Chapter 2. Assessment of needs (Module 1)

This chapter describes the module to assess the risks and vulnerabilities faced by individuals throughout their lives. It presents objective and subjective vulnerability indicators, and their potential data sources, which could be used to analyse present and future social protection needs. The methodology employs a life cycle approach, recognising the linkages between life stages and the need to address basic protection coverage gaps. The module includes multi-dimensional and dynamic poverty analysis, and a latent class analysis that maps out poverty and vulnerability profiles.

Analytical dimensions

Module 1 of a Social Protection System Review (SPSR) focuses on a country's current social protection needs now and into the future. It identifies and analyses the risks and vulnerabilities that confront individuals at various points in their lives and assesses how these might evolve over time. It also highlights broader risks and vulnerabilities confronting particular groups, regions or the country as a whole. This process is crucial in assisting policy makers to design appropriate interventions, identify synergies across instruments, achieve sustainable progress in alleviating poverty and protect individuals against risks (OECD, 2007[1]).

Individual-level risks are analysed through a lifecycle framework. Risks and vulnerabilities over the lifecycle may be related. For instance, many challenges later addressed by social protection have roots in childhood, underscoring the need to take into account all life stages in developing social protection systems (Bonilla García and Gruat, 2003[2]; Cain, 2009[3]). Individuals are characterised as vulnerable when they face high exposure to certain risks and lack the ability to protect themselves against them or cope with the consequences. Risks can also emerge from covariate shocks affecting large groups of individuals simultaneously, such as natural disasters, health epidemics, political crises or economic instability (Bonilla García and Gruat, 2003[2]). Within countries, some regions are better developed than others, resulting in major disparities in income poverty and broader measures of deprivation. Understanding the macro-fiscal and socio-economic contexts of a country's social protection provision is therefore important.

Sustainable and appropriately designed social protection interventions also require forward-looking analysis that identifies future risks and vulnerabilities. This allows policy makers to incorporate into long-term planning the key drivers of demand for social protection subject to change in the future, such as demographics, urbanisation, migration and climate change (Devereux, Roelen and Ulrichs, 2015[4]).

Indicators and data sources

Module 1 provides a diagnostic of multi-dimensional risks and vulnerabilities to map out poverty and vulnerability profiles. Harmonised and comparable indicators should be used whenever possible to allow for benchmarking across a sample of countries. These profiles include new or emerging risks, such as demographic or climate change. Table 2.1 summarises the module's core indicators.

Thus, in addition to objective vulnerability indicators, subjective indicators, such as life evaluations, can also be included in the analysis, based on the Gallup World Poll or, whenever available, nationally representative household surveys. Subjective indicators may include additional indicators, such as evaluations of economic conditions or standards of living, as well as opinions on the availability of social services.

Table 2.1. Main indicators and data sources for Module 1

Indicators	Potential data sources
Child labour, excessive work hours, informality, labour force participation, labour productivity, NEET, unemployment	Household survey, International Labour Organization, national statistical office
Dependency ratio, population growth, population pyramids, urbanisation	Demographic and Health Survey, United Nations Department of Economic and Social Affairs
Education (enrolment rate)	Household survey, national statistical office, United Nations Educational Scientific and Cultural Organisation, World Development Indicators
Employment, GDP, inflation, sectoral value added	International Monetary Fund's World Economic Outlook, national statistical office, World Development Indicators
Gini, income growth, low pay	Household survey, national statistical office
Health (disability rates, disease burden, fertility rate, immunisation rate, infant mortality, maternal care, maternal mortality, need for medical assistance, stunting, underage pregnancy, unmet need for contraception, wasting)	Demographic and Health Survey, household survey, Institute for Health Metrics and Evaluation, United Nations Development Programme, United Nations Population Fund, World Development Indicators, World Health Organization
Migration	Household survey, national statistical office
Multi-dimensional poverty	Demographic and Health Survey, Oxford Poverty & Human Development Initiative, Global Multi-dimensional Poverty Index, United Nations Development Programme, Human Development Index
Natural emergencies	National statistical office
Poverty rates	Household survey, national statistical office, World Development Indicators
Subjective well-being	Gallup, household survey

Methodology

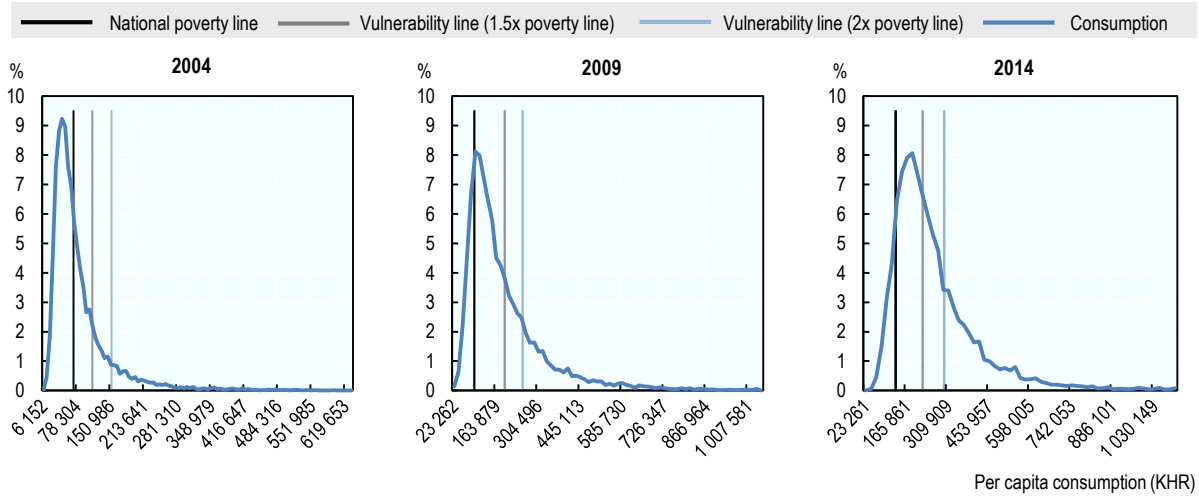
Poverty measurements

Module 1 analysis of vulnerabilities aims to provide a fuller picture of poverty than broad indicators, such as the poverty rate. This can be accomplished in two ways: through sensitivity analysis of monetary poverty and through inclusion of multi-dimensional poverty indicators.

Sensitivity analysis sheds light on the proportion of households or individuals at risk of falling into poverty by categorising poverty as extreme poverty (or food poverty), poverty and vulnerability. Households with incomes (or consumption) below 1.5 times the poverty rate are typically considered vulnerable, although this threshold can be adjusted to produce various estimates. Figure 2.1 shows significant levels of vulnerability in Cambodia at 1.5 and 2 times the poverty line, despite a decrease in the poverty headcount ratio.

Figure 2.1. While the poverty headcount has decreased, vulnerability remains high in Cambodia

Cumulative distribution of household consumption (2004-14)

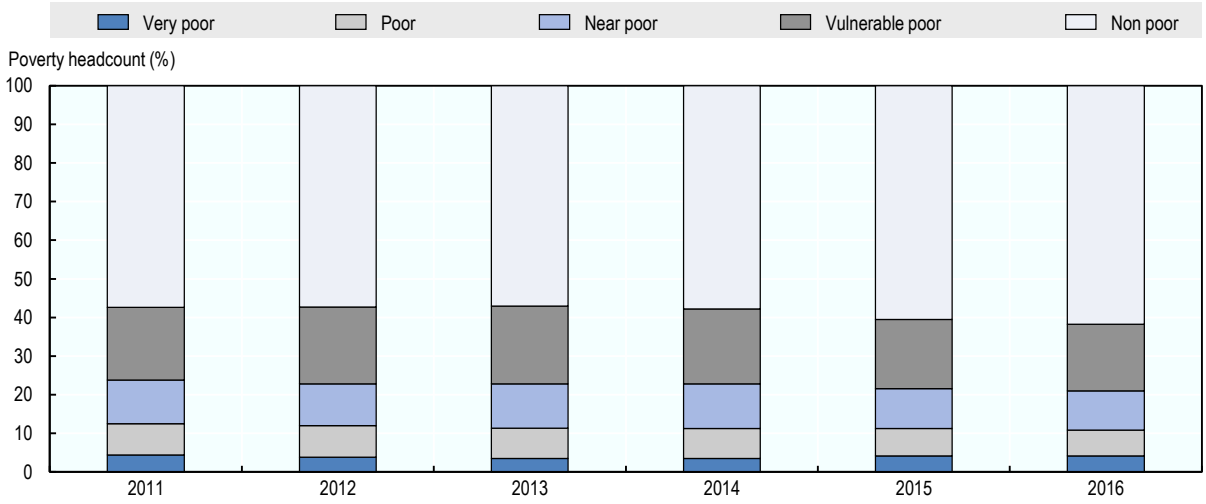


KHR = Cambodian Riel.
Sources: OECD (2017[5]), *Social Protection System Review of Cambodia*, http://dx.doi.org/10.1787/9789264282285-en, based on NIS (2004[6]; 2009[7]; 2014[8]), *Cambodia Socio-Economic Surveys 2004, 2009 and 2014*, https://www.nis.gov.kh (accessed September 2018).

Indonesia similarly showed a steady level of vulnerability in the last few years (Figure 2.2).

Figure 2.2. Around 40% of the population remains vulnerable in Indonesia

Poverty status (2011-16)

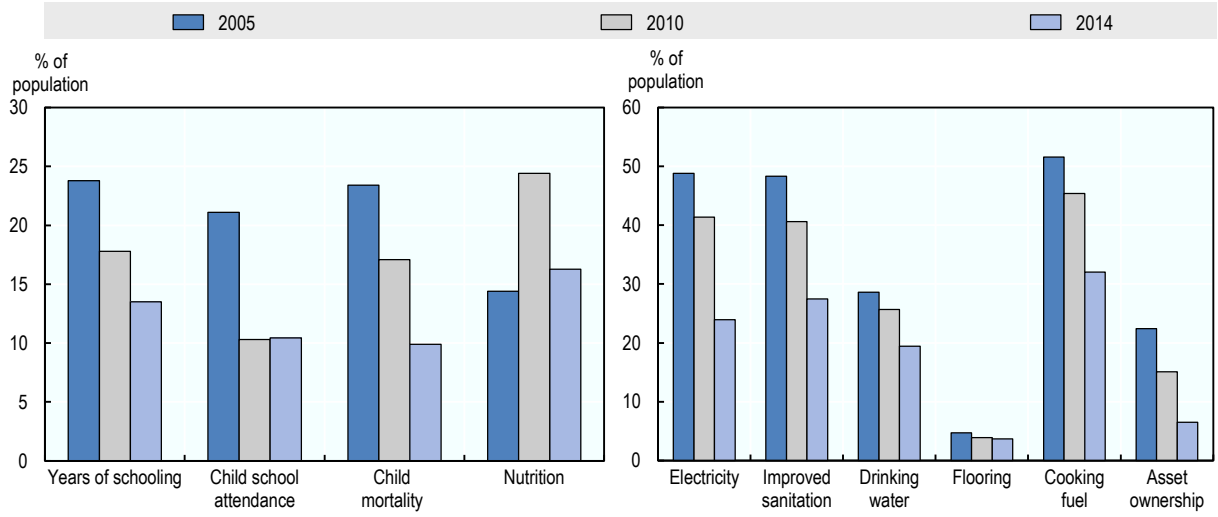


Sources: OECD (forthcoming[9]), *Social Protection System Review of Indonesia*, OECD Development Pathways, OECD Publishing, Paris, based on Statistics Indonesia (2016[10]), *Survei Sosial Ekonomi Nasional 2016 Maret (KOR)*, https://microdata.bps.go.id/mikrodata/index.php/catalog/769 (accessed on 22 June 2018).

Multi-dimensional poverty indicators are useful, as they shed light on vulnerabilities beyond monetary poverty. Indicators for non-monetary poverty can be based on separate deprivation indicators created from household surveys or official statistics (Figure 2.3). Alternatively, several organisations provide multi-dimensional poverty indicators (Table 2.1), such as composite indexes reflecting health, education and living standards, which can used to compare monetary and non-monetary poverty indicators, through heat maps, for example (Figure 2.4).

Figure 2.3. Most indicators of deprivation are improving in Cambodia

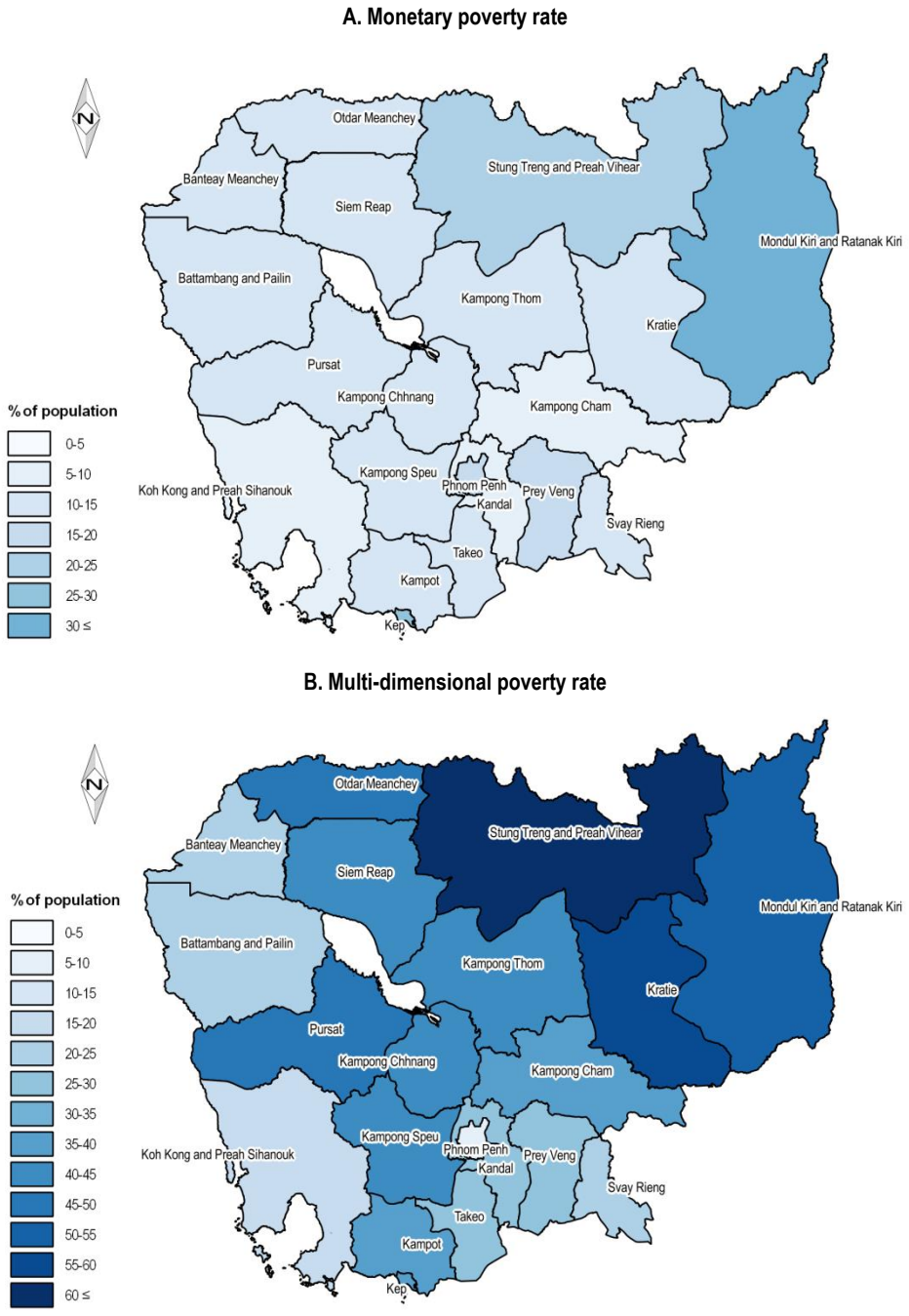
Multi-dimensional poverty deprivations (2005-14)



Sources: OECD (2017[5]), *Social Protection System Review of Cambodia*, http://dx.doi.org/10.1787/9789264282285-en, based on authors' own calculations, based on NIS, MoH and ICF International (2015[11]), *Cambodia Demographic Health Survey 2014*, dhsprogram.com/publications/publication-fr312-dhs-final-reports.cfm; NIS, MoH and ICF Macro (2011[12]), *Cambodia Demographic Health Survey 2010*, dhsprogram.com/publications/publication-FR249-DHS-Final-Reports.cfm; and NIPH, NIS and Opinion Research Company Macro (2006[13]), *Cambodia Demographic Health Survey 2005*, dhsprogram.com/publications/publication-FR185-DHS-Final-Reports.cfm.

Figure 2.4. Monetary poverty has fallen, but multi-dimensional poverty persists in Cambodia

Monetary and multi-dimensional headcount poverty rates by region (2014)

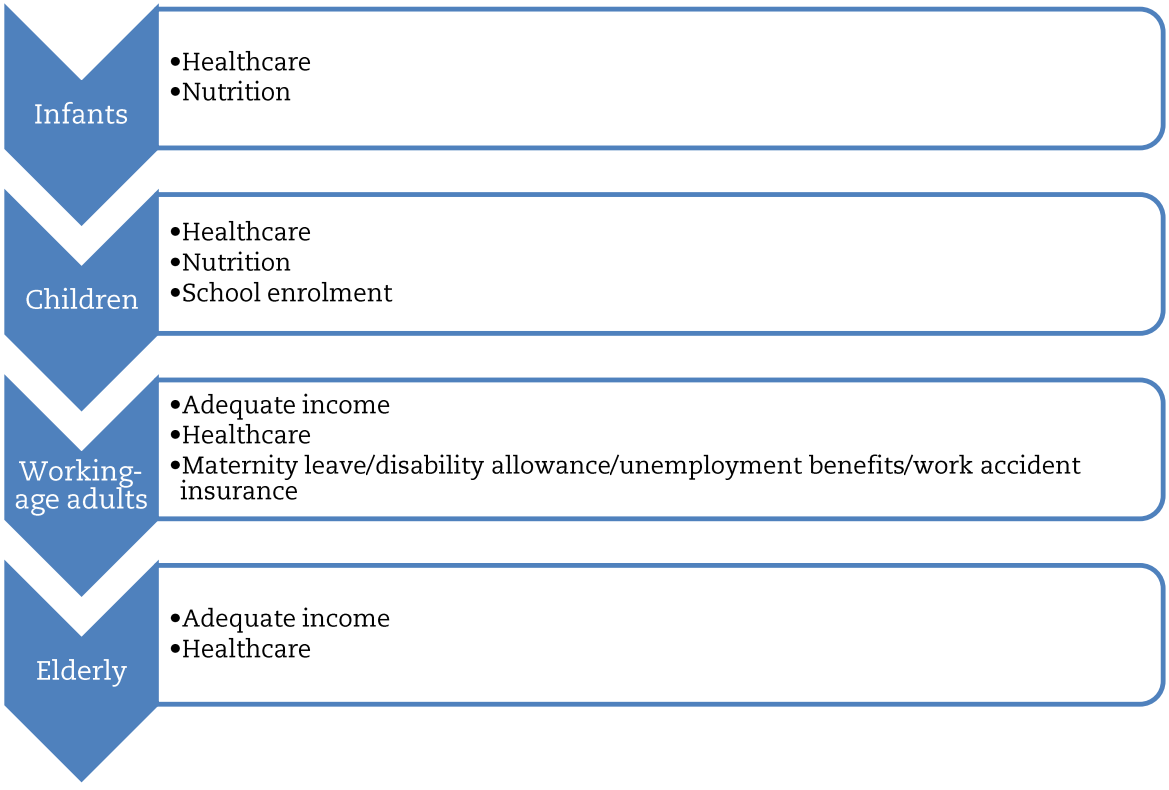


Sources: OECD (2017[5]), *Social Protection System Review of Cambodia*, http://dx.doi.org/10.1787/9789264282285-en, based on authors' own calculations, based on NIS, MoH and ICF International (2015[11]), *Cambodia Demographic Health Survey 2014*, https://dhsprogram.com/pubs/pdf/fr312/fr312.pdf; and OPHI (2016[14]), *Multidimensional Poverty Index (MPI): Cambodia 2016*, https://ophi.org.uk/multidimensional-poverty-index.

Lifecycle risks

The SPSR takes a lifecycle approach to the assessment of vulnerabilities, i.e. to identify vulnerabilities within the population along the lifecycle and assess the system's adequacy in addressing them. This involves evaluating risks to basic protection posed at various life stages (Figure 2.5). The lifecycle approach is crucial to ensure programmes within a social protection system are complementary, thereby increasing effectiveness by reducing coverage gaps and ultimately decreasing poverty. It also recognises linkages among life stages, for instance, stressing the importance of adequate infant and child nutrition to ensure physical growth and healthy lives. The effects of undernutrition can span generations, given maternal nutrition status affects children (The Lancet, 2014[15]).

Figure 2.5. Basic protection throughout the lifecycle

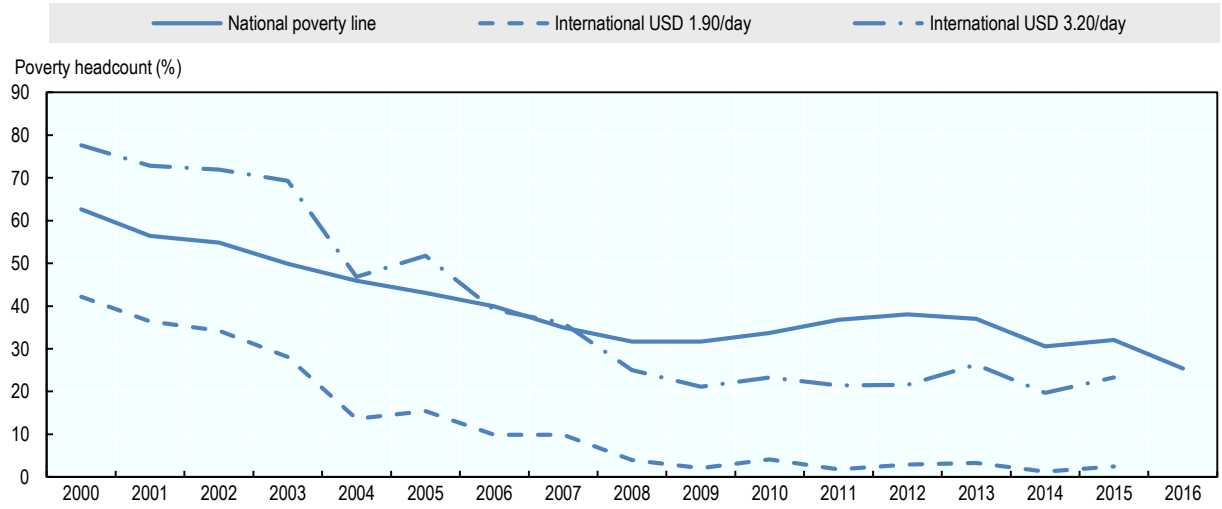


Dynamic poverty analyses

Dynamic poverty analysis is a key characteristic of Module 1, allowing insights into vulnerability trends beyond static levels for various dimensions. This type of analysis can be performed with time series of statistics, panel household survey data or repeated cross-sectional household surveys. For example, it is useful to visualise the evolution of poverty to understand trends. A look at national poverty indicators in Kyrgyzstan reveals poverty decline stalled after 2008 but resumed in 2016 (Figure 2.6).

Figure 2.6. National poverty in Kyrgyzstan is far below 2000 levels

Poverty headcount ratio (2000-16)



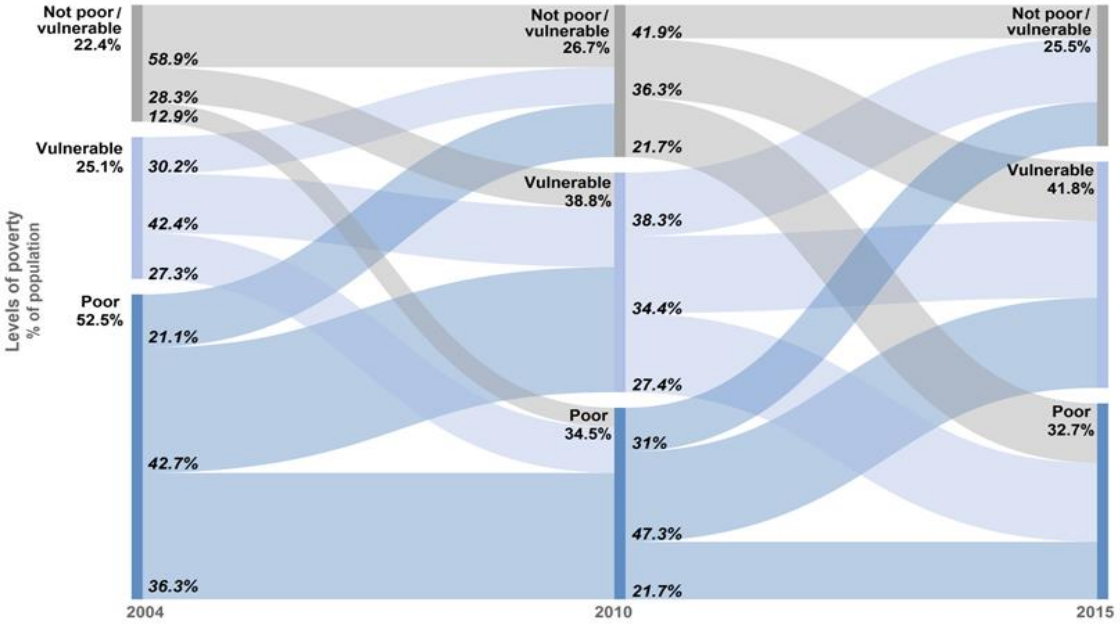
Source: OECD (2018[16]), *Social Protection System Review of Kyrgyzstan*, http://dx.doi.org/10.1787/9789264302273-en, based on NSC (2017[17]), "Poverty rate", stat.kg/en/statistics/uroven-zhizni-naseleniya (accessed January 2018).

Panel household survey data allow for a broader range of analyses, for instance, of changes within the population. Better understanding transitions into and out of poverty or informality can be particularly useful to measure vulnerabilities not captured by overall statistics, such as the risk of falling into (deeper) poverty and the overall frequency of transitions.

Figure 2.7 shows such transitions and mobility among groups, based on household-level data on Kyrgyzstan. The Sankey diagram shows greater movement among income groups in 2010-15 than in 2004-10, even though the poverty rate did not change nearly as much over the latter period.

Figure 2.7. Despite progress in poverty reduction in Kyrgyzstan, a growing share of individuals remain vulnerable to poverty

Poverty transitions in Kyrgyzstan (2004-15)



Source: OECD (2018[16]), *Social Protection System Review of Kyrgyzstan*, http://dx.doi.org/10.1787/9789264302273-en, based on (2004[18]; 2014[19]; 2015[20]), *Kyrgyz Integrated Household Survey 2004, 2010 and 2015*, http://stat.kg/en (accessed June 2017).

At the macroeconomic level, this module includes analysis of income inequality and inclusive growth, based on the Gini index, and income distributions and growth incidence curves. It also analyses the current economy and prospects for economic growth, based on sectoral contributions to output and employment, and includes analysis of specific sectors, such as health or education, reflecting the importance of social protection in improving outcomes. However, household surveys are the cornerstone of lifecycle risks analysis, especially valuable when long time series are available.

Vulnerability profiles

The SPSR also employs latent class analysis (LCA) to assist policy makers to understand the determinants of poverty and vulnerability. LCA can be used to group poor and vulnerable households into clusters based on pre-defined characteristics (Box 2.1), allowing social protection planners to improve intervention design or targeting.

Box 2.1. Statistical basis of latent class analysis (LCA)

The main purpose of LCA is to identify an organising principle for a complex array of variables. This model uses "categorical observed variables, representing characteristics, behaviors, symptoms, or the like as the basis for organizing people into two or more meaningful homogeneous subgroups" (Collins and Lanza, 2010[21]). Formally, LCA enables characterisation of a categorical latent (unobserved) variable, starting from an analysis of the relationships among several observed variables (indicators) using a maximum likelihood estimation method. The LCA method also includes covariates, which are "variables that may be used to describe or predict (rather than to define or measure) the latent classes and if active, to reduce classification error" (Vermunt and Magidson, 2005[22]).

LCA scores individuals according to the likelihood of belonging to each of the computed latent classes and then assigns them to the class to which they have the highest posterior probability of belonging (modal assignment), given their observed characteristics.

Statistics, such as the Bayesian Indicator Criterion, are used to identify the most appropriate number of classes, i.e. the model that has, on average, the highest likelihood of predicting class membership for all individuals in the given sample. A fundamental assumption underlying LCA is that of local independence, which implies that each of the chosen indicator variables is related to the others uniquely through the latent class membership, and a random error. Advanced computational techniques allow detecting and, in part, controlling for the correlation between the residuals of selected indicators, thus enabling the use of the available information to construct categories.

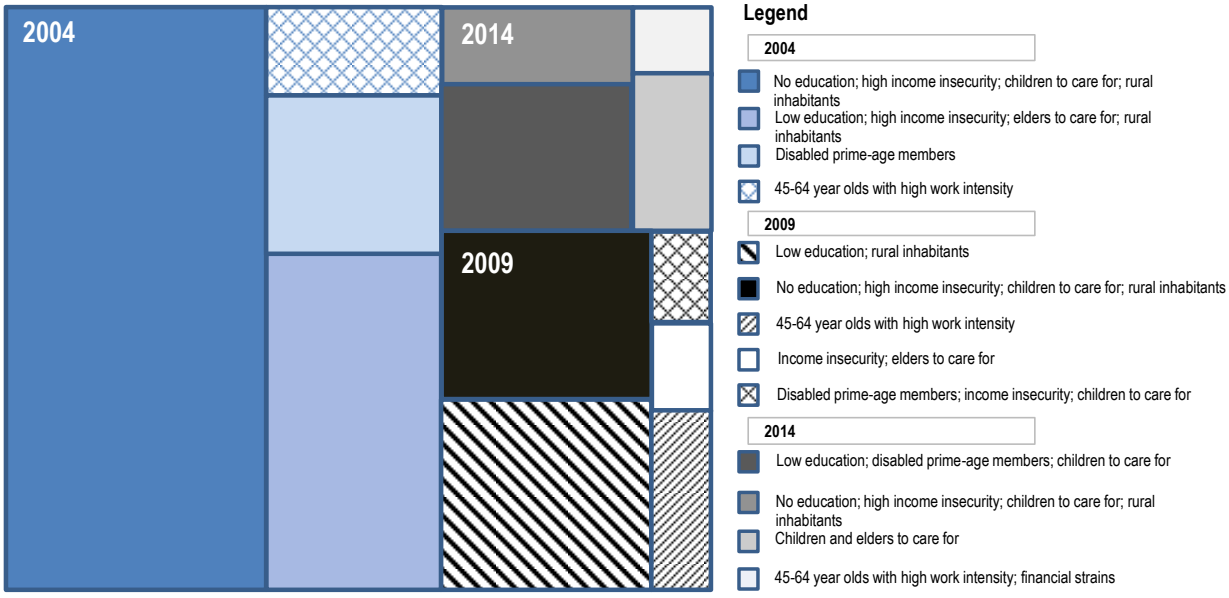
Source: Sundaram, R. et al. (2014[23]), *Portraits of Labor Market Exclusion*, https://openknowledge.worldbank.org/handle/10986/29618 .

LCA can be applied for a single year or over time to show how the characteristics of poverty change, as was carried out for Cambodia (Figure 2.8). The shrinking size of the three outlined squares for 2004, 2009 and 2014 indicates the decline in overall poverty, while the smaller squares shows how poverty affected various groups over this period.

Figure 2.8, from the Cambodia SPSR (OECD, 2017[5]), provides a vulnerability profile for 2014, showing that youth and elderly cohorts faced elevated risks relative to the rest of the population. These risks can stem from individual characteristics, such as gender or ethnicity; place of residence; change in marital status or household structure (e.g. divorce, widowhood); work status (e.g. loss of employment, loss of income); or health (e.g. illness, childbirth, absence of access to services or to financial risk protection).

Figure 2.8. While absolute poverty has decreased in Cambodia, poverty persists among rural, youth and elderly populations

Latent class analysis of poor populations (2004-14)



Sources: Authors' calculations, based on NIS (2004[6]; 2009[7]; 2014[8]), *Cambodia Socio-Economic Surveys 2004, 2009 and 2014*, https://www.nis.gov.kh (accessed September 2018).

References

Bonilla García, A. and J. Gruat (2003), *Social Protection: A Life Cycle Continuum Investment for Social Justice, Poverty Reduction and Sustainable Development*, International Labour Organization, Geneva, https://www.ilo.org/public/english/protection/download/lifecycl/lifecycle.pdf (accessed on 17 September 2018). [2]

Cain, E. (2009), "Social Protection and Vulnerability, Risk and Exclusion Across the Life-Cycle", HelpAge International, London, http://www.oecd.org/development/povertyreduction/43280790.pdf (accessed on 17 September 2018). [3]

Collins, L. and S. Lanza (2010), *Latent Class and Latent Transition Analysis: With Applications in the Social Behavioral, and Health Sciences*, Wiley, https://www.wiley.com/en-fr/Latent+Class+and+Latent+Transition+Analysis:+With+Applications+in+the+Social,+Behavioral,+and+Health+Sciences-p-9780470228395 (accessed on 18 September 2018). [21]

Devereux, S., K. Roelen and M. Ulrichs (2015), "Where next for social protection?", *Policy Anticipation, Response and Evaluation*, No. 124, Institute of Development Studies (IDS), Brighton, https://opendocs.ids.ac.uk/opendocs/ds2/stream/?#/documents/25296/page/1 (accessed on 17 September 2018). [4]

National Institute of Statistics, Ministry of Health of Cambodia (MoH) and ICF International (2015), *Cambodia Demographic and Health Survey (DHS) 2014*, USAID, Phnom Penh, https://dhsprogram.com/publications/publication-fr312-dhs-final-reports.cfm (accessed on 18 September 2018). [11]

NIPH, NIS and ORC Macro (2006), *Cambodia Demographic and Health Survey (DHS) 2005*, USAID, Phnom Penh, https://dhsprogram.com/publications/publication-FR185-DHS-Final-Reports.cfm (accessed on 18 September 2018). [13]

NIS (2014), *Cambodia Socio-Economic Survey 2014*, National Institute of Statistics, Royal Government of Cambodia, https://www.nis.gov.kh/index.php/en/14-cses/12-cambodia-socio-economic-survey-reports (accessed on 18 September 2018). [8]

NIS (2009), *Cambodia Socio-Economic Survey 2009*, National Institute of Statistics, Royal Government of Cambodia, https://www.nis.gov.kh/index.php/en/14-cses/12-cambodia-socio-economic-survey-reports (accessed on 18 September 2018). [7]

NIS (2004), *Cambodia Socio-Economic Survey 2004*, National Institute of Statistics, Royal Government of Cambodia, https://www.nis.gov.kh/index.php/en/14-cses/12-cambodia-socio-economic-survey-reports (accessed on 18 September 2018). [6]

NIS, Ministry of Health of Cambodia (MoH) and ICF Macro (2011), *Cambodia Demographic and Health Survey (DHS) 2010*, USAID, Phnom Penh, https://dhsprogram.com/publications/publication-FR249-DHS-Final-Reports.cfm (accessed on 18 September 2018). [12]

NSC (2017), *Poverty Rate*, National Statistics Committee of the Kyrgyz Republic, Bishkek, http://stat.kg/en/statistics/uroven-zhizni-naseleniya. [17]

NSC (2015), *Kyrgyz Integrated Household Survey*, National Statistics Committee of the Kyrgyz Republic, Bishkek, https://www.nis.gov.kh (accessed on 01 June 2017). [20]

NSC (2014), *Kyrgyz Integrated Household Survey*, National Statistics Committee of the Kyrgyz Republic, Bishkek, https://www.nis.gov.kh (accessed on 01 June 2017). [19]

NSC (2004), *Kyrgyz Integrated Household Survey*, National Statistics Committee of the Kyrgyz Republic, Bishkek, https://www.nis.gov.kh (accessed on 01 June 2017). [18]

OECD (2018), *Social Protection System Review of Kyrgyzstan*, OECD Development Pathways, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264302273-en. [16]

OECD (2017), *Social Protection System Review of Cambodia*, OECD Development Pathways, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264282285-en. [5]

OECD (2007), *Promoting Pro-poor Growth*, OECD Publishing, Paris. [1]

OECD (forthcoming), *Social Protection System Review of Indonesia*, OECD Development Pathways, OECD Publishing, Paris. [9]

OPHI (2016), *Multidimensional Poverty Index (MPI): Cambodia 2016*, Oxford Poverty and Human Development Initiative (OPHI), Oxford. [14]

Statistics Indonesia (2016), *Survei Sosial Ekonomi Nasional 2016 Maret (KOR)*, https://microdata.bps.go.id/mikrodata/index.php/catalog/769 (accessed on 22 June 2018). [10]

Sundaram, R. et al. (2014), *Portraits of Labor Market Exclusion*, World Bank, Washington, DC, https://openknowledge.worldbank.org/handle/10986/29618 (accessed on 14 November 2018). [23]

The Lancet (2014), "Executive summary", *The Lancet series on Maternal and Child Undernutrition*, The Lancet, http://www.who.int/nutrition/publications/lancetseries_maternal_and_childundernutrition/en/ (accessed on 17 September 2018). [15]

Vermunt, J. and J. Magidson (2005), "Factor analysis with categorical indicators", in van der Ark, A., M. Croon and K. Sijtsma (eds.), *New Developments in Categorical data Analysis for the Social and Behavioral Sciences*, Erlbaum, Mahwah, https://pure.uvt.nl/portal/en/publications/factor-analysis-with-categorical-indicators(34883493-72df-419a-86e5-c771b0809461).html (accessed on 18 September 2018). [22]