THAI CIVIL REGISTRATION AND VITAL STATISTICS AND UNIQUE IDENTIFICATION NUMBER SYSTEMS FOR UNIVERSAL HEALTH COVERAGE: A CASE STUDY

DISCUSSION PAPER **August 2019**

Supasit Pannarunothai
Boonchai Kijsanayotin
Samuel Mills

THAI CIVIL REGISTRATION AND VITAL STATISTICS AND UNIQUE IDENTIFICATION NUMBER SYSTEMS FOR UNIVERSAL HEALTH COVERAGE:

A Case Study

Supasit Pannarunothai
Boonchai Kijsanayotin
Samuel Mills

August 2019

Health, Nutrition and Population (HNP) Discussion Paper

This series is produced by the Health, Nutrition, and Population Global Practice of the World Bank. The papers in this series aim to provide a vehicle for publishing preliminary results on HNP topics to encourage discussion and debate. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to the World Bank, to its affiliated organizations or to members of its Board of Executive Directors or the countries they represent. Citation and the use of material presented in this series should take into account this provisional character.

The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of the World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

For information regarding the HNP Discussion Paper Series, please contact the Editor, Martin Lutalo at mlutalo@worldbank.org or Erika Yanick at eyanick@worldbank.org.

Health, Nutrition and Population (HNP) Discussion Paper

Thai Civil Registration and Vital Statistics and Unique Identification Number Systems for Universal Health Coverage: *A Case Study*

Dr. Supasit Pannarunothai[a], Dr. Boonchai Kijsanayotin[b], Dr. Samuel Mills[c]

[a] Centre for Health Equity Monitoring Foundation, Phitsanulok, Thailand
[b] Health Information Standards Development Center, Health System Research Institute, Ministry of Public Health, Bangkok, Thailand
[c] Health, Nutrition and Population, The World Bank, Washington, D.C., United States

This paper is part of a series of country case studies that the World Bank Health, Nutrition and Population Global Practice has commissioned.

Abstract: The Thai civil registration (CR) system was established two centuries ago. Over the past four decades, the system has changed from a manual, paper-based registration system to a centralized, electronic, online system. A unique identification number (UIN) system was implemented in 1982, along with a computerized CR database system. The Thai citizen identification card has evolved along with the two systems from a paper card to an integrated circuit–chip smart card. All provincial-, district-, and municipality-level registration offices are linked online to the central CR system database.

Thailand's vital statistics (VS) system has improved since 1996, when the CR system began feeding electronic birth and death data directly into the VS management system. VS reports are now up to date, of good quality, and available for use by any agency that needs them.

Thailand declared its universal health coverage (UHC) policy in 2001. Health insurance coverage was expanded to all Thais through the Universal Coverage Scheme. The use of UINs and CR databases has enabled and facilitated rapid enrollment of beneficiaries and improved the beneficiary registries of all three of the country's major insurance plans. All Thais are entitled to coverage from one of these plans. The use of UINs and personal demographic information from the CR system significantly improved the quality of health care information and provider payment systems.

Misuse of UINs and personal information in CR is threatening the integrity of the UIN and central CR databases. New initiatives by the Thai government, such as the National Digital Identification Platform project, are ongoing to expand e-

government and private services and to prevent the misuse of personal information and personal identity challenges.

Keywords: Thailand, civil registration and vital statistics, unique identification number, health insurance, universal health coverage

Disclaimer: The findings, interpretations and conclusions expressed in the paper are entirely those of the authors, and do not represent the views of the World Bank, its Executive Directors, or the countries they represent.

Correspondence Details: Samuel Mills, The World Bank, 1818 H Street NW, Washington, D.C., 20433, United States, Telephone: +1-202-473-9100, Fax number: +1-202-477-6391, Email: smills@worldbank.org, Website: http://www.worldbank.org

Table of Contents

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

BORA	Bureau of Registration Administration
CID	Thai citizen identification
CR	Civil registration
CRVS	Civil registration and vital statistics
CSMBS	Civil servant medical benefit scheme
DRG	Diagnosis-related group
MOI	Ministry of Interior
MOPH	Ministry of Public Health
NHSO	National Health Security Office
PID	Personal Identification number
SSS	Social security scheme
UCS	Universal coverage scheme
UHC	Universal health coverage
UIN	Unique identification number
UNICEF	United Nations Children's Fund
VS	Vital statistics
WBG	World Bank Group
WHO	World Health Organization

ACKNOWLEDGMENTS

This report was prepared by Dr. Supasit Pannarunothai (Centre for Health Equity Monitoring Foundation) and Dr. Boonchai Kijsanayotin (Health Information Standards Development Center, Ministry of Public Health (MOPH), Thailand). Dr. Samuel Mills (WBG) provided input and overall guidance. The report also benefited greatly from the input of many experts and people from many organizations in Thailand, including the Bureau of Registration Administration (BORA), Ministry of Interior (MOI), Mae Sot Hospital, MOPH, National Health Security Office, and the United Nations Children's Fund (UNICEF) and U.N. High Commission for Refugees offices in Thailand, who have worked in CRVS, UHC, and social welfare for many years. The World Bank, Korea-World Bank Partnership Facility, and the Gavi Alliance are gratefully acknowledged for financial support. The authors are grateful to the World Bank for publishing this report as an HNP Discussion Paper.

PREFACE

The World Bank Group (WBG) Data Council endorsed the 2016–2030 Civil Registration and Vital Statistics)CRVS(Action Plan in December 2015, which has a goal of achieving universal civil registration (CR) of births, deaths, and other vital events—including reporting cause of death and providing access to legal proof of registration—for all individuals by 2030. The WBG has been working closely with development partners to provide the requisite support to countries through three interlinked initiatives: the Strategic Actions Program for Addressing Development Data Gaps, the Identification for Development initiative, and the Global Financing Facility.

The WBG has two goals: to end extreme poverty and promote shared prosperity in a sustainable way. The WBG Health, Nutrition, and Population Global Practice contributes to the two WBG goals by helping countries improve HNP outcomes and reduce impoverishment due to illness. It is assisting countries to accelerate progress towards universal health coverage)UHC(, ensuring that all people have access to the quality, essential HNP services they need without enduring financial hardship. Documenting and disseminating of the CRVS-related country case studies, such as the use of a unique identification number)UIN(for UHC are key to this process.

This report on Thailand, one in a series of case studies commissioned by the Health, Nutrition, and Population Global Practice, provides a comprehensive view of how the Thai CR and identity management system, along with the Health Information System, facilitated achievement of UHC and other social welfare roles in Thailand.

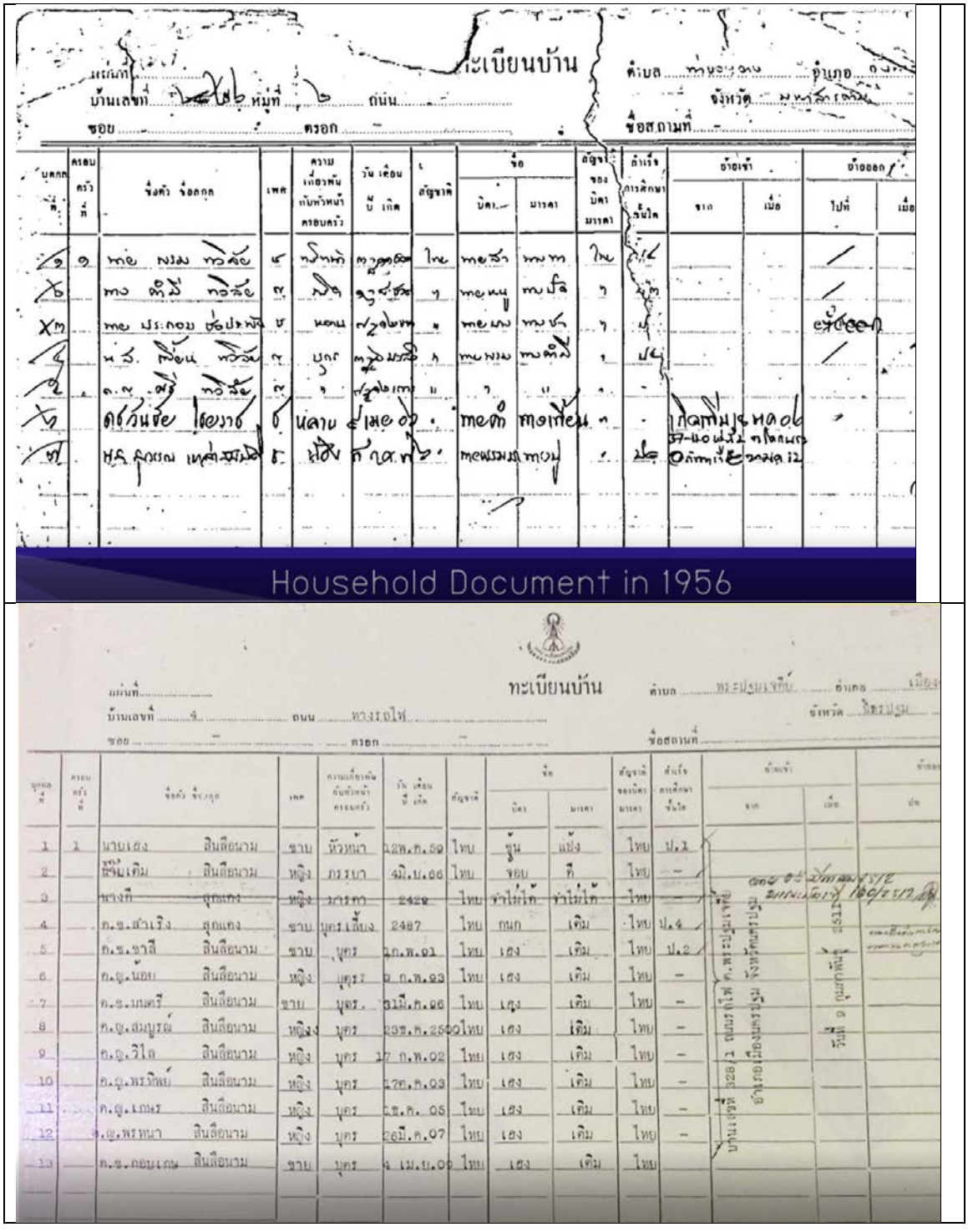
PART I – CIVIL REGISTRATION SYSTEM, UNIQUE IDENTIFICATION SYSTEM AND CITIZEN IDENTIFICATION CARD

1.1 EVOLUTION OF A CR SYSTEM

The first CR law in Thailand, enacted in 1909, specified that a population registration system should be prepared and maintained and a birth and death registration system should be created. In 1917, the requirement to register births and deaths was enforced throughout the kingdom. With the arrival of democracy in 1936, the Civil Registration in Municipal Areas Act was issued, which facilitated creation of a network of local registry offices and acting registrars and set out clear guidelines for registration of births, deaths, fetal deaths)for the first time(, households, and population registration and directed that births and deaths be entered into the population register. A comprehensive CR act passed in 1956 was applicable to the entire country and superseded earlier laws. A population census was conducted and systematic household and individual registration was established. The act required that a document be created for each household, entered into the population register, and provided to each household (figure 1(. Improved facilities were offered for the reporting of vital events, and additional registration offices were opened around the country.

From 1970 to 1972, significant improvements were made in the CR system, with a view to achieving a high level of accuracy and completeness of registration. All forms and registers were reviewed and revised. Birth and death certificates replaced birth and death registers, and household register forms were replaced with improved forms. In 1972, Announcement No. 234 of the Revolution Council)established after the military coup d'état(revised the Civil Registration Act of 1956. It established a hierarchy of registration authorities from the central government to the district level and clear procedures for CR and specified types of informants, places and times for registration, forms, functions, responsibilities of registrars, and other requirements for registration. The MOI issued the Regulation of Central Civil Registration Division of 1973, on the basis of which the provisions of the 1972 act were implemented.

Figure 1. **Household Registration Document**



The national CR authority is the Civil Registration Division, Department of Local Administration, MOI. Located in Bangkok, the capital of Thailand, the division directs, coordinates, and supervises CR throughout the country. The Director of the Department of Local Administration is the Registrar-General. The Head of the Civil Registration

Division serves as the Deputy Registrar-General. The primary registration units, located in municipalities and districts, are responsible for recording vital events in accordance with regulations and instructions that the Civil Registration Division issues.

By law, births must be registered within 15 days and deaths and stillbirths within 24 hours. The head of the household or the baby's mother is responsible for reporting a birth or stillbirth to the local registrar. In the case of death, the head of the household or the person who finds the body must report the event. According to the situation, a vital event may be reported to the local registrar at the municipal office, the *tambon* registrar at the subdistrict level, or the assistant *tambon* registrar at the village level. The MOI appoints registrars, who are MOI officers)Kijsanayotin 2011; Kijsanayotin et al. 2013).

1.2 THE COMPUTERIZED POPULATION DATABASE

The CR system improved significantly after the MOI established the Population Identification Number Project in 1982, which enabled the creation of a computerized population database)figures 2, 3 and 4(. More than 50 million population records from the paper registration system were digitized into the central computerized population database. The data input process took longer than three years)1984-1987(to complete. The computer center for CR was established in the Civil Registration Division, which became BORA, Department of Local Administration, MOI. Because of the project, in 1990, the MOI received the ComputerWorld Smithsonian award[1] in the governmental and nonprofit category for automating population demographic data collection and developing five subsystems to track Thailand's 50 million people and enable more accurate planning in healthcare, education, and economic development)Enterprise 1990).

[1] The ComputerWorld Smithsonian Award has been given annually since 1989 to individuals or organizations that have used technology to produce beneficial changes for society. A group of 100 chief executive officers of information technology companies propose nominees.

Figure 2. Operators Working Around the Clock to Create a Computerized Population Database

More than 1,000 Operators Working Around the Clock in Three Shifts Verifying 50 Million Population Records from the Paper Population Registration System and Entering Them into a Computerized Central Database: 1984–1987

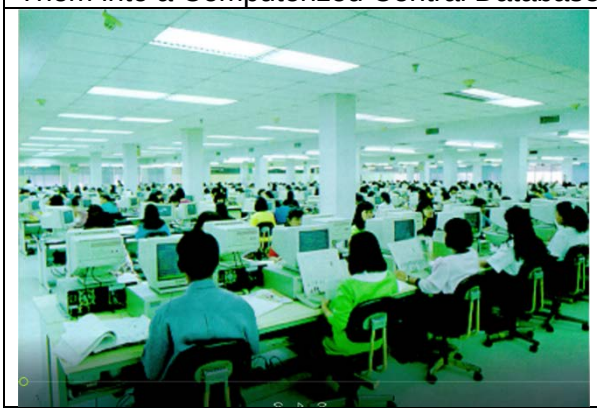


Figure 3. Computer-Generated Household Document with Unique Household Identification Number)11 digits(and Personal Identification Number)13 digits(

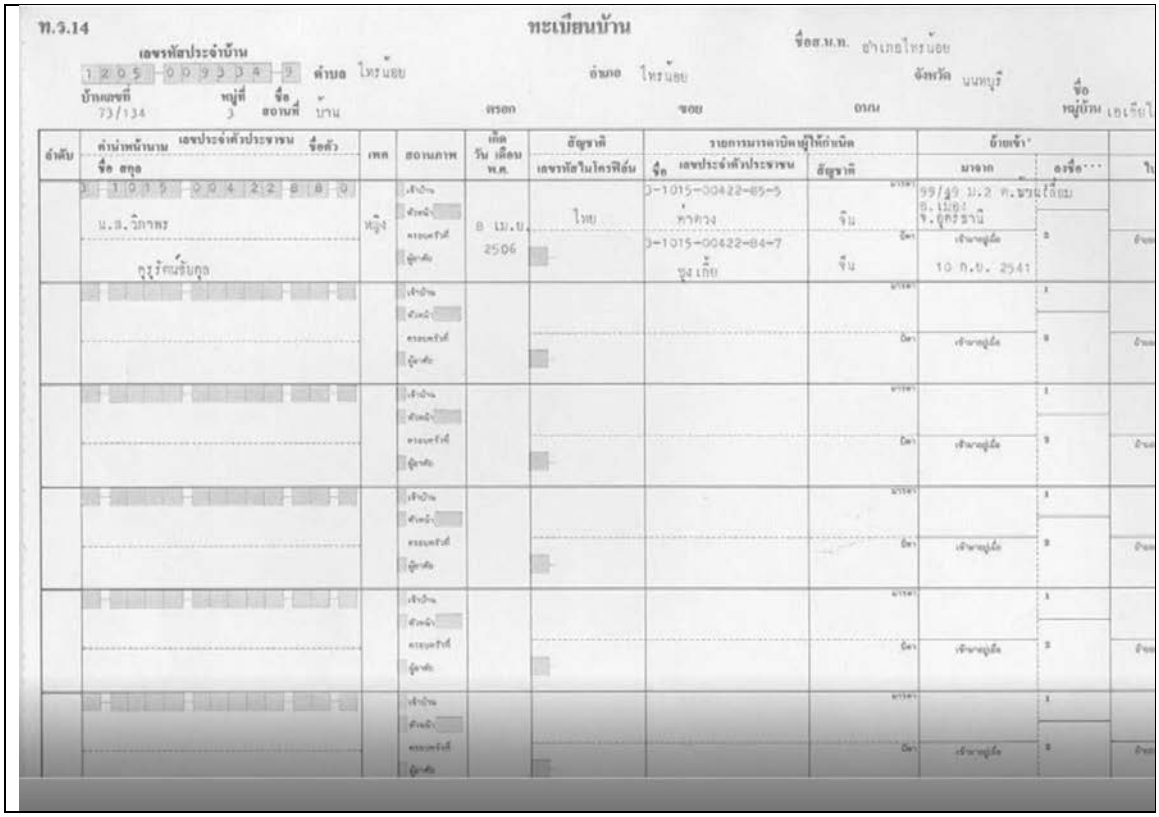
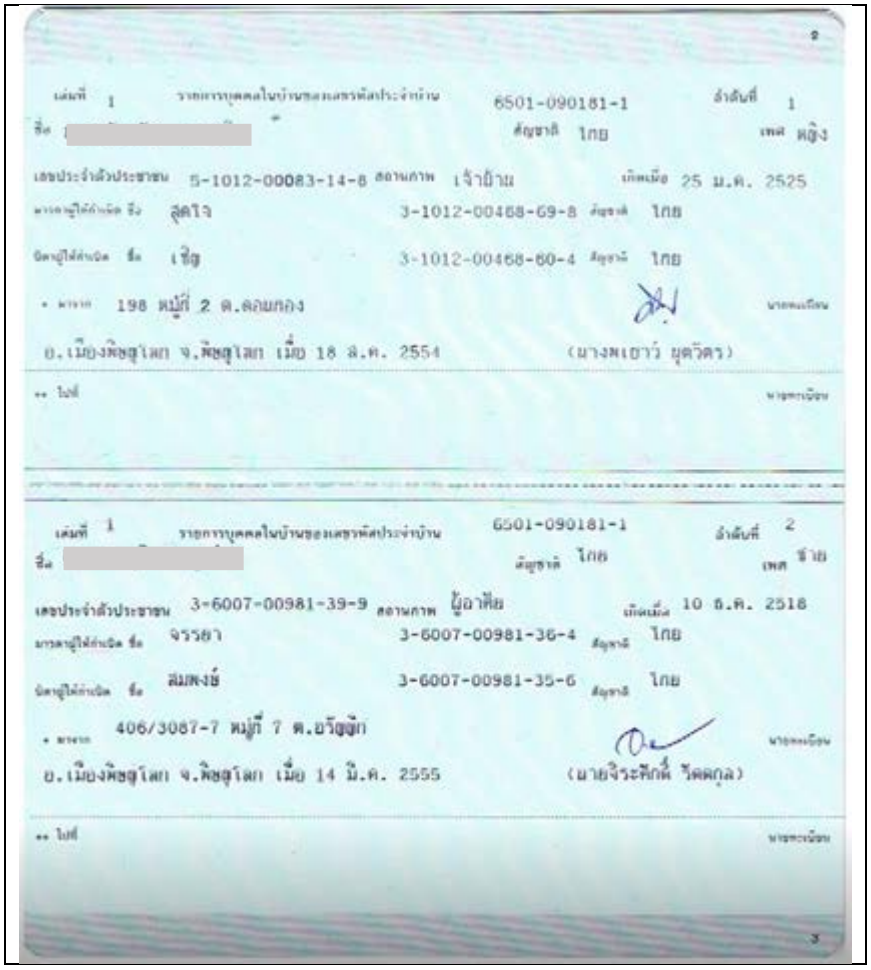


Figure 4. New Bank Book-Like Household Document with Unique Household Identification Number)11 Digits(and Personal Identification Number)13 Digits(



1.3 THE UIN SYSTEM

The Population Identification Number Project involved transferring household and individual personal information from the paper-based CR system into the centralized population database and assigning a UIN to each household and individual. The household identification number is an 11-digit code, and the individual identification number is a 13-digit code. The household identification number and the PID became the entry keys to the population files in 1982.

The BORA operates and maintains the population database for the country and issues CID cards and passport-like household booklets. The electronic population files are held at the BORA's computer center and arranged according to PID. The record for every person in the file contains all information taken from the population register. Birth and death certificates sent from the registration offices around the country were transferred to and kept at the BORA. A PID is given to each individual at birth or when the individual is entered into the population register for the first time. The district registrar assigns the PID at the time of registration of birth.

The PID consists of 13 digits divided into five groups.

1		2	3	4	5		6	7	8	9	0		1	2		3

The first digit)1(identifies the person's category. For example, a "1" in the first space indicates a Thai citizen born and registered since January 1, 1984, the date that the law mandated that every Thai citizen be assigned a PID; a "3" in the first space indicates a Thai citizen born and registered before January 1, 1984; and a "0" indicates a foreign citizen who is allowed to live temporarily in Thailand.
The second through fifth digits)2, 3, 4, 5(identify the district-level registration office location where the household and individual registered.
The sixth through tenth digits)6, 7, 8, 9, 0(identify citizen category groups registered at the district level registration office or the serial number of the birth certificate registration book.
The eleventh and twelfth digits)1, 2(identify the order of the individual in the group or the serial number of the birth certificate in the registration book.
The last digit)3(is the modular arithmetic check digit for calculating checksums[2] that are used within the identifier.
The designer of the PID structure has asserted that this 13-digit number will be able to accommodate Thai population growth for hundreds of years.

1.4 THE CID CARD

The first CID document law was enacted in 1914, when Thailand had an absolute monarchy. The government issued a passport-like CID document to certify that an individual was a Thai citizen. Government officials could demand that an individual present the document to identify him- or herself. In 1943, when the democratic government recognized the importance of individual identification for public security and communication between public-private and private-private entities for trade and other services, the CID card law was enacted and implemented—at first only in the capital and later across the country, although the law was not enforced. A CID card law enacted in 1962 mandated that every Thai citizen aged 17 and older have a CID card.

Since 1962, the CID card has evolved from the first-generation paper card to a fifth-generation integrated circuit–chip smart card in 2005)figure 5(. The first two generations of paper cards did not have UINs)before implementation of the Population Identification Number Project in 1982(. Many duplicate CID cards were issued, leading to high potential for illegal identity and identity theft. In 1983, the government amended the 1962 CID card law and implemented the third-generation)watermarked paper(CID card, which had a unique PID and personal information printed from the central computerized database on the card, and the age at which one was required to have a card was reduced from 17 to 15 years old.

In 1997, all 1,200 district-level registration offices were computerized and provided with online access to a central database, and the fourth-generation magnetic CID card was implemented. Many vital event legal documents such as birth certificates, death

[2] A checksum is used to check the correctness of the other UIN digits.

certificates, marriage and divorce notifications, household registration booklets, and CID cards could now be printed at a local office from the central population database. At this time, photographs, personal biometric data, and fingerprints were entered into the system when a CID card was issued. Fingerprints were taken for further personal verification and identification, if needed)Bureau of Registration Administration, Ministry of Interior n.d.(.

The fifth-generation CID card, introduced in 2005, was a smart card—an integrated circuit–chip card with electrically erasable, programable, read-only memory containing personal information that government agencies could read using a smart card reading device. Information in the chip includes:

- personal information from the CR system
- public information that appears on the card (e.g., name, address, photograph)
- private information (e.g., birth, marriage, divorce information)
- health insurance plan eligibility from the national health insurance beneficiary registration system
- personal information related to the Thai veterans'organization
- personal information related to the military reserve office
- personal information from the office of agricultural economic farmer registration system

The Registration of Residential Inhabitant Act of 1991 gave the MOI authority to share data with other government agencies according to their specific missions. In 2005, the Thai government implemented a government services improvement program. The government encourages government offices to use the national population database and CID smart cards to improve and link their services to services of other offices. The BORA has given government service providers)e.g., police, revenue department, National Health Security Office(online links to access CR information. Authorized government service providers can access and retrieve civil personal information)e.g., name, date of birth, photograph, fingerprints(and household information from the central database and the chip on the smart card. More than 120 government agencies link their information systems to the BORA central database, and approximately 140,000,000 transactions are requested each year. In 2008, the BORA agreed to allow banks in Thailand and some large private companies to access civil personal formation from the smart card to enhance their services. In 2011, the government lowered the age at which a citizen must have a CID card to seven years old. The card must be renewed every six years.

In 2015, the government established a committee of population database integration and improvement of government services. The Minister of Interior chairs the committee, and the committee board comprises the ministries' permanent secretary and the general secretaries of related government agencies. The goals of the initiative are to integrate all population service databases of all related government agencies using the 13-digit PID as the record link key and to set information exchange standards for all government services)figure 6(to enhance and improve government services to citizens and support eGovernment and the Thailand 4.0[3] policy)Thai Government Public Relations Department n.d.(.

[3] Thailand 4.0 is an economic model that aims to overcome several economic challenges resulting from past economic development models that emphasized agriculture (Thailand 1.0), light industry (Thailand 2.0), and advanced industry)Thailand 3.0(. These challenges include "a middle income trap," "an inequality trap," and "an imbalanced trap")see http://thaiembdc.org/thailand-4-0-2 /(.

Figure 5. Evolution of Personal Identification Cards Since 1943

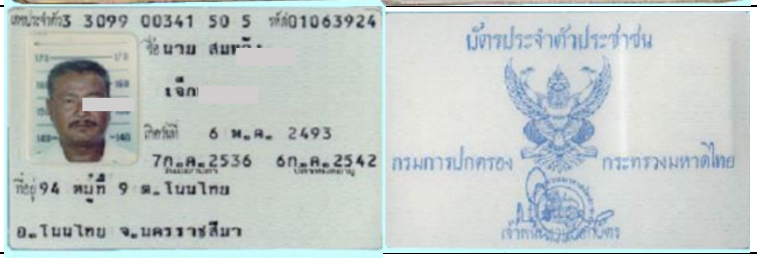
1st generation)1943(	
2nd generation)1962(	
3rd generation)1983(	
4th generation)1997(	
5th generation)2005(	

Figure 6. Population Database Integration and Improvement of Government Services, Initiated in 2015

Notes: BORA = Bureau of Registration Administration, GIN = Government Information Network, PID = personal identification Number.

PART II – VITAL STATISTICS SYSTEM

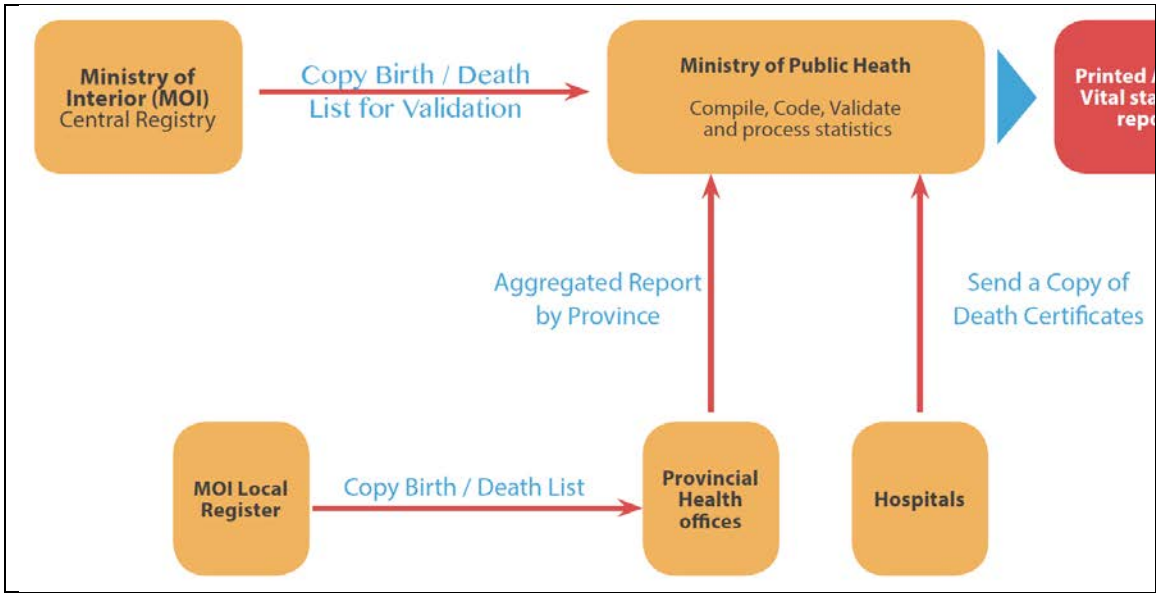
2.1 EVOLUTION OF VS

In the UN *Principles and Recommendations for a Vital Statistics System*, *Revision 3*, the components of a VS system are stated as:)a(legal registration and)b(statistical reporting of and)c(collection, compilation and dissemination of statistics pertaining to vital events)live births, adoptions, legitimations and recognitions; deaths and fetal deaths; marriages, divorces, separations, and annulments of marriage)United Nations Statistical Division 2001). In Thailand, the legal registration of vital events is the responsibility of the MOI.

The MOI is responsible for the CR system, but the MOPH compiles, processes, and publishes VS, which cover live birth, death, fetal death, cause of death, and mortality. Compilation of VS was initiated in 1920, and a VS Division was established in the MOPH in 1942. Since the MOPH was restructured in 1993, VS functions have been performed at the Health Information Center, Bureau of Health Policy and Strategy, Office of the Permanent Secretary, MOPH.

Birth and death registrations have routinely been used as the main sources of birth and mortality statistics since the establishment of the CR system. The VS system has evolved along with the CR system from paper-based data collection to an electronic system. Before 1996, MOPH officers compiled birth and death statistics from paper forms that the MOI local and central registration offices and hospitals provided)figure 7(. The process created discrepancies in birth and death counts between reports from hospitals and provincial health offices that were sent directly to the MOPH health information center and those from the MOI BORA. In addition, the MOPH could not produce timely national VS reports. There was a two- to three-year delay because transcribing data from copies of MOI birth and death certificates to the VS system and validating information from hospitals and the CR system was labor intensive)Kijsanayotin et al. 2013).

Figure 7. **Ministry of Public Health Vital Statistics Production Process Before 1996**

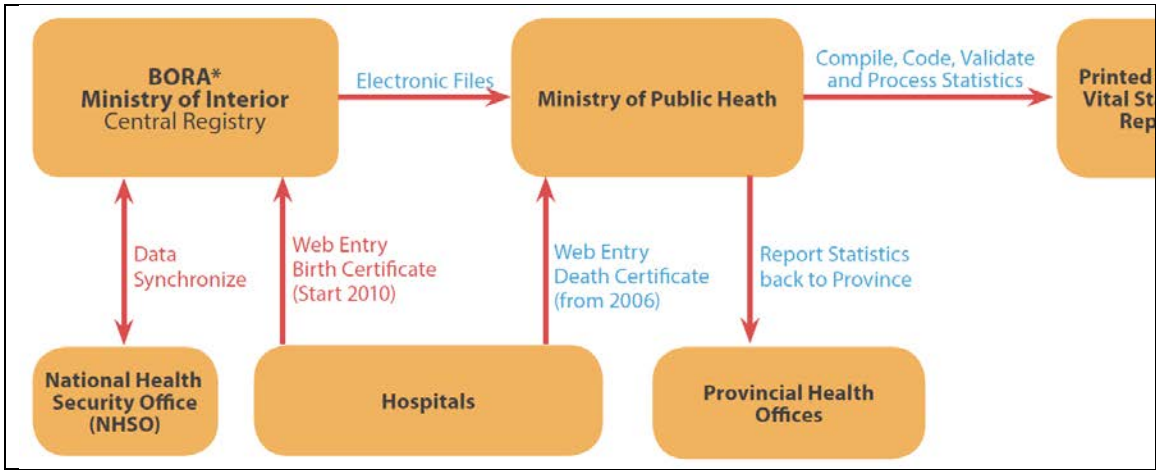


2.2 CR SYSTEM AND UIN IMPROVE VS

As mentioned above, a computerized central population database replaced the paper-based civil information system in 1987. At the time, each individual had been assigned a unique 13-digit PID. The CR system and the central population database had been improved over the years and were functioning well for government administrative purposes. In 1991, the Registration of Residential Inhabitant Act provided the MOI with the authority to share data with other government agencies according to their specific missions. Under the law, the MOI began to allow government agencies to access and use electronic civil information from the database to improve government services.

In 1996, to improve the VS system, the MOPH signed an agreement with the BORA, Department of Local Administration, MOI, regarding use of CR data from the central registration database, hoping to reduce redundancy of birth and death data. All birth and death records from the CR system are transferred electronically to the MOPH monthly, where the records are coded using *International Classification of Diseases, Tenth Revision*, codes. The coded data are analyzed and reported for health planning and policy making at the ministry and provincial levels)Figure 8(. With this close collaboration between the MOI and MOPH, information on the number and health status of the population at the national and provincial level is available to any agency that needs it)Kijsanayotin et al. 2013).

Figure 8. Ministry of Public Health Vital Statistics Production Process After 1996

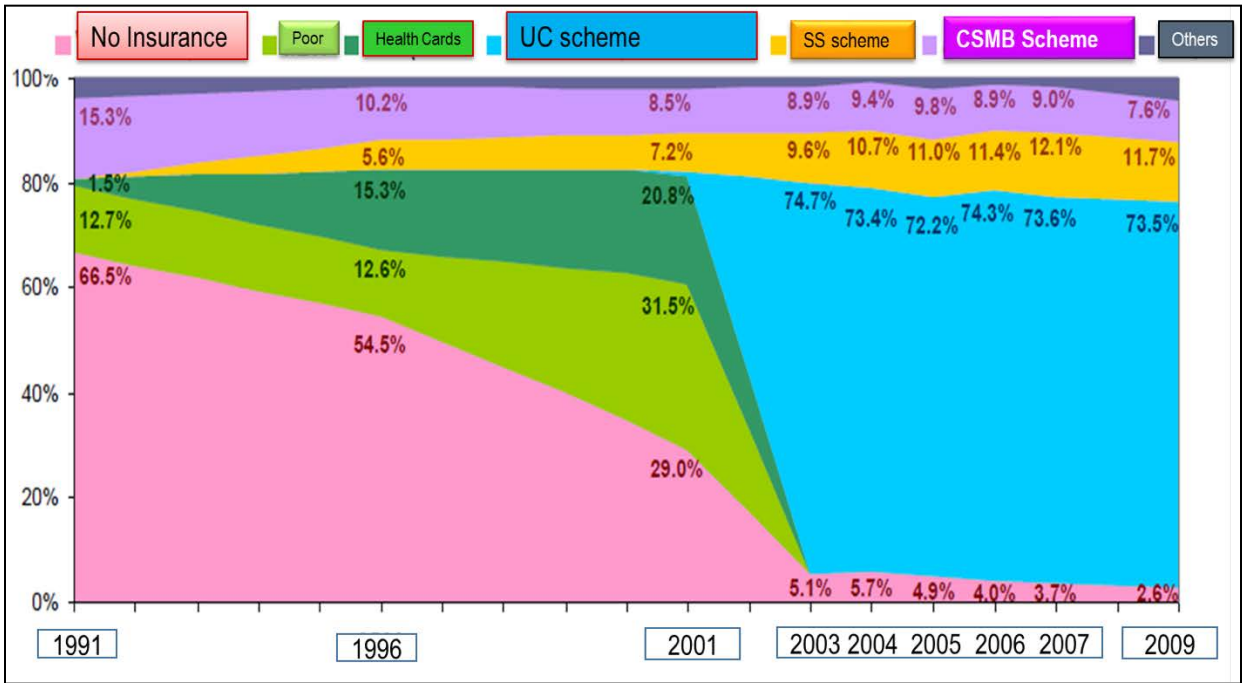


PART III – THAILAND UNIVERSAL HEALTHCARE COVERAGE

UHC has risen to the top of the global health agenda and is a target of the UN Sustainable Development Goals. At its core, UHC is about the right to health. Everyone – whether rich or poor – should receive the health care they need without suffering financial hardship)Averill and Marriott 2013(. Thailand has become known internationally, and the World Health Organization)WHO) has praised Thailand for implementing UHC despite being a developing country. The current WHO Director General once stated that "Thailand is the living proof that UHC is achievable and affordable for all countries, at all income levels")WHO n.d.(.

Thailand achieved UHC in 2001 after more than 40 years of health infrastructure development and three decades of designing and implementing various financial risk protection plans. This meant that all Thais were covered by health insurance, guaranteeing them access to a comprehensive package of health services. In 2002, the National Health Insurance Act was passed, and the National Health Security Office)NHSO(was established to operate the UCS. The scheme rapidly expanded and within a year was providing coverage to 47 million people)75% of the population(. The UCS covers the people previously served by a collection of piecemeal schemes)Medical Welfare Scheme, Voluntary Health Card Scheme: two existing publicly subsidized schemes(and the people who were without health protection, particularly in the informal sector, who accounted for 30 percent of the population—18 million previously uninsured people. The other 25 percent of the population were government employees, retirees, and dependents, who remained under the Civil Servant Medical Benefit Scheme)CSMBS(, and private-sector employees, whose healthcare costs the contributory Social Security Scheme)SSS(covers)Figure 9(

Figure 9: Health Insurance Coverage in Thailand: 1991-2009



The Thai UCS is a tax-financed scheme that provides free health care at the point of service)Table 1(. The benefit package is comprehensive and includes preventive care, general medical care and rehabilitation services, high-cost medical treatment, and emergency care. The UCS improved access to necessary health services, increased the equity of service use, reduced the incidence of catastrophic health expenditures, and prevents medical impoverishment.

Table 1. **Thai Universal Health Coverage Public Health Insurance Scheme**

	CSMBS	SSS	Universal Coverage Scheme
Introduced in:	1960s	1990s	2001
Target beneficiaries	Government employees and dependents, retirees	Private sector employees	Those not covered by CSMBS or SSS
Population coverage	7%)5 million(	16%)10 million(	75%)48 million(
Funding	Government budget	Payroll contribution, tripartite	Government budget
Payment to health facilities	Fee-for-service for outpatient services, DRG for inpatient services	Capitation for outpatient and inpatient services, DRG for adjusted relative weight ≤2	Capitation for outpatient services, DRG for inpatient services

Notes: CSMBS = Civil Servant Medical Benefit Scheme, SSS = Social Security Scheme, DRG = Diagnosis-Related Group.

Although many factors contributed to achievement of UHC, the most significant was an ambitious reform known as the UCS. The successful launch of the UCS in 2001 benefitted from the convergence of three factors: political commitment, civil society engagement, and technical expertise)Health Insurance System Research Office 2012).

Between 2003 and 2010, the number of outpatient visits per member per year rose from 2.45 to 3.22, and the number of hospital admissions per member per year rose from 0.094 to 0.116. Data from 2010 indicate a low level of unmet need for health services in Thailand. Impoverishment, as measured by the additional number of nonpoor households falling below the national poverty line as a result of paying for medicines or health services, decreased significantly from 2.7 percent in 2000)before the UCS(to 0.5 percent in 2009. Although it is not dedicated to the poor, its universal nature has pro-poor effects. For example, the UCS benefits the lowest income quintile of the population more than any other segment)Health Insurance System Research Office 2012).

Many factors contributed to achievement of UHC, such as government commitment to UHC policy, financing reform, continuous investment in health delivery system infrastructure, long-standing health workforce capacity, and health information system development. Three major health information system and information technology developments were in place when the UCS was implemented. The computerized CR system and the national UIN system have contributed to the development of the country's

health insurance beneficiary registration system. The extensive adoption of provider information and communications technology and a national information and communications technology infrastructure, including the experience in exchanging administrative electronic data and the Diagnosis-Related Group information system, support and enhance the healthcare insurance reimbursement system)Kijsanayotin 2013).

PART IV – CIVIL REGISTRATION SYSTEM, UNIQUE IDENTIFICATION NUMBER SYSTEM, FACILITATED UNIVERSAL HEALTH COVERAGE AND SOCIAL WELFARE

4.1 CR System and UIN System Facilitate Implementation of UCS

The MOI computerized CR system, with its network of registration offices across the country and the UIN system at the time of UCS implementation, has enabled and facilitated rapid enrollment of UCS beneficiaries. At the beginning of UCS implementation, the priority was to identify UCS beneficiaries. The unique PID system and the computerized CR database not only enabled the NHSO to establish UCS beneficiary registration, but also helped the General Comptroller Department, Ministry of Finance, and the Social Security Office, Ministry of Labor, to improve their CSMBS and SSS beneficiary registry, respectively.

Thai citizens who are not already covered under the CSMBS or SSS are eligible for the UCS. UCS enrollment is automatic, but registration is required. People living in Bangkok can register at any district office, and people living outside of Bangkok can register at health centers, public hospitals, or provincial health offices)Hanvoravongchai 2013(. The insurance schemes, in particular CSMBS, do not have a comprehensive roster of their beneficiaries. There was more than 10 percent duplication of beneficiaries between schemes)CSMBS, SSS, UCS(. Citizens needed to be entered into one of the insurance schemes according to their entitlement. With NHSO coordination, BORA, the Social Security Office, the Department of the Comptroller General, and NHSO collaborated to sort out their beneficiaries. A complete CSMBS, SSS, and UCS beneficiary registration system was set up using the unique PID and citizens' individual information to identify and verify who were on the CSMBS and SSS beneficiary rosters. The remaining citizens in the CR system were automatically enrolled in the UCS, allowing the registration systems to be finished within one year instead of taking years to identify each citizen. The registries have been continuously updated, with close collaboration of the organizations)National Health Security Office 2008(.

UCS members must specify their registered providers who will be the main contractors with the NHSO. Members can change their provider up to four times a year by reporting to any UCS-contracted health care provider or any Bangkok district office. Sharing of personal civil information, household registration information, and the PID among the BORA, CSMBS, SSS, and UCS allows the UCS to add or remove beneficiaries if its members switch from one scheme to another)Hanvoravongchai 2013(.

The NHSO is the coordinator of all insurance registries. CSMBS and SSS send their beneficiary updates to the NHSO at least twice a month. The NHSO central registration office updates the country health insurance registries every night using information from the CR central database, the CSMBS, the SSS, and the NHSO regional and provincial office beneficiary registration databases. The NHSO can also verify health insurance benefits on-line. Health care providers and hospitals across the country can access the health insurance benefit registries on-line and through the NHSO call center)National Health Security Office 2008(.

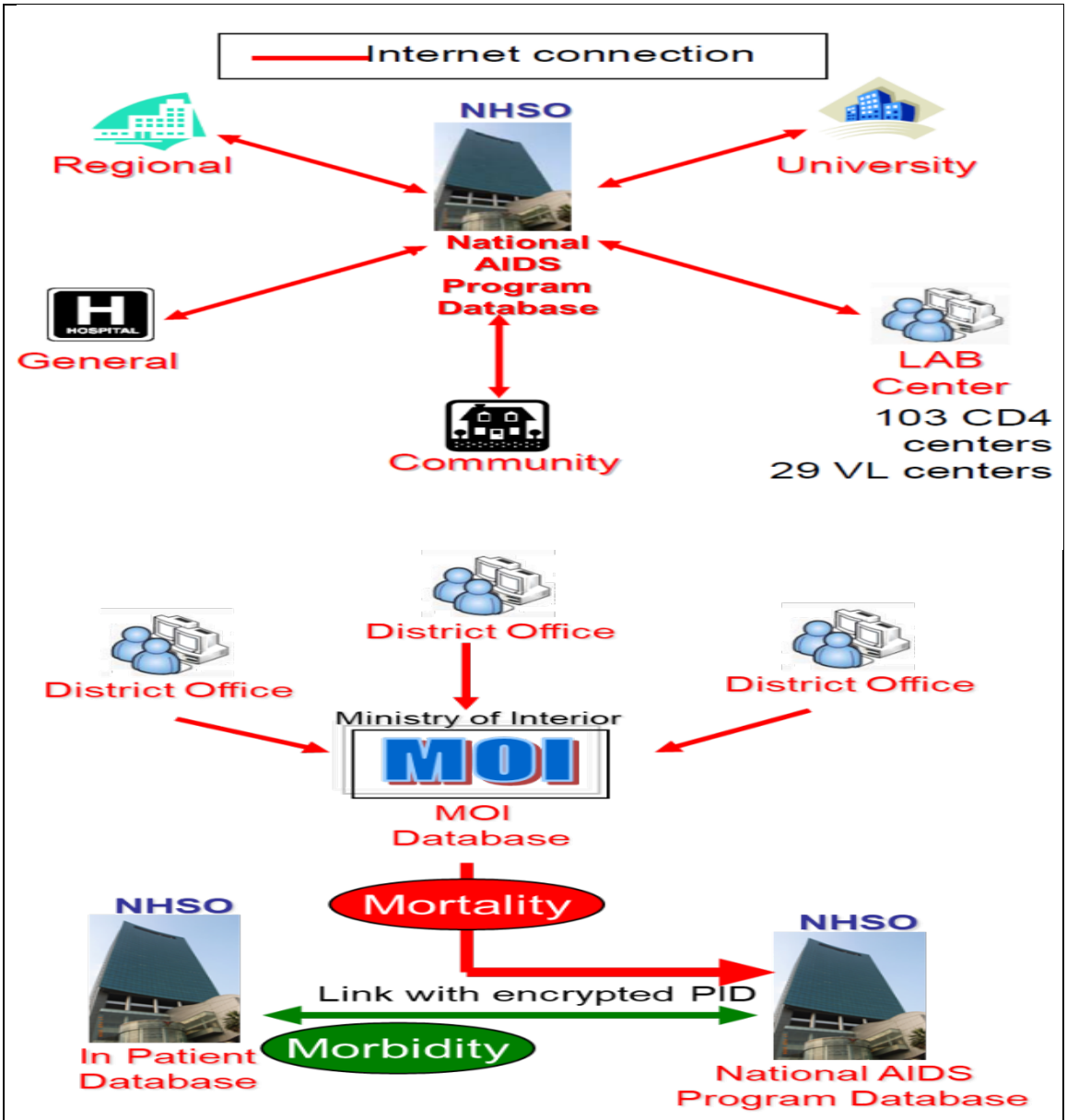
4.2 CR System and UIN System Support Healthcare Services and Insurance Payment Systems

Individual-level information on health care delivery services and provider payment models is necessary for successful implementation of the UHC, CSMBS, and SSS. UINs and personal demographic information from the CR system play an important role in development of healthcare information and provider payment systems)Wilson, K 2014). Each hospital's healthcare information system creates its own patient identification number)called a hospital number(for its local use, although all hospitals map the hospital numbers with PIDs. When a patient visits a hospital, the hospital can retrieve personal demographic information from patient's smart identification card to verify his or her, populate personal data into the hospitals patient registration system, and generate a patient hospital number. Furthermore, hospitals can check patients' health insurance benefit with the NHSO's online health insurance beneficiary registry using the patient PID)UIN(. Health care providers and insurers use PIDs to link patient records and their beneficiaries from different providers and insurers to support continuity of care and claims reimbursement.

All hospitals in Thailand are computerized and have electronic medical records. Health information is exchanged electronically between healthcare providers and the country's three major insurers. Health insurers require that hospitals file claims electronically for reimbursement (Kijsanayotin, Kasitipradith, and Pannarunothai 2010). The integrated CR and PID systems help the electronic claim system identify individuals, avoid duplication, detect fraud, and process claims efficiently. Although clinical care processes (e.g., e-referral system among healthcare providers) have not been established nationally, many e-referral projects have been initiated across the country. The integrated CR and PID systems are the foundation of all e-referral projects to develop a client registry and identify individuals across the spectrum of clinical care.

One of nationally successful healthcare service programs that benefits from PID and a CR system is the National AIDS Program)Figure 10(. Involved parties use encrypted UINs to identify individuals for health care service provision and reimbursement. Health care providers and insurers use encrypted UINs to verify eligibility, track delivery of services, settle claims, and build a shared medical record for each patient, which helps improve providers' point-of-service workflow significantly)UNAIDS 2009(.

Figure 10. Thai National AIDS Program Use of Encrypted Unique Identification Numbers)UINs(to Support Health Provisions and Insurance Reimbursement for Individuals with HIV or AIDS



Notes: MOI = Ministry of Interior, NHSO = National Health Security Office, IP = inpatient, VL = viral load, PID = personal identification number.

The UCS outpatient services uses a capitation payment model)hospitals, clinics(. UCS beneficiaries are assigned to a primary care provider located near their house or workplace. Health care providers are paid per capita according to the number of beneficiaries in their catchment area. Individual demographic information from the CR, unique household number, and UIN systems are used to identify and locate UCS beneficiaries so that the insurance schemes can reimburse hospitals and clinics.

For the insurance payment process, UINs help detect claim duplication, enable electronic health care service data exchange between payers and providers, and aggregate health care visit–level data to case based–level data. Development and maintenance of the Thai Diagnosis-Related Group, an inpatient case-based provider payment model that all health insurance schemes use, also uses the UIN system to de-duplicate and identify patient admission–level data, including for aggregating resources used level data into case-based level data.

For public health monitoring and evaluation and population-based research and planning, UINs help detect multiple counting and provide reliable estimates of the patient identification error rate. Data managers also use UINs to improve the accuracy of aggregate reporting)UNAIDS 2014(.

4.3 Implementing UHC Improved the CR System

Unique PIDs are issued along with birth certificates when parents register their children at district registration offices)Figure 11(. Before the UCS was implemented, although parents could register their children at district registration offices, some parents did not bring the birth notification document, which a hospital or head of village issues, to register their children in the CR system and obtain a birth certificate. Because some parents thought the birth notification document was the birth certificate, they did not see the benefits of a birth certificate, they lived far from the registration office, or they were just not motivated to register. Therefore, not all births are registered in the CR system.

With implementation of the UCS, a PID)UIN(is used to identify and verify that a person is a Thai citizen. All Thais are covered under one of the three major insurance scheme, but having a PID is essential for obtaining free healthcare and government childbirth support. This is a strong motivation for parents to register their children, especially when the child is born in the hospital, because health providers will request the child's PID from the parents for processing insurance claims)Kijsanayotin 2013(.

4.4 Online Birth Registration System

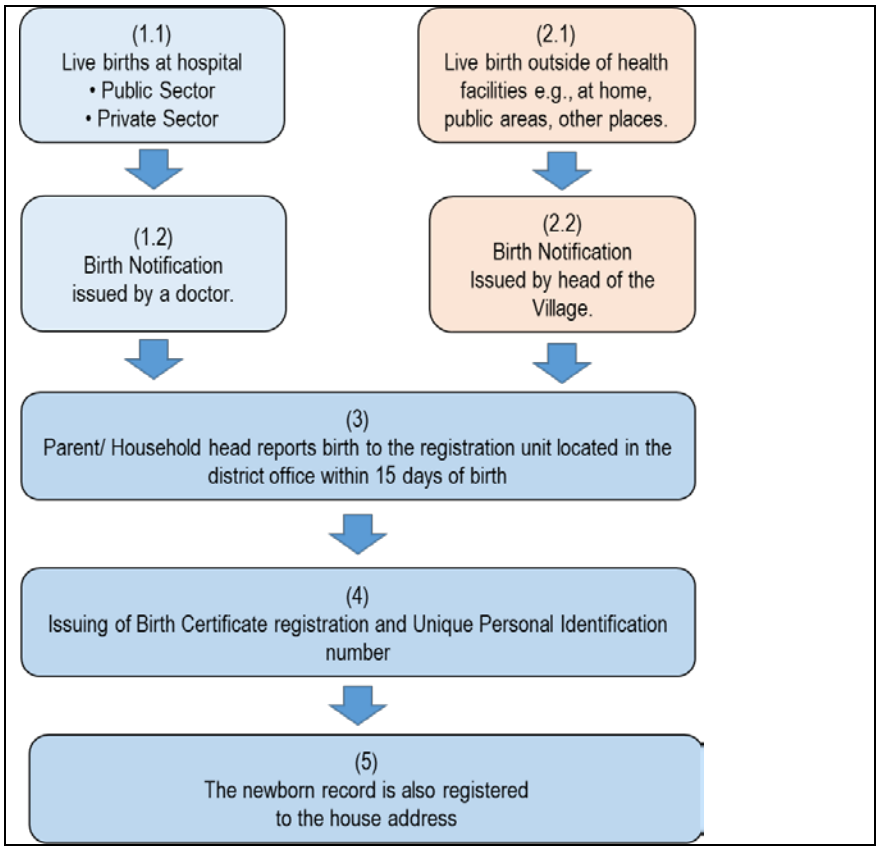
According to Thai CR law)Figure 11(, all births must be registered within 15 days. The head of the household or the baby's mother are responsible for registration. There is a fine (usually nominal, not to exceed THB 1,000) for late registration. In 2016, 96.4 percent of births were in the hospital. For in-hospital births, the hospital issues a birth notification)TR 1/1 document(. For births outside the hospital, the head of the village issues the notification. The head of the household or the baby's mother brings the document and the CID card of the mother or father and their household booklet to the district registrar, who checks the nationality of the baby's mother or father and registers the baby in the system, updates the household members, and issues a birth certificate. The baby's PID is assigned at the time of registration of birth or whenever she or he is entered into the population register for the first time.

Before 2011, It was estimated that 5 percent to 7 percent (40,000–55,000) of newborn children were not registered each year. The gap may be greater, reportedly as high as 20 percent, in areas where registered and unregistered migrant workers and other unregistered non-Thai residents are concentrated. The biggest difference is in children from non-Thai households, for whom the birth registration rate is only 79.2 percent. This happens even though the law states that any child born in Thailand, including to non-Thai

parents or parents who have no legal status, has the right to be registered and to obtain a birth certificate)Bureau of Registration Administration, Ministry of Interior n.d.(.

In 2009, the BORA, MOI; MoPH; and NHSO, with the support of UNICEF, launched a pilot hospital-based online birth registration system)e-birth registration system(in six hospitals. The project expanded to 44 hospitals in 2011 and 898 hospitals by 2016. Hospital staff enter information on hospital births, or the information is abstracted from electronic hospital information systems into a web-based application that automatically transmits the birth information to the CR system)Figure 12(. Hospital staff can print out birth notification documents directly from the system, without having to fill out a paper form, and give them to parents for registration at the local registration office. Although this system still requires parents to visit the local CR office, it takes the civil registrar only minutes to issue an official birth certificate and a obtain a PID from central CR system for the baby. The system also allows the civil registrar to monitor which families have not registered their children's birth so that they can be followed up with)Bureau of Registration Administration, Ministry of Interior n.d.; UNICEF n.d.; National Health Security Office 2016; International Organization for Migration n.d.(.

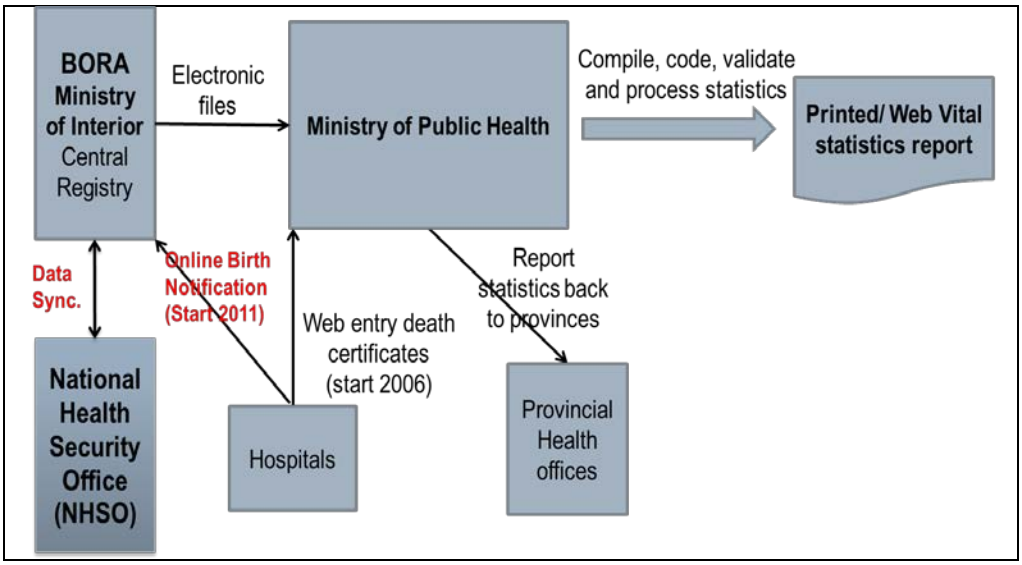
Figure 11. Birth Registration Process and Issuance of Unique Personal Identification Number at Birth



In big hospitals where many births take place, BORA posts staff)civil registrar(, allowing parents to complete registration in the hospital, often within a few hours after birth.

A birth certificate is the first identity document that proves the baby's identity. Birth certificates also facilitate access to essential services, such as health care, social services, and education. Children who are unable to prove their age are at risk of being forced into child marriage. Not having a birth certificate may be an obstacle to finding work in the formal sector or completing one's education. In 2008, Thailand updated its CR law so that all children born in Thailand, not just Thai citizens, can be registered and receive a birth certificate. This does not mean that all children born in Thailand will be given Thai citizenship but that all births will be registered and all children be given a birth certificate. BORA set up another UIN system using a 13-digit format for non-Thai citizens. To make birth registration accessible to the families of migrant workers—typically from neighboring Myanmar, Cambodia, or Lao People's Democratic Republic —BORA works with MOPH hospitals, the International Office of Migration, and nongovernmental organizations,, to provide legal advice and translation in hospitals where the most children are born)International Organization for Migration n.d.(

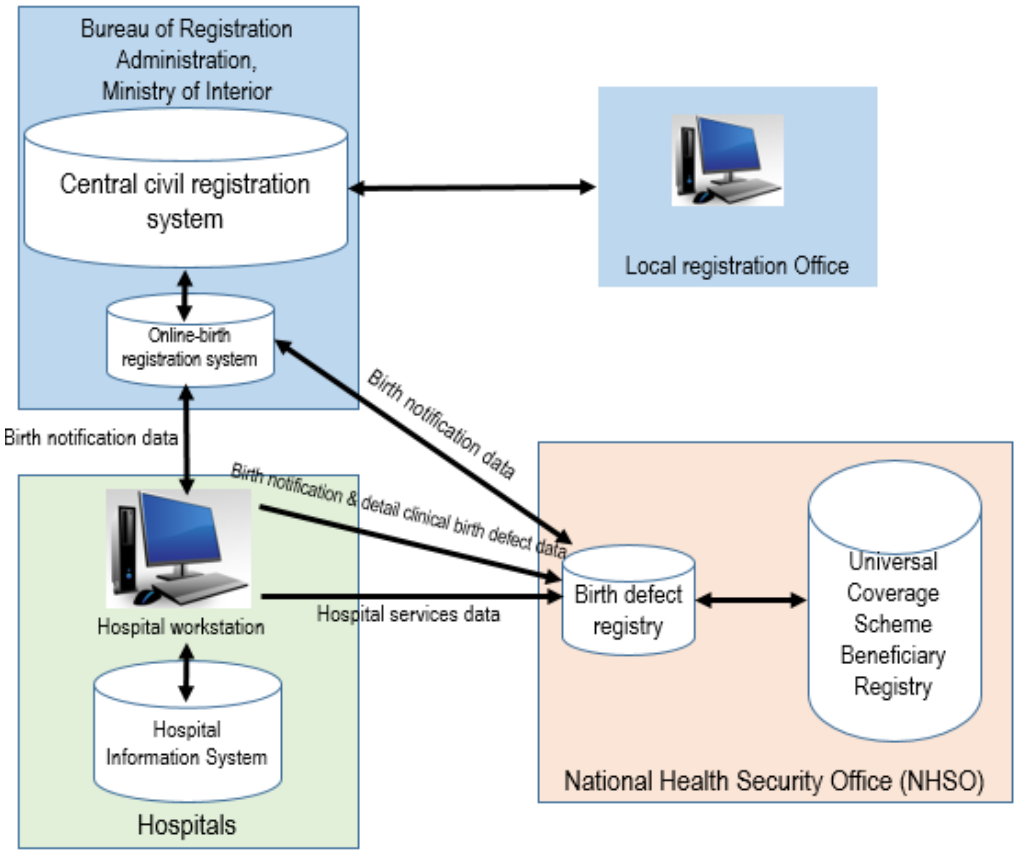
Figure 12. **Online Birth Registration System**



Birth registration statistics in 2016 showed that 96.8 percent of 1,734,442 birth notification documents issued were registered in the central CR system, with only 54,810)3.2%(birth notifications issued still waiting for registration. The system has increased birth registration significantly.

The NHSO has extended information from the online birth registration system to develop a national birth defect registry (Figure 13). The birth notification document (TR 1/1) contains a data field indicating whether a baby has any birth defects. The NHSO initiated the online congenital birth defect registry by linking data from the TR 1/1 and added data fields detailing any birth defects. The congenital birth defect registry database receives data from two sources: the online birth registration system and the hospital service data which records birth defects detected when a child seeks hospital care. The extended online congenital birth defect registry system has allowed the NHSO and MOPH to develop a national birth defect registry and expand coverage of care)Pangkanon et al. 2014; National Health Security Office n.d.; Pangkanon 2014; Pangkanon n.d.(.

Figure 13: Online Birth Registration System Helps National Health Security Office (NHSO) Creates National Birth Defect Registry



Close collaboration between the MOI, MOPH, NHSO, hospitals, and UNICEF on online birth registration improved Thailand's birth registration system and the birth-defect registry and increased health care coverage of children.

4.5 UIN AND CR SYSTEMS SUPPORT SOCIAL WELFARE PROGRAMS

Integration of the CR and UIN)PID) systems has facilitates many Thai public service initiatives, such as government welfare for low-income Thais, child support grants for children younger than seven years old)C. Wilson 2017(. CR and PID systems are the foundation that enables public and private databases to share information.

Although Thailand shifted from a low-income to an upper-middle-income economy in 2011, with poverty rates declining from 67 percent in 1986 to 11 percent in 2014, economic growth has slowed in recent years. Poverty and inequality pose significant challenges. In response to these challenges, the government is seeking welfare reform to improve conditions for those living in poverty in Thailand. Having a good database covering poor people helps the government track and address poverty. The government offers social welfare benefits to low-income Thais such as free rides on the Metropolitan Rapid Transit and Bangkok Mass Transit systems, public buses, and trains; free electricity and water

)below certain usage levels(; a one-time payment of 1,500 to-3,000 baht; and 300 to 600 Baht per month in the form of a debit card called a welfare card)Figure 14) that can be used to obtain free tickets for public transportation and buy certain commodity products from government-certified village grocery shops across the country. The program is part of the national e-payment program.

The government needs to have a database of low-income Thais to support the poverty-targeting system. Inaccurate targeting would exclude eligible poor individuals while including ineligible people who are not poor enough to receive support from the government. Determining who is poor is difficult in general and much more so for countries with large informal sectors such as Thailand)Jitsuchon n.d.(. The government must have criteria and a process to verify low-income individual easily. The government establishes the poverty criteria: Thai citizen, aged 18- and older, unemployed or yearly income less than 100,000 Baht (~US$3,125), and no assets or bank account or having assets or a bank account of less than 100,000 Baht. The Ministry of Finance is the program manager, collaborating with all government agencies involved, include the Department of Lands; BORA, MOI; Department of General Comptroller; Revenue Department; and Fiscal Policy Office, Ministry of Finance, Bank of Thailand and all commercial banks. The integrated CR and PID system enable information of Thai individuals from these government agencies and banks to be linked because their databases use CR information and PIDs to identify individuals in their databases. There were 14.18 million people registered in 2017. With the ability to link the databases of the various agencies involved with the results of a onetime survey of registered families, the government can identify and verify 11.43 million eligible individuals who meet the criteria and exclude 2.75 million. In addition, the supporting money is deposited directly in the beneficiary bank account through the national e-payment system, which the UIN)PID system) also enables. Direct deposit bypasses the old money-transferring processes, which were handled by many governmental offices thereby curbing corruption.)Fiscal Policy Office, Ministry of Finance 2017(.

Figure 14: Welfare Card Given to Low-Income Thais in the Government Social Welfare Program

PART V – LESSONS LEARNED AND CHALLENGES AHEAD

5.1 LESSONS LEARNED

The integration of UINs into the development of a central computerized CR system has benefited all service domains in Thailand, including health care)Dahan 2015(. Political support, commitment, and collaboration of many organizations is necessary for development and linkage of CR, VS, and UIN systems, and this takes time.

The primary reason the Thai government initiated CR system improvement and implementation of a UIN system was for homeland security and creating voter rosters for democratic elections)Rananand 2007(, but the system benefits many government and private sector improvement programs and initiatives such as UHC, social welfare for farmers and disadvantaged citizens, and banking.

CRVS systems and UINs are the backbone of a health system, enabling policy planning, allowing progress of health system development, and enabling monitoring of the effect of health policies in Thailand. UHC implementation not only benefits from a CRVS and UIN system, but also helps improve the quality of the CR system.

5.2 CHALLENGES

Integration of the UIN system with the CR system enables the country to expand and transform public and private services)Dahan 2015(, but it also increases risk of identity theft, leaking of private information, and abuse of personal information. The Thai 4.0 policy has expanded opportunities and encouraged private and public organizations to use information from the CR and UIN systems to improve and expand services)Royal Thai Embassy n.d.; Thai Government Public Relations Department n.d.(The risk that authorized inside users and unauthorized outside users will misuse UIN has also increased. Recent news of a 24-year-old Thai officer who was jailed for three days after her CID card was stolen by a call center gang is a sample of the threat. The gang used her identity to open many bank accounts for receiving money from the victims of their scam)Bangkok Post Public Company Limited 2018(. There are numerous documented examples worldwide of abuse of personally identifiable information stored in databases, such as privacy abuses, illegal surveillance, and misuse of personally identifiable information)Hillestad et al. 2008(.

5.3 NEXT STEPS

Thai government has appointed a national digital identification committee to develop, by the end of 2018, a national single-point digital identity platform to enable identity verification to be integrated, pushing the country toward a digital economy)Thailand 4.0 policy(. The national single-point digital identity platform will centralize identity verification, reduce online fraud, and increase the efficiency of financial transactions and e-commerce. The platform will help verify the identity of involved parties using an information pool. The platform aims not only to expand e-government and private services, but also to stop the misuse of personal information and personal identity theft)Electronic Transactions Development Agency n.d.; Bangkok Post Public Company Limited n.d.(.

REFERENCES

Averill, Ceri, and Anna Marriott. 2013. *Universal Health Coverage: Why Health Insurance Schemes Are Leaving the Poor Behind*. Oxfam International. https://oxfamilibrary.openrepository.com/oxfam/handle/10546/302973.

Banchongduang, SomruediI, and Bangkok Post Public Company Limited. n.d. "Task Force for Digital ID Recommended." Retrieved August 8, 2019 from https://www.bangkokpost.com/tech/local-news/1363583/task-force-for-digital-id-recommended.

Bangkok Post Public Company Limited. 2018. "Nicha's Scam Nightmare Spurs Security Scare." Retrieved August 8, 2019 from https://www.bangkokpost.com/news/special-reports/1395850/nichas-scam-nightmare-spurs-security-scare.

Bureau of Registration Administration, Ministry of Interior. n.d. "Bureau of Registration Administration's Documents." http://e-registration.dopa.go.th/Nbirth_cer/on%20web/html/%E0%B9%80%E0%B8%AD%E0%B8%81%E0%B8%AA%E0%B8%B2%E0%B8%A3%E0%B8%97%E0%B8%B2%E0%B8%87%E0%B8%A3%E0%B8%B2%E0%B8%8A%E0%B8%81%E0%B8%B2%E0%B8%A3.html.

———. n.d. "Evolution of Thai citizen ID card." Official Statistics Registration Systems. Retrieved August 8, 2019 from http://stat.bora.dopa.go.th/card/card.htm.

Dahan, Mariana. 2015. "Identification for Development (ID4D) Integration Approach Study." The World Bank Group.

Electronic Transactions Development Agency. n.d. "Digital ID – Digital ID." http://www.digitalid.or.th/.

Enterprise, I. D. G. 1990. *Computerworld*. IDG Enterprise.

Fiscal Policy Office, Ministry of Finance. 2017. "Guideline of Government Welfare Registration Programme."

Hanvoravongchai, Piya. 2013. "Thailand - Health Financing Reform in Thailand: Toward Universal Coverage under Fiscal Constraints." World Bank. Retrieved August 8, 2019 from http://documents.worldbank.org/curated/en/476621468132279566/Thailand-Health-financing-reform-in-Thailand-toward-universal-coverage-under-fiscal-constraints.

Health Insurance System Research Office. 2012. *Thailand's Universal Coverage Scheme: Achievements and Challenges: An Independent Assessment of the First 10 Years (2001-2010) Synthesis Report*. Nonthaburi: Health Insurance System Research Office, Bamrasnardura Infectious Disease Institute.

Hillestad, Richard, James H. Bigelow, Basit Chaudhry, Paul Dreyer, Michael D. Greenberg, Robin C. Meili, M. Susan Ridgely, Jeff Rothenberg, and Roger Taylor. 2008. “Identity Crisis: An Examination of the Costs and Benefits of a Unique Patient Identifier for the US Health Care System.” Santa Monica, CA: RAND Corporation.

International Organization for Migration. n.d. “Migrant Assistance and Protection Programme: Thailand.”

Jitsuchon, Somchai. n.d. “Registering the Poor to Beat Poverty – TDRI: Thailand Development Research Institute.” Retrieved August 8, 2019 from https://tdri.or.th/en/2017/02/registering-the-poor-to-beat-poverty/.

Kijsanayotin, Boonchai. 2011. “Using Health Care Service Administrative Data to Improve National Vital Statistics: Thailand Experiences.” New York: United Nations Statistics Division, Department of Economic and Social Affairs. Retrieved August 8, 2019 from http://unstats.un.org/unsd/demographic/meetings/egm/CRVS2011/list_of_docs.htm.

———. 2013. “Impact of Thailand Universal Coverage Scheme on the Country’s Health Information Systems and Health Information Technology.” *Studies in Health Technology and Informatics* 192: 989.

Kijsanayotin, Boonchai, Pianghatai Ingun, Kanet Sumputtanon, and Thai Health Information Standards Development Center. 2013. *Review of National Civil Registration and Vital Statistics Systems: A Case Study of Thailand*. Nonthaburi, Thailand: Thai Health Information Standards Development Center.

Kijsanayotin, Boonchai, Narong Kasitipradith, and Supasit Pannarunothai. 2010. “EHealth in Thailand: The Current Status.” *Studies in Health Technology and Informatics* 160 (Pt 1): 376–80.

National Health Security Office. 2008. “Universal Coverage Scheme Beneficiary Registration Management Handbook (Thai Language).

———. 2016. “Progress report on the on-line birth registration.”
———. n.d. “Birth Defects Registry.
Pangkanon, Suthipong. 2014. “Thailand National Birth Defect Registry,” September. Retrieved August 8, 2019 from http://kb.hsri.or.th/dspace/handle/11228/4180.

Pangkanon, Suthipong. n.d. “Thailand National Birth Defect Registry Presentation.” Retrieved August 8, 2019 from http://kb.hsri.or.th/dspace/handle/11228/1/discover?query=Thailand+National+Birth+Defect+Registry&term=1.

Pangkanon, Suthipong, Siraporn Sawasdivorn, Chulaluck Kuptanon, Uraiwan Chotigeat, and Warunee Vandepitte. 2014. “Establishing of National Birth Defects Registry in Thailand.” *Journal of the Medical Association of Thailand = Chotmaihet Thangphaet* 97 Suppl 6 (June): S182-S188.
Rananand, Pirongrong Ramasoota. 2007. “Information Privacy in a Surveillance State: A Perspective from Thailand.” In *Information Security and Ethics: Concepts, Methodologies, Tools, and Applications: Concepts, Methodologies, Tools, and Applications*, 124–37. IGI Global.

Royal Thai Embassy, Washington D.C. n.d. “Thailand 4.0.” Retrieved August 8, 2019 from http://thaiembdc.org/thailand-4-0-2/.

Thai Government Public Relations Department. n.d. “Thailand 4.0 Policy to Transform the Thai Economy.” Retrieved August 8, 2019 from http://thailand.prd.go.th/mobile_detail.php?cid=4&nid=3784.

UNAIDS (Joint United Nations Programme on HIV/AIDS). 2014. “Considerations and Guidance for Countries Adopting National Health Identifiers.” Retrieved August 8, 2019 from http://www.unaids.org/en/resources/documents/2014/national_health_identifiers.

UNICEF. n.d. “UNICEF Thailand - Child Protection - Birth Registration.” https://www.unicef.org/thailand/protection_14929.html.

United Nations Statistical Division. 2001. *Principles and Recommendations for a Vital Statistics System*. New York: United Nations.

Wikipedia. 2017. “Thailand citizen identification number.” Retrieved August 8, 2019 from https://th.wikipedia.org/w/index.php?title=%E0%B9%80%E0%B8%A5%E0%B8%82%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B8%88%E0%B8%B3%E0%B8%95%E0%B8%B1%E0%B8%A7%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B8%8A%E0%B8%B2%E0%B8%8A%E0%B8%99%E0%B9%84%E0%B8%97%E0%B8%A2&oldid=7315328.

Wilson, Casie. 2017. “Welfare Database Reform May Improve Poverty in Thailand.” *The Borgen Project* (blog). April 24, 2017. Retrieved August 8, 2019 from https://borgenproject.org/improve-poverty-in-thailand/.

Wilson, Kate. 2014. *Provider Payment Reform and Information Technology Systems: A Chicken and Egg Question for National Health Coverage Programs*. Joint Learning Network. https://afhea.confex.com/afhea/intl14/webprogram/Paper1211.html.

World Health Organization. n.d. “Achieving Universal Health Coverage: From the Past to the Future Prince Mahidol Award Conference, Bangkok, Thailand.” Retrieved August 8, 2019 from http://www.who.int/dg/speeches/2018/achieving-universal-health/en/.

Pangkanon, Suthipong. 2014. “Thailand National Birth Defect Registry.” Retrieved August 8, 2019 from http://kb.hsri.or.th/dspace/handle/11228/4180.

The Thai civil registration (CR) system was established two centuries ago. Over the past four decades, the system has changed from a manual, paper-based registration system to a centralized, electronic, online system. A unique identification number (UIN) system was implemented in 1982, along with a computerized CR database system. The Thai citizen identification card has evolved along with the two systems from a paper card to an integrated circuit–chip smart card. All provincial-, district-, and municipality-level registration offices are linked online to the central CR system database.

Thailand's vital statistics (VS) system has improved since 1996, when the CR system began feeding electronic birth and death data directly into the VS management system. VS reports are now up to date, of good quality, and available for use by any agency that needs them.

Thailand declared its universal health coverage (UHC) policy in 2001. Health insurance coverage was expanded to all Thais through the Universal Coverage Scheme. The use of UINs and CR databases has enabled and facilitated rapid enrollment of beneficiaries and improved the beneficiary registries of all three of the country's major insurance plans. All Thais are entitled to coverage from one of these plans. The use of UINs and personal demographic information from the CR system significantly improved the quality of health care information and provider payment systems.

Misuse of UINs and personal information in CR is threatening the integrity of the UIN and central CR databases. New initiatives by the Thai government, such as the National Digital Identification Platform project, are ongoing to expand e-government and private services and to prevent the misuse of personal information and personal identity challenges.

ABOUT THIS SERIES:

This series is produced by the Health, Nutrition, and Population Global Practice of the World Bank. The papers in this series aim to provide a vehicle for publishing preliminary results on HNP topics to encourage discussion and debate. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to the World Bank, to its affiliated organizations or to members of its Board of Executive Directors or the countries they represent. Citation and the use of material presented in this series should take into account this provisional character. For free copies of papers in this series please contact the individual author/s whose name appears on the paper. Enquiries about the series and submissions should be made directly to the Editor Martin Lutalo (mlutalo@worldbank.org) or HNP Advisory Service (askhnp@worldbank.org, tel 202 473-2256).

For more information, see also www.worldbank.org/hnppublications.

1818 H Street, NW
Washington, DC USA 20433

Telephone: 202 473 1000
Facsimile: 202 477 6391
Internet: www.worldbank.org
E-mail: feedback@worldbank.org