Expanding social health protection in Cambodia: An assessment of the current coverage potential and gaps, and social equity considerations

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Abstract The Royal Government of Cambodia recently launched its National Social Protection Policy framework to strengthen and expand social security and assistance. To

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inform social health protection policy, we examine socio-economic survey data and administrative coverage data to assess the coverage potential of existing coverage mechanisms and current gaps; and compare equitable contribution rates. Over 53 per cent of the population currently has no social health protection coverage mechanism, and about 16 per cent of the population who do have access to a mechanism are not yet enrolled. Current expansion efforts focus on the formal employee scheme, primarily benefiting individuals from higher income households. In addition, recent coverage expansion to some informal workers leaves significant gaps, particularly among the informal sector. We find out-of-pocket health care expenditure to be an excessive share of income among lower wealth quintile individuals and conclude they are financially vulnerable. Finally, we illustrate that an equitable approach to individual, monthly health care contributions among the lower three quintiles has a severely limited potential for revenue generation, and collection costs could exceed the amount collected. Therefore, we recommend that vulnerable groups should be exempted from contribution payments as social health protection is expanded.

Introduction

The global development agenda is increasingly focused on expanding social health protection to alleviate poverty, vulnerability and inequality. In 2012, the International Labour Conference adopted the Recommendation concerning National Floors of Social Protection, 2012 (No. 202), to establish that, as a minimum, "all in need have access to essential health care and basic income security". In 2015, the United Nations General Assembly adopted the 2030 Sustainable Development Goals (SDG). Goal 1, End poverty in all its forms everywhere, calls for implementation of "nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable". Goal 3, Good health and well-being, calls for the achievement of "universal health coverage, including financial risk

protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all".[1] More specifically, universal health coverage (UHC) implies that there is equitable access and use of quality services by all those who need them (SEARO, 2019). Monitoring progress towards the achievement of UHC, including equity-oriented monitoring, is important to ensure an increased and continuing focus to reach the ambitious SDG targets (Barreto et al., 2014; Hosseinpoor et al., 2014; Ng et al., 2014; Mtei, Makawia and Masanja, 2014; Saksena, Hsu and Evans, 2014).

Cambodia has experienced more than two decades of strong economic growth with an average rate of 7.7 per cent for 1995–2017 (World Bank, 2018). In June 2016, the country was reclassified from a low-income to a lower-middle-income economy (Ly, 2016). In 2017, gross national income (GNI) per capita reached 1,230 US dollars (USD) (World Bank, 2018). Despite this progress, the World Bank estimates that around 4.5 million people, or nearly 28 per cent of the population remain near-poor and vulnerable to falling back into poverty when exposed to economic and other shocks (World Bank, 2018). Vulnerability to poverty has increased as a large proportion of the population is concentrated at the bottom of the wealth distribution (ADB, 2014; OECD, 2017).

The Royal Government of Cambodia (RGC) has established the reduction of poverty, vulnerability and inequality as explicit policy goals in its National Social Protection Policy (NSPP) framework 2016–2025 (RGC, 2017). Aligning with the United Nations SDGs, the framework's strategy aims to protect all citizens and includes the development and expansion of health coverage schemes to achieve UHC. The Cambodian Ministry of Health (MOH) estimates that the existing health coverage schemes may collectively cover about 4.7 million Cambodians or 30 per cent of the population. The MOH aims to increase coverage to 50 per cent of the population by 2020 (MOH, 2016).

Presently, the Cambodian social health protection landscape includes insurance for civil servants and formally employed workers, as well as social assistance with the Health Equity Fund (HEF) for the poorest of the poor. The National Social Security Fund (NSSF), under the Ministry of Labour and Vocational Training, manages the civil servants' and formally employed workers' schemes. The NSSF is rapidly expanding enrolment in the formal employee scheme. The number of people covered increased from 265,761 in 2016 to 608,965 in 2017, and in April 2019 the scheme had more than 1,712,000 people enrolled. The contribution rate is set at 2.6 per cent of the employee's salary. Currently, contributions are paid by the employer only, thus minimizing the administrative and logistical burden of contribution collection. The contribution for the civil

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1.   See *About the Sustainable Development Goals.*

servants' scheme is 1 per cent of salary, paid by the State. These schemes do not presently include family members.

The Health Equity Fund (HEF), established to provide free access to health care for the poorest, is operated by the Ministry of Health (MOH), but with claims and payment verification under the responsibility of a semi-autonomous Payment Certification Agency. Eligibility is primarily determined at the household level through a pre-identification IDPoor[2] programme, operated by the Ministry of Planning using community-based proxy means testing; pre-identification accounts for about 92 per cent of enrolment. This system is complemented with a post-identification system enabling enrolment at the point of service delivery; post-identification accounts for the remaining 8 per cent of enrolment. Since 2017, approximately 2.6 million household members have been covered under the HEF, representing about 80.9 per cent of the poorest wealth quintile (assuming that all current beneficiaries are in the poorest wealth quintile) or 16.1 per cent of the total population. More recently, free benefits under the HEF have been extended to some informal workers and selected populations (see below). However, there are large segments of the population that presently have no social health protection mechanism.

Health Equity Fund extensions

In late 2017, the RGC issued Regulation 404, a joint legal directive expanding eligibility to coverage under the HEF to some informal workers. This regulation aimed to extend health coverage to approximately 2 million informal workers defined as individuals with a signed employment contract for work of not more than eight hours a week, part-time, casual or seasonal. Coverage under this directive requires that the individual has completed a registration process with the NSSF. In addition, special category beneficiaries are deemed eligible under other directives issued by the Ministry of Labour and Vocational Training (December 2017), Ministry of Health (January 2018) and the Council of Ministers (February 2019). Beneficiaries under these HEF extensions include commune council members, village chiefs, deputy village chiefs, professional sport practitioners, association members, and People Living with HIV (PLHIV).

Towards Universal Health Coverage (UHC)

Many low- and middle-income countries have adopted health financing reforms over recent decades with the intention of achieving UHC and equity in the financing of health care delivery (Asante et al., 2016). The NSPP framework's

2. IDPoor: Identification of Poor Households Programme.

stated focus on poor and vulnerable populations establishes a clear policy directive for Cambodia's expansion prioritization.

Vulnerability is defined as the potential of harm occurring due to risk exposure and the inability to manage risks and shocks (Alwang, Siegel and Jørgensen, 2001).[3] Vulnerability is most commonly understood as financial vulnerability. However, income and assets are only one aspect of the various complex dynamics of human well-being (Mechanic and Tanner, 2007; Edstrom, 2007).

Vulnerability is multi-dimensional with risks relating to economic exclusion (financial), social exclusion and marginalization (societal), emotional disaffection (personal), discrimination (institutional), and health status (biological). These dimensions generally overlap: compounding the overall vulnerability of an individual, and thus their household (Luchenski et al., 2017; Bradshaw and Finch, 2003). These factors directly or indirectly affect the quality of life, especially income and assets. As such, each risk dimension can exasperate vulnerability by affecting an individual, and therefore their household's ability to cope with stressors and shocks, potentially undermining their economic security. For these reasons, the poorest, children younger than age 5, pregnant women, PLHIV, people with tuberculosis (TB), the disabled, and the elderly are also considered vulnerable (ADB, 2014). Among these vulnerable groups, only the poorest of the poor, and (more recently) PLHIV, currently have a health care coverage mechanism. Finally, beyond the poorest, there is no consensus in Cambodia concerning who is considered financially vulnerable, and therefore who should be provided with free access to health care under the HEF.

The NSPP framework envisions the implementation of a health scheme for the non-poor informal sector. Fairness in health care financial contributions is a central health system goal and a paramount consideration for the expansion of social health protection (Murray et al., 2002). Social equity and solidarity are fundamental principles of the NSPP framework (RGC, 2017). For health care financial contributions to be fair, households should not become impoverished or pay an excessive share of their income to obtain health care; and, lower income households should pay less towards the health system than higher income households (Murray and Frenk, 1999). Equity in health care financing can be characterized as vertical (financial contribution proportional to capacity to pay) and horizontal (those with the same capacity to pay making the same contribution) (Wagstaff and van Doorslaer, 2000; Murray et al., 2002; O'Donnell et al., 2008). Vertical equity focuses on progressivity whereby health care contributions, as a proportion of income, rise as income increases (Amporfu, 2013). Vertical equity can be assessed by the degree of inequality in

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3. See Vulnerability Assessment and Analysis, Food and Agriculture Organization of the United Nations (FAO) E-learning Centre.

paying for health care when considering individuals' unequal ability to pay (O'Donnell et al., 2008; Van Doorslaer, Wagstaff and Rutten, 1993). In this article, we focus on vertical equity.

To plan for the expansion of social health protection it is imperative to understand the coverage potential of the current mechanisms, estimate the gaps vis-à-vis policy goals, and assess a fair and equitable approach to contributions within the current context. Decision-makers may ask a number of questions, among which: How many people do not yet have a coverage mechanism? Who is benefiting the most from the current expansion efforts focused on formal employees? How many informal workers are already eligible for coverage under the recent Health Equity Fund extensions? What would be an equitable approach to determining contributions?

To answer these questions and inform policy-makers on the expansion of health insurance in Cambodia we assess legal and effective coverage gaps, estimate vulnerable population and employment group sizes, review the poverty profile with a focus on the second and third wealth quintiles, and assess potential beneficiary contribution amounts using four approaches.

Data, methods and limitations

Data

We analysed the 2016 Cambodia Socioeconomic Survey (CSES) data set provided by the Ministry of Planning's National Institute of Statistics. This survey is a nationwide representative sample that includes questions asked about the household and individual household members. The 2016 data set contains records for 3,676 households with 10,746 individual working-age adults.

Data was adjusted ("winsorized") to bring income values below the first percentile to the first percentile and income values above the 97.5th percentile to the 97.5th percentile. This adjustment (winsorization) limits the influence of extreme outliers in the analysis (Ghosh and Vogt, 2012).

We adjusted the daily per capita international poverty line (USD 1.90) and the lower middle-income class poverty line (USD 3.20) using the 2016 Cambodia Purchasing Power Parity (PPP) conversion factor for private consumption.[4,5] These poverty metrics were used as benchmarks for the wealth comparison.

Capacity to pay is defined as an individual's effective income net subsistence expenditure (Murray et al., 2002; Xu, et al., 2003).

4. See World Bank FAQs: Global poverty line update.
5. $1 PPP = 1,643.3 Cambodian riel (KHR). Local currency figures were converted to USD using the standard Cambodia Socioeconomic Survey exchange rate of KHR 4,100 = USD 1.

The average monthly NSSF contribution rate is based on 2.6%*170 US dollar per month minimum wage for garment workers (USD 4.79 per person per month), and the regulatory salary ceiling for contribution collection of 1 million Cambodian riel (KHR) or 2.6%*244 US dollar (USD 6.87 per month per person per month).

Vulnerability group sizes for pregnant women and persons who are physically disabled[6] were estimated by applying 2014 Demographic Health Survey proportions for those groups to 2019 population projections (NIS, 2017b). Vulnerable age groups (i.e. children younger than age five, and seniors aged 60+) were taken directly from 2019 population projections. Elderly are defined as people aged 60+ because there is Cambodia-specific evidence indicating households with people older than age 59 are very vulnerable to out-of-pocket (OOP) health care expenditures (Jacobs, de Groot and Fernandez Antunes, 2016). Estimates for PLHIV and people with TB were sourced from the World Health Organization Global Health Observatory[7] and the *Yale Global Health Review* (*YGHR*, 2015), respectively. We used Stata 15.1 for all data management and analysis.

Employment group classification

We reviewed the CSES master survey questionnaire to establish inclusion criteria to identify employment groups among working-age adults (aged 15–59). To the degree possible, employment groups were defined to correspond to health scheme coverage eligibility. Individuals were assigned to one of eight employment groups: two formal sector groups (private and public workers); four informal sector groups (part-time, seasonal, farmers and fishery workers, and self-employed); not-active adults; and employers. Categorization followed the inclusion/exclusion criteria detailed in Table 1.

There are four informal groups: part-time, seasonal, farmers, and self-employed. A part-time worker is defined as any employee who reported working more than zero hours, but less than 40 hours per week.[8] Casual workers are generally defined as employees with no guaranteed hours of work. As casual workers cannot be differentiated in the CSES data, we do not present them as a separate group. We adopt the CSES definition of seasonal work, which is the report of work done during only part of the year with that same job reoccurring every year. Finally, we consider farmers and fishery workers (hereafter referred to

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6. Physical disability is determined as an assessed great difficulty or inability to see, hear, walk, concentrate, self-care, or communicate.
7. See World Health Organization Global Health Observatory data.
8. Due to the limited number of working-age adults self-reporting as an employee and working less than 8 hours in the past week, we collapsed this category into "part-time".

Table 1. *Employment group inclusion and exclusion criteria among working age adults*

Employment group	Exclusion/inclusion criteria
Public sector	Individuals reporting government employment including civil servants and commune/village chiefs/administrators
Employees	Individuals reporting any non-government employment and working at least 40 hours in the past seven days
Farmers (and fishery workers)	Individuals who identified that the farm or fish products they produced in the last seven days in their main economic activity was mainly or only for sale
Self-employed	Individuals reporting their main occupation or economic activity as working on their own account, as an unpaid family worker, or other, and reporting working hours during the past week, exempting farmers as defined here
Part-time workers	Individuals reporting being an employee and working less than 40 hours in the past seven days
Seasonal employees	Individuals who identified their current or previous employment (within the past 13 months) as seasonal. Seasonal work is work done part of the year but the same job is reoccurring every year. As per the CSES, examples of seasonal work include construction, tourism, and salt field workers
Non-active/unemployed	Individuals who had no report of a main occupation or economic activity, or reported working on their own account, as an unpaid family worker, or other, but did not report working any hours in the previous seven days and did not identify their most recent employment as seasonal.
Employers	Individuals who identified as such; these individuals were excluded from further analysis as they are not the focus of this study and are small in number (<1% of respondents).

Source: Adapted from the 2016 CSES definitions.

only as farmers) and the self-employed as separate informal-sector employment groups.

Methods

Household survey consumption expenditure data is generally considered more reliable than income data. This is attributed to a variety of factors including under-reporting, as respondents may not wish to reveal their true income for privacy or other reasons. In addition, income data is more vulnerable to random shocks. Therefore, over time the variance of current expenditure is smaller than the variance of current income (O'Donnell et al., 2008; Deaton and Zaidi, 2002; Xu, et al., 2003; Bouis, 1994; Deaton, 1992; NIS, 2017a). Furthermore, households may report disposable income less than zero; this is because there is no standard in Cambodia on how to depreciate expenditures for investments over time (NIS, 2017a). For these reasons, we use consumption expenditure as a proxy for effective income, particularly among the lower quintiles. All household level expenditure data was individualized (i.e. total household amount divided by

the household size) to enable a direct comparison with the average NSSF contribution rate.[9]

We recognize that consumption expenditure data does not enable a fair comparison of wealth at a population level, as lower-income individuals and households expend a greater proportion of their total income compared to their higher-income counterparts. This issue is particularly problematic when analysing data with a high wealth disparity (Lakner et al., 2016). Therefore, we use total income to estimate the proportional distribution of wealth. Total income is defined as the sum of wages and salaries, self-employment and property income, as well as transfers received (net transfers such as taxes, and transfers to other households and for charity) (NIS, 2017a).

We consider a person to be financially vulnerable if an average (one-month) OOP health care expense would reduce the average monthly effective income of an individual to the poorest quintile. From the CSES survey data, we calculate the average monthly OOP health care treatment expenditure for working-age adults among those with an expenditure at USD 43.08 [95%CI: USD 19.60 – USD 66.58][10] for the second wealth quintile, and USD 46.68 [95%CI: USD 28.70 – USD 64.65] for the third wealth quintile.

We use four approaches to illustrate fair and equitable health insurance contribution rates by wealth quintile and compare these rates with the mean and median NSSF individual monthly contribution rates (USD 5.83 and USD 6.87, respectively). First, we apply the NSSF fixed contribution rate of 2.6 per cent to effective income to illustrate a proportional income-based approach. This approximates the current approach used for formal employees, albeit the employer pays the contribution. We apply this approach to the mean effective income by wealth quintile and estimate an individual monthly contribution rate (see Equation 1 in the Appendix).

Second, we apply the NSSF fixed contribution rate of 2.6 per cent to calculate the proportional share of capacity to pay (CTP), which is mean effective income for each quintile net subsistence expenditure (see Equation 2 in the Appendix). Third, we calculate a weighted NSSF rate according to the share of total income by wealth quintile (see Equation 3 in the Appendix), and apply the weighted rate to the mean effective income by wealth quintile to estimate an equitable approach (see Equation 4 in the Appendix). Fourth, we estimate equitable CTP by reducing the mean effective income for each quintile by subsistence expenditure and applying the weighted NSSF rate to CTP (see Equation 5 in the

9.   This rate was not based on the actual cost of the provision of care (i.e. services reimbursed by NSSF are still subsidized by the State through the health sector).
10.   A 95%CI [confidence interval] is a range of values for which one can be 95% certain contains the true mean of the population.

Appendix). Subsidence expenditure is based on $1.90 PPP per person per day, which equates to USD 0.76 per person per day for Cambodia.

Limitations

Due to limitations with the data set, it was not possible to analyse vulnerable groups (i.e. pregnant women, persons with disabilities) by wealth quintile or capacity to pay. As the source data for these estimates were not linked to the CSES data, it is not possible to segment these populations by wealth quintile.

We aligned employment categories, to the degree possible, with health coverage eligibility groups. In addition, we grouped currently non-eligible groups to create four major categories: unemployed, self-employed, farmers and fishery workers, and employers. However, we recognize there is considerable heterogeneity within each category. For example, farmers and fishery workers have different livelihoods as landownership is important for the former, and common property resources are important for the latter (Tong, 2012). As our primary focus was on identifying health care coverage gaps, a more detailed poverty analysis of sub-employment categories was considered beyond the scope of this study.

In addition, the data set did not permit the identification of different types of government workers. This would have been useful to enable the sub-analysis of civil servants who have a separate scheme, and commune council members who were covered recently under the HEF extension. We used 2019 administrative data to estimate effective coverage (i.e. people enrolled) and compare it with our legal coverage estimates.

We also note that effective income may be a misleading measure of financial well-being as it does not account for debt, which can increase consumption expenditure or decrease capacity to pay (i.e. effective income net subsistence expenditure) due to loan repayment obligations (O'Donnell et al., 2008).

Finally, this study did not assess horizontal equity. As noted above, horizontal equity can refer to people with the same ability to pay making the same contribution (Amporfu, 2013). This type of assessment was not undertaken, as this study focuses on a non-contributory scheme. In addition, for the NSSF scheme, contributions are paid entirely by the employer (2.6 per cent of salary). This minimizes the potential for variation in contribution rates vis-à-vis ability to pay. Horizontal equity can also refer to equity in access to health care services among people with the same needs. This can be assessed by comparing the utilization of care for paying and fee-exempted individuals (Schneider and Hanson, 2005). This type of assessment is beyond the scope of this study, which focuses on examining coverage and applying an equity lens when considering potential contribution rates.

Results

Population size estimates and coverage gaps

There is an important distinction between legal coverage, which refers to people who are legally entitled to be covered by a scheme, and effective coverage, which refers to people enrolled in the scheme. We applied population estimates and administrative enrolment data to estimate gaps in legal and effective coverage. Figure 1 shows the total estimated legal coverage (inner circle) compared to current effective coverage (outer circle) by scheme. Over 53 per cent of the population currently has no coverage mechanism, and therefore no possibility to access coverage under a government-managed scheme. In addition, more than 16 per cent of the population has a coverage mechanism but are not yet enrolled.

Vulnerable group size estimates

The vulnerable group populations, non-inclusive of the poor and financially vulnerable groups, collectively amount to 22.4 per cent of the total population or about 3.6 million people. This estimate includes about 1.6 million

Figure 1. *Legal and effective coverage estimates*
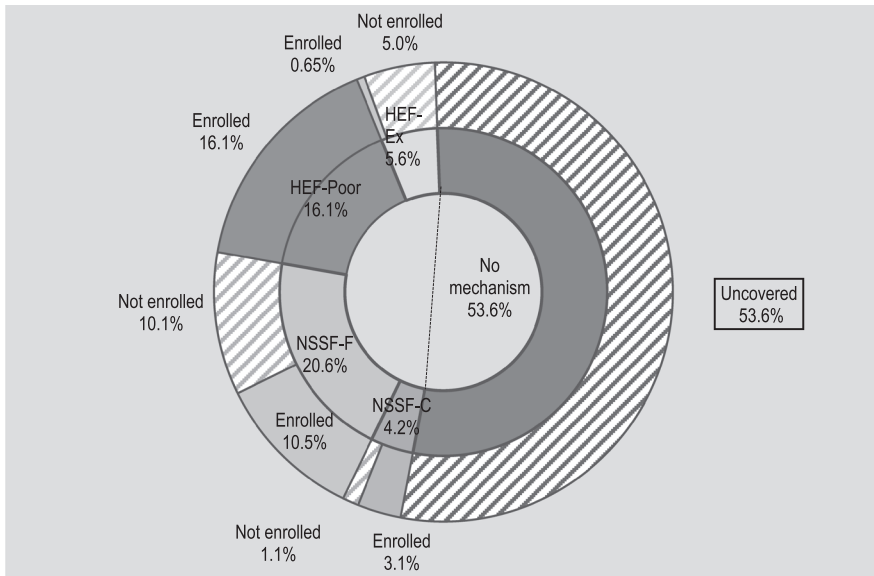
Notes: HEF-Ex = HEF Extension groups ; NSSF-F = Formal sector scheme ; NSSF-C = Civil servants' scheme.

Source: Authors' estimates using 2016 CSES data and 2019 administrative coverage statistics.

children younger than age five (10 per cent), 238,000 pregnant women (1.5 per cent), 175,000 PLHIV/TB (1.1 per cent), 312,000 people with disabilities (1.9 per cent), and 1.3 million people aged 60+ (8 per cent).
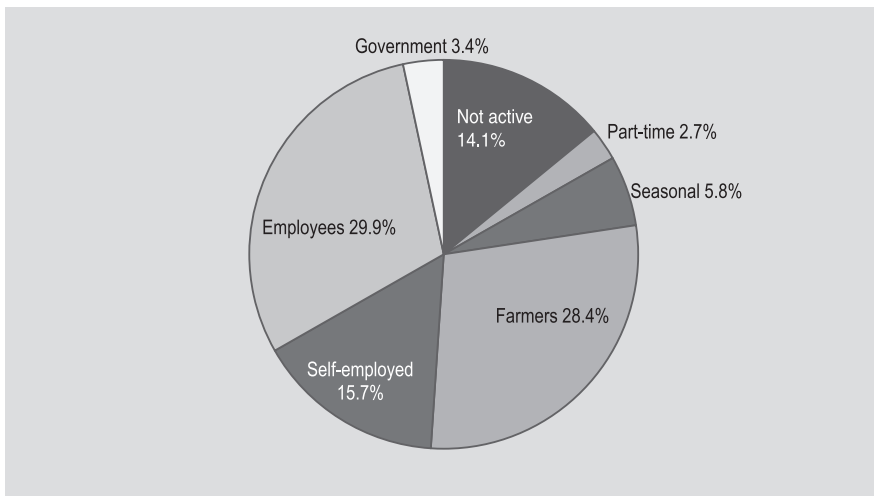
Employment group size estimates

Cambodia's population is predominately young and of working age. School-aged children (aged 5–14) represent 18.4 per cent or nearly 3 million; and working-age adults aged 15–59 represent 63.7 per cent of the total population or approximately 10.37 million adults (NIS, 2017b).

Figure 2 shows population proportion estimates among working-age adults by employment group. About 15 per cent of working-age adults are not currently working. Part-time and seasonal workers, those explicitly covered under Regulation 404, account for an estimated 8.3 per cent (about 845,000 people). Farmers (and fishery workers) constitute 26.4 per cent (2.7 million), self-employed represent 14.3 per cent (approximately 1.5 million), employees 32.3 per cent (nearly 3.3 million), and public-sector workers 3.4 per cent (approximately 344,000).

Finally, over three-quarters of Cambodia's population reside in rural areas. About 11.2 per cent of the population live in the capital city, Phnom Penh, and 12.9 per cent live in other urban centres.

Figure 2. *Employment group population proportion estimates among working-age adults*
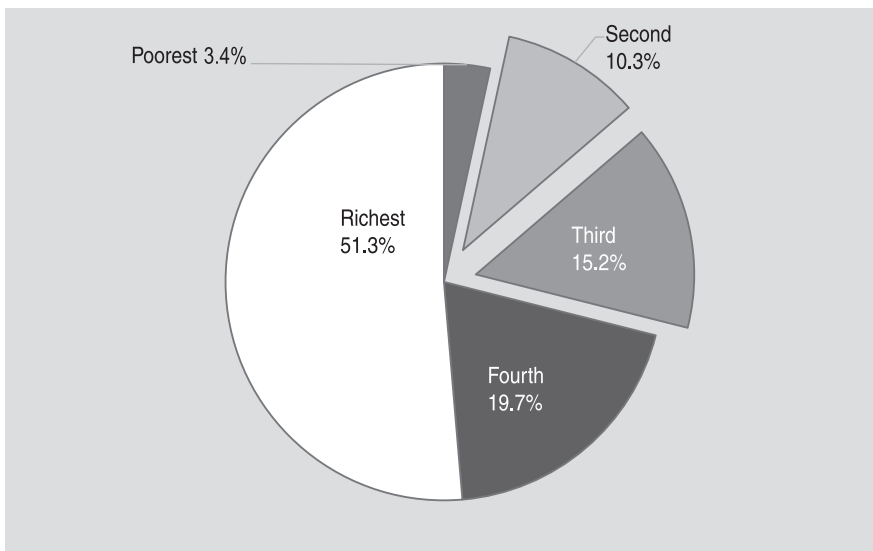

Source: Authors' estimates using 2016 CSES data.

Wealth profile by population and employment group

Figures 3 illustrates the distribution of total income by wealth quintile. The richest quintile accounts for 51.3 per cent of total income. The fourth quintile has 19.7 per cent of the total income wealth. Finally, the bottom three quintiles collectively have about 28.9 per cent of the total income: 15.2 per cent among the third quintile, 10.3 per cent among the second quintile, and 3.4 per cent among the poorest.
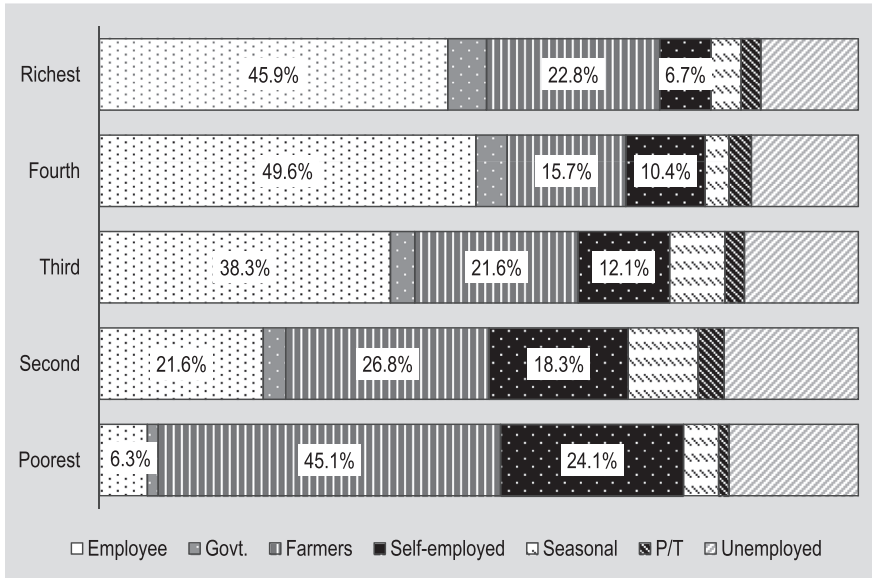
Nearly seven in ten (69.2 per cent) of the poorest are either farmers (45.1 per cent) or self-employed workers (24.1 per cent). These employment groups decrease as a proportion of adult workers as the wealth quintile increases: 45.1 per cent among the second quintile (26.8 per cent are farmers; 18.3 per cent are self-employed workers); 33.6 per cent among the middle quintile (21.6 per cent farmers; 12.1 per cent self-employed); 26.1 per cent among the fourth quintile (15.7 per cent farmers; 10.4 per cent self-employed workers); and 29.6 per cent among the rich (22.8 per cent farmers; 6.7 per cent self-employed workers). Inversely, the proportion of full-time employees increases with wealth quintile: 6.3 per cent among the poorest; 21.6 per cent among the second quintile; 38.3 per cent among the third quintile; 49.6 per cent among the fourth quintile; and 45.9 per cent among the richest (Figure 4).

Figure 3. *Proportional distribution of total income by wealth quintile*

Figure 4. *Employment category by wealth quintile among working-age adults*

Figure 5 presents the population breakdown (in per cent) by wealth quintile and employment group among working-age adults. The height of the cell in each column corresponds to the wealth quintile proportion of the adult working-age population for each employment category; the width of the column is proportional to the total percentage of the adult working-age population in each employment group. This enables the identification of vulnerability within employment groups, particularly those who do not presently have a health insurance coverage option.

Employees, representing 32.3 per cent of working-age adults, predominately belong to higher-income quintile households. Likewise, public-sector employees tend to reside in higher-income households, while they only represent 3.4 per cent of the working-age population. By contrast, farmers and self-employed adults represent large population segments (26.4 per cent and 14.3 per cent, respectively) and are concentrated among the lower wealth quintiles. In addition, they are less wealthy than their seasonally employed and part-time counterparts who represent only 5.7 per cent and 2.6 per cent of the adult population, respectively. The unemployed are evenly distributed across wealth quintiles.

Figure 6 compares monthly individual effective income by wealth quintile. Amounts in US dollars to the left of the stacked bar chart are the income cut-off

Figure 5. *Population proportions by wealth quintile and employment group among working-age adults (percentage)*

STATUS	EMPLOYEES	GOV	FARMERS	SELF-EMPLOYED	SEASON	P/T	UNEMPLOYED	TOTAL
Richest	9.1	1.0	4.6	1.3 / 2.1	0.8 / 0.6	0.5	2.6	19.9
Fourth	9.9	0.8	3.1 / 4.3	2.4	0.6 / 1.5	0.6	2.8	19.9
Third	7.7	0.6	5.4	3.7		0.5	3.0	20.0
Second	4.4	0.6	9.0	1.9 / 4.8		0.7	3.6	20.2
Poorest	1.3	0.3			0.9	0.3	3.4	20.0
TOTAL	32.3	3.4	26.4	14.3	5.7	2.6	15.3	100.0

Notes: Gov = Public sector; Season = Seasonal; P/T = Part-time.

Source: Authors' estimates from 2016 CSES.

Figure 6. *Monthly individual effective income by wealth quintile with averages and differences to the poorest quintile in USD*
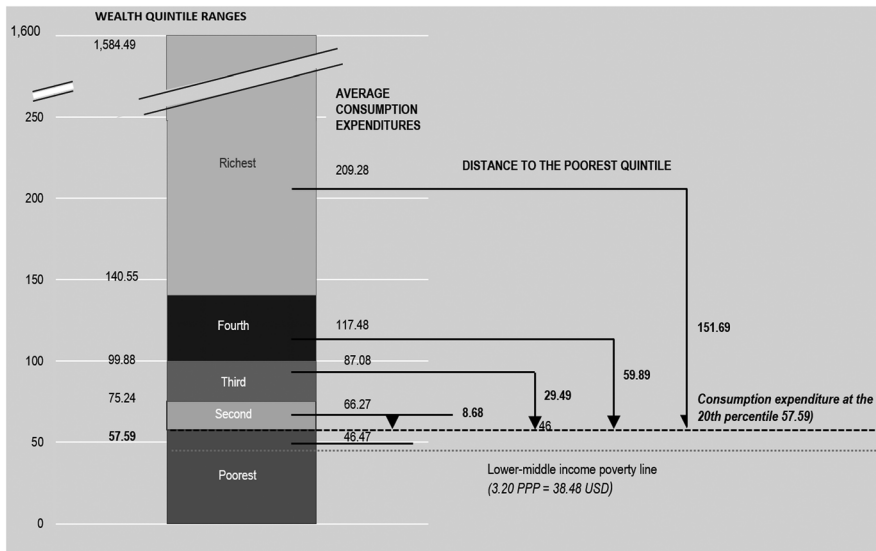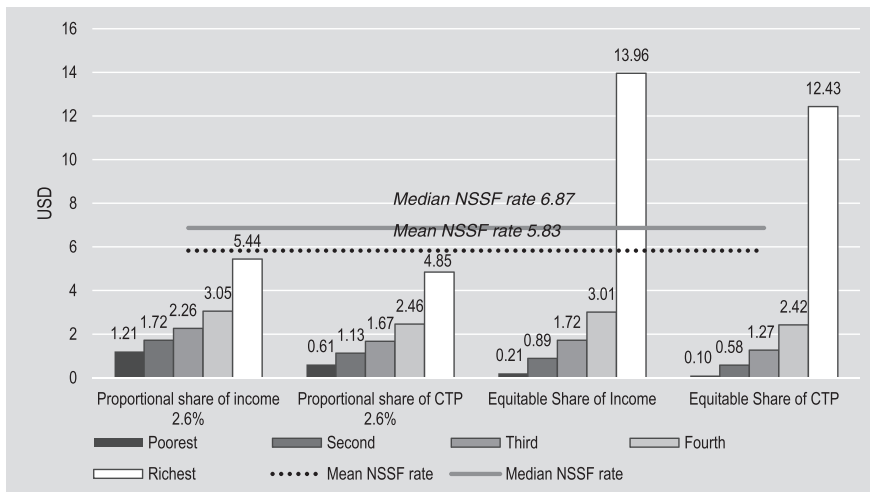

Source: Authors' estimates from 2016 CSES.

points for each wealth quintile. Amounts in US dollars to the right of the stacked bar chart are the average incomes by wealth quintile. Effective income under USD 57.59 (or USD 1.92 per day) falls under the 20th percentile or the poorest quintile (indicated with the black-dotted line). The mean monthly effective income among the poorest individuals is USD 46.47. This is slightly above the World Bank lower middle-income poverty line of $3.20 PPP, which is equal to USD 38.48 for Cambodia (indicated with the grey-dotted line).

The average effective monthly individual income for the second quintile is USD 66.27 [range USD 57.60–USD 75.24]; the third quintile is USD 87.08 [range USD 75.25–USD 99.88]; the fourth is USD 117.48 [range USD 99.89–USD 140.55]; and the richest quintile's effective income is USD 209.28 [range USD 140.56–USD 1,584.49]. Comparing the threshold for the poorest quintile with the average expenditure for other wealth quintiles reveals that the second quintile is only USD 8.68 above the poorest, and the third quintile is USD 29.49 above. As the average monthly OOP health care expense exceeds these amounts (USD 43.08 for the second wealth quintile, and USD 46.45 for the third wealth quintile), these quintiles are considered financially vulnerable. By contrast, the fourth and richest quintiles are USD 59.89 and USD 151.69 above the poorest quintile, respectively.

We assess a fair and equitable approach to contributions given the current context using four approaches (see Figure 7). First, we illustrate a proportional

Figure 7. *Proportional and equitable individual health insurance contribution estimates (monthly) by wealth quintile*

Source: Authors' estimates from 2016 CSES.

income-based approach by applying the NSSF fixed contribution rate of 2.6 per cent to effective income for each wealth quintile. This conservatively approximates the current approach used for formal workers and employees, albeit the rate is based on real income and the employer pays the contribution. We estimate an individual monthly contribution rate to assess the contribution rate, particularly among lower-income quintile households who comprise a higher proportion of informal workers. This approach results in the poorest individuals paying USD 1.21; and second and third quintile individuals' contribution rates of, on average, USD 1.72 and USD 2.26, respectively. By contrast, the fourth and richest quintile individuals pay USD 3.05 and USD 5.44, respectively.

Second, we estimate capacity to pay (CTP) by subtracting subsistence expenditure from effective income and apply the NSSF fixed contribution rate of 2.6 per cent for each wealth quintile. This results in an estimated individual monthly contribution of USD 1.13 for the second quintile, and USD 1.67 for the third quintile.

Third, we illustrate an equitable approach by weighting the NSSF rate following its proportional share of total income by wealth quintile (see Figure 2); then, we apply the weighted-rate to the average effective income by wealth quintile. This approach yields an estimated individual monthly contribution of USD 0.89 for the second quintile and USD 1.72 for the third quintile.

Fourth, to illustrate an equitable capacity to pay (CTP) approach, we adjust effective income by subtracting subsistence expenditure and apply the weighted NSSF rate. This approach results in a monthly contribution rate of just USD 0.58, on average, for second quintile individuals; and, USD 1.27, on average, for third quintile individuals.

Discussing and interpreting the results

The expansion of legal coverage and enrolment entitling all people to access health services under publicly organized schemes is a critical step towards the achievement of UHC (Knaul et al., 2012; Scheil-Adlung and Bonnet, 2011; Murray, 2009). Cambodia's social health protection system currently provides coverage mechanisms for civil servants, formal employees, the poorest of the poor, and some special populations. Current efforts to expand enrolment for formal employees has the potential to cover up to 3.3 million people. However, this coverage will primarily benefit individuals from higher income households. The HEF is estimated to provide social health protection for about 2.6 million individuals, leaving about 652,000 people in the poorest quintile without coverage, representing about 4 per cent of the total population.

Figure 8. *Gaps in legal social health protection coverage with breakdown by uncovered vulnerable group*
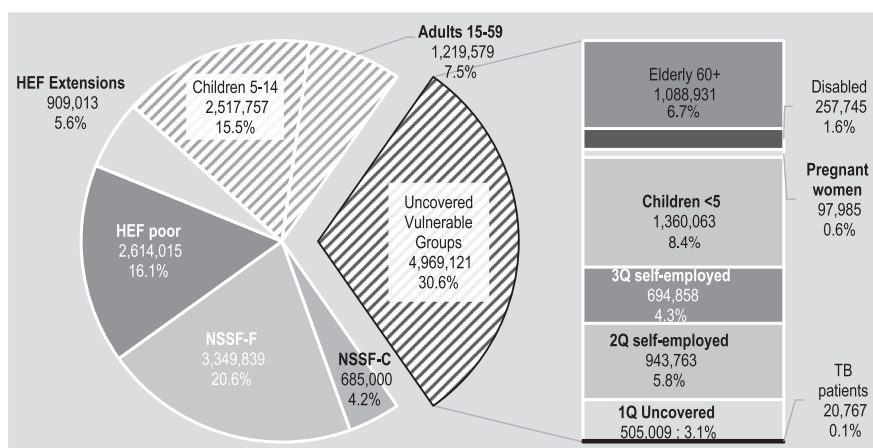
Sources: Authors' estimates from 2016 CSES, SEARO (2019), 2014 NIS (2016; 2017), WHO (2018) and Yale (2015).

It is important to recognize that there are multiple definitions of poor (ADB, 2014). Cambodia's most recent national poverty rate (announced in 2014) is 13.5 per cent. However, the current estimated enrolment in the HEF is 2.6 million beneficiaries, or about 16 per cent of the population.[11] The difference lies with the IDPoor Programme, which is the primary mechanism to identify HEF eligibility. This system does not apply an income eligibility threshold, rather it uses proxy means testing based on observable household characteristics and assets, and a participatory community process (White Kaba, et al., 2018). A recently completed analysis found that less than half of IDPoor cardholders are classified as poor using the national definition. However, that same study found that about 90 per cent of households targeted by the IDPoor Programme are classified as poor or under a vulnerability threshold of 1.5 times the national poverty threshold (OECD, 2017).

In addition, recent directives to expand the HEF could benefit about 910,000 special category individuals. As these are relatively small sub-groups, there are still significant coverage gaps, particularly among vulnerable groups.

Figure 8 shows total population coverage estimates and proportions by group, with a breakdown of coverage gaps for uncovered vulnerable populations. These estimates have been adjusted to account for (legal) vulnerable group coverage under existing schemes (i.e. they are non-duplicative). We estimate that about

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11.   Based on 2019 mid-year population projection of 16.3 million from the NIS.

8.7 million Cambodians do not yet have a social health protection mechanism – nearly five million of whom can be considered vulnerable. This amounts to 30.6 per cent of the total population.

The remaining uncovered populations of school-aged children and adults total about 23 per cent. An employment-based approach, if expanded to include the worker's household, could also mitigate this coverage gap – representing a potential opportunity to further increase enrolment by approximately 3.1 million household members.[12] More conservatively, costs could be offset by pooling funds or expanding coverage of the employer-based scheme to enrol vulnerable individuals who reside with a formal worker covered under that scheme.

In addition, farmers (26.4 per cent) and self-employed workers (14.3 per cent) are estimated to comprise about 40.7 per cent or nearly 4.2 million adults. An examination of the second and third wealth quintile households reveals that nearly half (45.1 per cent and 33.6 per cent, respectively) of these belong to farmers and self-employed workers – two employment groups with no coverage mechanism. There are about 932,500 and 686,500 farmers and self-employed workers in the second and third wealth quintiles, respectively.

In most developing economies, the middle-income groups have very low incomes, necessitating inclusion in social protection schemes (Ortiz, 2018). In Cambodia, the non-poor informal sector with capacity to pay into a contributory system is a relatively small group (OECD, 2017). To assess financial vulnerability, we compare the upper threshold for the poorest quintile with mean effective income for each other quintile. We find the average financial distance from falling into the poorest quintile for the second and third wealth quintiles is only USD 8.68 and USD 29.49 per individual per month, respectively. These amounts are insufficient to pay the average monthly OOP health care expense among working-age adults seeking care, which is estimated at USD 43.08 and USD 46.68 for the second and third wealth quintiles, respectively. Thus, we consider OOP health care cost to be an excessive share of income (O'Donnell et al., 2008; Murray and Frenk, 1999). As such, individuals within these quintiles may be considered financially vulnerable. This is consistent with a recent study by the Organisation for Economic Co-operation and Development (OECD) that found 55 per cent of Cambodian households to be either poor or vulnerable using a vulnerability line at 1.5 times the level of the national poverty line. Consequently, a relatively small income shock could dramatically raise the poverty rate (OECD, 2017).

Overall, 37 per cent of Cambodian households hold outstanding debt averaging USD 1,832. Rural areas have the highest proportion of indebted households (41.1 per cent) compared with other urban areas (37.4 per cent) and Phnom Penh (7.9 per cent), with an average outstanding loan of USD 1,645, USD 3,040, and

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12. Dependency ratio = 0.95.

USD 3,128, respectively (NIS, 2017a). Related to this, there is evidence that even relatively modest OOP health expenditure is a frequent cause of indebtedness and can lead to poverty in Cambodia (Van Damme et al., 2004).

The NSPP framework envisions the implementation of a health coverage scheme for the non-poor informal sector, initially voluntarily and then made compulsory. Willingness to Pay (WTP) for voluntary health insurance contributions can limit enrolment and coverage, reducing access to health services, particularly among lower-income quintile households (Dong et al., 2005). A WTP study among informal-sector workers in Viet Nam found that nearly half (48.8 per cent) of uninsured households were willing to pay for family health insurance (Nguyen, 2018). However, WTP does not necessarily translate into enrolment in subsidized voluntary schemes. A study from Viet Nam found enrolment at baseline to be 4 per cent. Information campaigns and the offer of a subsidy only increased enrolment by 1–3.5 per cent with results suggesting that such interventions may exacerbate adverse selection (Wagstaff et al., 2015). There is strong evidence demonstrating that voluntary health insurance programmes for the non-poor informal sector have extremely low uptake (Cotlear et al., 2015). These issues can undermine equity in access to health care. In addition, there is no clear enforcement mechanism by which to ensure enrolment under a compulsory approach for the informal sector. Finally, a recently published systematic review of WTP for health insurance in low- and middle-income countries found that the WTP for health care insurance among rural households to be just below 2 per cent of GPD per capita (Nosratnejad, Rashidian and Dror, 2016). In Cambodia, 2 per cent of GPD per capita equates to USD 14.98 per year,[13] or just USD 3.48 per person per year.

Another important consideration is whether to pursue a contributory or non-contributory approach. Contributions may be levied at a flat rate. However, this is a highly regressive way of funding health care, as lower-income people will contribute a higher proportion of their income than wealthier people (Chuma, Mulupi and McIntyre, 2013). Such vertical inequity could potentially undermine public trust and the expansion of social health protection. Informal workers could easily understand that they are paying a higher proportion of their income compared to their formally employed counterparts, especially as contribution payments among the formally employed are at present fully paid by the employer.

We illustrate rational and fair individual monthly health care contribution rates using four approaches that align with the NSPP framework's fundamental principles of equity and solidarity. These approaches reflect the current formal employee scheme rate of 2.6 per cent of income, and account for individuals' unequal ability to pay (Wagstaff and van Doorslaer, 2000; O'Donnell et al.,

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13.   GDP per capita (constant local currency – LCU) 3,069,876/4100 = $748.75*2% = $14.98.

2008). We find that the contribution rates are low for second and third wealth quintile individuals under all four scenarios: the rate ranges are USD 0.58–USD 1.72 and USD 1.27–USD 2.26 per individual per month for the second and third quintiles, respectively. One may consider the comparative base rate of 2.6 per cent to be excessively low. However, it is unlikely that this rate will be revised in the near to medium term, as current revenue collection is generating a large fund surplus for the employee scheme. Furthermore, as social security expands, the introduction of other employer-based payments is to be expected; potentially crowding-out increases to the employee scheme rate.

Although there may be some economies of scale if households enrol multiple members, the low contribution rates raise the issue of collection feasibility and its associated costs. One of the primary challenges to extending health care coverage to informal-sector workers, particularly in developing countries, is the logistical burden and associated administrative costs of contribution collection (Wolfe et al., 2014). There is evidence that national household contribution collection programmes, especially those that are voluntary, are administratively costly and have potential for regressive effects (Lagomarsino et al., 2012). This is because they require a strong administrative mandate and systems to track ability-to-pay (Bredenkamp et al., 2015). As informal workers are dispersed occupationally and geographically, the cost of contribution collection may exceed our illustrative rational and fair contribution rates. In addition, informal workers' use of formal banking is limited (Wilwohl, 2013), and they generally do not typically pay income taxes – thwarting the potential for automated payments or deductions for contribution collection. Theoretically, mobile payments, either using airtime or mobile money, can be used to collect contributions through payment reminders and self-payments via a mobile device (Saunders and Tappendorf, 2014). However, the application of such a system is yet to be demonstrated in Cambodia.

The most logical approach to resolve these issues is to exempt contribution payments among lower wealth quintile households that do not have another coverage mechanism. However, sub-targeting or identification of these households will still be necessary and will likely present many challenges (Mills et al., 2012). To address this issue, it is important to recall that Cambodia already has a well-developed IDPoor programme to assess household wealth. The IDPoor targeting tool could be revised to facilitate identification of lower-income quintile households for HEF enrolment.

Wagstaff found that social health insurance (i.e. contributory schemes) can easily cover the formal sector and the poor, but is not effective at covering non-poor informal sector workers until the economy has reached a high level of economic development (Wagstaff, 2009). A separate scheme for this population segment in Cambodia will face great challenges to generate sufficient revenue and

eschew adverse selection (OECD, 2017). Many countries have struggled to effectively implement contributory schemes. A recent study from Kenya found that the informal sector does not have the financial potential to sustainably pay contributions for health insurance (Okungu and McIntyre, 2019). In Ghana, the National Health Insurance Scheme's nationally-set minimum payment amounts to just over USD 5. However, authorities are unable to enforce the payment of the mandatory contributions for those in the informal sector, whose contributions amount to only 4–5 per cent of the scheme's cost (Amporfu, 2013; Chankova, Atim and Hatt, 2010; Cotlear et al., 2015; Schieber et al., 2012).

In Mexico, the national *Seguro Popular* health insurance programme initially set family contributions ranging from USD 60 (for the third income decile) to USD 950 for families in the highest decile. However, very few people (<1%) pay any contributions. The law has progressively exempted low-income households – initially the two poorest and subsequently the four poorest income deciles, as well as families in deciles four to seven with a pregnant woman or a young child (Han, 2012; Knaul et al., 2012; Cotlear et al., 2015).

Countries such as the Philippines have promoted enrolment with incentives for organized groups to increase enrolment among their members (Lagomarsino et al., 2012). However, there is a dearth of associations in Cambodia (Coventry, 2015). The NSSF is planning to test voluntary coverage extension through informal-sector associations targeting *tuk-tuk* (motorized tricycle taxi) drivers and domestic workers, the two largest informal worker groups in the capital city. These groups could potentially extend coverage to an additional 2,300 people (Vautier, 2019), a small fraction of the uncovered population.

As the collection of insurance contributions from workers in the informal sector is inefficient and unlikely to yield significant revenue, a focus on a tax-based approach is considered a more efficient and equitable approach (Averill and Marriott, 2013). In addition, there is evidence that tax-financed systems (i.e. those paid for primarily through public expenditure) tend to be proportional or mildly progressive, in contrast to social insurance systems (i.e. those paid for through enrolee contributions) which are regressive and private systems which are even more so (Wagstaff and van Doorslaer, 1992).

Thailand's system is considered fragmented, with three separate schemes: i) civil servants, ii) formal employees (contributory), and iii) the informal sector and the poor (tax-based, non-contributory). Although this has created several challenges to providing equitable benefits, several health system reforms have improved the equity and efficiency of the tax-based scheme (Prakongsai, Limwattananon and Tangcharoensathien, 2009). In addition, a recent assessment of that scheme showed evidence of substantial reductions in OOP payments and in the incidence of catastrophic health spending and medical impoverishment, while also reducing provincial gaps in child mortality (Tangcharoensathien et al., 2018).

However, each country's path to universal health care is unique (Lagomarsino et al., 2012). Progressive realization is a guiding principle for countries on their path to universal coverage (Baltussen et al., 2017). A phased approach for the gradual expansion of the HEF to vulnerable groups, including uncovered households in the first wealth quintile, as well as in the financially vulnerable second and third wealth quintiles, aligns with the Cambodian government's incremental approach to policy-making (Diaz Pedregal, Destremau and Criel, 2015). This current assessment of the coverage potential, coverage gaps and social equity considerations in Cambodia aims to enable decision-making and the development of options for health coverage expansion to support the RGC's national policy goals.

Conclusion and recommendations

Many countries are rapidly extending social protection coverage (Ortiz, 2018; Escobar, Griffin and Shaw, 2010; Knaul et al., 2012; Yiengprugsawan et al., 2010). The RGC has established national policy goals to reduce poverty, vulnerability and inequality with social equity as a fundamental principle. The progressive expansion of social health protection should ensure that the costs of expanding coverage for universal health care do not present an undue burden on enrolees and that those costs are fairly distributed. In addition, it is important to consider the relative efficiency of contribution collection, particularly among the informal-sector population who do not currently have a coverage mechanism.

This article has assessed the potential for coverage extension, current gaps, and social equity considerations to advance decision-making for the progressive expansion of social health protection. We offer a number of broad recommendations. The adoption of these recommendations would contribute to achieving UHC in Cambodia by expanding population coverage.

First, we recommend that Cambodia pursue equitable access to health care by extending coverage under the HEF to all vulnerable groups and, to the extent possible, their households, to avoid fragmentation. Population coverage may also be increased through the inclusion of family members of formally employed workers currently covered under the NSSF (formal sector) scheme.

In addition, the Cambodian government should reconsider the feasibility of establishing a new contributory scheme for the informal-sector population owing to financial vulnerability among the poorest three quintiles, the costs and logistical challenges associated with the collection of contributions, and the limited potential for revenue generation (Bredenkamp et al., 2015; Lagomarsino et al., 2012; Arnold and Campbell, 2018). The establishment of an additional scheme would result also in the further fragmentation of the current system.

To determine a specific policy approach, Cambodia should complete cost and coverage modelling to provide options and a timeline for a phased process of coverage expansion. The information and parameter estimates presented in this article seek to support the proposed modelling.

Second, we recommend that Cambodia should gradually increase the regulatory ceiling for contribution collection under the formal employees' scheme. This is currently set at KHR1 million (USD 243.90). Although the ceiling exceeds the mean income of the richest quintile (USD 209.28), it is not an equitable approach as it favours the workers at the highest end of the wealth curve by capping their contribution. Increasing the contribution ceiling would raise revenue to expand coverage, most logically to family members of formal employees already enrolled in the scheme. Minimally, the NSSF should enrol vulnerable individuals who reside with a formal worker. This will reduce the overall pool of uncovered individuals, including vulnerable people, and reduce the costs associated with HEF expansion to the remaining uncovered vulnerable groups.

Third, we recommend enabling higher-income informal workers to voluntarily enrol and self-pay contributions to the current employees' scheme.

Finally, we recommend the establishment of a social health protection monitoring and evaluation system to enable systematic progress monitoring of investment, enrolment coverage, service quality, financial risk protection, and utilization towards the achievement of universal health coverage. Related Sustainable Development Goal (SDG) indicators should be integrated into the proposed monitoring and evaluation system. This would ensure an increased and continuing focus to reach the ambitious SDG targets.

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A. Appendix

$$\text{Proportional share of income} = 2.6\% * \text{Mean\_Effective\_income}_{quintile} \quad (1)$$

$$\text{Proportional share of CTP}_{quintile} = \quad\quad\quad\quad\quad\quad\quad\quad (2)$$
$$2.6\% * \big(\text{Mean\_Effective\_income}_{quintile} - \text{Subsistence\_expenditure}\big)$$

$$\text{Weighted NSSF rate}_{quintile} = \sum_{i=1}^{5}(2.6\%) * \left(\frac{\sum\limits_{i=1}^{5} \text{Total}^{-}\text{income}_{HH}}{\sum\limits_{i=1}^{n} \text{Total}^{-}\text{income}_{HH}} \right)_{quintile} \quad (3)$$

$$\text{Equitable share of income}_{quintile} = \text{Weighted NSSF rate}_{quintile} \quad (4)$$
$$* \text{Mean\_Effective\_income}$$

$$\text{Equitable CTP}_{quintile} = \big(\text{Mean\_Effective\_income}_{quintile} - \text{subsistence expenditure}\big)(5)$$
$$* \text{weighted NSSF rate}_{quintile}$$

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