Financial Risk Protection of Thailand Universal Health Coverage: results from series of national household surveys between 1996 and 2015.

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Research

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Abstract

Background

Thailand, an upper-middle country, had demonstrated exemplary outcomes of Universal Health Coverage (UHC). The country has achieved UHC since 2002 when the whole population was covered by the three public health insurance schemes. Prior studies do not provide long series of UHC financial risk protection. This study assessed financial risk protection as measured by the incidence of catastrophic health spending and impoverishment in Thai households prior to and after UHC in 2002.

Methods

We used data from a fifteen-year series of annual national household socioeconomic surveys between 1996 and 2015, which were conducted by the National Statistical Office. The survey covered about 52,000 nationally representative households in each round. Descriptive statistics were used to assess the incidence of catastrophic payment as measured by the share of out-of-pocket payment for health by households exceeding 10% and 25% of household total consumption expenditure, and the incidence of impoverishment as determined by additional number of non-poor households falling below the national and international poverty lines after health payment.

Results

Using the 10% threshold, the incidence of catastrophic spending dropped from 6.0% in 1996 to 2% in 2015. This incidence reduced more significantly when 25% threshold was applied (from 1.8% to 0.4% in the same period). The incidence of impoverishment against national poverty line reduced considerably, from 2.2% in 1996 to approximately 0.3% in 2015. When the international poverty line of US$ 3.1 per capita per day was used, the incidence of impoverishment was 1.4% and 0.4% in 1996 and 2015 respectively; and when US$ 1.9 per day was applied, the incidence was negligibly low.

Conclusion

The significant decline in the incidence of catastrophic health spending and impoverishment was attributed to the deliberate design on the Thai UHC that provides comprehensive benefit package, zero co-payment at point of services. The well-founded healthcare delivery systems also play critical role in supporting and sustaining the function of the UHC.

Background

Universal Health Coverage (UHC), as committed by UN Member States in the Sustainable Development Goals (SDG), can contribute to health equity if it is properly designed and implemented [1]. The two explicit objectives of UHC, improving the equitable access to quality health services and financial risk protection, are keys in achieving health goals in the SDG, such as mortality reduction and prevention of premature mortality from non-communicable diseases.

After four decades of health infrastructure development and three decades of extending financial risk protection targeting different population groups with a comprehensive benefits package, Thailand finally achieved UHC in 2002 [1, 2] when the whole population were covered by one of the three public health insurance schemes: (1) the Civil Servant Medical Benefit Scheme (CSBMS) for government employees and retirees and their dependants, (2) Social Health Insurance (SHI) for private sector employees and (3) the Universal Coverage Scheme (UCS) for the remaining 47 million population (75% of total population) who are not covered by CSMBS and SHI, and.

The UCS, launched in 2002, is financed by general tax revenue through annual budget allocation. The SHI is financed by tri-partite payroll contributions, equally shared by employee, employer and the government, while the CSMBS is financed by general tax revenues [3]. Key characteristics of these three main schemes are described in Table 1.

Table 1
Key characteristics of the three main public health insurance schemes in Thailand as of 2020

Insurance scheme	Population coverage	Source of revenue	Mode of provider payment	Access to service
Civil Servant Medical Benefit Scheme (CSMBS)	~ 9%, government employees plus dependants (parents, spouse, and up to 2 children)	General tax, noncontributory scheme	Fee for service, direct disbursement to mostly public providers and Diagnostic Related Groups (DRG) for inpatient treatment	Free choice of public providers
Social Security Scheme (SSS)	~ 16%, private sector employees, excluding dependants	Tripartite contribution, equally shared by employer, employee and the government	Inclusive capitation for both outpatient and inpatient plus additional adjusted payments for accident and emergency and high-cost care	Registered public and private contractors
Universal Coverage Scheme (UCS)	~ 75%,the rest of the 'Thai' population not covered by the SSS and the CSMBS	General tax	Capitation for outpatients and global budget plus DRG for inpatients	Registered contractors, notably the network of public hospitals (Contracting Unit for Primary Care)
Source: Tangcharoensathien et al [21]				

The achievement of UHC in Thailand is remarkable, in terms of health-utilization outcome and economic merit [4]. The UCS resulted in a reduction of probability that an ill person would not have formal treatment and an increased probability of the use of both outpatient (OP) and inpatient (IP) services at public hospitals, where the increases in the OP utilization were greatest amongst the poor [5]. Recent study suggested that the incidence of catastrophic spending (using household health spending exceeding 10% of household consumption as a benchmark) in Thailand in 2010 was approximately 3%, around fourfold lower than the global incidence of 12% [6].

Notwithstanding these studies, knowledge gaps remain. For instance, research that details the long term sustainable success of UHC, not just a snapshot assessment is still lacking. Also, prior research on UHC mostly investigated financial risk protection through the assessment of catastrophic health spending; while impoverishment was not reported in details.

This study analysed the fifteen-year trend covered the pre-UHC prior to 2002 and post-UHC eras in the following dimensions: (i) the incidence of catastrophic health expenditure, as measured by out-of-pocket expenditure on health greater than 10% and 25% of total household consumption expenditure, and (ii) the incidence of impoverishment from health payment by households as assessed by three key poverty lines, namely Thailand national poverty line and two international poverty lines using purchasing power parity (PPP) at US$1.9 and US$3.1 per person per day [7, 8]. Finally, this paper explains determinants, in particular benefits package designs and health systems factors which contribute to the improved financial risk protection.

Methods

Data source

Data were retrieved from a series of annual national representative household socioeconomic surveys (SES), conducted by the National Statistical Office of Thailand (NSO), between 1996 and 2015. It should be noted that between 1996 and 2006 the SES was conducted biennially, but since 2007 it turned to be an annual survey. However, in this study, the scope of the analysis covered 1996 till 2015 where the most completed data are available. The SES used structured interview as main data collection techniques. A total of approximately 52,000 households were recruited in each survey. All samples were divided by 12 portions for a monthly survey in order to minimize the seasonal variations of household income and expenditure. A stratified two–stage random sampling was conducted.

A number of household attributes were collected, including household income, consumption expenditure, amount of capitals, changes in assets and debts, ownership of durable goods, housing characteristics and monetary expenditure at point of health services. The time reference for questions related to OP utilization and self-medication was one month whereas the reference for IP utilization was one year.

Data analysis

Descriptive statistics were applied to assess (i) the incidence of catastrophic payment, and (ii) the incidence of household impoverishment from healthcare spending. A wealth index which distinguishes rich and poor households was created by principal component analysis technique through ownership of durables and housing characteristics [9]. The index divided households into quintiles where the first quintile represented the poorest households while the fifth quintile represented the richest ones. The annual incidence of catastrophic and impoverishment, were stratified by household wealth quintiles, geographical regions (Greater Bangkok, Central, North, Northeast and South), and urban-rural areas.

It should be noted that the following operational definitions were used in the analysis. The out-of-pocket payment (OOP) was defined as a sum of medical and health-related expenditure at point of service and aggregated at household level [10]. The scope of OOP in this study encompassed the following components, (i) medical expenditure spent during the previous month for non-admission health services which included expenditure on self-medication, traditional or herbal drugs, contraceptives and condom, vitamins, first-aid kits and other medical equipment, (ii) OP care expenditure including dental care and optometric care in the previous month in all facility types (such as public health centres, public hospitals, private clinics and private hospitals), and (iii) IP care expenditure during the past 12 months in all facility types.

The incidence of catastrophic health payment was calculated from the sum of households having catastrophic payment if the share of healthcare spending in a given household exceeds the thresholds, using 10% and 25% of total household consumption expenditure, divided by the total number of sample households.

The household being impoverished from health payment was assessed by comparing total health expenditure before and after health payment against the national poverty line, updated regularly by the Office of the National Economic and Social Development Broad, and two international poverty lines using PPP US$ 1.90 and US$ 3.10.

To estimate impoverishment, the following procedures were applied. First, the number of households whose expenditure was below the poverty lines prior to health payment was estimated and was defined as ‘H-pre’. Second, healthcare payment was subtracted from the total household expenditure. The number of poor households after subtracting OOP was defined as ‘H-post’. Impoverished households are the number of additional poor households after health payment, and its incidence is equivalent to H-post minuses H-pre. Details of the Thailand poverty line during the study period by geographical regions are presented in Table 2.

Table 2

Thailand national poverty line (US$ per capita per month) by geographical regions and areas

Geography		1996	1998	2000	2002	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Greater Bangkok	Urban	74.27	51.35	53.88	51.21	57.41	66.31	74.32	80.88	78.05	86.98	95.15	96.33	99.16	96.47	91.45
	Total	74.27	51.35	53.88	51.21	57.41	66.31	74.32	80.88	78.05	86.98	95.15	96.33	99.16	96.47	91.45
Central	Urban	63.83	45.74	48.15	46.23	52.73	61.76	69.40	76.73	74.02	83.19	90.65	91.66	95.53	92.11	87.67
	Rural	55.25	40.53	42.44	40.32	45.84	53.94	60.59	67.93	65.85	74.71	81.23	82.34	85.52	82.51	77.54
	Total	58.09	42.29	44.41	42.49	48.52	57.15	64.31	71.74	69.48	78.57	85.60	86.74	90.32	87.19	82.55
North	Urban	56.99	39.93	42.19	40.30	45.15	52.53	59.13	65.59	63.50	71.60	78.81	79.70	82.97	80.46	75.73
	Rural	43.85	31.27	32.47	31.28	35.69	42.30	48.42	54.71	53.07	60.53	66.32	66.71	70.39	68.74	64.83
	Total	46.53	33.03	34.48	33.35	38.10	45.20	51.61	58.12	56.51	64.37	70.84	71.61	75.32	73.50	69.41
Northeast	Urban	52.78	38.09	39.55	37.81	42.83	50.33	57.20	63.70	62.18	70.95	77.50	77.76	81.51	79.51	75.12
	Rural	40.68	30.23	31.35	29.82	33.51	40.80	47.27	53.94	52.14	60.10	66.46	66.87	70.14	68.68	65.03
	Total	42.57	31.49	32.72	31.32	35.47	43.04	49.74	56.50	54.92	63.27	69.86	70.39	73.98	72.51	68.75
South	Urban	63.81	45.25	47.13	45.48	51.24	59.83	67.65	74.89	74.04	83.24	91.51	92.81	96.44	93.55	88.76
	Rural	49.52	34.69	36.11	34.72	40.16	49.22	55.60	62.93	61.17	69.33	76.57	77.43	80.44	78.64	73.80
	Total	52.63	37.04	38.64	37.36	43.09	52.24	59.17	66.62	65.30	73.99	81.73	82.90	86.27	84.21	79.52
Whole country	Urban	64.63	45.51	47.65	45.47	51.24	59.60	67.04	73.81	71.51	80.34	87.78	88.62	92.00	89.17	84.44
	Rural	45.84	33.36	34.76	33.29	37.94	45.69	52.19	59.13	57.38	65.59	72.08	72.82	76.17	74.26	70.04
	Total	51.52	37.07	38.77	37.37	42.73	51.07	58.13	65.20	63.42	72.11	79.20	80.16	83.70	81.50	77.20

Source: 1. NSO, Thailand [7]

Note: Exchange rate as of January 2020 as defined by the World Bank

Results

Profile of the samples

The majority of households resided in the rural areas (52–69% of total households). About one-third of the households were in the northeastern region and one-fourth in central and northern regions whereas only 10 to 14% were in Southern region and Greater Bangkok, Table 3. These profiles did not significantly change between 1996 and 2015.

Table 3
Percentage distribution of sample households by geographical region and areas between 1996 and 2015

Year	Geographical regions					Geographical areas		Total number of sample households
	Greater Bangkok	Central	North	Northeast	South	Urban	Rural	
1996	11.75	22.32	20.47	32.52	12.94	30.83	69.17	15,037,898
1998	11.97	22.47	19.99	32.50	13.07	31.18	68.82	15,758,198
2000	12.19	22.58	19.78	32.36	13.09	31.57	68.43	16,086,398
2002	12.43	22.67	19.50	32.25	13.15	32.56	67.44	16,323,070
2004	12.39	22.94	19.70	31.91	13.06	32.61	67.39	16,765,049
2006	10.76	24.58	19.57	32.07	13.02	31.61	68.39	18,051,358
2007	10.78	24.75	19.40	31.99	13.09	31.78	68.22	18,178,247
2008	10.37	24.48	19.71	32.46	12.99	32.11	67.89	18,993,547
2009	10.31	24.19	19.74	32.48	13.27	33.13	66.87	19,579,220
2010	10.24	24.24	19.71	32.44	13.36	36.00	64.00	19,740,866
2011	9.84	24.57	19.67	32.39	13.53	36.19	63.81	19,985,866
2012	9.77	24.63	19.64	32.39	13.57	36.18	63.82	20,068,020
2013	9.71	24.66	19.60	32.37	13.65	36.14	63.86	20,167,519
2014	12.33	29.84	18.30	26.49	13.03	46.28	53.72	20,601,044
2015	13.66	29.77	17.86	25.92	12.78	47.52	52.48	21,325,999

Incidence of catastrophic health expenditure

When the 10%-threshold was applied, the incidence of catastrophic health spending slightly decreased during the pre-UHC period—from 6.0% in 1996 to 5.7% in 2000. After the implementation of UHC, the catastrophic dropped dramatically from 4.1% in 2002 to 2.0% in 2015 (about 50% reduction), Fig. 1. Using the 25%-threshold, the incidence was much lower than using the 10%-threshold. A declining trend was observed, from 1.8% in 1996 to 0.4% in 2015. In terms of urban-rural differentials, before the UHC era, the incidence of catastrophic payment among rural households was much higher than the urban households. After the UHC was achieved, the urban-rural gap of catastrophic health spending diminished over time. In 2014, we observed zero urban-rural gaps of households catastrophic health spending.

Households living in Greater Bangkok area had higher incidence of catastrophic health spending than other regions, and the southern region came the second. In general, a declining trend was observed in all regions.

When the 25%-threshold was applied, the incidence of catastrophic health spending was not remarkably different from when the 10%-threshold was applied. The regional difference of the incidence of catastrophic health spending became smaller over time, Fig. 2.

When the households were stratified by asset quintiles, the incidence of catastrophic payment dropped drastically after the roll-out of UHC in 2002, in both the richest and poorest quintiles. The richest quintile experienced the greatest incidence of catastrophic spending compared to other quintiles in almost all years observed, Fig. 3.

Incidence of healthcare impoverishment

The poverty incidence after spending for healthcare, measured by the percentage of households living below the national poverty line, increased from 32.9% in 1996 to about 38.5% in 2000. Then it decreased by about six-fold to 6.6% in 2015. The incidence of impoverishment as a result of payment for medical bills also shrank by four-fold, from 1.3% in 2002 to approximately 0.3% in 2015, Fig. 4.

In 1996 the incidence of impoverishment was about 1.4% (using international poverty line of US$ 3.1 as a reference) and 1.7% (US$ 1.9 as a reference). After 2002, the trend hugely decreased despite some fluctuations. The incidence of health impoverishment using US$3.1 and US$ 1.9 poverty line greatly reduced after 2002 when UHC was launched. The incidence of impoverishment appeared to be smallest in 2015 (0.07% with US$ 1.9 used as the reference), Fig. 5.

Discussion

The UHC goals as proposed by the World Health Organization (WHO) is that ‘all’ people and communities are able to access essential services with sufficient quality, while government ensures that the use of such services does not expose the users to financial hardship [11]. This study clearly confirms that Thailand UHC had achieved high level of financial risk protection against catastrophic health spending and impoverishment from health payment by households and reaffirms the negative correlation between public health insurance coverage and incidence of catastrophic payments [6]. The percentage of households in Thailand encountering catastrophic health spending and healthcare impoverishment was on par with several high income countries in Europe, North America and Oceania; for instance, Austria, France and Germany [6, 12].

Several factors synergistically contributed to the financial protection of households against catastrophic health spending and impoverishment.

Firstly, all three public health insurance schemes provide full financial coverage to their members and cover full cost of services to healthcare facilities; hence not allow co-payment or balanced billing from the service users. Full financial coverage for services reduced OOP by households. Also general tax, the sole source of financing UCS and CSMBS, is the most progressive source of health financing as the rich pays higher direct tax in monetary terms than the poor [1]. Full financial coverage is reflected by the percentage of domestic general government health expenditure (GGHE-D) to current health expenditure had increased from 65% in 2002 (when the UCS was launched) to 78% in 2016; while the percentage of OOP to the current health expenditure had reduced from 28–12% during the same period [13]. The lower the proportion of OOP in financing health services is, the lower the incidence of catastrophic health spending and impoverishment incurs [14].

Secondly, benefits package covered by all schemes is comprehensive, without maximum limits of financial coverage and literally no co-payment at point of service, resulting in a massive reduction of OOP by households. The benefits package also applies negative list approach, that is, all interventions are covered except a few exclusion list such as infertility, aesthetic surgery and treatment under research or pilot study [1]. Later when the national capacity in conducting health technology assessment improved, more cost effective interventions were included in the benefits package, which further boosted the financial risk protection [15]. Curative services include medicines in the national list of essential medicines (NLEM). The NLEM was scaled up from the minimum 'essential medicine list' with reference to WHO model list to a 'reimbursement list' for all three public health insurance schemes since 2003. As of 2017, there are 849 drug items in the current NLEM [16], Table 4.

Table 4
Number of drugs in the national list of essential medicines, by 17 groups

Group no.	Category	No. of drugs
1	Gastrointestinal	39
2	Cardiovascular	72
3	Respiratory	30
4	Central nervous systems	102
5	Infections	133
6	Endocrine systems	43
7	Obstetrics and gynaecology	22
8	Malignant diseases and immuno-suppression	56
9	Nutrition	93
10	Musculoskeletal and joint diseases	24
11	Eye	41
12	Ears, nose, oropharynx and oral cavity	42
13	Skin	47
14	Immunological products and vaccines	24
15	Anaesthesia	31
16	Antidotes	33
17	Contrast media and radiopharmaceuticals	17
Total		849
Source: Food and Drug Administration (FDA), Thailand [16]		

Thirdly, closed end provider payment, notably the dominance of capitation for OP care and Diagnostic Related Group under global budget for IP care applied by the three schemes (except fee for service for CSMBS OP services), results in cost containment which frees up budget for extension of benefits package in further deepening financial risk protection [1]. The UCS covers certain high-cost life-saving interventions such as antiretroviral treatment for HIV in 2006 and renal replacement therapy in 2009 despite the cost ineffectiveness of chronic dialysis, but because the cost of dialysis is prohibitively high and can be catastrophic to households [17, 18]. Not only high-cost treatments but the UCS also covers long-term community interventions such as treatment for psychotic diseases, certain items of Thai traditional medicine, and seasonal influenza vaccination [19]. Figure 6 describes the chronological events of extension of the UCS benefits package to high cost interventions, all subject to rigorous health technology assessment.

Fourthly, Thailand has developed local capacities to generate evidence on health technology assessment, which was rigorously applied to the annual review for inclusion of new health interventions into the UCS benefits package. The benchmark for inclusion of cost-effective interventions is the incremental cost effectiveness ratio equal to one Gross Domestic Product (GDP) per capita for one Quality Adjusted Life Year gain from the intervention. Other criteria for decision include budget impact within fiscal capacity to fund new interventions and readiness of health systems to deliver the interventions equitably [20]. Health technology assessment helps improve efficiency of resource use and minimize waste from spending on interventions that are not cost-effective.

Fifthly, capitation payment requires the UCS members to register with a primary health care network, which consists of one district hospital and 10–12 sub-district health centres, serving about 50,000 people in the district catchment area [1, 3]. The gate keeping function of primary healthcare contractor network gains efficiency and provides better continuity of care for non-communicable diseases (NCD) in particular. Better access to primary health care network with assured referral to provincial tertiary care hospitals when clinically indicated results in adequate use of services and low level of OOP and transport cost by households [3, 18].

Lastly, the full geographical coverage of over 9,800 sub-district health centres in all 8,860 sub-districts, and 780 district hospitals and 116 provincial/regional hospitals in all 998 districts and 77 provinces throughout the country is the solid platform for equitable access to the comprehensive set of benefits package which result in favourable financial risk protection at sub-national level [3, 21].

Certain limitations remain. Firstly, data on OOP paid by households is an aggregate figure which did not break down by types of health facilities which hampers further detail breakdown analysis by types of health facility. Secondly, as the unit of analysis is 'household' not 'individual', therefore per capita expenditure was estimated from total household OOP divided by number of household members without adjustment; and this cannot perfectly represent the real data collection from individual household member. Lastly, interview survey is prone to recall bias which may undermine the accuracy of reported data by household members. Also, there was a possibility that the head of a household, who is the respondent to NHSO surveys, may not catch up with the real health spending by other household members.

Conclusion

Thailand has been successful in reducing the incidence of catastrophic health spending and healthcare impoverishment. This success is ascribed by numerous factors, which can serve as a good lesson for low- and middle-income countries for their quest towards progressive realization of UHC. The comprehensive benefits package including high-cost interventions notably chemotherapy, radiation therapy, dialysis and anti-retroviral treatment, and literally no co-payment at point of care contribute to low level of OOP and low incidence of catastrophic spending and impoverishment. Zero co-payment is possible as the insurance funds provide full cost subsidies to healthcare providers. The full cost subsidy is achievable because of political commitment on health by increasing fiscal space for health, as reflected by a large proportion of domestic general government health expenditure to current health expenditure. The design of strategic purchasing of the insurance funds and the foundation of primary health care networks operated by adequate number of qualified health workforce nationwide are enabling factors for pro-poor healthcare utilization and high level of financial risk protection. The full geographical coverage of health delivery systems in particular primary healthcare at district and sub-district level with provincial hospital referral backups are solid platforms for equitable utilization of health service by all. The comprehensive benefits package including high-cost interventions contributes to high level of financial risk protection while strategic purchasing contributes to cost containment and health systems efficiency.

List Of Abbreviations

CSMBS Civil Servant Medical Benefit Scheme

FDA Food and Drug Administration

GDP Gross Domestic Product

GGHE-D Domestic general government health expenditure

NCD Non-communicable diseases

NELM National list of essential medicines

NSO National Statistical Office of Thailand

OOP Out-of-pocket payment

PPP Purchasing power parity

SDG Sustainable Development Goals

SES Socioeconomic surveys

SHI Social Health Insurance

UCS Universal Coverage Scheme

UHC Universal Health Coverage

WHO World Health Organization

Declarations

Ethics approval and consent to participate

As the dataset used by this study is conducted by the National Statistical Office (NSO) which is mandated by the Law to produce national statistics. As mandated by Statistic Act 2007, NSO neither requires ethics approval for household surveys nor signed consent by surveyed respondents. However, as mandated by the Statistic Act, Article 15 ensures confidentiality of data collected by NSO field workers and other users of the dataset. In this study, the researchers had strictly followed the confidential requirement in Article 15 of the Act. In the dataset there is no personal attribute that one can trace back. All individual information was strictly kept confidential and not reported in the paper.

Consent for publication

Not applicable

Availability of data and materials

The data that support the findings of this study are available from the NSO but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of the NSO.

Competing interests

None declared

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Authors' contributions

VT and KT set the study design. KT, VV, SV and SL cleaned the data. KT, VV, SV and SL analysed the data. KT and RS crafted the first draft of the manuscript. RS and VT provided revision of the draft. All authors agreed to be accountable for all aspects of the work and approved the final draft of the manuscript.

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Figures

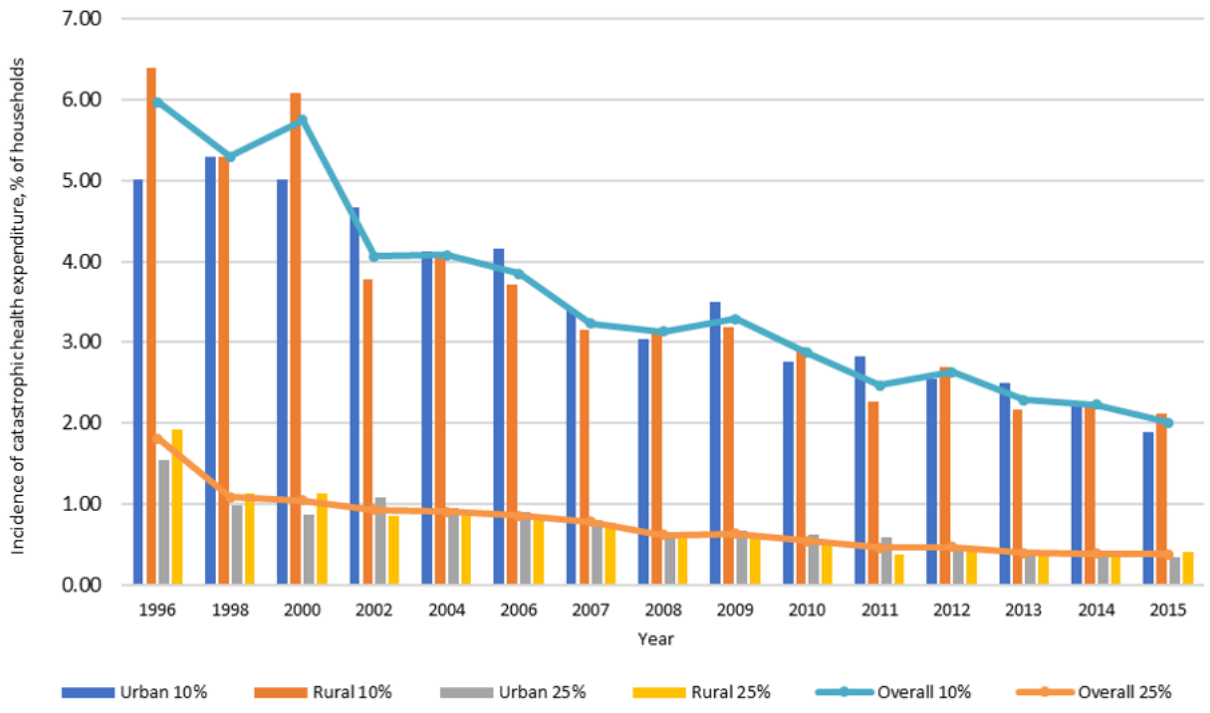

Figure 1

Incidence of catastrophic health expenditure between 1996 and 2015

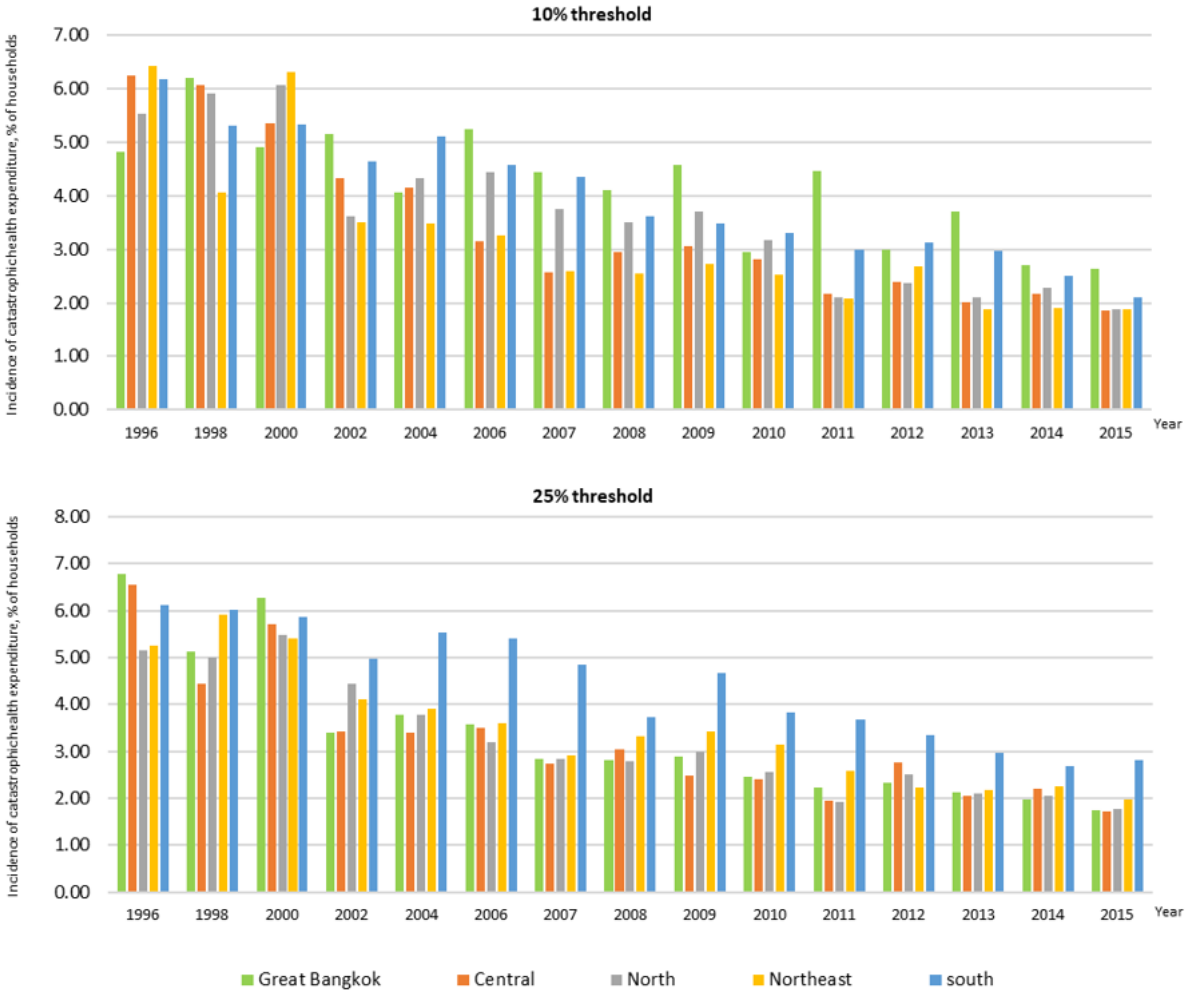

Figure 2

Incidence of catastrophic health payment by geographical regions between 1996 and 2015

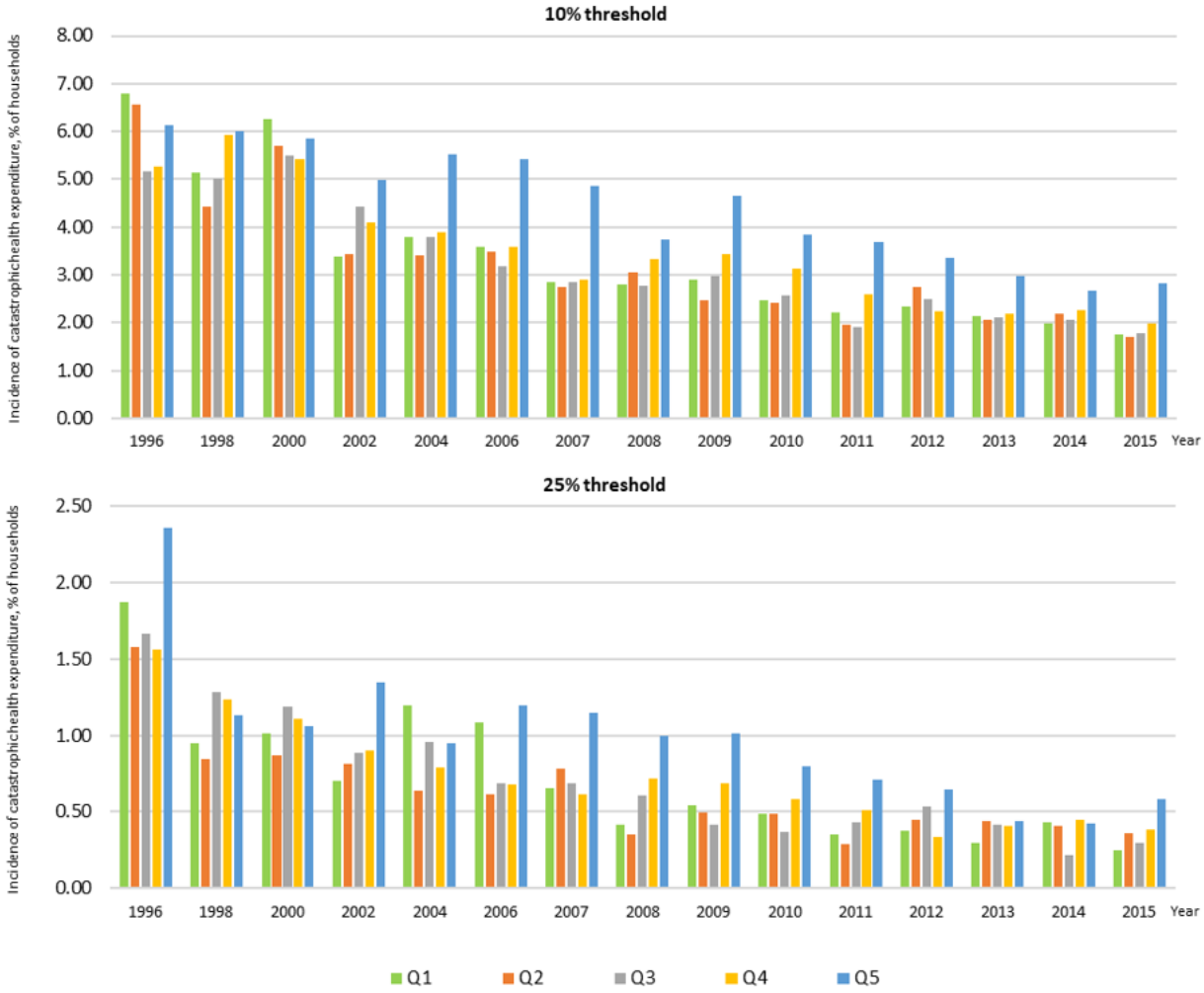

Figure 3

Incidence of catastrophic health payment by household asset quintiles between 1996 and 2015

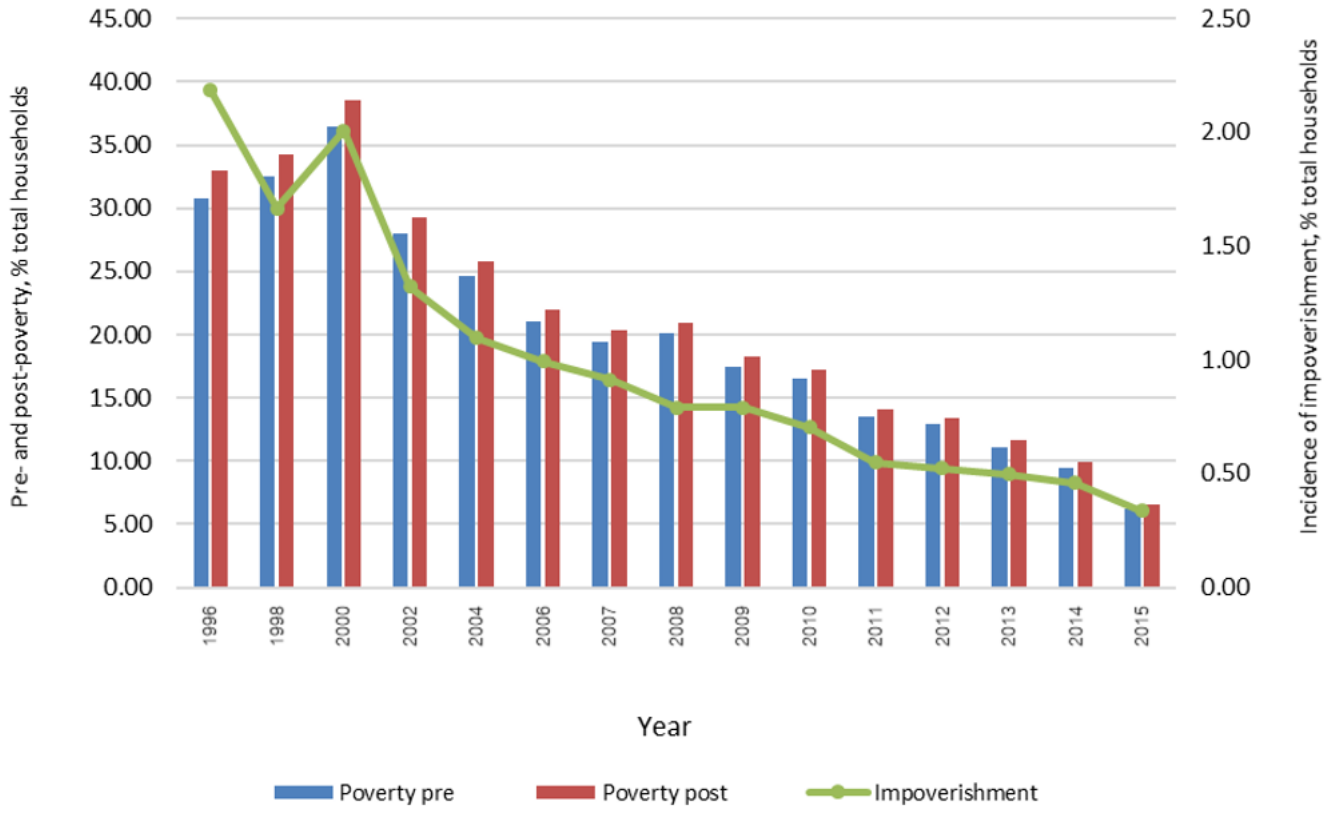

Figure 4

Incidence of households with impoverishment using national poverty line, % total households

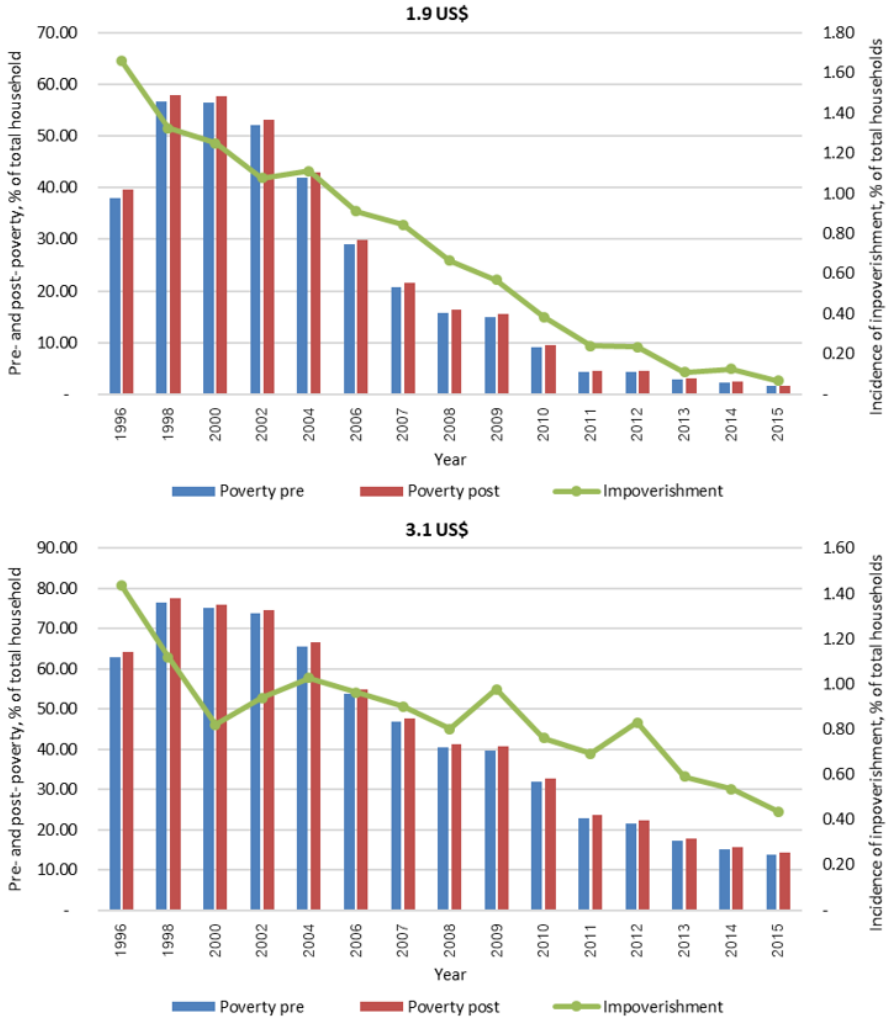

Figure 5

Incidence of impoverishment using international poverty lines (US$ per capita per day), % total households

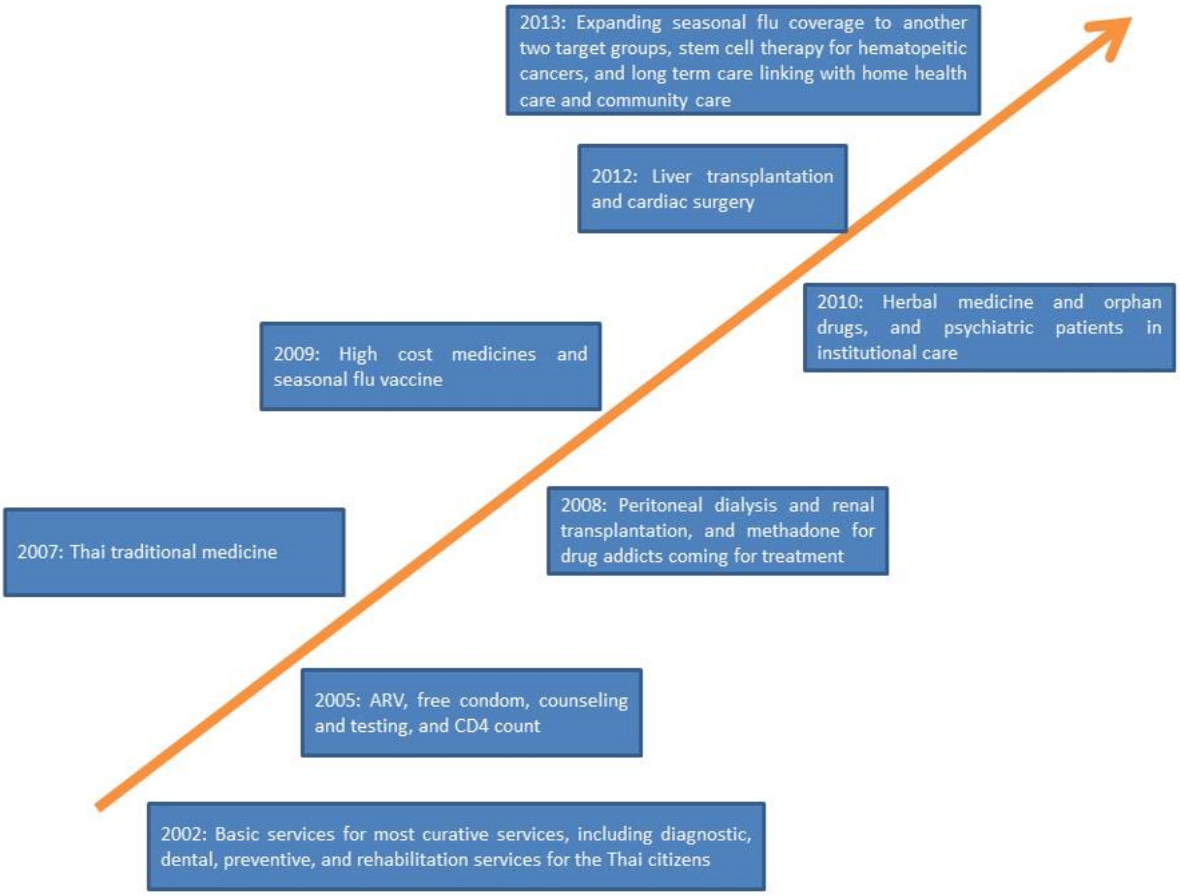

Figure 6

Historical evolution of the extension scope of the UCS benefits package