Methodology

Pew Research Center analyzed how the economic downturn resulting from the COVID-19 pandemic has affected the standard of living in India and China. The key data source for this analysis was household survey-based estimates of income or consumption distributions from the World Bank's PovcalNet database. These data, dating from 2011 for India and 2016 for China, were used to estimate a benchmark distribution of the population by income tiers in each country. It should be noted that the data for India and China refer to consumption, but the term "income" is used in this analysis for the sake of convenience.

The income tiers are defined by the daily per capita income of people in a region as follows: poor ($2 or less daily), low income ($2.01-$10), middle income ($10.01-$20), upper-middle income ($20.01-$50) and high income (more than $50). All dollar figures are expressed in 2011 prices and purchasing power parity dollars.

Extrapolating the benchmark estimates to 2020 required the following three steps:

1. Extrapolate benchmark-year income to 2020
2. Estimate income distributions in 2020 based on extrapolated incomes
3. Determine the population in each income tier in 2020.

Extrapolating incomes from benchmark years to 2020

Household incomes are extrapolated to 2020 using estimates of the growth in real gross domestic product (GDP) per capita in a region. This, in turn, required several sets of data.

The first is the level of GDP per capita in the benchmark year and in 2019, the latest year for which data are available in the World Bank's World Development Indicators database. In this database, GPD per capita is expressed in constant 2017 international dollars. The result is an estimate of the percentage change in per capita income in India and China from the benchmark year to 2019.

Next, the change in income from 2019 to 2020 is approximated by two measures of growth in real GDP (at market prices) issued by the World Bank in its reports on global economic prospects. The first measure of growth in 2020 is a forecast released in January 2020, prior to the emergence of the pandemic. The second measure is an estimate released in January 2021, with the economic effects of the pandemic more apparent. The change in per capita income in 2020 is estimated as the difference in the growth in GDP and the growth in population. The result is two estimates of how much per capita income changed in India and China from the benchmark year to 2020, one in a counterfactual "pre-pandemic" world and the other in a "post-pandemic" world, the period since the emergence of the coronavirus.

Estimating income distributions in 2020 based on extrapolated incomes

The estimated change in income from the benchmark year to 2020 is used to reset the boundaries of the income tiers. For example, based on the pre-pandemic forecast, it was estimated that per capita income in China would have increased by 26.1% from 2016 to 2020. As a result, people living on $1.60 to $2 a day in China in 2016 would have seen their income increase to more than $2 a day in 2020. Thus, they would no longer have been poor in 2020; only people with incomes of $1.59 or less in 2016 would still be poor in 2020. Thus, $1.59 is used as the poverty boundary to derive an estimate of the share who were poor in China in 2020 in the hypothetical pandemic-free world.

With the emergence of the pandemic, the growth in per capita income in China from 2016 to 2020 is estimated to have been 21.4%. In this circumstance, only people with incomes of $1.66 to $2 a day in 2016 would have emerged from poverty in 2020. Thus, $1.65 is used as the poverty boundary to estimate the state of poverty in China in 2020 in the post-pandemic scenario.

A similar procedure is used to reset the boundaries of all income tiers in China and India. The estimation of income distributions for 2020 was greatly facilitated by the "povcalnet" command in Stata developed by World Bank researchers (Castaneda Aguilar, R.A., C. Lakner, E.B. Prydz, J.S. Lopez, R. Wu and Q. Zhao, Estimating Global Poverty in Stata: The Povcalnet Command, September 2019).

Determining the population in each income tier in 2020

The estimates derived from PovcalNet yield the percentages of people in India and China who are poor, low income and so on. These percentages are applied to the estimated population in each country to determine the number who fall into each income tier.

The overall population in 2020 is derived from two sources: World Bank data on population through 2019, as listed on PovcalNet, and United Nations forecasts of the change in population from 2019 to 2020.

Key assumptions and potential uncertainties

As is the case with any projection, the estimates reported in this analysis are subject to a degree of uncertainty. One issue is that the January 2021 estimates of real GDP growth from the World Bank that are used in the analysis are likely to be revised in the coming months as more complete data on national output and income become available.

The methodology in this analysis assumes that incomes change at the same rate for all people, whether poor, low income, middle income, upper-middle income or high income. In other

words, it is assumed that there is no change in inequality from the benchmark year to 2020. If the COVID-19 recession has worsened inequality, the increase in the number of poor is likely greater than estimated in this analysis, and the decrease in the number who are high income is likely less than estimated. The middle class may have shrunk by more than projected.

Although World Bank researchers have simulated the relationship between inequality and the poverty rate, more precise measures of changes in inequality in the COVID-19 era will not be forthcoming until newer household survey data become available. Also, the extent to which social spending by governments may have ameliorated the effects of the COVID-19 downturn is not yet clear.

Another assumption in this analysis is that personal incomes change at the same rate as GDP per capita. Empirically, it is not unusual to observe that personal income or consumption increases at a slower rate than GDP per capita. The World Bank often assumes a "pass-through" rate of 0.85, i.e., only 85% of national output growth is passed through to household income or consumption. If a pass-through rate of 0.85 is assumed for this analysis the estimated change in the number of people in each income tier in India is as follows: poor (+68 million), low income (-40 million), middle income (-22 million), upper-middle income (-5 million) and high income (-1 million). The estimated change in the number of people in each income tier in China would be as follows: poor (+1 million), low income (25 million), middle income (-8 million), upper-middle income (-15 million) and high income (-2 million).

From the point of view of measuring poverty, a key issue is that the latest available benchmark survey for India was conducted in 2011. The World Bank has applied a variety of estimation techniques to update the poverty counts for India, but uncertainty lingers in these updates for India.