaft für Internationale Zusammenarbeit
HIS	Health Information System
ICT	Information and Communications Technology
ITU	International Telecommunication Union
MoHFW	Ministry of Health and Family Welfare
MeitY	Ministry of Electronics and Information Technology
MoLVT	Ministry of Labour and Vocational Training
MOI	Ministry of Interior
NSSF	National Social Security Fund
NHIIS	National Health Insurance Information System
NDHE	National Digital Health Ecosystem
NHIF	National Hospital Insurance Fund
NFC	Near-Field Communication
PCP	Primary Care Physician
PDS	Public Distribution System
PHI	Personal Health Identifier
PID	Personal Identification Number
SDG	Sustainable Development Goal
SHI	Social Health Insurance
SHP	Social Health Protection
SSS	Social Security Scheme
S2HSP	Support to the Health Sector Programme
UHC	Universal Health Coverage
UI	User Interface
UIDAI	Unique Identification Authority of India



01

► Introduction

Universal Health Coverage (UHC), as laid down in Sustainable Development Goal 3.8, is the central objective of social protection systems and a cornerstone to the realization of the Human Rights to health and social security. To achieve this goal, the ILO supports its constituents in extending social health protection (SHP). Through this report, the ILO intends to share experiences of SHP technical innovations that provide gainful insights to practitioners on related challenges and on following best practices. It also shares examples of other countries in terms of their health insurance initiatives, especially digital innovations.

In the framework of the project¹ on expanding access to SHP in India as a pathway to formality, the ILO aimed to document the successful integration of innovative technologies, which facilitated the provision of social health insurance (SHI), especially to informal economy workers and their families through examples of selected countries.

A strong movement is going on to promote different digital technologies, such as innovations for demand generation, better management of information and improved efficiency of health workers as a means of strengthening social health systems and social protection delivery in low- and middle-income countries. Different countries finance their health care services using a combination of three health financing functions: raising resources for health, pooling resources for compatible beneficiary groups and purchasing health services. This document outlines several examples from different countries that show how digital health technologies can be used to enhance these health-financing functions and thus contribute to progress toward UHC.

This technical resource document highlights several cases from different countries to showcase successful examples of the following service deliveries:

- i) improved SHI coverage with a significant part of the workforce in the informal economy making innovative use of technologies;
- ii) improved social health insurance management and administration through digitization and innovative technologies; and
- iii) improved services delivery through innovative technologies and partnerships.

This document is NOT intended to provide advice to *“the project”* or any of its Indian counterparts regarding suitable technological innovations. It is meant to disseminate vital information, which will contribute to a healthy technical dialogue among the project’s ecosystem partners and constituents contributing to the decision-making of key SHI actors.

¹Hereon, ‘the project’ refers to the ILO project - Technical support to ESI for improving and expanding access to health care services in India – A transition to formality.

Digital technology for universal health coverage

Digital technology has remarkably improved the quality of our lives over the last several years. While many experts have rightly highlighted the current global digital divide, there is a significant degree of penetration of mobile phones and internet connectivity across diverse populations around the world. Most of the people in the United States, Europe, the United Kingdom, Viet Nam, Bhutan, India and other countries can catch up on vital health care trends or locate the nearest health clinic online via their mobile phones.

Dimensions of Digital Technology for Health

WHO and the International Telecommunication Union (ITU) National eHealth Strategy Toolkit define digital technology as: “E-Health is the **cost-effective and secure use of information and communications technologies** in support of **health and health-related fields**, including health-care services, health surveillance, health literature, health education, knowledge and research.”²

There are several additional definitions for different digital health sub-categories. Some of the definitions can be accessed using the links given below:

World Health Organisation (2019). “eHealth at WHO”. World Health Organization, Geneva. <https://www.who.int/ehealth/about/en>

WHO (2011). mHealth New horizons for health through mobile technologies. World Health Organization. Geneva. https://www.who.int/goe/publications/goe_mhealth_web.pdf

WHO on TeleHealth. World Health Organization. Geneva. Last accessed 1 August 2019. <https://www.who.int/sustainable-development/health-sector/strategies/telehealth/en>

²(World Health Assembly 2005 Resolution No. 58.28)



► e-health

is the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, health education, knowledge and research.



Currently, there is no standardized definition for “**digital insurance**”. The term can best be described as a strategy to deliver the information needed by health insurance players using digital technologies. It requires administrative information and enough clinical data to enable efficient and prompt payments of insurance claims.

Digital technology tools can help people better understand and solve their health care problems.

Already there is a common understanding among the constituents, practitioners and policy planners that developing digital tools for the health care sector requires a focus on the needs of the end-users (patients). Private and public health providers, as well as governments, have an important role to play in ensuring that the digital tools are interoperable, are developed across all functions, involve all actors, and serve the patients timely and efficiently.

Data utilization for health insurance implementers

Transformative Technologies generate and manage a multitude of Health Care Data

The electronic health record, the recording of health data via apps, communication between doctors and hospitals via an online platform, video consultation hours - are just a few examples of digital technologies that are currently transforming the healthcare industry in Europe. The basis for digitization is the insured person’s medical data, which are exchanged not only between doctors and patients but also between individual service providers and health insurers, using the latest information and communication technologies.

Digitization enables new diagnostic and treatment options, such as personalized medicine; it eases communication between various stakeholders in



The accumulation of huge medical data allows health insurance companies to move from the centuries-old concept of reactive care to preventive medicine.

the healthcare system. It allows individual patients to have more robust control over their health, for example, through the usage of apps and information on the Internet.

Digitization involves many risks also. For example, citizens fear the loss of their privacy with so much data being shared by multiple parties. For this reason, the issue of data protection assumes significant particular importance for health insurers when they collect and manage the medical information of their insured members for consistent, secure and correct reimbursement of incoming claims.

Focus on Cost Savings – the Transition to Preventive Care

The accumulation of huge medical data allows health insurance companies to move from the century-old concept of reactive care to preventive medicine. The future holds out the promise of simple, fast and highly personalized insurance plans based on information available in the health care system itself and enriched with data from health sensors and trackers.

Many medical conditions develop mainly due to poor lifestyle choices: excessive consumption of tobacco, alcohol, taking unhealthy food and lack of exercise. With more population ageing in western countries, there is an accelerated shift in the burden of disease towards non-communicable and chronic diseases. Even in the developing world, the increase in the prevalence of such partially preventable diseases is outstripping the reduction in acute infectious diseases. Interconnected systems allow the transition from reactive care to preventive and personalized care, that is, to better characterize a patient and intervene promptly at the level of lifestyle choices and preventive measures. This transition will become more and more important in the future and will help in better managing health care costs. The availability of electronic medical records, the possibilities of linking personal behaviour and health data will change the healthcare system and make it potentially more cost-efficient.

From an insurer's perspective, every intervention that helps to move from curative care to preventive medicine usually has a long-term cost-saving impact as prevention is always better and cheaper than cure.



▶ National digital health strategies: helpful or essential?

What leverage do technological solutions have with SHP systems? Let's zoom into how and why digital solutions can advance public SHP systems and SHI operations and which areas need to be considered by a national digital health strategy.

National Strategy for Interoperability

Excellent quality of social protection services depends on the provider's ability to synthesize information from a large variety of (data) sources into a precise picture of a citizen.

A robust IT solution that supports the administrative procedure of different funds, for instance, health insurance, accident insurance, pension, unemployment and so on needs to be flexible enough for getting connected with a broader framework of electronic tools for delivering decent social protection services to citizens.

Interoperability in social protection refers to a state wherein the social protection system has the capability to 'talk' with all its operations, exchange data and use the information generated from the exchange.³

To achieve interoperability, **standards** are **foundational components in building a social protection ecosystem** that allows an interoperable

exchange of information. This applies equally to a strong **social health protection** system. A country might, therefore, want to invest in developing a **National Strategy** towards an "integrated digital approach to link health insurance operators with health service deliverers."

The main reason for an increasing need for a well-aligned strategy for Africa and South-East Asia is the **growing fragmentation among digital IT solutions** throughout the region and an ever-increasing complexity of National Social Health Insurance Schemes due to growing sophistication in customer expectations and an increasingly "mobile generation".

Policy-makers need to consider two aspects when they design their strategies and plan data management innovations for their public health insurance systems. These aspects are:

1. The use of the readily increasing available public data on individuals, and
2. The need to protect those individuals' privacy.

³<http://sil-asia.org/interoperability-and-universal-health-care-in-the-philippines/>

Personal health information no longer remains personal or private if the personal data gets shared via social media platforms, wearable fitness trackers or mobile apps for use of healthcare systems. Many apps were originally designed to help users achieve a healthier lifestyle or provide easier access to medical services. Now, these data also provide critical inputs on potential insurance beneficiaries such as a person's health status, thereby generating a comprehensive risk profile. In many cases, there is no disclosure by or consent from the individuals using the app, and even when personally identifiable data are removed from health information, they can be retrieved with little effort. Policy-makers during their strategy design need to strike a delicate balance between using available data for cost-efficient decision making and simultaneously protecting personal medical data to not discriminate against SHI beneficiaries based on their risk profile.

A national strategy that contributes to defragmented ICT solutions

In many developing countries, we can see a high level of fragmentation of ICT solutions within the health sector. The lack of coordination among different health actors results in high transaction costs and inefficiencies. It also creates a burden to smooth service delivery at the local level, as data entries need to be done via multiple software solutions, very often feeding separate data containers.

Also for **life-long tracking of a citizen's insurance status**, a health service provider should know in real-time whether a patient is insured or who will pay for his or her treatment. If there are fewer data systems, it becomes easier for insurance providers to maintain a coherent patient profile.

Significance of Digital Health Eco-System for India

The National Digital Health Blueprint (NDHB) underlines the need of creating a framework for the evolution of a National Digital Health Eco-system (NDHE): an Eco-system and NOT a System. This clearly shows that interoperability is key and health insurers need to be a part of a larger Digital Health Eco-System as well.



► Holistic Coordination Strategy



A holistic strategy

The national strategy should consider questions of portability of benefits within social health insurance schemes.

It is necessary to understand whether a Social Health Insurer:

- a. offers a uniform and countrywide benefit package;
- b. whether there are any regional differences; and
- c. whether the scheme ties beneficiaries to a specific set of facilities.

In addition, the service packages might differ according to insurance products offered or target group (employees vs. informal sector workers, poor households, migrants and so on). This needs to be considered when designing portability options. Often a mix of different situations is also found present currently.

Given the **huge population of India**, the **portability of SHI benefits** for seasonal workers between administrative territories (especially between states) is a major concern.

Technological Requirements

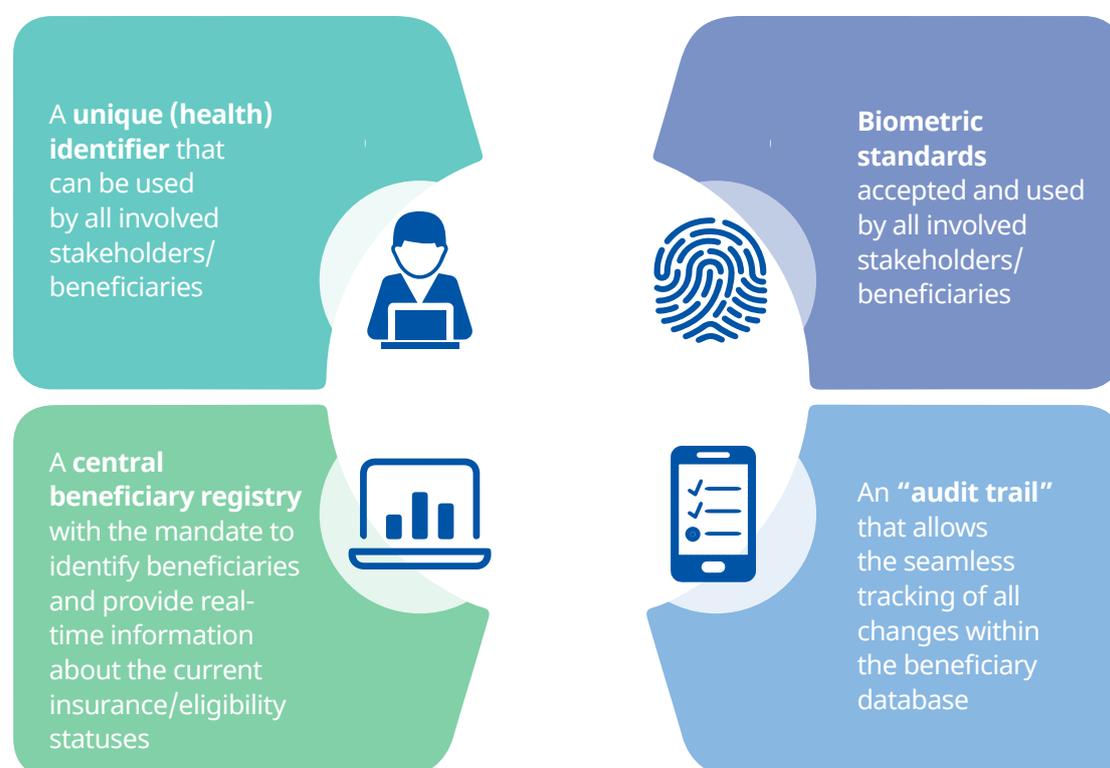
From the technological perspective, the definition of data exchange and storage standards in addition to standards for core operational procedures across involved stakeholders is important to understand and agree on to enable the insurer's portability. It is the first and foremost a policy question to which the technological solution adapts.

► Examples of portability across countries within the European Union

The EU, where the free movement of workers between the EU Member Countries is one of the fundamental principles, modernized social security coordination rules. Regulations (EC) Nos 883/2004 and 987/2009 entered into force on 1 May 2010. The utilization of health services falls under the jurisdiction of the individual member country where the workers live in.

Individuals staying temporarily in a state other than where they are insured, typically tourists or students, are entitled to all benefits in kind which become medically necessary during their stay provided they are insured under a statutory health-insurance scheme in their home state/ country. The European Health-insurance Card (EHIC) has simplified the process of receiving medical assistance during a temporary stay within the EU or in Iceland, Norway, the Swiss Confederation, and the Principality of Liechtenstein, etc. If medical assistance is received in a country that charges for health care, EHIC holders are reimbursed either immediately or after they have returned home. Otherwise, the assisting medical institution is reimbursed by the card holders' insurers.

Individuals who are not working while residing in a state different from where they were insured – for instance, family members of the insured individuals, or pensioners who had moved abroad or returned home after retirement – are entitled to all benefits, in-kind, provided under the legislation of the state where they reside. These benefits are provided by insurance institutions of the individuals' place of residence as if they were insured with it.

FIGURE 2.1: Technological solutions can support portability with four main ingredients”

SHI up-scaling requires a concerted strategy

If a health insurance operator provides “limited” service packages to its customers or targets only a small proportion of the population, most of the operational processes can be done without defining all business processes in detail and without strong information and communications technology (ICT) support.

The real challenges usually emerge when the Government wants to extend the scheme by either providing better service packages or extending to a new beneficiary group. The mandate of an existing health insurance provider may extend “politically” overnight while there is no organizational readiness.

Expanding an insurance scheme that covers the formal sector workers to new target groups, such as the informal economy or self-employed, will be much more challenging as this group is not homogeneous. Own account

Having a long-term health financing strategy, in place, is crucial for the achievement of UHC via properly aligned health financing mechanisms.

operators, casual wage workers, homeworkers and unpaid family workers all operate under distinct employment relationships. Their incomes are generally low, irregular and unpredictable, and

their employment situation is intermittent with no formal contract and multiple employers.

These issues should be adequately understood and addressed before attempting any further major expansions. In most cases, the extension of coverage becomes a challenge, requiring the collaboration of a variety of institutional players.

In practical terms, SHI-upscaling through ICT solutions entails:

- ▶ Taking into account existing national and social sector policies that have a link to health insurance;
- ▶ Aligning potential interventions with existing national strategic plans and frameworks;
- ▶ Respecting existing laws such as those formulated by the Ministry of Telecommunication or other regulatory/legislative bodies; and

- ▶ Sticking to or developing a proper law, strategy or guideline on data security and data privacy.

Having a long-term health financing strategy, in place, is crucial in the achievement of UHC via properly aligned health financing mechanisms. Throughout the development of an excellent long-term strategy, a participatory approach involving multiple stakeholders is often required. The development of a **Digital Strategy or Roadmap** linked to health financing and health service delivery is highly recommended.

An example from Cambodia below illustrates Cambodians' approach for an overarching Digital Social Protection Strategy.

▶ Spotlight Cambodia

In Cambodia, discussions around extending SHP mechanisms have largely been separate from parallel debates about the expansion and reform of SHP ICT Systems. With Cambodian health care providers implementing various patient management systems and the related setup of parallel patient indexes of the patients that they treat, social health protection agencies need to deal with a highly fragmented and complex system.

Therefore, in 2018, the General Secretary of the National Social Protection Council Secretary (NSPC) underlined the need for a commitment to guide relevant ministries in harmonizing their IT interventions. The NSPC developed a small strategy paper with the main purpose of providing directions for **better digital linkages across Social Health Protection implementers**. They included formulating roadmaps and guidance documents to link health service providers with social health insurance implementers.

Three goals are defined as undermentioned:

Short term goal:

To establish a robust **Health Insurance Beneficiary registry** that helps to connect the National Social Security Fund (NSSF)/ Payment Certification Agency (PCA) with various patient registration systems throughout the country.

Medium-term goal:

To establish a robust **Health Protection Beneficiary registry** that helps all Health Protection implementers to provide the right patient-centred services to the right person at the right time.

Long term goal:

To establish a robust **Social Protection Beneficiary registry** that helps all Social Protection implementers to provide the right service to the right person at the right time.

Note: The difference in the abovementioned beneficiary registries lies only in the target group. In the long-term solution, the registry contains the data for all social protection programmes, whereas, in the initial approach, only the health protection data are used.

Significance for India

The National Digital Health Blueprint is expected to generate an enormous amount of health data, mostly in the digital space for the provision of services through the public and private sector under Ayushman Bharat Yojana. To ensure leveraging the cutting-edge digital technologies, it is crucial to focus on creating an appropriate architecture and data structures that are pan-Indian. With the current system of fragmented data capturing by multiple stakeholders without any standardization, there is a serious risk of compartmentalization of Digital Health assets.

The blueprint outlines a very promising approach and also refers to the above-mentioned statement on upscaling Social Health Insurance (SHI). Expanding the SHI with a “siloeed” approach may not work in the long run. It is important to have a road map in place that does not only focus on the digital needs of a particular health insurance operator but also keeps in mind the already usable government services (for example, a Unique ID) and where collaborations can yield desired results.

Key strategies from other countries

Many developing countries look to Europe, Korea or Japan to learn from their experience in developing a strategy to use digital technology as a lever for expanding SHI. It is essential to be up to date and to learn from other countries what has worked for them and what has not worked, especially as technology changes quickly.

Unfortunately, size matters when it comes to expanding SHI. **Many smaller European countries** (such as Finland, Denmark and Sweden) **are well ahead in using digital technology for their citizens** within the health sector due to the following key reasons:

These countries are relatively “rich” and their respective Governments can afford a large proportion of the budget for investments in digital health and/or e-Government.

1. The Governments are centralized and the Ministry representatives can work together within a geographic distance of 5-10 km,
2. The Governments have invested in developing proper road maps and defined

Many developing countries look to Europe, Korea or Japan to learn from their experience in developing a strategy to use digital technology as a lever for expanding SHI.

medium- and long-term goals before discussing potential digital solutions,

3. The Governments invested heavily in infrastructure development and IT literacy of the entire population, and
4. The Governments invested in creating “beneficiary registries” and assigned a National Identifier to each citizen.

Estonia took its first steps towards eHealth in 2004, adopted the **first eHealth roadmap** in 2005, and launched the **National Health Information System (NHIS)** in 2008.

Since then, several additional services have been introduced in Estonia. E-prescribing began in 2010, and all prescriptions were digital in 2018. E-consultations, which allow family doctors to consult virtually with specialists, were introduced in 2012. In 2015, ambulance operations went digital, and in 2016 a decision support system was introduced to notify doctors about drug interactions. In 2018, they started focusing on personalized medicine, enhanced analytics and research, as well as on cross-border services.

The success of introducing e-Health in Estonia is mainly based on good governance, committed stakeholders, a clear policy and strategy, and clear benefit for the citizen. The relatively small size of the country is certainly an advantage for the technical implementers.

▶ EXAMPLE 1. ESTONIA

There are 1.3 million citizens in Estonia, and every citizen and every resident has a unique ID number. In Estonia, 88 per cent of households had a broadband connection (2015), 82 per cent of households used a mobile Internet connection (2016), 96 per cent of income tax declarations were made via the e-tax board (2016), 32 per cent of votes were cast over the Internet (2017), and 99 per cent of bank transfers were carried out electronically.

The Estonian Health Insurance Fund (EHIF), the digital invoicing system for electronic transfer of reimbursement claims was launched in 2001. In 2002, all pharmacies were obligated by law to submit the prescription information for reimbursement to the EHIF electronically. Over 75 per cent of healthcare providers and 45 per cent of all pharmacies had signed data transmission contracts. In 2005, all the reimbursement claims and prescription data in Estonia were submitted electronically.

Estonia has implemented an Estonian nationwide Electronic Health Information System (EHIS).

EHIS also hosts many central registers and databases such as for hospitals, family doctors (general practitioners), pharmacists, school nurses, medicine interactions, and different quality registers (cancer, HIV, tuberculosis, and so on). Furthermore, it utilizes several nationwide registers, such as the population and the business registers.

One of the crucial parts of EHIS is the patient portal. Using the patient portal, a user can:

- ▶ Log in with an ID card or mobile ID;
- ▶ View and update personal data and add contact data of close relatives;
- ▶ View his/her medical data from healthcare providers;
- ▶ View electronic referral letters and electronic prescriptions;
- ▶ Add representatives for him/herself for actions such as collecting e-prescriptions;
- ▶ Make declarations of intent (for example, donation of organs);
- ▶ Access health insurance data;
- ▶ Hide sensitive health data from doctors and representatives;
- ▶ Complete a health declaration form before an appointment; and
- ▶ View the log of people who have accessed his/her data (audit trail).

Source: http://ceur-ws.org/Vol-2336/MMHS2018_invited.pdf

Significance of health data digitization for India

India has made great progress in digitization in recent years. However, this does not necessarily mean that the target group for health insurance also has digital literacy to use digital services. Additionally, the data privacy discussion is predominant in India as well, and the risk of data misuse is an important area for discussion. Estonia is a small country and therefore can invest in digital literacy for the entire population over two decades. A comparison with India would probably be wrong due to the high population of India as compared to Estonia, but the most interesting lesson for India is

certainly the “audit trail” which allows every citizen to see in real-time who is looking on to their data.

For example, if a nurse or doctor opened the electronic medical record of a specific person, he/she would need to sign in with a doctor/nurse ID number to pull the record. A citizen who logs into his/her “My Health” portal could automatically see which doctor/nurse has retrieved which information from the medical record. This principle applies not only to the health sector but to all e-Governance Services. A citizen would see if a police officer looked onto a particular data set (exact timestamp is given) without permission to do that.





▶ Impact of IDs for Health Insurance Operators

Unique identification is a way to verify or authenticate any individual and the ability to aggregate person-level data. This is important for health insurance and other benefit programmes within the health care system. To access health care facilities and therapy, in most countries, a person must be able to demonstrate that he or she is covered by insurance. Failure to provide proper identification may result in the denial of services. Similarly, insurers and service providers may see more cases of fraud if the identification of beneficiaries is wrong.

In some cases where the health information systems are fragmented, patients may be double-billed, providers double paid, or patients may not receive proper reimbursement if they try to receive treatment at multiple facilities. Effective health finance and insurance need complete and accurate records of services utilization in order to correctly charge patients, pay providers and make budgeting and business decisions sustainable.

Integrating **foundational ID** identifiers into health insurance programmes can **improve their effectiveness and efficiency of such programmes**, and increase their comprehensiveness.

The application of a **unique National ID** for an orderly administration of the health protection sector is expected **to produce several benefits** such as:

- ▶ reduced operational costs for beneficiary management;

- ▶ enabling beneficiaries to remain registered when re-locating within the country;
- ▶ eliminating duplicate or ghost beneficiary records;
- ▶ facilitating electronic payments via the banking sector; and
- ▶ cross-referencing from one programme to another programme to improve programme integration and impact for beneficiaries.

The advantages result from a centrally administered identification number (National ID) with the corresponding standard for capturing and retrieving biometric information.

Note: The National ID should be based on the Civil Registry which is the “digital heart” of a State. In some countries, the National ID is not linked to the civil registration and vital statistics (CRVS) System or citizens below a certain age do not get a National ID Number.

► EXAMPLE 2. INDIA - The Aadhaar Foundational ID Scheme

In September 2010, ten people from Tembhli, Maharashtra received their Aadhaar numbers, the very first in the country. Thus, the **foundational ID** (Unique Identification Number) in India was kick-started. With the Aadhaar system, India adopted a multipurpose or foundational identity system; similar digital ID schemes are in place in countries such as Sweden, Thailand and Estonia.

The Aadhaar system currently serves a variety of **identity-related needs**: to prove and provide entitlements after migration from a state or country; to open a bank account where one was previously denied, or to receive benefits directly from bank accounts.

However, critics say that an Aadhaar-based authentication for access to state social protection services such as the Public Distribution System (PDS) is not always accurate. They justify this statement with the generation of many error messages that even led to a denial of benefits. An IDinsight 2017-18 survey from three states of India found that Aadhaar-related failures led to a denial of benefits from 0.8 per cent to 2.2 per cent of PDS beneficiaries. Further, some states reported the absence of Aadhaar seeding, authentication errors, connection or power problems, and the lack of physical presence of beneficiaries to authenticate the Aadhaar database.



Significance of unique ID for India

There is no consensus on the reliability of the Aadhaar number to be used universally for the entire health sector because the availability of the Aadhaar number alone cannot address completely the interoperability/portability issues, as aforementioned in the report. The “number-to-body match” or the beneficiary authentication is a key challenge for all social protection implementers. Another factor worth consideration is the complete mapping of family/beneficiary structures. In case, an insurer provides free coverage to family members, a database is required to show the family structure and the entitlement of a particular family member for health insurance services (for which IDs of all family members are useful).

► **EXAMPLE 3. THAILAND – National ID for Social Health Protection use National ID, managed by BORA**

Established in 1984, Thailand's foundational identification system includes a digitized national population register based on household and civil registration, which now covers over 99 per cent of the resident population. The system is managed by the Bureau of Registration Administration (BORA) under the Ministry of Interior, Thailand.

BORA registers Thai citizens, eligible migrants, stateless persons and refugees; each of them receives a 13-digit Personal Identification Number (PID) at the time of birth or on first household registration. Thai citizens are issued national ID smart cards at age 7, while non-citizens receive a simple plastic card at age 16.

The PID and national ID smart cards have become a part of daily life in Thailand as the primary means of authenticating the unique identity of individuals. Because they are also used as proof of address for a wide range of purposes (for instance, to establish a voting constituency and an address for official correspondence), significant incentives are provided to individuals by the government to keep this data up to date.

All government agencies collect the PID, which facilitates interoperability between systems.

Thailand is, therefore, an excellent example where, the national population registry serves as the baseline list of beneficiaries for the universal healthcare scheme, allowing for rapid coverage and eliminating the need for a duplicative enrolment campaign. <http://documents.worldbank.org/curated/en/595741519657604541/text/The-Role-of-Digital-Identification-for-Healthcare-The-Emerging-Use-Cases.tx>

The Thailand national ID number printed on the national ID Card provides information to verify the identity of the beneficiary through the authentication of personal data such as:

- National ID
- Given name, middle name, last name
- Family name
- Gender
- Date of birth
- Prefix
- Home town address
- Biometrics (height, photos and pointer fingerprint)

The Thai National ID Card is also called a smart card that contains a chip on which the above-mentioned information is stored.

Thai Health Protection Scheme

Launched in the year 2001, the Universal Coverage Scheme (UCS) covers all residents not covered by other social health protection schemes, namely the private employees' Social Security Scheme (SSS) and the Civil Servants' Medical Benefits Scheme (CSMBS). A national registry of beneficiaries has been developed based on the population database maintained by the Ministry of Interior (MOI). It is used by the three social health protection schemes. Identification of UCS beneficiaries is done by removing people covered by SSS and CSMBS from this complete database. The national ID number is used by healthcare providers to verify eligibility, track delivered services, settle claims, and build shared medical records for each patient.

Detailed information on the set-up of the Thai National ID and utilization of the health sector is available at the following link:

<https://www.social-protection.org/gimi/gess/RessourcePDF.action?ressource.ressourceId=531>

Main lessons learned

Thailand's UCS highlights the importance of national database systems for achieving universal health care. The unique national ID number is used to ensure that all the population has access to health coverage and the utilization of healthcare services and financial transactions can be properly monitored.

- ▶ The use of the national ID numbers has led to improvements in the efficiency and transparency in the management of the national social health protection system, as well as prevent misuse of public resources.
- ▶ Additional identification systems had to be developed to cover those residents who are not part of the national ID card system, such as minorities and migrant workers.

The development and maintenance of the shared database system depend on clear cooperation outlined in a memorandum of understanding signed by the MOI and the National Health Security Office. The Registration of Residential Inhabitant Act, B.E. 2534 (1991), provides the MOI with the authority to share data with other government agencies according to their specific missions.

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► The unique national ID number

is used to ensure that all the population has access to health coverage and the utilization of healthcare services and financial transactions can be properly monitored.

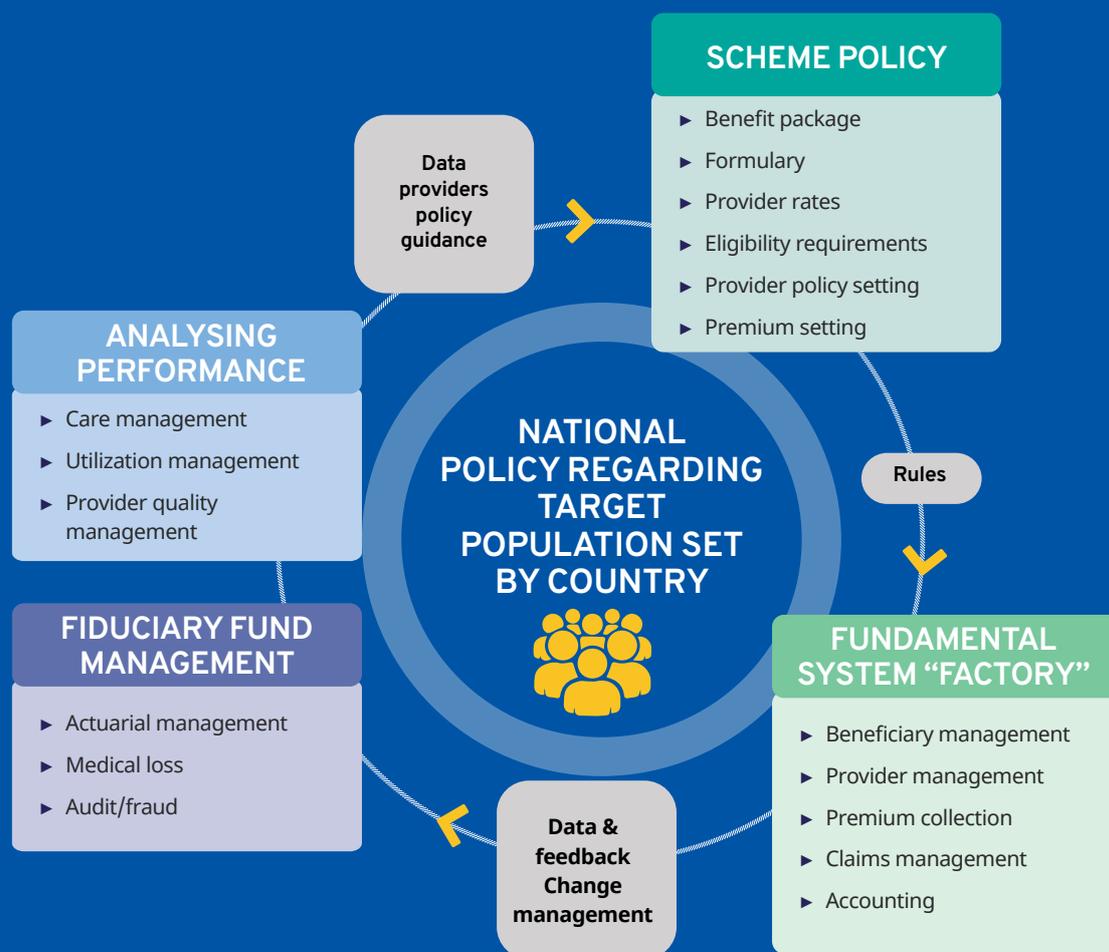




▶ National Health Insurance Framework and its Core Business Processes

Any national health insurance system that has complex data management needs to be connected to different processes, ranging from the development of the insurance benefits scheme to management, fiduciary assessments and performance monitoring.

Figure 4.1: National health insurance framework



Source: JLN Network (<https://www.jointlearningnetwork.org/resources/a-guide-to-common-requirements-for-national-health-insurance-information-systems/>)

Overview of core business processes for SHI

Without having a modern and digitally expandable ICT infrastructure, successful digital change in terms of effective data management for decision making and operations is not possible. Therefore, health insurance companies, in particular, should invest in a uniform company-wide system.

Any digital solution that does **not explicitly map the business processes** of a company and serves the employees as a tool for their daily work only **will fail sooner or later**.

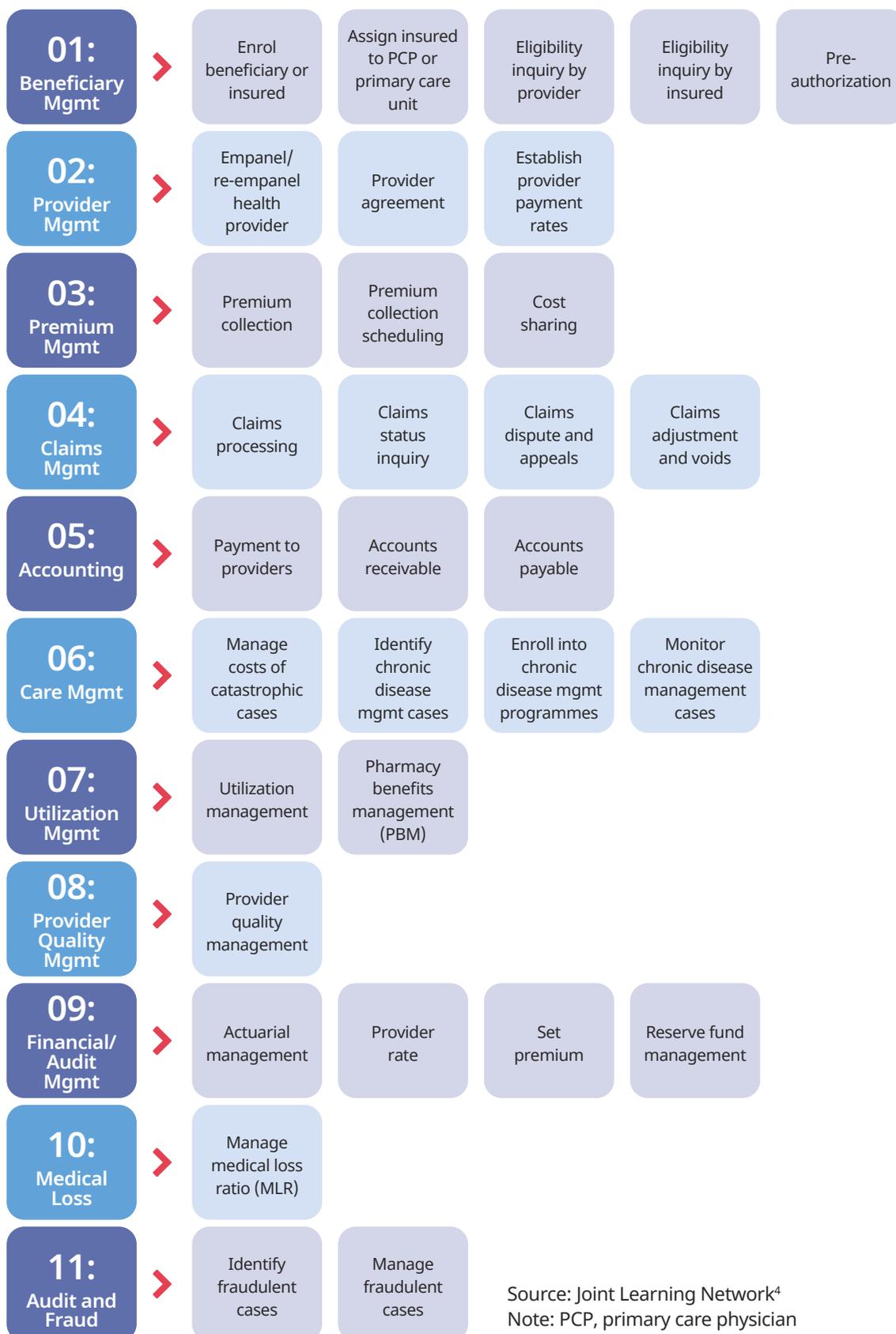
The Joint Learning Network (JLN) ICT Initiative also drafted a structured framework for organizing business processes to show the significant process groups, functional areas and the related business processes. It allows countries to understand a variety of processes and sub-processes involved in a task and begin to expand to a level of granularity needed for software development. Also, by **defining the major process groups**, this framework creates flexibility for a range of scheme designs. While some systems may not require

beneficiary enrolment and others may require it, both systems will require some level of beneficiary management.

The Joint Learning Network (JLN) ICT Initiative also drafted a structured framework for organizing business processes to show the significant process groups, functional areas and the related business processes.



Figure 4.2: Core business processes for social health insurance



Source: Joint Learning Network⁴
 Note: PCP, primary care physician

⁴<https://www.jointlearningnetwork.org/resources/a-guide-to-common-requirements-for-national-health-insurance-information-systems/>

National Health Insurance Information System (NHIS)

The National Health Insurance Information System (NHIS) in Malaysia is composed of 11 core business processes, as shown in illustration 1. The NHIS is an ICT solution that was implemented to support the operations and management of national health insurance schemes.⁵

In the context of India, the term “national” might be confusing as several states aim for solutions of their own Public Health Insurance coverage. However, the broad principles remain the same, as illustrated below.

There are **three main actors in health insurance schemes: beneficiary, payer, and provider**. At the very minimum, the goal of an NHIS solution for UHC should be on accommodating the diverse processes and interactions occurring among the three actors, as shown in Figure 4.3 below.

In the context of India, the term “national” might be confusing as several states aim for solutions of their own Public Health Insurance coverage. However, the broad principles remain the same.

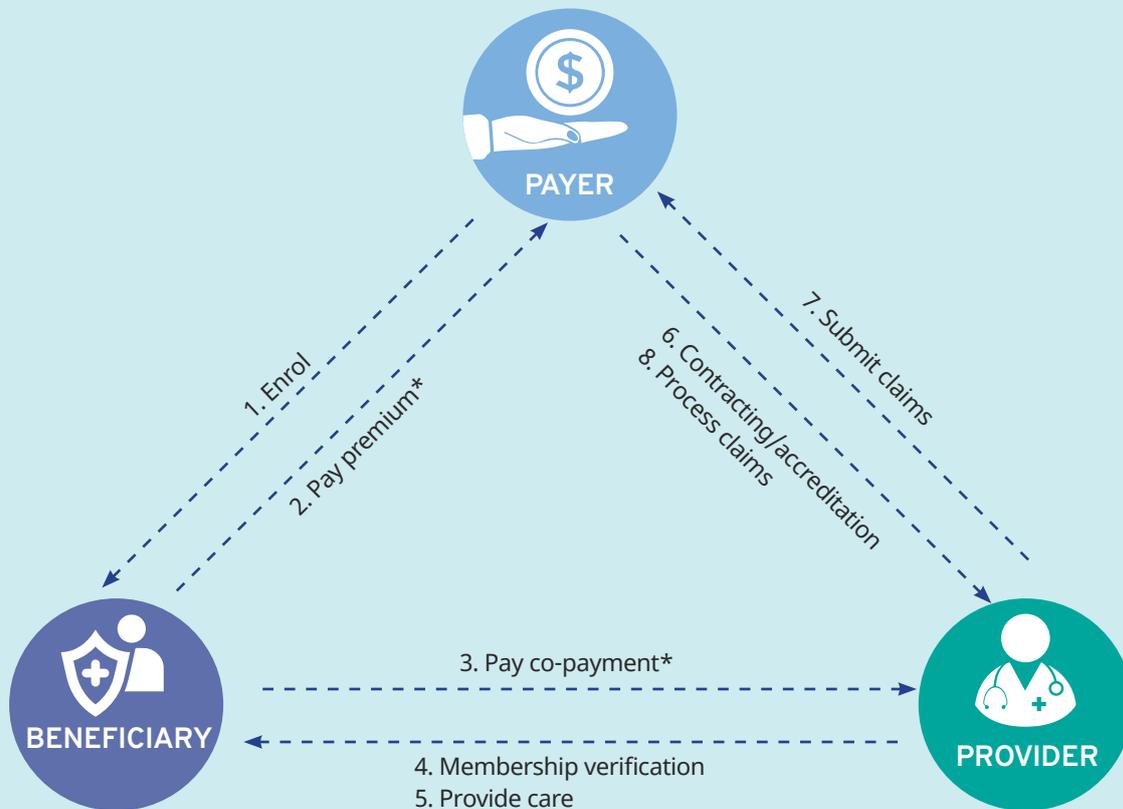
⁵<http://www.jointlearningnetwork.org/what-we-do/jln-resources>



► **The NHIIS is an ICT solution**

implemented to support the operations and management of national health insurance schemes.



Figure 4.3: Interactions among different actors in health insurance

Core business processes for SHI

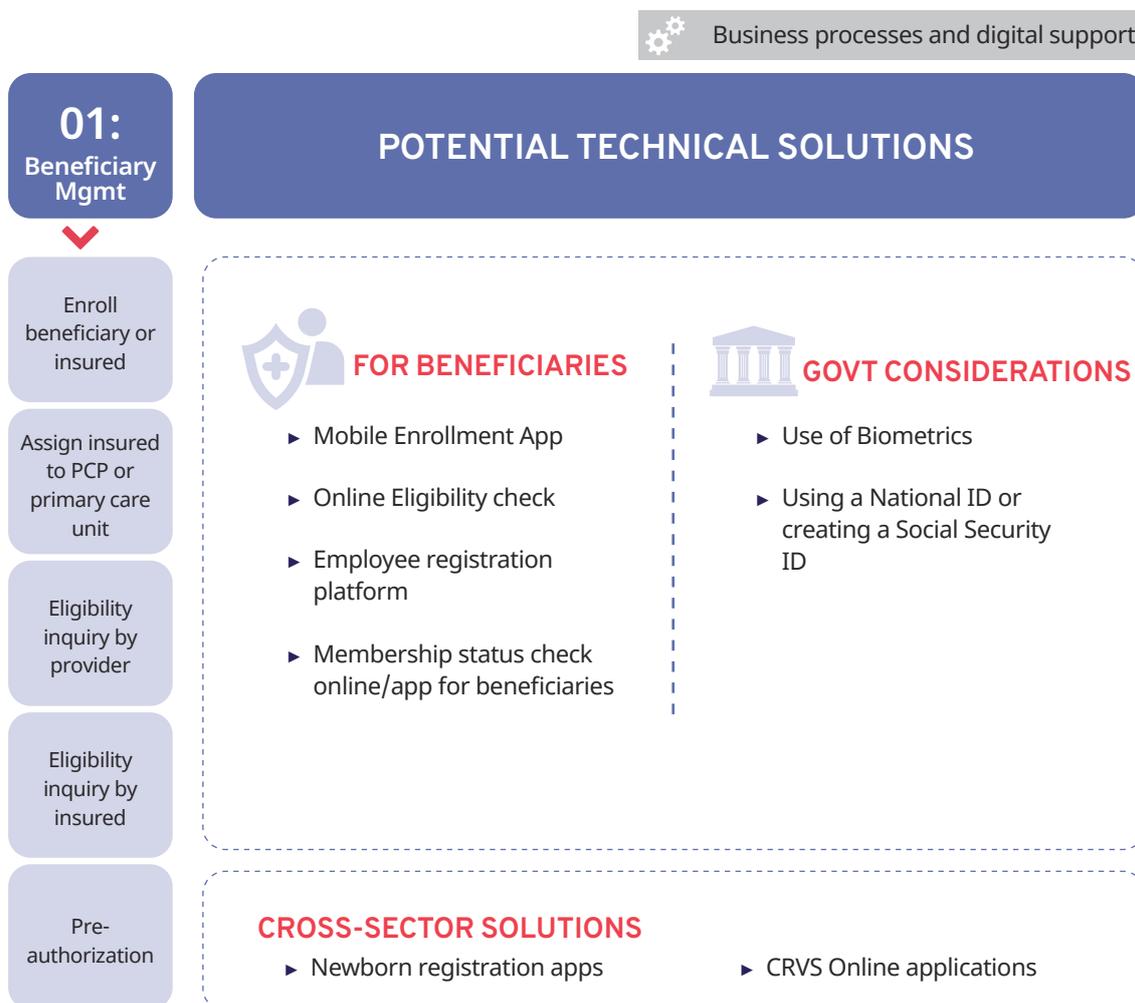
The chapters below show several digital solutions pertaining to the core business processes of SHI. The listed solutions are, by no means, exhaustive but serve as an overview of existing solutions as are found in other countries.

Sometimes, there is a common misunderstanding that digitization is the responsibility of the ICT Department. This is partly true as the ICT Department is usually important but not the strategic driver for a digital change it is usually closely interlinked with all relevant operational departments of the organization to facilitate the ICT solutions.

1. Core Process Beneficiary Management

Digital beneficiary management in the insurance industry brings improvements in terms of revenue, cost efficiency and customer satisfaction. However, the customer approach in the insurance industry is far from being consistently digitized and value-oriented, despite the availability of the technology. The following graphic (Figure 4.4) shows possible digital interventions for the beneficiary management process.

Figure 4.4: Potential digital solutions for beneficiary management.



Note: CRVS: Civil registration and vital statistics; PCP: primary care physician
 Authors own adaptation of the Joint Learning Networks Core business processes for Social Health Insurance graphic.

Beneficiary management can have several barriers to the expansion of health insurance coverage such as:

- ▶ Inability to enrol in schemes: Complex or not clearly communicated eligibility criteria create potential barriers to proper enrolment and difficult administrative mechanisms result in the exclusion of target groups.
- ▶ Inability to use the system after people have successfully enrolled: Sometimes, participants in a health insurance scheme do not have access to the benefits to which they are legally entitled. This may reveal the administrative

inability of the public sector scheme to provide benefits to all those entitled under it.

- ▶ Inability to receive appropriate and high-quality services: Members who succeed in overcoming obstacles to enroll may sometimes not receive adequate insurance protection. Health insurance coverage must be appropriate to the needs of all persons, especially those from high-risk groups such as children, women, families or people that are exposed to other forms of discrimination.



Digital solutions for beneficiary enrolment

1. Mobile Enrolment Apps

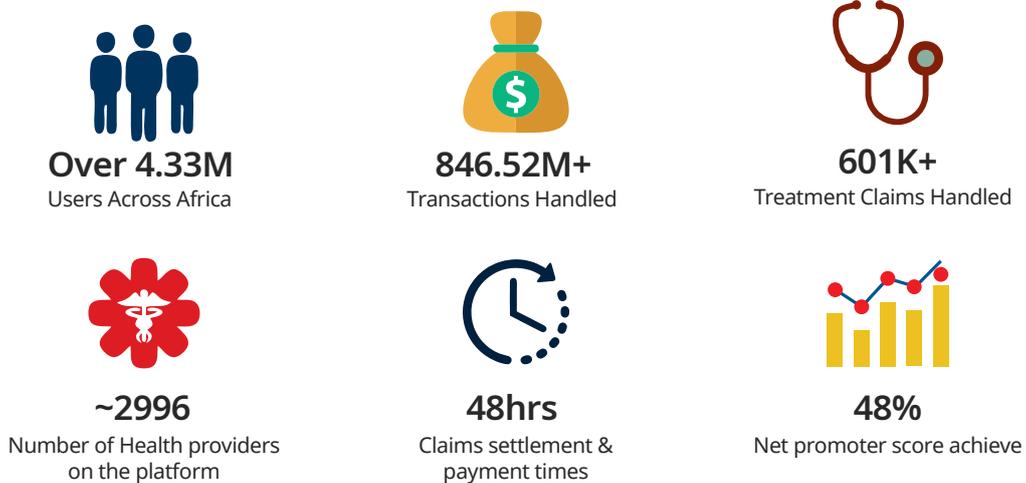
Mobile enrolment solutions can be divided into three categories:

1. Solutions for "self-enrolment" that allow a potential beneficiary to enrol himself/herself in the health insurance scheme.
2. Solutions where the enrolment is done by a third party who could be an employer or an "agent" who takes care of the enrolment of certain population groups.
3. Solutions where health insurance employees take over the registration, for instance, through mobile enrolment units.

Registration to and information on the M- Service are facilitated by the certified M- Agents.

M-TIBA Website Here are some more up-to-date data on the utilization of the M- scheme:

Figure 4.5: Data on the utilization of the m- scheme



▶ EXAMPLE 4. SPOTLIGHT KENYA

The Example from Kenya (M-) shows a category one and category two enrolment (“self-enrolment”). The terms and conditions for enrolment and use of M- services are mentioned below:

To avail of any M- Service, one must fulfil the following conditions:

- ▶ A person of minimum 18 years of age with full legal capacity; He/ she should be major in age;
- ▶ Either be a Safaricom subscriber with a registered SIM card and an activated M-PESA account or the subscriber of any other mobile telecommunication network which have enabled M- products;
- ▶ should be registered as a user for the M- service; and
- ▶ Should be a resident of Kenya.

Registration to and information on the M- Service are facilitated by the certified M- Agents.⁶

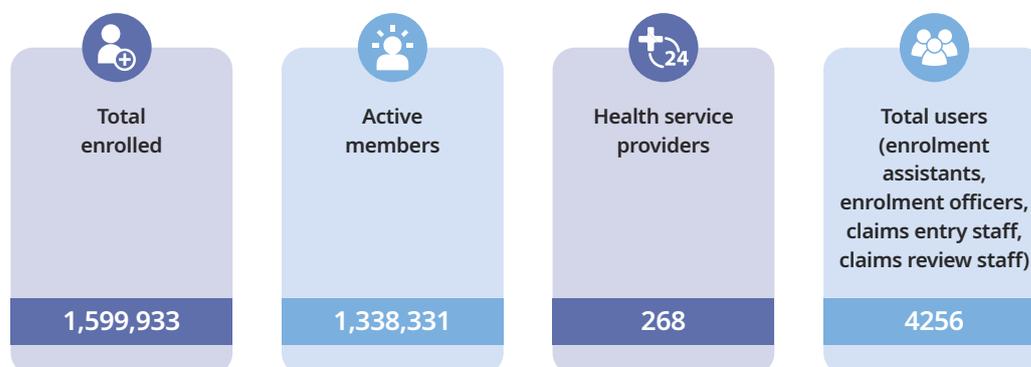
▶ EXAMPLE 5. SPOTLIGHT NEPAL

The following example from Nepal shows a category three enrolment -health insurance agent enrolment. In the Nepal Social Health Insurance Scheme, households are actively approached by an enrolment assistant to make them aware of the SHI availability. The enrolment assistant then enrolls the beneficiary (family) via a mobile enrolment kit together with the beneficiary.

Given below is a more detailed description/ MIS of the app for beneficiary enrolment in Nepal.

Here are some up-to-date numbers from Nepal⁷ (2019):

Figure 4.6: Status of the social health insurance app for beneficiary enrolment in nepal (2019)



⁶http://m-co.ke/M_Terms_and_Conditions.pdf

⁷<https://www.openimis.org/nepal>

2. Online Eligibility Check

The online eligibility check is essentially done to provide a digital option to check the eligibility or insurance status in real-time. This check can be a digital check that returns as "return information" whether someone is suitable for admission to a health insurance fund. This application can also give information if a particular person is insured on a specific day. The latter is often truly relevant for health service providers in countries where multiple health insurance schemes exist, in parallel, as in India.

The online eligibility check is very advantageous in countries with a high proportion of domestic migration or for areas with many seasonal workers who are not covered by a formal health insurance scheme for 365 days/year. It is necessary to avoid the coverage gaps, or the occurrence of double

insurance when citizens move around, especially when it is related to the question of scheme portability. Online and real-time eligibility checks can help to address these challenges. But there are some limitations as well. A widespread problem is the lack of explicit identifiers across different health insurance operators. Member database "silos" are typical. From a software development perspective, conducting a bullet-proof and real-time membership coverage check is challenging unless robust identification systems are put in place.

A better understanding of Identification Systems can be gained from the chapter on the impact of IDs on health insurance.

► EXAMPLE 6. CAMBODIA: Using Beneficiaries Apps as part of the beneficiary management processes

The law on social security for workers covered under the Labour Laws was enacted in 2002. It stipulated the introduction of social security benefits and the establishment of a new administrative institution - the National Social Security Fund (NSSF) under the Ministry of Labour and Vocational Training (MoLVT).

According to the law, the NSSF is governed by a tripartite board of directors, comprising representatives of workers and employers (two each), and of the Government (one member each from MOLVT, MOEF, and MOH).

The law stipulates the introduction of the following social security benefits:

- A compensation fund for the victims of employment injuries and occupational diseases;
- A pension insurance fund; and
- Other benefit branches as relevant (health insurance).

In January 2016, the erstwhile Prime Minister signed the establishment of a mandatory SHI for private-sector workers into law. On 1st May 2016, the NSSF launched this branch together with maternity and sickness branches, although the process of collecting contributions commenced in September 2016 only. NSSF is constantly adding new target groups for SHI coverage. It has recently started covering civil servants, military and veterans. It is expected that NSSF will cover the informal sector workers also soon.

Technological Solution

NSSF developed an app that serves not only the NSSF beneficiaries but also the health service providers. The Google Play store, therefore, shows two apps: one for NSSF members and the other for health service providers.

App for the Beneficiaries:

The app allows NSSF members to access their personal information, monitor their work history and view their statement of transactions with the NSSF. Accessing and using NSSF anywhere, anytime becomes very easy and user-friendly.

NSSF member app provides the following options to an insured person:

- ▶ Easy login with the NSSF ID
- ▶ Updation of personal information
- ▶ Viewing all the NSSF branch office information and location
- ▶ Finding nearby health facilities located ou (including map function/directions)
- ▶ Viewing of NSSF profile
- ▶ View the statement transaction (has the employer contributed their share?)
- ▶ View NSSF news
- ▶ Call the NSSF Hotline directly for redressal of any grievance

App for Health Facilities:

NSSF health facility/branch is an application for providing information on health facilities and NSSF branches. It allows staff from health facilities and branches to search and check eligible members when an NSSF member accesses health facilities or branch services. It is also an easy way for these users to contact NSSF anywhere, anytime.

The app contains the following menus:

- ▶ Easy login with username and password
- ▶ Search member profile by using NSSF ID and QR Code
- ▶ Update the health facility/branch information
- ▶ Update queue amount (waiting times for patients at a particular health facility)
- ▶ View all the NSSF branch office/health facilities information
- ▶ View NSSF news.

From a technical perspective, a role-based approach is adopted. Only registered staff at health facilities are allowed to use (log in to) the NSSF app.

The current app version has not yet included the following:

- ▶ Contribution payments via the app
- ▶ Claim reimbursements

Impact

As the app was introduced recently, some bugs need fixing. One of the main challenges at the moment is the speed of the app. As the NSSF member database is quite "old", the app programmers face difficulties with connecting the app to this database via a proper application programming interface (API). The software developers are in contact with NSSF to resolve this issue. As soon as the speed is acceptable and the number of users increases, the impact of the app may be assessed much better.

Figure 4.7: Screenshot of the myhome screen for an nssf member in cambodia

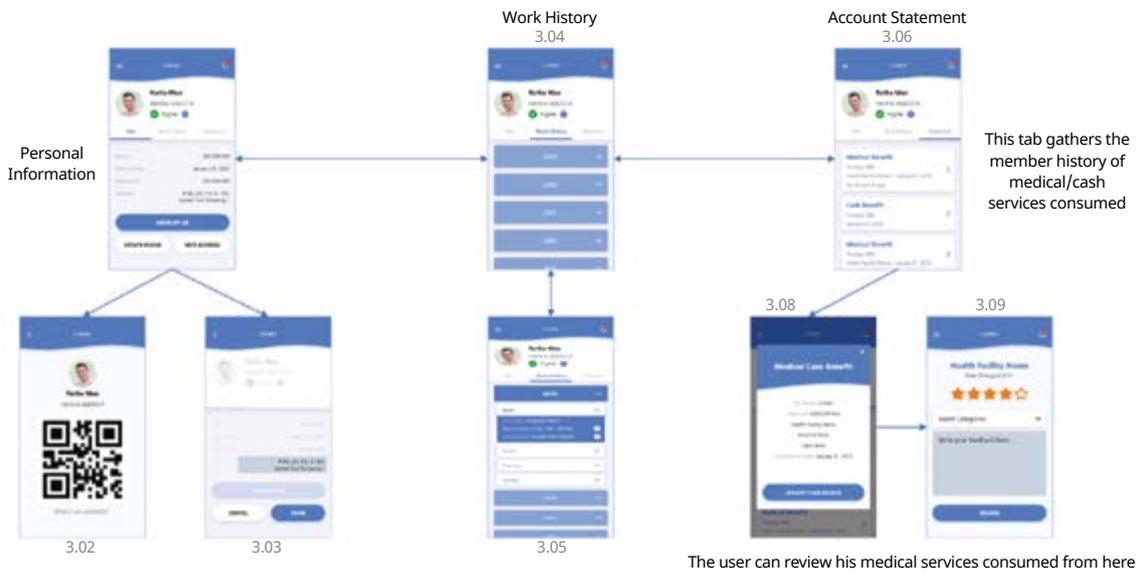


Figure 4.8: Example of the home screen for health facilities



3. Employee Registration Platforms

Employee registration platforms are all-digital solutions for the registration of workers and employees in statutory health insurance. It is

often a great relief for larger companies if there is a standard electronic procedure for the transfer of information to the health insurance operator, especially for the formal sector.

► EXAMPLE 7. SPOTLIGHT GERMANY

Only certain programmes that meet all requirements for data protection and transmission security are permitted for electronic data transmission between employers and statutory health insurance funds. One possibility of data transmission is electronic submission. This enables the employers to submit social insurance notifications, contribution statements, reimbursements requests, other certificates and messages to the social insurance agencies.

Notifications and contribution statements are often generated by payroll accounting programmes and are transmitted to health insurers automatically. However, a prerequisite for participation in the automatic transmission, by the provisions of the Administrative Simplification Act, is that the payroll programmes have passed a system test. The test is required particularly if an employer has to submit the data with a non-certified software product (which rarely is the case, in practice).

► EXAMPLE 8. NEPAL: Using an app for beneficiary enrolment

Nepal's social health insurance system was initiated as a voluntary scheme. It provides different payment mechanisms for different target groups: voluntary payments for informal sector workers, government subsidies for the poor, and a percentage of salary for those working in the formal sector. For those making voluntary payments, the contribution is a lump sum payment per household, equivalent to around US\$25 per annum.

Once enrolled, the insured does not pay any cash at the participating health facilities for any services covered under the insurance scheme, and the hospitals are directly reimbursed by the Health Insurance Board. This is important for a scheme designed to enable access by the poor.

Subsidies for the registration fee of 100 per cent, 50 per cent and 25 per cent are provided for the ultra-poor, poor and marginalized groups, respectively based on a poverty card/index.

The Government of Nepal has committed US\$15 million in the fiscal year 2018/19 for the subsidies, demonstrating a strong commitment to universal coverage. As a next step, support to the Health Sector Programme (S2HSP) (a GIZ Programme) enabled the government to design and introduce a new Unified Beneficiary Registry (UBR), similar to those in Malawi and Turkey. The UBR helps to ensure that time and resources used to identify beneficiaries of the different health and social sector schemes are not duplicated. The UBR could also provide an excellent basis for a new patient registry which would contribute to the interoperability between these schemes.

Technical Solution: Enrolment app

In the Nepal Social Health Insurance Scheme, households are ACTIVELY approached by an enrolment assistant to make them aware of the SHI availability. The most common methods of enrolment are:

- Door to door enrolment;
- Through health facilities, for example at a specific day; and
- At various social gatherings.

Households are enrolled via an enrolment form and via capturing their picture through **smartphone technology**. Forms and membership identity cards with **QR codes are pre-printed** and given to the SHI enrolment assistant prior to the enrolment procedure. The client needs to pay the contribution during the time of enrolment.

The above graphic (Figure 4.9) shows the core enrolment procedure. More information about the coverage of Social Health Insurance via the above-mentioned enrolment process under OpenIMIS is available in following link: <https://www.openimis.org/nepal>

SHI scheme in Nepal started as a voluntary scheme for the population, working in the informal sector opting for open-source insurance management and information system. Here the focus of the ICT Solution (OpenIMIS) was **not yet on formal sector enrolment**. A few recommendations were given to the OpenIMIS product developers in Nepal in order to cover the formal sector workers in future via properly aligned digital business processes.

Adaptation needs for Nepal (but also applicable to other SHI contexts/countries also) – FORMAL SECTOR SPECIFIC

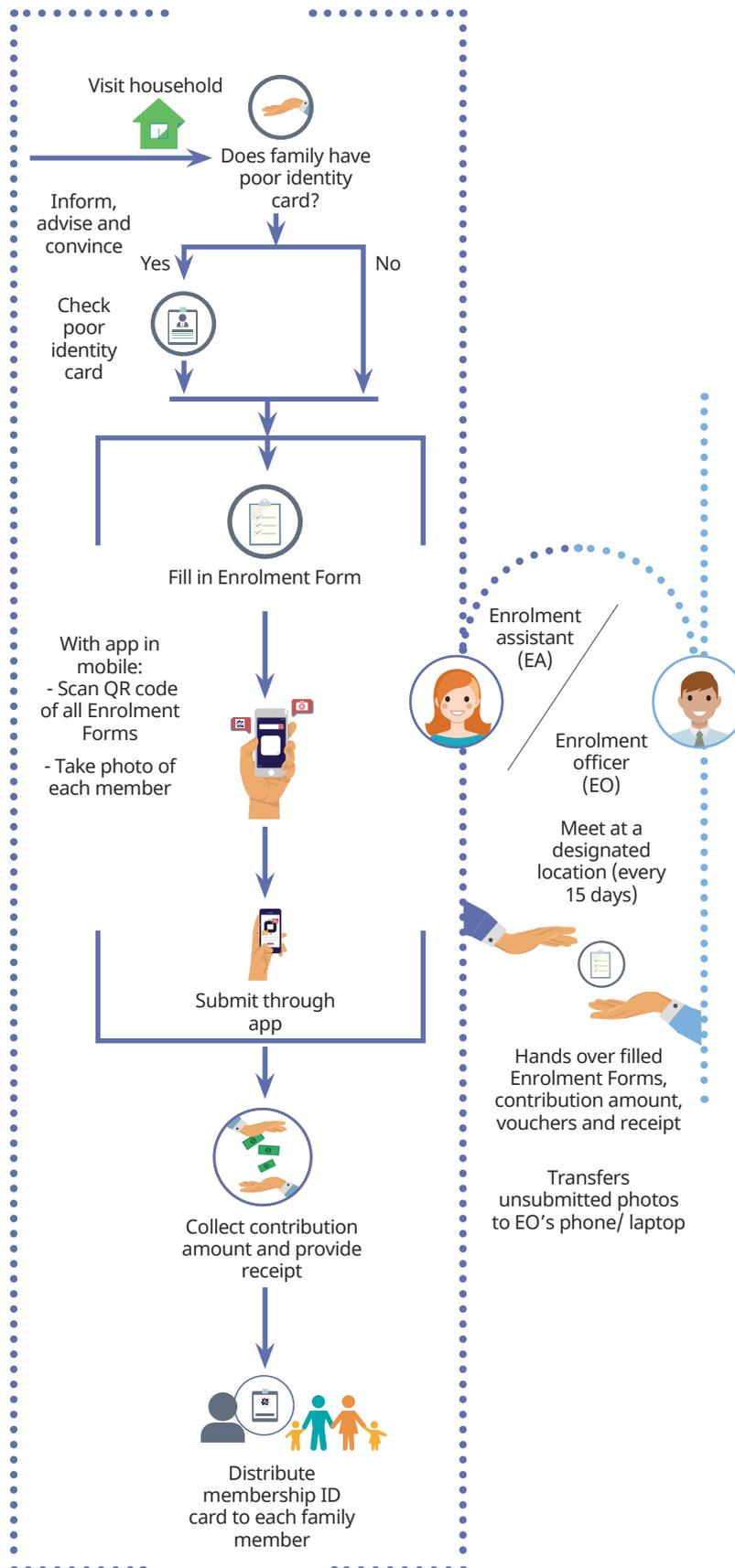
- ▶ Enrolment should be done without the need for pre-printed enrolment forms. The SHI identification number and the ID card should be given directly through the system.
- ▶ Individual membership accounts: The user interface needs to show family relations in a structured way. The user should see the head of the household and the related family members on one screen. The user must see immediately if the breadwinner and the family are covered via a voluntary scheme or as part of a formal sector coverage. This is a user interface (UI) question.
- ▶ Employers register their workers at the enterprise on the day when the workers are supposed to start working - based on a work contract (usually, the labour law makes such provision). The following scenarios are common in South East-Asian countries:
 - ▶ The employer registers each worker via a standardized (electronic) form and sends this form to the health insurance fund;
 - ▶ The employers send a list of all new workers via Excel sheet to the health insurance fund;
 - ▶ The employers provide information on all new workers via an online interface, designed/provided by the health insurance fund;
 - ▶ The employers use different data formats for providing the information but stick on a pre-defined API, given by the SHI Operator; and
 - ▶ Workers visit an SHI Operator Branch office and register themselves by showing their work contract and ID card.

The above-mentioned scenarios usually happen once a month.

Note: For the formal sector enrolment, understanding the difference between initial enrolments (for example, the Government decides to include formal sector workers as a new target group for SHI) and ongoing enrolments throughout the year becomes crucial.

A family member who was previously insured via the informal sector scheme (family coverage) might start a job in the formal sector and now need to pay his/her contribution. A family member who stops working for the formal sector might need coverage via the informal sector scheme again.

Figure 4.9: Flow diagram of nepal social health insurance scheme



Government considerations and Cross-sector solutions

Biometrics

As described in the chapters above, there are several digital possibilities for membership and beneficiary administration. It is difficult to improve existing procedures for member administration and to provide better linkage between existing systems without clearly identifying an individual beneficiary.

In order to use personal digital identification, biometrics must meet certain requirements:

1. The biometric features must occur only in one person (uniqueness).
2. Should involve as many people as possible (universality);
3. Do not change or change only slightly over a period of time (constancy);
4. Technically as simple as possible (measurability);
5. Be convenient, practical and quick for the user (user-friendliness); and

6. Be as inexpensive and error-free as much as possible.

There are different individual recognition features with different advantages and disadvantages:

1. Personal handwriting has been used as a signature for a long time. However, the risk of forgery has always been relatively high.
2. The dactyloscopy procedure to use fingerprints for identification has been in firm use for approximately 100 years in the fight against crime.
3. Not only the finger lines but also the hand geometry and lines as well as the vein pattern of the back of the hand are used as a biometric feature. So far, the quality of recognition is unclear, especially in case of changes due to working and ageing processes. Another disadvantage is that the hand geometry shows many similarities in different individuals.
4. A measurement of the face of the rainbow or retina is already in use. Eye feature determinations are classified as very safe,



but they are also very cost-intensive and due to the laser beam used for scanning, these features are accepted only to a limited extent.

5. Photographs in identity cards can be automatically compared with the face of the person concerned using current technology ("machine-readable identity cards"). In practice, however, not enough samples have been examined, to date, to be able to make a reliable statement about the relationship between image quality and recognition probability.

Identification Numbers within the Health System

As already mentioned in the chapter on mobile enrolment apps, a widespread problem is the lack of explicit identifiers across health insurance operators. In general, Governments around the globe have addressed this concern in two different ways.

One possibility is through the introduction of a **foundational ID** (for example, the Aadhaar Number) where it is mandatory for government agencies to use this for unique member authentication.

Another possibility is the introduction of a **health-specific ID** (functional ID).

The Unique Health ID is then linked to a database - the Client Health Registry - that is used within a healthcare organization to provide consistent, accurate and up-to-date demographic and essential medical data about its patients seen and administered in its different wards. Each patient is assigned a unique health identifier. This identifier is then used to refer to that particular person across the entire healthcare ecosystem.

The Indian National Digital Health Blueprint (NDHP) highlights the first out of 23 building blocks for identification:

Identification: Unique identification of persons, facilities, diseases and devices is a key requirement and challenge as well in National Digital Health Ecosystem (NDHE). The blueprint handles this requirement through two building blocks: **Personal Health Identifier (PHI) and Health Master Directories & Registries**. The uniqueness in the identification of Persons (citizens) required as an essential attribute of PHI is sought to be achieved through a combination of Aadhaar-based identification/authentication for schemes notified under section 7 of the Aadhaar Act, and through other specified types of identifiers in respect of the rest. However, the Committee recommended that the design of the PHI may be finalized by the MoHFW, in consultation with the Ministry of Electronics and Information Technology (MeitY) and Unique Identification Authority of India (UIDAI) duly taking into consideration the regulatory, technological and operational aspects. PHI in tandem with Digital Health Locker facilitates the creation and maintenance of Personal Health Records.⁸

New-born Registry and CRVS apps

A well-functioning CRVS system is the best source of **continuous and up-to-date information on birth, death and population statistics** and it has many administrative advantages.



As CRVS can provide continuous information on the **conditions and needs of specific population groups**, it can be used for the design, implementation and evaluation of various services from health, social and protection to research. **Health Insurance Funds, for instance, can collect more accurate and up-to-date information** about their populations and therefore provide targeted services.

A major advantage of the **CRVS system** is that it provides the basis for the development of a **National Population Register (NPR)**. The population register can best be described as the “digital glue” for connecting government registries. Linked registries provide faster and accurate services by speedy authentication of a potential beneficiary. The latter is particularly relevant for “single window service” set-ups.

UNICEF has done significant work in the last couple of years for improving Newborn registration via mobile apps⁹ and communication apps with mothers (for example, Rapid Pro¹⁰). Rapid Pro is a useful app for exploring the UNICEF initiatives for more information

Significance of NDHB for India

The National Digital Health Blueprint for India adopts features all Federated Architecture in all aspects. Only the identified Core Building Blocks are developed and maintained centrally. All other building blocks are designed to be operated in a federated model that factors regional, state-level and institution-level platforms and systems to function independently but in an interoperable manner.¹¹

This approach is promising and requires careful planning of how to connect the patient registration systems at the health provider level and the health insurance operators with the CRVS Database.

The National Digital Health Blueprint for India adopts features all Federated Architecture in all aspects. Only the identified Core Building Blocks are developed and maintained centrally

⁸https://www.nhp.gov.in/NHPfiles/National_Digital_Health_Blueprint_Report_comments_invited.pdf

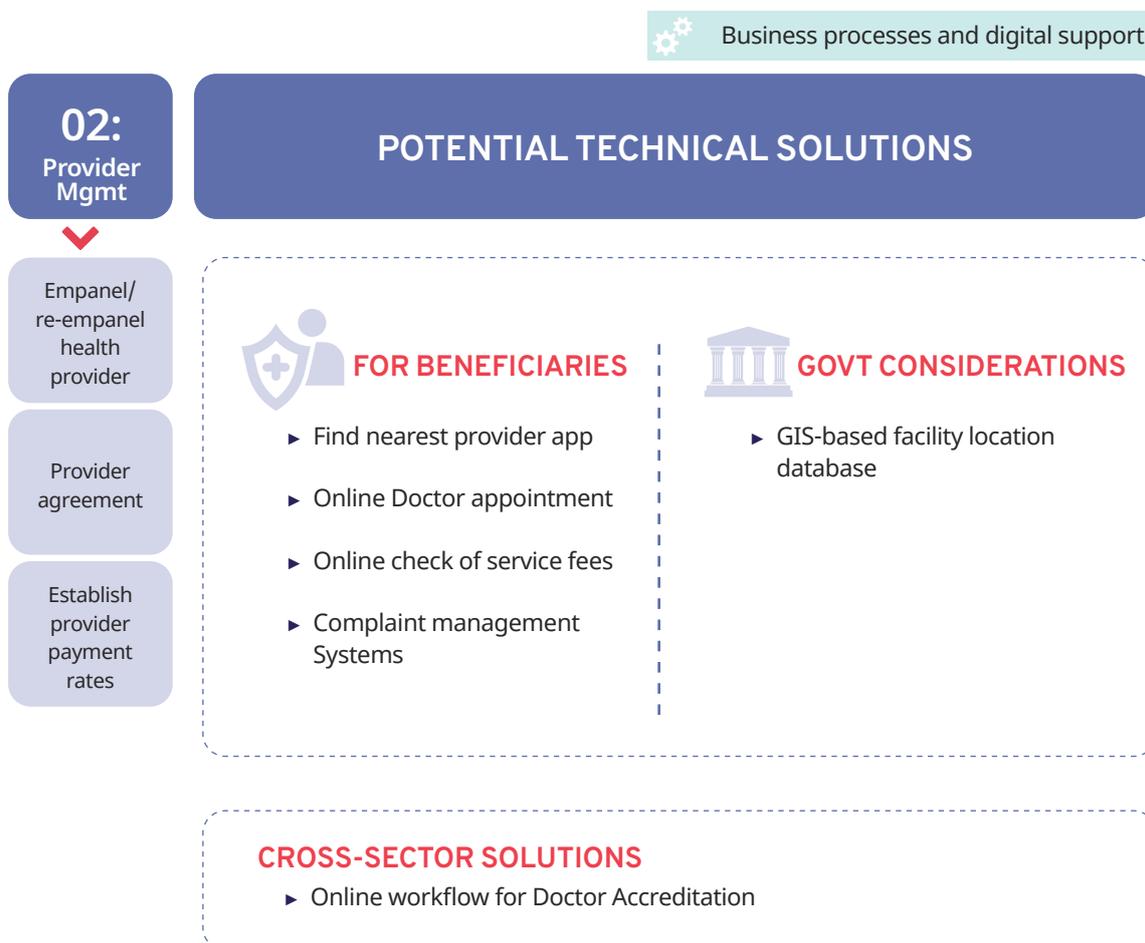
⁹<https://getinthepicture.org/news/smart-phone-app-revolutionize-birth-registration-system-pakistan>

¹⁰<https://rapidpro.io/>

¹¹https://www.nhp.gov.in/NHPfiles/National_Digital_Health_Blueprint_Report_comments_invited.pdf

2. Core Business Process Provider Management

Figure 4.10: Potential digital solutions for provider management



Source: Author’s own adaptation of the Joint Learning Network’s *Core business processes for Social Health Insurance* graphic.

Digital Solutions

1. Find the Nearest Provider App

The term "find the nearest provider"- app may be slightly misleading. It refers to mobile services (for instance, a smartphone app) which allow the customers to **find a doctor in their insurance network** directly from their mobile device. The app can also have other additional functions such as patient reviews or direct booking of doctor's appointments.

Zocdoc is one of the most popular platforms in the US (<https://www.zocdoc.com>).

It offers the following advantages to health insurers:

- ▶ A client need not visit a health facility outside their insurance network;
- ▶ The number of hotline calls might reduce as the patient can find the nearest facility via smartphone and even use the navigation function to reach there; and
- ▶ The insurer can add more information about a particular facility (for example, service fee; and others what were not covered earlier).



2. Online Appointment of Doctors

The idea is certainly not new and has been implemented through various technologies over the past several years. In the age of smartphones, the principle has not changed but is now only implemented through more beautiful user interfaces.

A patient can book an appointment with a doctor (preferably a doctor within the associated insurance network) directly and receive a booking confirmation.

This allows the patient some flexibility to search for free appointments while allowing the health facility to manage patient flows better.

3. Service Fee Check

Another useful digital application, especially useful for health insurers, is the real-time check of service fees payable/paid by the patient. It shows that the patients can check for themselves whether a requested service or consultation fee is correct or whether an additional, non-permitted fee has been charged.

4. Complaint Management Systems

The author intentionally refrained from listing available software products on the subject of complaint management, as the International and Indian market certainly provides a large number of implementable solutions off-the-shelf which can be easily adapted for health insurance operators.

Government considerations and Cross-sector solutions

GIS-Based Facility register

The digital applications described above require not only a solid database of all available hospitals and doctors, pharmacies but need linkages to geographical data. In many countries, geography and time are still among the worst captured dimensions in the country's health information system (HIS). The reason for this is the difficulty involved in the collection and updation of the data. Smart governments are investing in a technological solution - a common registry - that allows the associated geographic data to be stored in a GIS readable format and be available to all connected stakeholders. An example of this would be the provision of a database with the geographical information (GIS coordinates) of all health facilities as a central service for all connected stakeholders. These stakeholders could then use the data to develop specific apps where the location of health providers is a core requirement.

Some advantages for Health Insurers are mentioned in an above chapter on the "nearest provider app".

If a Government invests in a country-wide health facility registry that is available for all connected stakeholders, the connected stakeholders (that is a health insurer) would not need to build this database in-house and face the burden of registry updates and maintenance. Having an API to a central registry would allow them to use **the health facility data in real-time and build more powerful digital solutions for their in-house operational processes but particularly for their member.**

Spotlight COVID-19: During the Covid-19 crisis, access to the right health facility (for getting a Covid-19 test) was difficult at the beginning of the year in 2020 when patients did not know where to go for the check-up.

Online Workflow for Doctor Accreditation

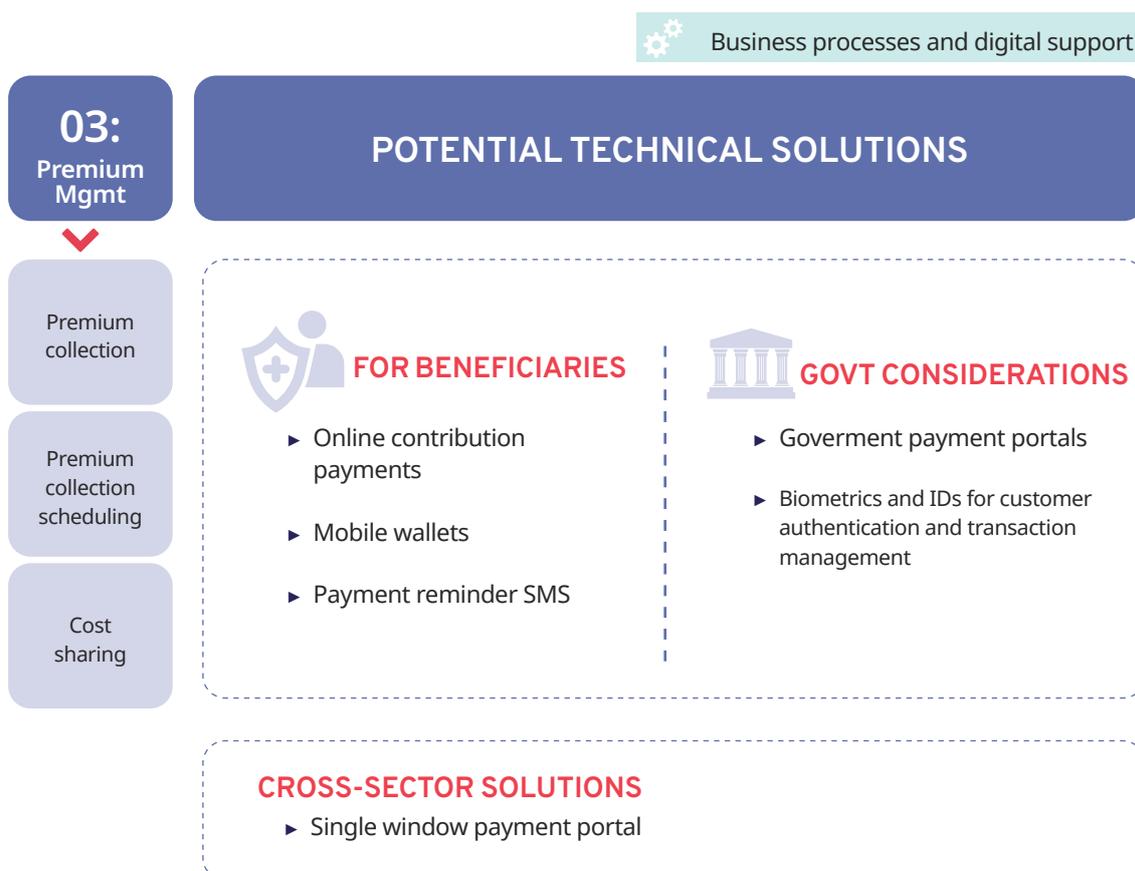
Similar to the above-mentioned central database for health facilities, it is also useful for health insurers if a clear workflow for the certification and accreditation of health workers (doctors, nurses, pharmacists and midwives) is in place. If the accreditation process cannot be done online yet, there should, at least, be a central database where all information on all accredited health workers are stored.

This is important from a **health insurance perspective**. In some countries, the number of dual practices is very high. Patients who visit an accredited provider may have to pay a surcharge because the consultation takes place after official opening hours. Without questioning the **dual-practice** here, the consequences on the reputation of a health insurance company should certainly be considered.

A customer who pays a regular contribution to a health insurance fund and still has to pay additional fees will never be happy.

3. Core Business Process Premium Management

Figure 4.11: Potential digital solutions for premium management



Source: Author’s own adaptation of the Joint Learning Network’s *Core business processes for Social Health Insurance* graphic.

The NHIF is using a variety of web-based and mobile digital solutions to keep its members engaged and to provide them better services

Digital Solutions

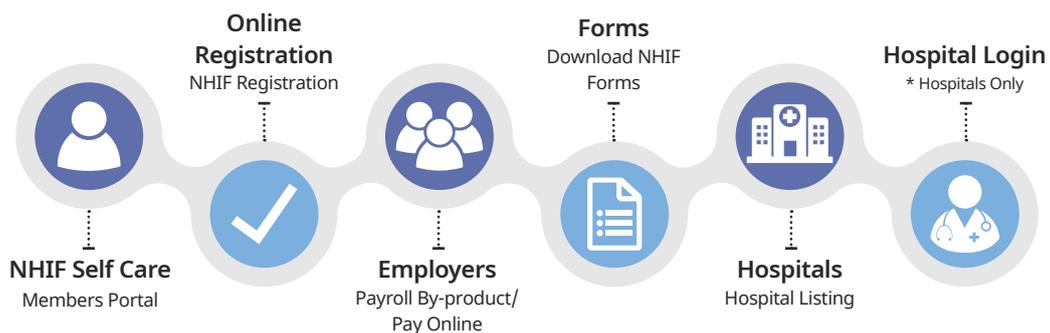
Mobile/Online Contribution Payments

The term online contribution payments refer to the payment of contributions to the health insurer using digital technology. These can be made directly by a member as well as by an employer. Such payments include cumulative payments also.

Technical solutions

The NHIF is using a variety of web-based and mobile digital solutions to keep its members engaged and to provide them better services. These are shown in the Figure 4.12 given below.

Figure 4.12: NHIF technical solutions



► EXAMPLE 9. KENYA: Mobile Payments of Contributions

The National Hospital Insurance Fund (NHIF) is a Kenya Government state corporation with a mandate to provide health insurance to all Kenyans over the age of 18. The core business for NHIF is to provide accessible, affordable, sustainable and quality health insurance for all Kenyan citizens who have attained the age of 18 years and have a monthly income of Kenyan shilling (KES) 1000 and above.

NHIF registers all eligible members from both the formal and informal sectors. It is compulsory for people from the formal sector to be a member of NHIF. For the retirees and those in the informal sector, fund membership is open and voluntary. To register with NHIF as a member, a Member's Form has to be filled in. To register as an employer or organized group, an Employer's Form is filled in.¹²

¹²<http://www.nhif.or.ke/healthinsurance/customers>



Certainly, the **M-Pesa Payment** option is one of the innovations for an individual member. Besides, the **“Payroll By-product”** option, can be used by employers to pay the contribution. Additionally, a new Health Service Platform – M- –was launched in 2016.

To use all of the above mentioned services, users have to first register. After registration, they get an NHIF membership number by SMS. This allows them to ace different NHIF self-care services such as payment of monthly contributions, payment of

penalties and arrears. It also allows them to select a hospital(s) of their choice for the main member and the dependents. At any time they can change the selected hospital for each member.

M-Pesa

The Figure below shows the procedure of paying contributions via M-PESA.

Figure 4.13: Process of making payment through M-PESA APP

MAKING PAYMENTS THROUGH MPESA

You can now make payments for monthly remittances before 9th of every month.

1. Go to the Mpesa menu and click on Lipa na Mpesa then select Pay Bill.
2. Enter 200222 as the NHIF Business Number.
3. Enter your National ID as the Account Number.
4. For a monthly payment, enter KES 500 or KES 6,000 to pay for the whole year.
5. Enter your PIN Number.
6. You will receive a message confirming that you have successfully paid.

*Safaricom Terms & Conditions Apply

Call us today (toll free) 0800 720 601

LIPA NA MPESA

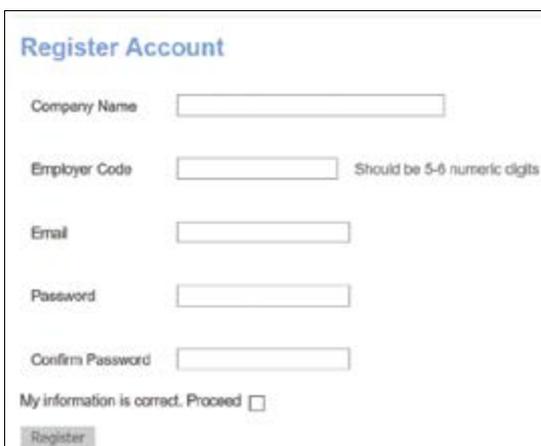
M-PESA registration makes processing faster and reduces the chances of human error

Payroll By-product

The NHIF has also introduced a far more efficient and faster method of collecting employers' monthly payroll by-products to NHIF via the online by-product system.¹³

Rather than sending hard copy documents or email of the same to NHIF, companies can just register and upload the documents once they log in. Only .xls and .xlsx files are accepted by NHIF, but this Fig.4.14. M-PESA registration makes processing faster and reduces the chances of human error.

Figure 4.14: M-PESA registration



The screenshot shows a web form titled "Register Account" with the following fields and elements:

- Company Name:
- Employer Code: Should be 5-6 numeric digits
- Email:
- Password:
- Confirm Password:
- My information is correct. Proceed
- Register button

¹³<http://www.nhif.or.ke/healthinsurance/byproduct>



An example of an .xls file is given below:

Figure 4.15: Format of .xls file for nhif submissible by companies

	A	B	C	D	E	F	G
1	EMPLOYER CODE	12345					
2	EMPLOYER NAME	YOUR COMPANY NAME					
3	MONTH OF CONTRIBUTION	2011-05					
4							
5	PAYROLL NO	LAST NAME	FIRST NAME	ID NO	NHIF NO	AMOUNT	
6	392	KAMAU	JOSPHAT KIMANI	1085678		320	
7	393	MOHAMMED	ADDI HUSSEIN	1320079		320	
8	394	ONYANGO	MARY AKINYI	1415746		320	
9					TOTAL	960	
10							
11							
12							

Mobile Wallets

There are many terms used for mobile, electronic or digital wallets, but most of them refer to cashless payments on the internet. The user loads a virtual or digital wallet with an amount determined by him. The preferred methods of payment depend on the provider's offer. The most common methods of payment include:

- ▶ credit card payment
- ▶ transfer
- ▶ direct debit system

Mobile wallets, which are digital purses, have recently become increasingly popular, especially because digital money transfer is becoming increasingly popular. If you look at the results of the Global System for Mobile communications Association (GSMA)'s "State of the Industry Report", the wallet market is predicted to grow rapidly by 79 per cent by 2025 (<https://www.gsma.com/mobileeconomy/>).

Unprecedented development witnessed in Africa is of particular interest here. Here, mobile wallets have already established themselves as indispensable financial instruments. Besides, the most important customer markets, including India, China, Latin America and the Philippines, are also about to make greater use of digital wallets. Soon digital wallets may become the number one financial instrument. The payment

The most important customer markets, including India, China, Latin America and the Philippines, are also about to make greater use of digital wallets. Soon digital wallets may become the number one financial instrument

process is extremely simple. A user has to install the appropriate app on a smartphone, enter the account data and, if the point of service supports Near-Frequency (NFC) technology, it is possible to pay with the smartphone.

The following example shows the concept of CarePay, where a mobile wallet is used for health purposes.

- ▶ *The case of Kenya Mobile Health Wallet has been discussed earlier in this report. See EXAMPLE 4. CONTINUED FOR KENYA: Mobile Health Wallet*

M-

The M- mobile health platform for inclusive healthcare was launched in Kenya in June 2016 by PharmAccess Foundation, M-Pesa pioneer Safaricom and Kenyan company CarePay. Any Kenyan citizen can sign up for the **mobile health wallet on a simple mobile phone** and add any number of dependents, whether friends or family to their wallet. A person can visit the clinics/ hospitals connected to the platform where and when they want, based on their healthcare needs. Clinics can register healthcare claims and bill their patients on a tablet that is connected to the mobile platform, and receive claims payments quickly. The collected data allow clinics to track the patients online, provide better disease management and monitor the quality of healthcare services as well as their financial income.

For both private funders and governments, the platform can increase the impact of available funds. The data provide transparent insights into healthcare needs and costs, the deposits of funds can be made directly in mobile health wallets at very low marginal costs and varying healthcare financing streams can be unified.

Taken together, M- enables subscribers to save, send, receive and pay for medical treatment through their phones. It also enables friends and family to send funds to loved ones exclusively for health expenditures and provide a secure channel for subsidies or vouchers from donors.

M- is addressing the needs of patients, providers and insurance companies

M- has incorporated lessons from earlier ventures to design a platform that connects patients, providers and payers in a seamless system and provides important benefits to each of these stakeholders. Patients can more easily save and **access resources such as government subsidies, product vouchers and contributions from family and friends**. Early adopters received matching funds from PharmAccess to incentivize enrolment and savings. M- payments are designed for transactions in small, irregular amounts, considering the uneven income and expenses of low-income populations. Savings used for preventative services reduce risks of long-term, costlier illnesses.

Participating providers benefit from M-'s marketing and training tools, receive a faster payout for services, and have more options to engage proactively with patients. Banks otherwise leery of lending to clinical providers with unsound financial health or poor accounting systems can use M- data to establish creditworthiness. The Medical Credit Fund provides cash advances based on clinics' cash flows through M- and M-PESA. Terms of repayment are calculated as a percentage of revenues earned at clinics, deducted directly from M- payments to the clinics.

Insurance companies connected through CarePay have lower administration costs and receive an instant analysis of transactional data for diagnoses made; treatments provided; and costs per patient, per clinic and per region. By tracking patient's journey and treatment protocols, the platform measures the quality of care and benchmarks providers.

The data generated by the app are also **helping insurance programmes to improve coverage**. Data on what types of services people use and how often are helping NHIF to tailor premium costs and benefits covered to increase its population coverage. Employer-supported insurance programmes also gain valuable insights for managing their costs and improving staff health. Oserian, a flower farm in Nakuru, Kenya, enrolled its 4,600 workers in health insurance through M-. Through the use of M-'s backend data, Oserian now has visibility into what services its employees are accessing and where those treatments are most successful

What are the challenges for M-?

M-'s rapid growth is impressive, but it faces some challenges. Approximately 4,000 users sign into M- every day, enabling real-time analysis of how, when, and where the platform is used. The data have shown that many accounts are dormant because low-income consumers have limited funds to save. M- has developed

tailored incentives, such as bonus top-ups, to encourage people to save. M- also allows relatives, friends and donors to make mobile money transfers to others, knowing that the money will be used for health care. Another challenge is that enrolling new participants into Kenya's national health insurance requires intensive education and better ways to help low-income Kenyans pay their monthly premiums through savings and nudges.

M- must also find ways to increase its efficiency, sustain its growth and reduce its dependence on donor funding. One learning has been to slow its enrolment of new providers. This is a costly process that requires training, the installation and maintenance of electronic devices, and service quality monitoring. Currently, providers upload their service data to a parallel reporting system, which increases their administrative burden. M- is exploring the ways how to integrate its platform with providers' existing systems and how to improve the quality of data.

Digital Payment Reminders

The term "digital payment reminders" refers to applications that remind existing/ potential contributors of the due date of their contributions. These functions are often integrated into existing digital applications such as a "Myinsurance" app.

Government Considerations & Cross-sector Solutions

Government Payment Portals

The goal of the e-payment gateway is to provide a mechanism for the processing of all government payment transactions. The e-payment gateway, a key enabler for the successful delivery of

payment services, could enhance the acceptance of e-services through its operational effectiveness. It can provide a single access point for all payment and billing offices, serving all ministries and departments of the central government for online payment transactions. Furthermore, all government payment transactions are searchable and collatable.

From the viewpoint of a statutory health insurance company, the central provision of an e-payment platform by a central Government agency can help save a lot of effort, time and work (as long as a good and transparent solution with appropriate support is offered).

► EXAMPLE 10. SPOTLIGHT INDIA

India is on the way to leverage the technology and cover its vast population. Data can be accessed from the following link: <https://gepg.nic.in/>

Government Service for Identification and Authentication

As mentioned in the chapter for Identification and ID Numbers, clear identification of beneficiaries is key. Many Governments are now looking into a solution where a National ID can be used as a unique key for connecting not only, the stakeholders within the health domain but also other partners beyond health (for example, Banking; Private Insurance). As data security and privacy is an important point to consider, the trend is towards a **distributed IT solution** that uses a unique digital key for data linkages but **without having a central database performing only data exchange**.

▶ EXAMPLE 11. CAMBODIA

Cambodia is currently developing a data exchange platform which allows secure and multi-lateral data exchange between different information systems over the Internet.

The project is in the design stage and updates are to be expected very soon.

Please check: <https://camdx.gov.kh>

▶ EXAMPLE 12. ESTONIA – Using a digital ID for implementing e-Government, including eHealth

Since 2002, in Estonia, every resident has had a digital identity. This identity is based on the unique identifier (personal ID number), digital certification organizations (police, certification centre), and physical security devices like smartcard (ID card), mobile SIM card (mobile ID) and smart ID. The digital identity has two functions: authentication and digital signature. The digital signature is available also for companies in the form of digital stamping. Besides X-Road and e-identity, the important infrastructure for e-health is a legal environment initiated by the Estonian government and implemented by the Parliament.

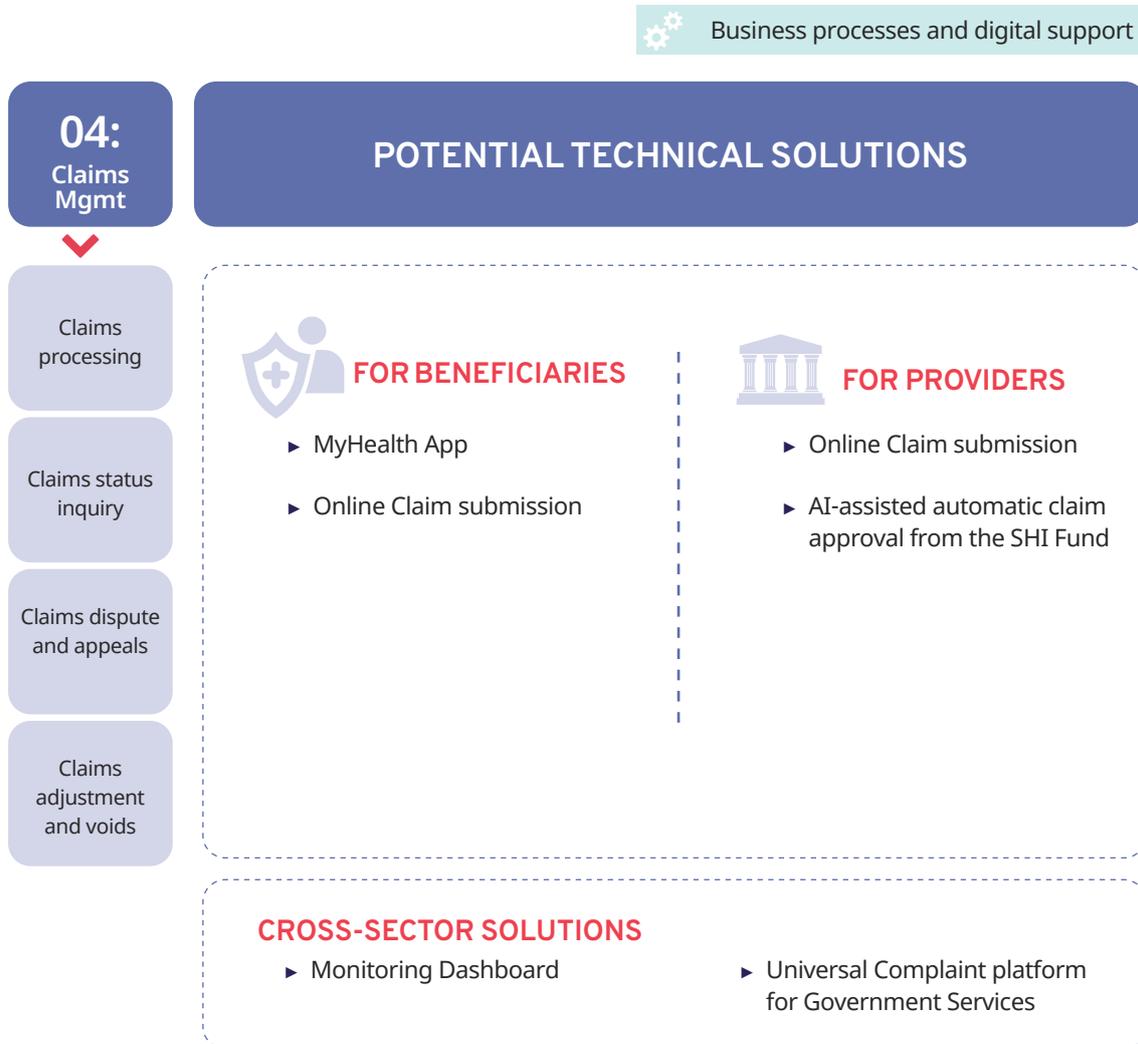
The first idea was to create separate legislation for the e-health system. However, due to the natural relationship between the e-health system and the healthcare system, and also due to the intention to direct healthcare professionals to accept and to use the e-health system, the relevant legislation was made part of the healthcare legislation. The Health Services Organization Act, Estonia which regulates the healthcare service provision, was extended by a new chapter on EHIS. This chapter lays down the responsibilities of patients, health service providers and provides requirements for document standards, and so on. For example, all healthcare providers must send certain health data to EHIS. The set of documents is defined by the law.

The Act also stipulates that access to patient data is available only to licensed medical professionals, legal representatives, or patients' trustees. In the Estonian e-health system, the concept of the attending doctor has been introduced. This means that the physician or a nurse must prove the treatment related to the patient when accessing the patient's data in EHIS. The Act also states (and this is realized in the patient portal), that the patient has the right to hide their data so that healthcare professionals are no longer able to view them. This could be done by either hiding a single document or by hiding all their personal data in EHIS.

All attempts to view healthcare data in EHIS are monitored by the government authorities and are reported to the patients in the patient portal. In case of suspicions of unlawful access to the data, necessary actions are taken immediately. According to the Act, an ethics committee was set up to lead discussions on patient's rights and to select the proper system for the EHIS. Citizens can access their own data, declare intentions and preferences, and monitor logs.

4. Core Business Process Claims Management

Figure 4.16: Potential technical solutions for claim management



Source: Author's own adaptation of the Joint Learning Network's *Core business processes for Social Health Insurance* graphic.

Digital Solutions

1. Coverage Status Check and Claim Submission by the Beneficiary

The word "insurance status and claim submission" in this chapter stands for all digital applications that **give a beneficiary** the option to access their insurance data online. This gives control over the insurance policy, allows him/her to see the billed services and allows him/her to submit the own reimbursement applications online (or just have them checked), if necessary.

The word "insurance status and claim submission" stands for all digital applications that give a beneficiary the option to access their insurance data online



► SPOTLIGHT EUROPE/ASIA/GLOBAL: Allianz Streamlines Medical-Claims Submissions with a New App

Members using the free MyHealth app provide details about their claim, take a photo of their medical invoices and submit it to the company. It is the latest example of a health insurer leveraging mobile to meet customers' demand for a simpler claims-submission process as well as quick access to services, especially during medical emergencies. The app also makes policy documents instantly accessible via a mobile device, whether the user is online or offline. Members previously had to find where they filed their hard-copy policy documents or had to log on to Allianz's online services to access the documents.

The app was developed after taking valuable inputs from a variety of clients. It enables the users to leave their paperwork at home but still be able to share policy documents and membership cards with a provider at the point of treatment. It also allows users to find nearby hospitals on a map with a GPS-enabled feature, includes a guide to local equivalents of brand name drugs, and can translate common ailments into 17 languages.¹⁴

2. Claim submission for health care providers

When leading managers of health insurance institutions are asked about the "next big thing" in the insurance industry, a solution for digital claim submission is very often mentioned. There is a need to receive claim submissions electronically and to use intelligent algorithms (using artificial intelligence) to identify the incorrect claims settlements and at the same time, detect fraud and abuse. This dream might become true in

the near future. Some countries have already invested in electronic solutions for electronic claim submission. Regardless of the enormous potential, critics say that humans must always be on top of the IT system, as individual decisions are sometimes necessary, especially in the area of health. It should never be a machine alone that decides whether a certain insurance benefit is provided or not.

¹⁴<https://www.retaildive.com/ex/mobilecommercedaily/allianz-streamlines-medical-claims-submissions-with-new-app>

► EXAMPLE 13. GHANA

NHIA LAUNCHES CLAIMS PAYMENT APPLICATION

The National Health Insurance Scheme (NHIA) of Ghana has the goal to provide equitable access and financial coverage for basic health care services to all Ghanaian citizens. The government supports all 212 Districts, Municipal and Sub-metro schemes in Ghana in the set-up of the scheme.

Different types of premiums are available under the country's NHIS. Ghanaian contributors are grouped according to their levels of income. Based on the group, a Ghanaian contributor falls in, a specific premium that ought to be paid is determined. A Ghanaian's contribution payable could vary from one district to the other as even the disease burden was also not the same in all the districts. To ensure that all Ghanaian citizens made some contribution to the scheme, a 2.5 per cent Health Insurance Levy on selected goods and services was passed into law so that the money collected could be put into a National Health Insurance Fund to subsidize contributions.

Technical solutions – Claim-it app for providers

The NHIA has launched an app known as "Claim-it" to replace the manual, cumbersome paper-based process that has been the cause of undue delays and standoffs between the National Health Insurance Scheme and its service providers. The product was successfully piloted at 15 public health facilities in Greater Accra and Eastern Regions before launching at the end of 2016.

Speaking at the product launch in Accra, the Chief Executive Officer of NHIA ascertained that "...all claims submitted for adjudication are **validated by the application** and ensure due diligence prior to claims submission. The provider-end module runs fully offline, allowing users to work independently without internet, needing to interact with the internet only when necessary, for the purpose of system updates and claims submission." The Director-General (DG) of the Ghana Health Service termed the introduction of the software as a big leap forward in the operations of the scheme in the country. He said that he was confident the new software would **tackle the incidents of fraud** within the National Health Insurance system. The DG stated that: "This software will solve many problems. For us, it will reduce the number of rejections that come in, which means that if you see a patient, you ensure that you **submit the right type of claims** and ensure that at the **level of care** you prescribe that is **demand of you**. It will always ensure that that gatekeeper system works."¹⁵

A few more details:

The CLAIM-it app serves as a platform that allows health providers' credentials by the National Health Insurance to generate and submit claims. It implements and enforces all the necessary claims generation rules and protocols of the NHIS. Hence all claims submitted for reimbursement are validated by the software, ensuring due diligence prior to claims submission. The application runs fully offline, allowing users to interact with the Internet only where necessary for the purposes of system updates and claims submission. The application can be installed and operated on a single user computer or implemented as a network application with as many user nodes as needed. It can also be integrated into any existing Hospital Health Management System (HMS). Claims are submitted electronically by downloading and saving claims on a flash drive for later submission or submitted directly to NHIS over the Internet. The application also has a printing feature for the printing of claims where necessary.

¹⁵<https://www.pharmaccess.org/update/11388/>

Figure 4.17: Benefits of claim-it APP



Figures: (4.18 and 4.19) below show two screenshots from the APP interface.

Figure 4.18: Validation status toggling

Claim-it Import Report

Overview

Report Date	Mon 31 Jul 2017 01:06 pm					
Claim Month	Passed	Warning	Failed	Total Volume	Total Cost (GHC)	Total Updated Cost Diff (GHC)
Feb 2017	4,916	0	792	5,708	199,336,10	0.00
Totals	4,916	0	792	5,708	199,336,10	0.00

Validation Details

ERROR SAVED

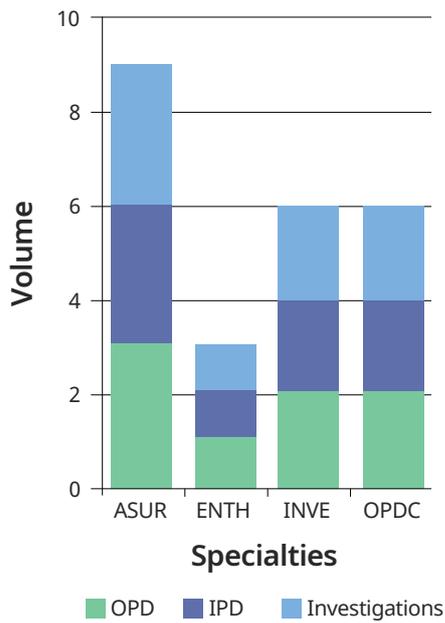
No.	Claim ID	Out-come	Cost (GHC)	Init. Cost (GHC)	Diff. (GHC)	Details	
13	447515	ERROR	-	-	-	1. Specially attended ZOOM is invalid or not applicable 2. GDRG for Diagnosis 1 (ZOOM02A) is not applicable 3. GDRG for Diagnosis 2 (ZOOM02A) is not applicable	DETAILS
15	450851	ERROR	-	-	-	1. Specially attended ZOOM is invalid or not applicable 2. GDRG for Diagnosis 1 (ZOOM02C) is not applicable 3. GDRG for Investigation 1 (INVES52D) is not applicable 4. GDRG for Investigation 2 (INVES99D) is not applicable 5. GDRG for Investigation 3 (INVES09D) is not applicable	DETAILS
18	442435	ERROR	-	-	-	1. GDRG for Diagnosis 1 (OPDC02A) is not applicable	DETAILS
26	444231	ERROR	-	-	-	1. Indicate whether the baby is a dependent or not.	DETAILS
27	444669	ERROR	-	-	-	1. Indicate whether the baby is a dependent or not.	DETAILS
60	445509	ERROR	-	-	-	1. Specially attended ZOOM is invalid or not applicable 2. GDRG for Diagnosis 1 (ZOOM02A) is not applicable 3. GDRG for Diagnosis 2 (ZOOM02A) is not applicable	DETAILS

Figure 4.19: Utilization table and charts from the app interface

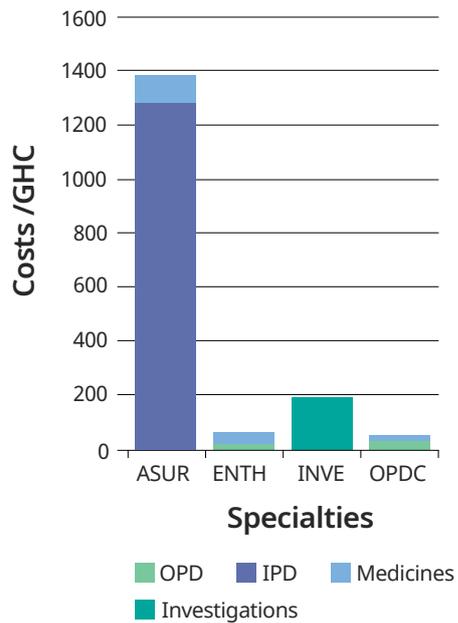
Utilization Table

	OPD		IPD		MEDICINES	INVESTIGATIONS		TOTAL (GHC)	
	VOLUME	COST	VOLUME	COST	COST	VOLUME	COST	VOLUME	COST
ASUR	0	0.00	3	1,281.87	94.68	0	0.00	3	1,376.55
ENTH	1	20.16	0	0.00	42.80	0	0.00	1	62.96
DIAGNOSTIC	0	0.00	0	0.00	0.00	2	191.84	2	191.84
OPDC	2	32.14	0	0.00	23.02	0	0.00	2	55.16
TOTAL (GHC)	3	52.30	3	1,281.87	160.50	2	191.84	8	1,686.51

Claim Volumes per Specialty



Claim Cost per Specialty



Source: <http://claimit.nhia.gov.gh/>

► EXAMPLE 14. TAIWAN (CHINA): SHI cost savings - Medi Cloud

Taiwan (China) , like the Republic of Korea, is experiencing financial pressure on health insurance. Taipei, unlike Seoul, has found a way to save health budgets in IT. The island country has improved the healthcare system, by sharing treatment records through the cloud, preventing overlapping check-ups, and confirming personal health records in real-time. To save money, Taiwan set about to reform the health insurance system by making the most of IT. The Taipei government set up Pharma Cloud (see above) in 2014, and Medi-Cloud in 2015.

Technical solution

On the Medi-Cloud screens are a wide variety of data, such as three months' medical records, six months' operation, and check-up records, 24 months' teeth treatment records, check-up results, situations when leaving hospitals, rehabilitation records, and specific medicines' treatment records. In the case of images, the results of six kinds of check-ups – MRI, X-ray, ultrasonic

tests, dental X-ray, and microscopes – can be shared for two months. The agency offers incentives to hospitals that submit medical records to Medi-Cloud. Since the introduction of the Medi-Cloud system, the health insurance agency has been **able to save US\$10 million in the drug costs** to treat six diseases, including high blood pressure and diabetes, and **reduced US\$38.9 million in conducting 20 major check-ups**, including those using CT and MRI.¹⁶



¹⁶<http://www.koreabiomed.com/news/articleView.html?idxno=4635>

5. Core Business Process Accounting

Several accounting systems in the market are suitable for the financial monitoring of health insurance companies. This document has not listed specific products at this point because the functionalities of all the leading accounting solutions on the market can be easily adapted to the needs of the accounting department of a health insurance implementer. However, it should be noted that online banking has been opening new opportunities for some time now, which are not yet sufficiently used in many countries.

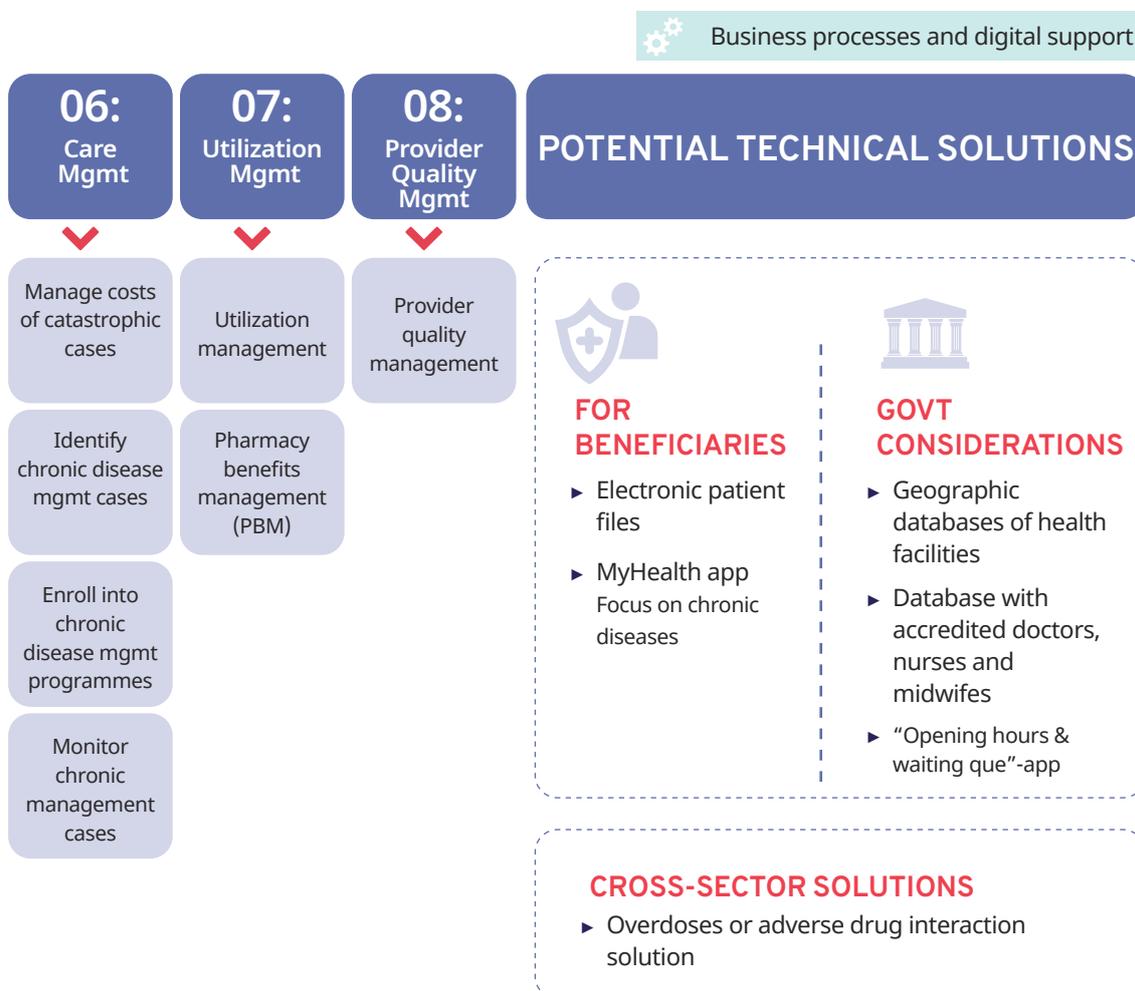
In the analysis of different existing identification systems in the health sector in Myanmar, Laos, Cambodia, Vietnam and Nepal (ADB, 2015), it becomes evident that accounting, as well as monitoring & evaluation tools, often operate in parallel to the core systems, such as contribution collection or claim payments, without any connections. It should be possible for a health insurance operator to check on daily or at least monthly the contributions that have actually been received and the payments that have been made to health providers.

In the analysis of different existing identification systems in the health sector in Myanmar, Laos, Cambodia, Viet Nam and Nepal, it becomes evident that accounting, as well as monitoring & evaluation tools, often operate in parallel to the core systems



6-8. Core Business Process Health Care & Utilization Management

Figure 4.20: Potential technical solutions for care and utilization management



Source: Author’s own adaptation of the Joint Learning Network’s *Core business processes for Social Health Insurance* graphic.

Digital Solutions

1. Digital Electronic Patient Files

Electronic medical records (EMRs) are a digital version of the paper charts in the clinician’s office.

Electronic health records (EHRs) do all those things—and more. EHRs focus on the total health of the patient—going beyond standard clinical data collected in the provider’s office and inclusive of a broader view on a patient’s care. EHRs are designed to reach beyond the health organization that originally collects and compiles the information. They are built on sharing information with other health care providers, such

as laboratories and specialists, so they contain information from all the clinicians involved in the patient’s care.

Remote access to electronic health allows managing a person’s health information on the go with the mobile electronic device. Via this device (laptop, smartphone), a person may have access to medical data such as consultation results and lab results but it might also allow the request for prescription renewals and to communicate securely with physicians, schedule appointments, and more.

▶ EXAMPLE 15. SPOTLIGHT UK

A study on the impact of patient record access (2014)¹⁷ was done by medical students in the UK, as mentioned below:

They asked patients in two general urban medical practices who used remote access whether it had increased or decreased their use of those providers over the previous year. Using practical data, they calculated the change in appointments, telephone calls and staff cost. They also estimated the reduction in environmental costs and patient time. Following are the findings of the study:

- ▶ Patient record access is likely to save time for patients and practices.
- ▶ If 30 per cent of patients accessed their electronic general practice record online at least twice a year, a 10,000-patient practice is likely to save 4,747 appointments and 8,020 telephone calls each year – about 11 per cent of appointments.
- ▶ Patient record access offers environmental savings from fewer patient visits.
- ▶ There is a business case for patient record access for UK general practice.

The government had made a commitment that all the interested patients would be able to have online access to their electronic GP records by 2015.

Studies in the US suggest the opposite – that remote access can **reduce resource demand**. In Kaiser Permanente, RA linked with secure messaging led to a 25 per cent reduction in visits to primary care and a 14 per cent reduction in telephone calls. Cisco, US company found that 87 per cent of employees with RA had fewer work absences and 72 per cent said they reduced physician office visits, saving over US\$4 for every US\$1 invested in RA. There was a reduction in telephone calls to primary care in Teito in Finland when record access began.

Generally from a health insurer's perspective, Remote access for patients to their own health data has following advantages:

- ▶ Services rendered by the medical provider and services not rendered are directly known to the patient. This can be helpful for random checks with regard to correct claim billing;
- ▶ Depending on how the portal/app is structured, the customer can see directly which services the doctor wants to claim from the health insurance;
- ▶ Expensive visits to the doctor for minor cases can be avoided if, for instance, the patient does not have to travel to the health facility only to get an explanation of the laboratory results.

Government considerations and cross-sector solutions

The Government considered establishing a Government Cloud service which enables

physicians at contracted medical services providers to search patients' **medication records** over the previous three months.

¹⁷<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4235347/>

- ▶ *Another case of medical cloud system for Taiwan (China) has been discussed earlier in this report. See EXAMPLE 14. CONTINUED FOR TAIWAN (CHINA): Medication Records - Pharma Cloud System*

The National Health Insurance programme is compulsory for all citizens starting from birth. It is based on the concept of mutual assistance and depends on the insured paying their premiums according to regulations. By law, every Taiwanese citizen with official residency or foreign national living in Taiwan with an Alien Resident Certificate (ARC), regardless of age, gender, or employment status, must enrol in the programme. Also, this insurance programme lasts an entire lifetime. No one may arbitrarily withdraw, except those who lose their insurance eligibility (such as people who give up their Taiwan citizenship, move abroad, let their Alien Resident Certificate expire, or a person who goes missing). Taiwan has a dense network of health care providers, and if people do not regularly seek care at a fixed facility, their medical records end up scattered across several different medical institutions. This can result in a patient taking double doses of the same medicine or medicines which should not be taken together. This can lead to overdoses or adverse drug interactions.

Technical Solution

The National Health Insurance Administration adopted cloud technology in July 2013 to set up the patient-centred “NHI PharmaCloud System.” The system enables physicians at contracted medical services providers to search patients’ **medication records** over the previous three months. The records contain:

- ▶ The sources of the prescriptions;
- ▶ The diagnoses behind the prescriptions;
- ▶ The pharmacological effects of the drugs;
- ▶ The names of the drugs’ ingredients;
- ▶ The drugs’ names, specifications, and pharmaceutical NHI codes;
- ▶ Drug usage and dosage instructions;
- ▶ Patient treatment dates;
- ▶ Chronic disease refill prescription drug claim dates;
- ▶ Drug amounts;
- ▶ Number of drug administration days; and
- ▶ Calculation of the number of days of medicine that should be left for each prescription.¹⁸

¹⁸https://www.nhi.gov.tw/english/Content_List.aspx?n=02BA04454AED80E0&topn=BCB2B0D2433F6491



Information in the NHI PharmaCloud System can be accessed by **medical professionals authorized by NHI-contracted medical institutions after dual-card verification** (such as, the medical personnel's card and the patient's NHI card) through an **exclusive card reader** (containing a verification chip). Medical professionals shall also comply with regulatory restrictions and keep known patient information confidential when providing medical services. Safeguarding Medication Safety through the "NHI PharmaCloud System".

As doctors examine patients, they can find out which **drugs patients have recently used or are using currently through the "NHI PharmaCloud System"**. When issuing prescriptions, they will be able to see whether or not the medication taken has been repeatedly taken or whether there are drug interactions, thereby improving medication

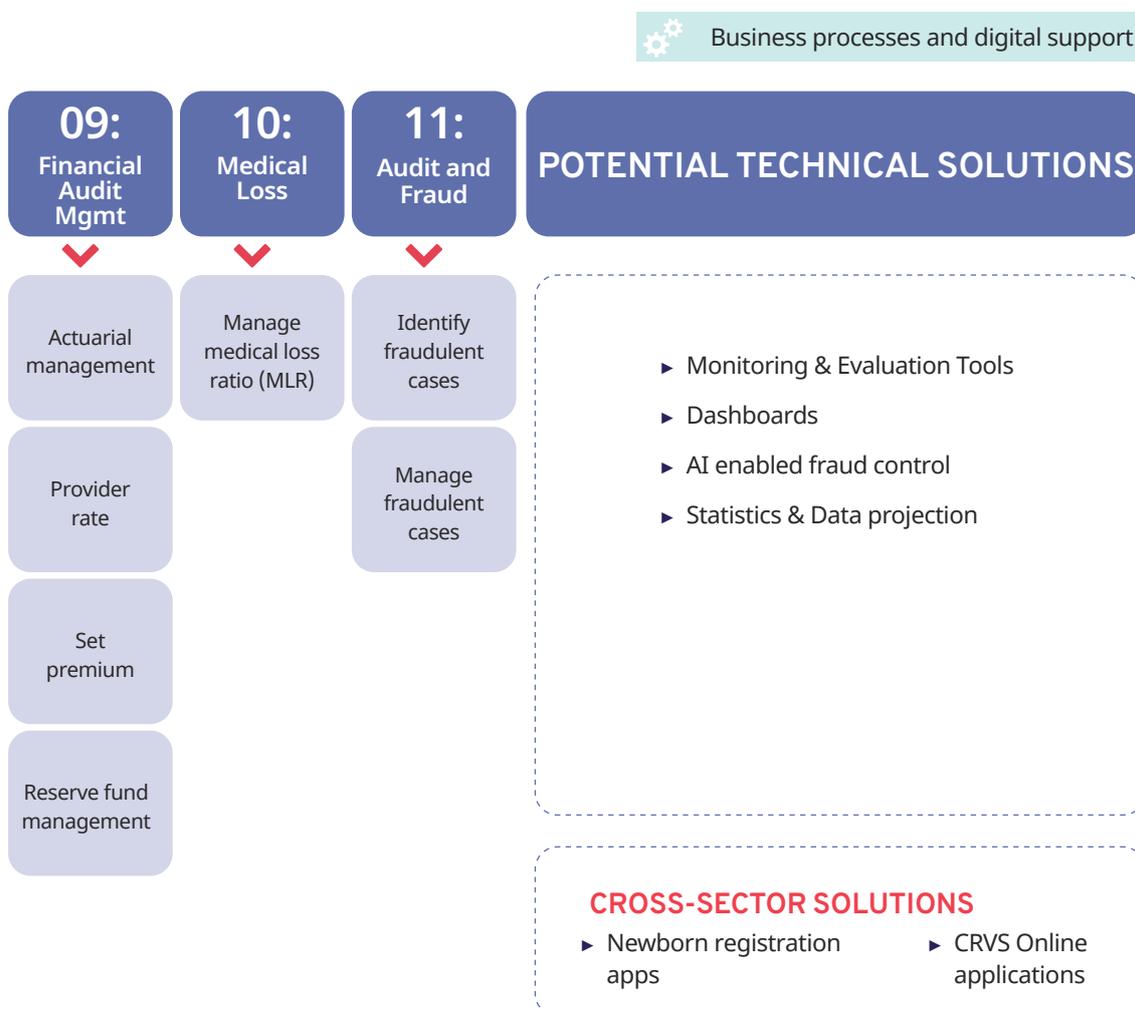
safety and quality. In addition, they will also take more initiative to care for patients, thus enhancing doctor-patient relationships. Patients can also take the initiative to remind the doctor or pharmacist when seeking attention to help them understand their recent medical information; accompanying family members may also remind the doctor to check the patient's past medical records. If both the doctor and the patient attach importance to medication safety, the doctor's prescription will be better informed, benefiting patients, physicians and the NHI system.

As of 31 July 2015, **all hospitals in Taiwan were connected to the NHI PharmaCloud System**, and a total of 15,108 contracted medical institutions, including hospitals, clinics, pharmacies and home care institutions, had conducted searches on the system.¹⁹

¹⁹https://www.nhi.gov.tw/english/Content_List.aspx?n=02BA04454AED80E0&topn=BCB2B0D2433F6491

9-11. Core Business Processes Financial Audit & Loss and Fraud control

Figure 4.21: Potential technical solutions for financial audit & fraud control



Source: Author’s own adaptation of the Joint Learning Network’s *Core business processes* for *Social Health Insurance* graphic.



▶ Conclusion

As the desk review on existing technological solutions for Social Health Insurance Operators was partly carried out during the COVID-19 crisis, it became evident how rapidly the population is getting used to mobile technologies when the urgency and importance of doing so become clear. It also became apparent that not all applications were of direct benefit to the public and that data protection issues urgently need to be clarified.

According to the **Digital Health Blueprint**, the Government of India envisages the attainment of the highest possible level of health and well-being for all age groups. The most promising approach, adopted by National Health Policy towards this goal, is the **extensive deployment of Digital Tools/Technology** to enhance health system performance.

The Government is committed to Universal Health Coverage for all citizens; to make healthcare **affordable**, accessible, and equitable, and Digital Health technology has immense potential for supporting Universal Health Coverage (UHC).²⁰

The National Digital Health Blueprint suggests the creation of a National Digital Health Ecosystem and the analysis of existing Organizations and IT Initiatives.

The health policy leadership in India has highlighted that Health Insurance is a part of a larger Digital Ecosystem.

Institutions like the ESIC are using Digital Solutions in their “core” Social Health Insurance Processes. At the same time, such solutions are being deployed for stakeholders and business processes in ESICs other work areas such as telemedicine, online classes, lab reports, electronic health records, pandemics and training classes.

The ESIC agreed that “**digital transformation is all about people and not about technology**”, **that is**, to serve the end-user and hence needs to be interlinked with all operations of health insurance and its different enabling actors and providers. While in many countries, this message has not yet reached all healthcare leaders, and digital transformation is still widely seen as a task for the IT department, the ESIC understands the importance of looking beyond and across functions for integrated digital solutions.

ESIC has already invested in digitizing the core business areas and all ESIC offices, as well as all “ESIC accredited” health facilities, are connected electronically with access to patient files. To deal with the high volume of claims per day received electronically, ESIC is also exploring innovative digital solutions for easing claims management processes.

This document is developed as a useful information source for ESIC and similar institutions with the need and commitment for adopting digital solutions for improving their core functions and end-user experience.

²⁰https://www.nhp.gov.in/NHPfiles/National_Digital_Health_Blueprint_Report_comments_invited.pdf

When looking at the country examples in the report, it is noticed that the **complexity of some digital solutions is easily under-estimated or over-estimated**. The complexity of implementing digital solutions is not only due to the large number of beneficiaries - which ESIC undoubtedly has - but also arises from dependencies to other government stakeholders.

An excellent example of this complexity is the seemingly “easy to implement” solutions of mobile apps for:

- ▶ Finding the nearest accredited doctor
- ▶ Seeing the associated service fees of accredited health facilities
- ▶ Scheduling appointments online
- ▶ Displaying the waiting time in health facilities
- ▶ Rating a health facility service quality

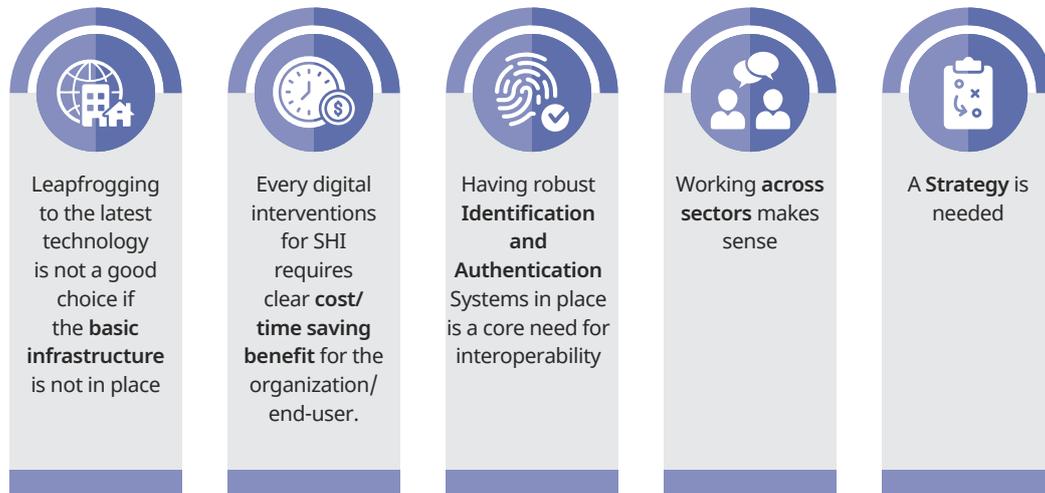
The complexity of some digital solutions is easily underestimated or over estimated



► **The complexity of implementing digital solutions**

is not only due to the large number of beneficiaries but also arises from dependencies on other government stakeholders.



Figure 5.1: Essential ingredients for successful upscaling of social health insurance schemes

Source: Author's own adaptation from various sources.

Without registries in place, GPS data and transparent standards for the process of doctor accreditation, these mobile Apps may not **work successfully. However, the coding can be done by every skilled programmer.**

Five essential ingredients for successful upscaling of Social Health Insurance Schemes have been identified as:

1. A clear **digital strategy** for ESIC is embedded in a broader digital health eco-system
2. Strong and **committed leadership**
3. Organizational change facilitators because Digital Transformation needs to be driven by culture and **mindset change within the organization.** The technology bit is an enabler and a means to make the change tangible.
4. **Innovative technical people.**
5. A **robust technical basic infrastructure** (for example, power, network)

The Way Forward

ESIC has already invested in digital solutions, and success is visible. The country examples presented in this document may provide additional attractive and useful solutions. It is clear that the successful use of digital technology, especially the use of data material for planning and monitoring depends very much on the data input of the user. Therefore, it is important for the physicians to record the data of their patient correctly. This could have high-value returns where a smart algorithm can reliably support them in the treatment of the patient at a later stage. The same goes for recording the claims-related and other types of data.

The goal should be to identify priorities for making strategically correct decisions about the best digital solutions.

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