

# **Consumption baskets of Indian households: Comparing estimates from the CPI, CES and CPHS**

No. 343

17-August-2021

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17th August 2021

## **Abstract**

A study of inflation requires a fixed consumption basket. The last publicly available data on household consumption baskets is from Consumer Expenditure Survey (CES) 2011-12. A more recent source of data has been the CMIE Consumer Pyramid Household Survey (CPHS). In this paper we compare the weights of various commodities in the Consumer Price Index (CPI) series with the CES 2011-12 and the CPHS 2019. We first document the methodology of construction of the Consumer Price Index (CPI) including details on commodity classification, reference and recall periods. We find that while CPI is based on CES 2011-12, CPI weights closely match those of CES 2011-12 only once the sub-group ‘Housing’ is excluded from the total consumption expenses. For comparison with CPHS, we first map the CPHS commodities to CPI to make them comparable. We find the differences in some categories such as food, household goods and services are less than 2 percentage points. Differences in the shares of commodities such as transport and communication, health, education and intoxicants are larger.

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\*The authors are researchers at NIPFP. We thank Vidisha Metha, Vimal Balasubramaniam, Amey Sapre, Pramod Sinha and Ajay Shah for useful comments. Views are personal.

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# 1 Introduction

The Consumer Price Index (CPI) is used as an indicator in various policymaking contexts, such as inflation targeting, as deflator of National Account Statistics, for determining dearness allowances, wages under welfare schemes among others. In particular, the use of the CPI-Combined index has gained greater significance since the adoption of the inflation targeting framework in India.’

A key component of the CPI is the consumption basket of households. The basket of items and their weights in the CPI series are derived on the basis of average monthly consumer expenditure of an Indian household obtained from the Consumer Expenditure Survey (CES). The CES is traditionally a quinquennial (recurring every five years) survey conducted by the government’s National Sample Survey Office (NSSO). The survey is designed to collect information on the consumption spending patterns of households across the country, both urban and rural. The weights in the current CPI series are based on the CES, 2011-12 which is the 68th round of the National Sample Survey. More recent CES survey data (from CES 2017-18) is not publicly available and has not been used to update CPI weights. A more recent and regularly updated version of the data has been the CMIE Consumer Pyramid Household Survey (CPHS). The CPHS longitudinal household survey is conducted by the Centre for Monitoring the Indian Economy (CMIE) since 2014. It conducts three rounds (or waves) of this survey every year over a nationally-representative sample of over 170,000 households.

Given the importance of CPI, it is useful to ask, how do the weights from the CPHS compare with what is used in the CPI? In this paper, we draw on the official sources, and document the methodology of construction of the CPI. We highlight important details on the construction of the CPI, in particular the details on commodity classification, reference and recall periods. We compare the weights of commodities in the CPI series with the share of each item in the total consumption expenditure in the CES, 2011-12. This exercise helps us in assessing how representative the weights in the CPI are of an average Indian household’s consumption basket. We then compare the weights in CPI with the share of each item obtained from CPHS, 2019. Prior to comparing the weighting pattern of CPI

with CPHS, we conduct an item-wise mapping of CPI with the categories and sub-categories of CPHS. After mapping every CPI item to the CPHS category at the disaggregated level, we aggregate them to the main categories of CPI and CPHS. We present details of our mapping exercise and highlight key differences in how items have been classified into categories in CPI and CPHS. This is an important input into any research that uses CPHS data for research on inflation.

We find that while CPI is based on CES 2011-12, CPI weights are not entirely consistent with those of the CES. However, the difference in weights is primarily on account of the 'Housing' category. The difference arises because unlike CES, the 'House Rent' category in CPI includes both actual rent expenses as well as imputed rent of owner-occupied housing. In CES, only actual rent is included. Once the 'Housing' category is excluded from the total consumption expenses, CPI weights closely match those of CES 2011-12<sup>1</sup>.

We find that several categories have different weights in CPI and CPHS, particularly in the urban region. Categories such as 'Food', 'Intoxicants', 'Housing', 'Transport and Communication', 'Education' and 'Health' have a difference of more than 1 percentage point between CPI and CPHS. In the rural sector, 'Food', 'Clothing & Footwear', 'Transport and Communication', and 'Health' have the highest difference in weights between CPI and CPHS. However the magnitude of these differences reduce, once the category of 'Housing' is excluded from both the CPI and CPHS. Since food constitutes roughly half of the CPI basket, we show the difference in the weighing pattern within the category of 'Food'. We find that there are differences in the weights in categories such as 'Sugar & confectionary', 'Vegetables', 'Spices', 'Fruits' and 'Prepared meals'.

We explore three possible reasons for differences in weights: year of survey, recall period and the difference in commodity classification. The CPI-CPHS differences in weights are highlighted for CPHS users to understand the persistent difference between CPI and CPHS, especially for application of CPHS survey data to research on inflation.

The rest of the paper is structured as follows: Section 2 documents the CPI meth-

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<sup>1</sup>Central Statistics Office (Ministry of Statistics and Programme Implementation), 2015.

odology, including classification, price collection and computation. Section 4.2 maps the weights in the NSS Consumption Expenditure Survey (CES) with the weights in the CPI basket. The ‘Housing’ category shows the biggest discrepancy between the CPI and CES weights and causes the CPI weights for other categories to depart from the empirical weights implied in CES. This section also maps the weights in the CES and CPI after excluding the ‘Housing’ category. In Section 4, we map the CPI commodity classification to the CPHS classification. We then compare CPI-CPHS weights and discuss their comparability in detail. Section 5 concludes.

## 2 The construction of CPI

Consumer Price Index (CPI) is a measure of the change in cost of a basket of goods and services relative to its cost in the base year. Indian CPI is a Cost of Goods Index, i.e. it estimates the change in cost of a fixed basket of goods and services which is representative of households’ consumption <sup>2</sup>. The CPI is estimated as a weighted average of relative prices as follows:

$$CPI = \sum_i \frac{P_{i,t} Q_{i,b}}{P_{i,0} Q_{i,b}} = \sum_i \frac{P_{i,t}}{P_{i,0}} w_{i,b} \quad (1)$$

Here,  $w_{i,b}$  is the weight of the commodity  $i$  in the household’s basket of goods and services in the reference or base period,  $b$ . The weight reference period  $b$  is the period in which the household expenditure survey was conducted to estimate average household expense share on each commodity  $i$ .  $P_{i,0}$  is the price of commodity  $i$  in period 0.  $P_{i,t}$  is the price of commodity  $i$  in period  $t$ , where  $t$  is the base year for price indexing in the CPI series.

The CPI-Combined Index thus aggregates prices of commodities used by a representative household and is designed as a Laspeyres-Young Index, also called a Modified Laspeyres Index. A Laspeyres-Young CPI is a weighted mean of prices,

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<sup>2</sup>See, for instance, Diewert, Greenlees and Hulten, 2009 for a discussion on Cost of Goods Index and Cost of Living Index as CPI measures.

with weight of commodity  $i$  equal to its expense share in total expenses of an average household in base year  $b$ .

As the CPI aims to reflect pure changes in prices, this basket is fixed at the consumption level of weight reference year  $b$ . This implies that changes in cost of this basket of goods and services, as captured by CPI, reflect changes in purchasing power of the households, to the extent that the basket of goods is representative of their consumption.

Till January 2015, the Central Statistics Office was compiling Consumer Price Indices (CPI) on base year 2010. The basket of items and their weighing pattern in the CPI was based on Consumer Expenditure Survey (CES) of 2004-05 conducted by the National Sample Survey Office (NSSO). The survey reveals the average expenditure on goods and services and helps generate estimates of household Monthly Per Capita Consumer Expenditure (MPCE).<sup>3</sup> However, there was a gap of six years between the weight reference year and the price reference year.<sup>4</sup>

The NSSO conducted the 68th round of the Consumer Expenditure Survey in 2011-12 with reference period of July 2011 to June 2012. As the new data on item basket and their weights became available, it was decided to revise the item basket and their weights used as the reference in the CPI. It was also decided to revise the price reference year to bring it closer to the weight reference year. In January, 2015, the CSO revised the base year of the CPI from 2010 to 2012. This has reduced the gap between the weight reference year and the price reference year<sup>5</sup>.

The CSO prepares the CPI basket of items and their weights using the Modified Mixed Reference Period (MMRP) data of the 68th Round of the Consumer Expenditure Survey. Under this method, for food items and certain other items, data on expenditure incurred are collected during last seven days. For durable goods, clothing, and footwear, data on expenditure incurred are collected during last 365 days. For certain other items such as fuel and light, miscellaneous goods and services, the reference period is 30 days. This method is understood to provide a

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<sup>3</sup>The estimates of MPCE help in assessing demand trends as well as in analysing the shifting priorities of households in terms of basket of goods and services.

<sup>4</sup>The weight reference period being 2004-05, while the price reference period was 2010.

<sup>5</sup>Central Statistics Office (Ministry of Statistics and Programme Implementation), 2015.

more accurate reflection of consumption expenditures.

Not all items included in the 68th Round of the Consumer Expenditure Survey (CES) are included in the CPI basket. Items having negligible weights and consumed by very few households are not included in the CPI basket. In particular, the following four criteria are adopted for inclusion of items in the CPI basket:

1. All items included in the Public Distribution System (PDS);
2. All items accounting for 1% or more of total expenditure at subgroup level;<sup>6</sup>
3. All items for which more than 75% households have reported consumption.

There are a few items which do not qualify in the above-mentioned criteria but still need to be included in the basket for price collection because they may get a weightage in subsequent base revisions. Items of similar nature are bunched together and if their combined share exceeds 0.5% of the sub-group share, such items are referred to as ‘composited items for price collection’. The share of composited items is transferred to the respective residual category of items (named as composite items).<sup>7</sup>

The price of each commodity  $i$  is collected at different price centres and then aggregated to signify  $P_i$ . The overall CPI (CPI-Combined) takes a Geometric Mean of prices of commodity  $i$  across markets  $k$  to prices  $p_{i,k}$ .

$$P_i = \sqrt[k]{\prod_k \left( \frac{p_{i,k,t}}{p_{i,k,0}} \right)} \quad (2)$$

Prices of items in the basket are collected from 1181 village markets covering all districts and 1114 urban markets distributed over 310 towns of the country. For the identified villages and towns, market survey is undertaken for identification of popular markets, selection of shops or outlets for different commodities in the

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<sup>6</sup>The basket of items follows a hierarchical order comprising of Group, Category, Sub-group and Section. As an example, Food and beverages is the Group, within this group, ‘Food’ is the category, within this category, one of the sub-groups is ‘Cereals and Pulses’. Within this sub-group, ‘Major cereals and products’ and ‘Coarse cereals and products’ is the Section.

<sup>7</sup>See Table 1.1. of the Manual: *Consumer Price Index: Changes in the Revised Series (Base Year 2012)*

selected markets and determination of specifications of commodities to be priced.<sup>8</sup>

## 2.1 Commodity Classification

CPI classifies commodities into Groups, Categories, Sub-Groups and Sections based on the international standard classification COICOP (Classification of Individual Consumption according to Purpose) and adapted to the Indian context. This has led to the following groups and sub-groups of commodities in CPI-Combined (Base Year 2012) basket:

- Food and beverages
  - Cereals and Products
  - Eggs
  - Fish and Meat
  - Pulses and Products
  - Milk and Products
  - Oils and Fats
  - Fruits
  - Vegetables
  - Sugar and Confectionery
  - Spices
  - Prepared Meals, sweets, snacks etc.
  - Non-alcoholic Beverages
- Pan, Tobacco and Intoxicants
- Clothing and Footwear

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<sup>8</sup>For the sampling procedure for the selection of villages and towns, see the Manual: *Consumer Price Index: Changes in the Revised Series (Base Year 2012)*

- Housing
- Fuel and Light
- Miscellaneous
  - Household Goods and Services
  - Health
  - Education
  - Personal Care and Effects
  - Transport and Communication
  - Recreation and Amusement

For instance, the Food group category, sub-group, and section classification is represented in Table A.1 in the Appendix. The group: “Food and Beverages” is divided into further sub-groups such as “Cereals and Products” and sections such as “Major and Coarse Cereals and Products”. Within these sections, there are several items to which positive weights have been assigned, such as Rice-PDS, Rice-Others, Wheat-PDS etc in Major Cereals and Products. These are called “Weighted Items” and may consist of more than one sub-items called “Priced Items” for which prices are collected and then aggregated to reflect the price of the weighted items. Thus, the items at different levels of disaggregation are weighted and aggregated to form the index.

### **3 CPI and CES 2011-12: Comparison**

We verify that the weights assigned to each commodity by CPI are comparable to the household expense shares observed in the official household survey on which they are based, i.e the 68th round of the NSS, Consumer Expenditure Survey (CES) 2011-12. To compare the weights of CES with CPI, it is important to ensure that the CPI and CES are measuring consumption expenditures on the same basket of goods and services. Hence, we map the commodity classification

of CPI and CES at the item-level to derive a comparable basket of goods for each major commodity category.

### 3.1 CPI-CES category mapping

The CPI-CES mapping exercise reveals that the commodities in groups ‘Food and Beverages’, ‘Pan, Tobacco, and Intoxicants’, ‘Clothing and Footwear’, ‘Fuel and Light’, ‘Education’ in CPI map to respective categories with similar names in CES. ‘Health’ in CPI maps to ‘Medical (Institutional) and ‘Medical (Non-institutional)’ in CES.

We aggregate sub-groups ‘Recreation and Amusement’, ‘Transport & Communication’, ‘Household goods and services’, ‘Personal Care and Effects’ from CPI in ‘Misc’. This maps to CES sub-groups ‘Conveyance’, ‘Consumer Services’, ‘Miscellaneous Goods’, ‘Entertainment’ and ‘Durable Goods’ which we aggregate in ‘Misc’. A more disaggregated mapping of ‘Misc’ subgroups is not possible due to differences in CPI-CES classification of these sub-groups. For instance, vehicles such as car, jeep etc are included in ‘Transport & Communication’ in CPI and gold and silver ornaments are included in ‘Personal Care and Effects’ in CPI. However, these are included in ‘Durable Goods’ in CES, not in ‘Conveyance’ or ‘Entertainment’. Thus, we aggregate these sub-groups into a group ‘Misc’ which broadly matches in CPI and CES.

The only major difference in CPI-CES category mapping is ‘Housing’. CPI Housing subgroup includes ‘House Rent’, and Housing charges like ‘residential building & land (cost of repairs only)’, ‘water charges’, and ‘watch man charges’. Unlike CES, the CPI category of ‘House Rent’ includes both actual rent expenses as well as imputed rent of owner-occupied housing. On the other hand, CES definition of ‘Rent’ category includes only actual rent and not imputed rent <sup>9</sup>. CES does collect data on imputed rent, but does not include it in ‘Rent’ or ‘Total Expense’ for calculating MPCE and expense shares. Thus, for comparing expense shares, the closest mapping to Housing sub-group in CPI is ‘Rent’ and ‘Consumer Taxes

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<sup>9</sup>CES ‘Rent’ includes residential, garage rent but it is not clear if CES includes ‘Water Charges’ etc in ‘Rent’, though it does estimate water charges.

and Cesses’ in CES (which does not include imputed rent). Thus, CPI and CES commodity classification matches closely for all categories, except ‘Housing’.

### 3.2 The weights in CPI (Base Year 2012) and CES (2011-12)

We compare the weights across all mapped categories of CPI and CES, to observe how closely the two match. Panel (a) of Table 1 reports the CPI weights of major commodity groups as reported in CPI (Base Year 2012) Manual<sup>10</sup>. The CES expense shares are estimated from MPCE (by MMRP method) reported in the report of 68th Round of NSS survey, CES 2011-12.<sup>11</sup> These expense shares are taken as the ratio of the monthly per-capita expense (MPCE) on the respective categories to the total expense for rural/urban region, as reported by CES 2011-12. This gives us an estimate of weight of the respective category.

Panel (a) of Table 1 shows that the CPI weights and CES 2011-12 expense shares match closely in most categories for the rural sector. However, in the urban sector, the CPI-CES shares differ by a margin of upto 13 percentage points. For instance, the share of Food and Beverages in MPCE was 42.6% in CES but CPI weight is 36%. The ‘Misc’ group combines several miscellaneous consumer goods and services, such as transport, recreation, household consumables etc, and has a difference of 4 percentage points in CPI and CES urban weights. Similarly, CPI-CES weights for ‘Education’, ‘Fuel and Light’ categories also differ by more than 1 percentage point.

A striking difference in weights is in the category ‘Housing’. CPI assigns no weight to ‘Housing’ group for rural households while CPI urban weight is 21%. These differ from CES expense shares found for Housing; CES ‘Housing’ share, which excludes imputed rent, is only 8% in urban sector and 21.3% if imputed rent is added to ‘Housing’.<sup>12</sup>

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<sup>10</sup>Central Statistics Office (Ministry of Statistics and Programme Implementation), 2015.

<sup>11</sup>See Chapter 3 of the NSSO Manual: “Household Consumption of Various Goods and Services in India 2011-12”

<sup>12</sup>House/garage rent (imputed) for urban households in CES is reported to be Rs 475.06, which

**Table 1** Comparison of CPI weights and CES expense shares, with and without Housing

This table compares the reported CPI (Base Year 2012) weights with CES 2011-12 expense shares in Panel (a). We observe differences in CPI-CES weights in nearly all categories in urban sector, with a difference of 13 percentage points in the ‘Housing’ category. In Panel (b), we exclude ‘Housing’ from both CPI and CES, by deducting it from ‘Total Expense’ (denominator) in CES and recalculating the expense shares for all categories. In CPI, ‘Housing’ weight is redistributed to other categories. The result is that CPI and CES weights match (on approximating to two decimal places), indicating that weights of all categories are impacted due to the disproportional share attributed to ‘Housing’ in CPI.

**Panel(a): Including housing**

CPI Category (CES)	CES weights		CPI weights	
	Rural	Urban	Rural	Urban
Food & Bev.	0.529	0.426	0.54	0.363
Clothing& Footwear	0.07	0.063	0.074	0.056
Pan,tob.,Intoxicants	0.032	0.016	0.0326	0.0136
Housing (Rent,Taxes& Cess)	0.007	0.08	0	0.21
Misc.	0.18	0.231	0.17	0.19
Fuel and Light	0.079	0.067	0.079	0.055
Education	0.036	0.069	0.034	0.056
Health (Medical)	0.067	0.055	0.068	0.048

**Panel(b): Excluding Housing**

CPI Category (CES)	CES (2011-12) weights		CPI (Base Year 2012) weights	
	Rural	Urban	Rural	Urban
Food & Bev.	0.529	0.456	0.54	0.463
Clothing & Footwear	0.07	0.069	0.074	0.07
Pan,tob.,Intoxicants	0.032	0.017	0.0326	0.017
Housing	0.007		0	
Misc.	0.18	0.249	0.17	0.244
Fuel and Light	0.079	0.072	0.079	0.071
Education	0.036	0.074	0.034	0.07
Health (Medical)	0.067	0.06	0.068	0.061

Thus, the CPI weights match closely to those implied in CES 2011-12 for rural households, but differ for almost all categories for urban households. One potential reason for the mismatch between CPI weights and CES expense shares could be the difference in their commodity classification. This could result in difference in weights as the weight of excluded commodities is redistributed to other commodities, creating a mismatch. However, an item-wise mapping from CES to CPI shows that the difference due to classification or exclusion of some commodities is very small. Some examples of differences arising on account of exclusion of certain items or difference in weighing patterns are given below:

- Some commodities like ‘Cooked meals received for free at workplace’, ‘Cooked meals received as an assistance’, ‘ganja’ etc in CES are excluded from CPI and some like ‘Biscuits, chocolates etc’, ‘Ghee’, ‘Butter’ etc are classified in different sub-groups but in the same group (thus not affecting the total weight of the group). For instance, ‘Ghee’ is classified in ‘Edible Oils’ in CPI but in ‘Milk and Milk Products’ in CES. This difference in classification alters the weights of the respective sub-groups but not of the ‘Food’ group as a whole. Hence, this type of classification difference is not likely to be the reason for CPI-CES weights difference.
- Some items such as ‘Candles’, ‘Grinding charges’, ‘Domestic servant’ are included in both CPI and CES but are classified in different groups. For instance, in CES, ‘Grinding charges’ is classified under ‘consumer services excl. conveyance’ subgroup in the ‘Misc’ group. While in CPI, ‘Grinding charges’ is classified under ‘Cereals and products’ in ‘Food’ group. However, the total number of such item-level mismatches is small and the effect of such exclusions and classifications on CPI weights is expected to be negligible.
- The CPI reports assigning the weight of the excluded commodities (called Composited Items) to their respective residual category (called Composite Items). For instance, CPI does not assign a positive weight to ‘Bread’, ‘Biscuits, chocolates etc.’ but assigns their CES weight to their composite

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is 18.06% of total expense of Rs.2630. (National Sample Survey Office (Ministry of Statistics and Programme Implementation), 2014, pg: 67)

item ‘Other Wheat Products’<sup>13</sup>.

These exclusions and differences in weighing patterns do not alter the aggregate weights in CPI and CES at the sub-group level, which is the unit of comparison in Panel (a) in Table 1. Thus, it is unlikely that commodity classification is the reason for the mismatch between CPI weights and CES expense shares.

Instead, we find that the difference between the CPI and CES weights can be attributed almost completely to the disproportionate weights assigned to ‘Housing’. To reiterate from Section 3.1, unlike CES, ‘House Rent’ category in CPI includes both actual rent expenses as well as imputed rent of owner-occupied housing. This is unlike CES definition of Rent category, which includes only actual rent and not imputed rent. CES does collect data on imputed rent for urban sector, but does not include it in Rent or Total Expense for calculating MPCE and expense shares. CES finds this imputed rent component to be 18.06% of total MPCE in urban sector. Accounting for imputed rent in ‘Housing’ weight (by adding to both Housing and Total Expense) results in a ‘Housing’ category weight of 21.3%, which closely matches CPI weight of 21.67%.

To verify if the CPI-CES difference in weights is due to ‘Housing’ and treatment of imputed rent, we exclude the Housing category and compare CPI and CES weights of other categories for urban households (CPI Rural Housing weight = 0). We exclude Housing from CES weights by deducting expense on Housing from Total MPCE (denominator of expense shares) and recalculating other categories’ weights with the new denominator. For the CPI, we deduct the weight of housing from the denominator. This gives us 78.33%. The new weights of other categories are now based on this denominator of 78.33%. This leads to, for example, the weight of ‘Food & Beverages’ to change from 36% to 46%.

The bottom panel of Table 1 shows that expense shares in CES match CPI weights (and almost perfectly on rounding off to two decimal places) when ‘Housing’ is excluded. This indicates that unlike CES, CPI urban weight for Housing is 21% due to inclusion of imputed rent. This has caused all expense shares for all commodity groups to change from those found in CES, as the balance weight has been

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<sup>13</sup>Central Statistics Office (Ministry of Statistics and Programme Implementation), 2015.

distributed to other commodity groups proportionately.

A closer look at the imputed rent component of ‘Housing’ in CPI presents other issues as well; imputed rent component includes subsidized or concessional housing provided to employees. In particular, imputed rent for government employees includes housing rent allowance (HRA) plus a license fee charged by the employer for use of concessional housing (Central Statistics Office (Ministry of Statistics and Programme Implementation), 2015). This increases the computed rent as HRA increases for higher-ranked employees (*ibid.*) and creates sudden spikes in imputed rent when new Pay Commission awards are implemented for the government employees. Due to a high relative weight to imputed rent in CPI, this creates volatility in CPI whenever DA or Pay Commissions are announced (Morris, 2021).

To summarise, the biggest difference in CPI and CES weights is seen with respect to the ‘Housing’ group. Once we exclude Housing from CES weights, we find that weights used in the CES and CPI broadly match.

## 4 CPI and CPHS: Comparison

We compare the weights of different commodities in the CPI to expense shares implied by a new, independent nationally-representative household survey, the CMIE Consumer Pyramid Household Survey (CPHS). CMIE has been conducting a large longitudinal household survey, Consumer Pyramids Household Survey (CPHS) since 2009. The individual record level data of about 150,000 households, has been available from 2014. CPHS uses a multi-stage stratified survey design to draw the sample of households. Its Primary Sampling Units (PSUs) were the villages and towns of the 2011 Census. The Ultimate Sampling Units (USUs) were the households from these PSUs, which are selected by a systematic random sampling process. For more details on CPHS survey design, refer to Appendix Section B.

CMIE visits each household three times a year. On each visit, it asks for consumption expenditure for each of the preceding four months. This provides us with monthly household expenditure, available since 2014. At the same time, the

household is also asked about the expenditure in the last seven days for a smaller subset of 22 commodities. Hence, there is one observation of weekly expense every 16 weeks (four months) for 22 commodities. We calculate the expense shares of various commodities captured by the CPHS in 2019 in a households consumption basket. These are calculated using the data collected over a four month recall period. We compare these with the weights in the CPI.

## 4.1 CPI-CPHS category mapping

To compare the expense shares of CPHS with CPI weights, it is important to ensure that the CPI and CPHS are measuring consumption expenditures on a broadly similar basket of goods and services. We map CPI commodity classification to CPHS classification, by comparing item-wise list of CPI<sup>14</sup> with category and sub-category descriptions of CPHS (at the highest level of disaggregation)<sup>15</sup>.

For instance, CPI items such as “Railway fare” and “Bus/Tram Fare” together map to CPHS monthly expense of “Bus Train And Ferry” and “Outstation Taxi Bus Train”. After mapping every CPI item to the most disaggregated CPHS category, we aggregate them to closely resemble the main categories. This results in the following major expenditure categories:

- Food
- Cooking Fuel and Electricity
- Transport and Communication
- Clothing and Footwear
- Intoxicants
- Recreation
- Health
- Education

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<sup>14</sup>Central Statistics Office (Ministry of Statistics and Programme Implementation), 2015.

<sup>15</sup>Mahesh Vyas, 2020b.

- Household Goods and Services
- Personal Goods
- Housing

The detailed mapping is presented in Section C in the Appendix. There are a few major differences in how certain items have been classified that are important to note. These are as follows:

1. *Food*: CPI category of “Food” includes sub-categories such as “Cereals and Pulses”, “Meat, Eggs, Fish”, “Sugar & Confectionary”, “Non-alcoholic beverages” etc. These map to categories with similar names in CPHS, as detailed in Appendix Section C. The CPI category of “Food” as a whole maps to CPHS category: “Monthly Expense on Food” (excluding “Monthly Expense on Health Supplements”) and “Monthly Expense on Food in Restaurants”.
2. *Education*: The CPI category of “Education” broadly maps to CPHS “Monthly Expense on Education”. However, CPHS includes “Monthly Expense on School Transport” under the category of education while CPI includes this under the category of “Transport”. Therefore, we exclude school transport from the mapped category “Education” in CPHS and add it to “Transport and Communication” to match the CPI classification. CPHS “Education” includes “Expense on Overseas Education” which is not included in CPI. It is thus excluded from the mapped ‘Education’ category.
3. *Transport*: CPHS categories “Monthly Expense on Transport” and “Monthly Expense on Communication” are added to match the CPI category “Transport and Communication”. In CPHS, “Monthly Expense on Petrol and Diesel” is included in “Monthly Expense on Power and Fuel”, while in CPI, it is a part of the “Transport and Communication” category. Hence, we extract it from the “Monthly Expense on Power and Fuel” and include it in our mapped category “Transport and communication”, while the other components of “Monthly Expense on Power and Fuel” are mapped to “Cooking Fuel, Electricity”.

A major difference in CPI and CPHS definition of this category is the expense on vehicles. CPI includes vehicles like cars, motorcycles, bicycles in ‘Transport and Communication’, while CPHS does not record expenditure on these under any head. This implies that CPI weights capture a higher proportion of household expenditure vis-a-vis CPHS and thus, we expect CPI “Transport and Communication” weights to be higher than CPHS.

4. *Clothing and footwear*: CPHS category ‘Monthly Expense on Clothing and Footwear’ includes “Monthly Expense on Gems and Jewellery” and “Monthly Expense on Bags, Wallets, Watches, Glasses”, which is categorised in “Personal Care and Effects” by CPI; hence, we deduct these two sub-categories from the “Clothing and Footwear” category and add them to the mapped category “Personal Care and Effects”.
5. *Recreation*: The CPI ‘Recreation and Amusement’ category maps to CPHS “Monthly Expense on Recreation”, “Monthly Expense On Newspapers And Magazines” and “Monthly Expense On Cable TV”. The latter two are sub-categories under CPHS “Monthly Expense On Communication and Info” and are extracted from it. CPI category ‘Recreation and Amusement’ also includes durables like TV, radio etc (which are not included in CPHS) and some expenses like library charges (which cannot be extracted from CPHS categories) and hence are not included in our category. We thus expect our mapped category “Recreation” to underestimate the household expense share on recreation compared to CPI.
6. *Household goods and services*: CPI “Household Goods and Services” includes several household items such as furniture, furnishings, detergents, appliances like AC, washing machine, stove, utensils etc. These map to several sub-categories of CPHS “Monthly Expense on Miscellaneous”, which are monthly expense on “Utensils”, “Lighting”, “ Furniture and Furnishings”, “Domestic Help”, “Paintings and Renovation”. The CPI items also map to CPHS monthly expense on “Kitchen Appliances”, “Household Appliances”, “Detergent Bars”, “Detergent Liquids and Powder” and “Other Housecare Products”.

Categorisation of some items in CPI such as torch, rope etc is not clear in CPHS, as it is not evident from the description of CPHS categories if they include the items. Hence, such miscellaneous items may not be reflected in the mapped CPI-CPHS category. Other sub-categories of CPHS “Monthly Expense on Miscellaneous” such as “Monthly Expense on Vacation” etc are not included among CPI items and are excluded from our mapped categories.

7. *Housing*: An important difference between the CPHS and CPI commodity classification is “Housing”. CPHS “Monthly Expense on Bills and Rent” has four components: “Rent”, “Water”, “Society Charges” and “Other Taxes”. The first three components map to CPI (Housing). This excludes the fourth component “Monthly Expense on Other Taxes” from our mapping. However, CPHS estimates only actual rent paid while CPI includes both actual and imputed rent paid on owner-occupied housing. Thus, our mapped category “Housing” includes only actual rent paid and other charges on housing, and excludes the imputed rent.

There is a significant difference in the treatment of the ‘Housing’ category in CPI and CPHS. As per the CPHS, households spent an average of 0.1% of their monthly consumption on ‘Housing’. In addition, ‘Housing’ category in CPHS has a very skewed distribution where less than 40% observations are non-zero. On the other hand, as discussed in Section 4.2, CPI allocates 21% weight to ‘Housing’ in urban sector, as it includes both actual rent paid as well as imputed rent.

8. *Personal care and effects*: CPI ‘Personal Care and Effects’ includes items such as toiletries, watches, handbags, precious jewellery etc. These items map to CPHS categories “Monthly Expense on Cosmetic and Toiletries” (excluding Face Wash, Other Cosmetics), “Monthly Expense on Hygiene Products” and “Monthly Expense on Parlor and Spa”, “Monthly Expense on Bags, Wallets, Watches, Glasses”, and “Monthly Expense on Gems and Jewellery”.

To sum up, the CPHS categories excluded from our analysis are monthly expenses on “All EMIs”, “Other Taxes”, “Face Wash”, “Other Cosmetics”, “Fit-

ness”, “Health Insurance Premium”, “Artificial Jewellery”, “Overseas Education”, “Parking Fees”, and “Toll Charges”.

## 4.2 The weights in CPI and CPHS

We compare the weights assigned to each commodity by CPI to the household expense shares estimated using the CPHS data. We match the CPI commodity classification by the mapping CPHS to CPI (as described in Section 4.1). We also match CPI-CES methodology to calculate weights, where the CPI-CES weights are per-capita monthly expense shares. They are estimated by dividing total household consumption in a region at a given time by household size. We estimate CPHS expense shares similarly as the per-capita expense share of the commodity in an average household’s consumption expense in the year 2019.<sup>16</sup> We exclude the data beyond 2019 from our analysis as the 2020-21 lockdown and post-lockdown consumption represents an unusual household consumption pattern.

The CPHS expense shares of commodity  $i$  are estimated as the ratio of per-capita expense on commodity  $i$  to total per-capita expense, in region  $k$  summed over all households over the time-period  $t$ . That is,

$$w_{i,k,t} = \frac{\sum_h C_{i,k,t,h}}{\sum_h C_{k,t,h}}$$

where  $C_{i,k,t,h}$  is the per-capita expense on commodity  $i$  by household  $h$  in region  $k$  at time  $t$ . As CMIE-CPHS collects only household-level expenditure data, we estimate per-capita shares by dividing household level expense (both commodity and total) by household size. We also use CPHS population household weights to get population-weighted estimates of expense shares.

Table D.2 in the Appendix compares the expense shares of the major categories estimated by the original CPHS and the modified (CPI-mapped) classification for 2015 and 2019 CPHS data as discussed in Section 4.1. The CPI commodity weights cited in the subsequent tables are as used by CPI (Base Year 2012) for rural and

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<sup>16</sup>National Sample Survey Office (Ministry of Statistics and Programme Implementation), 2014.

urban sectors.<sup>17</sup> The expense shares change by upto 5.7 percentage points from original to modified mapping and this change is the highest in Food, Cooking Fuel & Electricity (erstwhile Power and Fuel), and Transport and Communication. This suggests that mapping is important before we compare the CPI with the CPHS.

**Table 2** CPHS expense shares and CPI weights: rural and urban India

Table 2 compares CPHS expense shares (2019) and CPI (Base Year 2012) weights for major categories for urban and rural sectors in India. The CPHS expense shares are average per-capita expenses of a household on the specified commodity, as a proportion of ‘Total Expense’, averaged over the specified year. The CPHS commodity groups are mapped to CPI commodity classification. In Panel (a), the ‘Total Expense’ in CPHS and CPI includes ‘Housing’ expense while in Panel (b), CPI weights and ‘Total Expense’ of CPHS excludes ‘Housing’. The CPI-CPHS difference is more than 1 percentage point for most commodities and upto 10 percentage points in ‘Food’. However, CPI and CPHS weights align more closely when we exclude ‘Housing’, especially in the urban region.

Category Share	CPHS 2019		CPI weights	
	Rural	Urban	Rural	Urban
<b>Panel (a): Including housing</b>				
Food	0.51	0.46	0.54	0.36
Clothing	0.05	0.05	0.074	0.056
Intoxicants	0.042	0.033	0.032	0.013
Housing	0.0026	0.01	0	0.21
Household Goods & Services	0.04	0.054	0.038	0.039
Personal Care & Effects	0.055	0.06	0.043	0.035
Transport & Comm.	0.13	0.16	0.076	0.097
Cooking Fuel & Elec.	0.088	0.084	0.079	0.055
Recreation	0.02	0.03	0.013	0.02
Education	0.036	0.039	0.034	0.056
Health	0.024	0.024	0.068	0.048
<b>Panel (b): Excluding housing</b>				
Food	0.51	0.461	0.54	0.459
Clothing	0.052	0.049	0.074	0.07
Intoxicants	0.043	0.034	0.032	0.017
Household Goods & Services	0.041	0.055	0.038	0.05
Personal Care & Effects	0.055	0.06	0.043	0.045
Transport & Comm.	0.129	0.163	0.076	0.122
Cooking Fuel & Elec.	0.09	0.087	0.079	0.071
Recreation	0.024	0.032	0.013	0.025
Education	0.032	0.034	0.034	0.07
Health	0.026	0.026	0.068	0.061

Table 2 summarises the expense shares estimated by CPHS in 2019 and corresponding CPI weights for major categories. Panel (a) shows the weights when ‘Housing’ is included as both as a category and also in ‘Total Expense’ in CPHS. Panel (b) shows the weights when ‘Housing’ is excluded from ‘Total Expense’ and as a category for comparison.

<sup>17</sup>Central Statistics Office (Ministry of Statistics and Programme Implementation), 2015.

In Panel (a) we observe that several categories have different weights in CPI and CPHS, especially in the urban region. Categories such as ‘Food’, ‘Intoxicants’, ‘Transport & Communication’, and ‘Health’ have a difference of more than 1 percentage point in weights between urban and rural CPI and CPHS. In addition, ‘Housing’, ‘Recreation’, ‘Education’, and ‘Cooking Fuel & Electricity’ in urban sector see similar differences. In the rural sector, ‘Clothing & Footwear’ and ‘Personal Care & Effects’ also have more than 1 percentage points difference in CPI-CPHS weights.

The highest difference observed is in ‘Food’; CPI allots nearly 3 percentage points higher weight to ‘Food’ than CPHS in rural sector, but 10 percentage points lower weight than observed in CPHS in urban sector. For example, CPI weight of ‘Food’ in the household consumption basket is 0.36 in urban regions. In CPHS-2019, it was 0.46, which is about 10 percentage points higher than the CPI weight.

However, these differences reduce when one excludes ‘Housing’ from both the surveys (in Panel (b) of Table 2), given the issues with ‘Housing’ component of CPI as noted in Section . As the share of ‘Housing’ in CPHS 2019 is very small at less than 1%, the CPHS weights after excluding ‘Housing’ are very similar to Panel (a) in Table 2. The major changes observed in Panel (b) are for urban CPI. The difference in the weight of food between the two surveys is similar at about 3 percentage points for rural sector, as rural ‘Housing’ weight is 0 in CPI. However, the weight of ‘Food’ in urban CPI is now nearly the same as in CPHS 2019, at 0.459 and 0.46 respectively. The difference in ‘Cooking Fuel and Electricity’ has also reduced once housing is excluded.

We expected ‘Transport & Communication’ and ‘Recreation’ shares to be smaller in CPHS than in CPI, as CPHS does not include durables like vehicles and TV/radio respectively. However, CPHS shares exceed CPI weights in both categories, even after this underestimation, by 5.3 and 1.1 percentage points in rural sector. The CPHS shares in urban sector exceed CPI weights by 4.1 and 0.7 percentage points in ‘Transport & Communication’ and ‘Recreation’ respectively. We examine this difference in light of different commodity classifications in Section 4.4.2.

Other differences remain in Panel (b); ‘Clothing & Footwear’ and ‘Health’ also

have more than 2 percentage points difference in both urban and rural CPI-CPHS weights and ‘Education’ in urban CPI-CPHS weights. The other differences range from 0.2 to 1.7 percentage points.

### 4.3 Weights in Food

**Table 3** Expense Shares of Food Sub-categories, CPI and CPHS(2019)

This table compares household expense shares of the sub-categories of ‘Food’ observed in CPHS (2019) with their CPI weights. The CPHS expense shares are expressed as per-capita shares of the commodity in an average household’s consumption expense over the specified year. Here, we exclude ‘Housing’ from the overall expense. In Panel (a), the expense shares are estimated as a proportion of ‘Total Expense’ and in Panel (b), the expense shares are expressed as a proportion of expense on ‘Food’.

**Panel (a): Expense Shares of Food Sub-categories (as % of Total Expense)**

Category	CPHS (2019)		CPI (Base Year 2012)	
	Rural	Urban	Rural	Urban
Cereals & Pulses	0.144	0.116	0.153	0.106
Sugar & Confectionary	0.024	0.022	0.017	0.01
Meat, Eggs, Fish	0.055	0.051	0.049	0.039
Milk and Products	0.079	0.074	0.077	0.068
Oils and Fats	0.042	0.036	0.042	0.035
Vegetables	0.085	0.074	0.075	0.056
Spices	0.015	0.012	0.031	0.022
Fruits	0.015	0.017	0.029	0.037
Prepared Meals	0.035	0.043	0.056	0.071
Beverages	0.014	0.016	0.014	0.014
Food	0.509	0.461	0.543	0.459

**Panel (b): Expense Shares of Food Sub-categories (as % of Food Expense)**

Cereals & Pulses	0.28	0.25	0.282	0.23
Sugar & Confectionary	0.048	0.049	0.031	0.021
Meat, Eggs, Fish	0.11	0.11	0.09	0.085
Milk and Products	0.155	0.16	0.142	0.15
Oils and Fats	0.08	0.077	0.077	0.076
Vegetables	0.167	0.16	0.138	0.122
Spices	0.03	0.026	0.057	0.05
Fruits	0.03	0.038	0.053	0.08
Prepared Meals	0.07	0.094	0.10	0.15
Beverages	0.027	0.035	0.026	0.031

We further examine the source of differences in weights for the ‘Food’ category, as it is the largest category in terms of weights and sub-categories. Table 3 shows the difference in CPI-CPHS weights among the sub-categories of ‘Food’. In Panel (a), the CPHS expense shares are calculated as a proportion of total per capita expense excluding expense on Housing. CPI weights are also estimated excluding weight

to Housing. In Panel (b), the CPHS expense shares are calculated as a proportion of per capita expense on ‘Food’. CPI weights in Panel (b) are calculated as a proportion of ‘Food’ weights (weight of ‘Food’ excluding ‘Housing’, as in Panel (a)).

The CPI-CPHS differences in Table 3 indicate that the difference in CPI-CPHS weights in the ‘Food’ category is not distributed evenly across its sub-categories or even regions. The components of ‘Food’ that contribute to differences in weights between CPI and CPHS are different for urban and rural sectors. In urban sector, this difference is driven primarily by difference in weights of ‘Sugar & Confectionary’, ‘Vegetables’, ‘Meat, Eggs, Fish’, ‘Milk and Products’, and ‘Prepared Meals’. In rural sector, the CPI-CES difference of nearly 4 percentage points in Food is driven by ‘Cereals & Pulses’, ‘Vegetables’, ‘Spices’, ‘Fruits’, and ‘Prepared Meals’.

Panel (b) of Table 3 allows us to compare our results to a previous study comparing CPI and CPHS,<sup>18</sup>. The authors had compared weights of CPI-Industrial Workers (Base Year 2001) with the closest available household survey at that time: CMIE’s Consumer Pyramids Survey 2009.<sup>19</sup> CPI-IW estimates inflation for industrial or manual workers and was used by the authors for weights comparison. We did not have an overall CPI series at that time. In Panel (b), we replicate the authors’ approach towards comparison of weights. This replication is done using the most recent data available for CPHS and CPI respectively: the household expense shares calculated from CPHS (2019) and the weights used in the CPI (Base Year 2012) series (CPI-C). These expense shares are for sub-categories of ‘Food’ and are estimated as a proportion of expense on Food, as in Patnaik, Shah and Veronese (2011). Compared to their CPI-IW and CPHS 2009 weights difference, the CPI-C and CPHS 2019 weights difference has increased for some commodities such as ‘Meat, Eggs, Fish’, ‘Prepared Meals’, ‘Milk & Milk Products’ and ‘Beverages’. It has decreased for some other ‘Food’ sub-groups such as ‘Vegetables & Fruits’ and ‘Spices’ The net effect on ‘Food’ (as a percentage of total household expense) at an all-India level is an increase in difference between CPI and CPHS weights, to

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<sup>18</sup>Patnaik, Shah and Veronese, 2011.

<sup>19</sup>CMIE did not release record level data in 2009. The estimates of the paper are based on aggregated data.

2.5 percentage points from 1.2 percentage points in 2009.

Thus, we see that CPI weights do not closely resemble household expense shares (as measured by CPHS) at the sub-category level within ‘Food’, even after excluding ‘Housing’. This caveat is important to note for CPI researchers, as food inflation is a topic of wide interest in Indian policy research.

## **4.4 Potential reasons for differences**

There could be several reasons for the observed difference in CPI weights and CPHS 2019 expense shares: difference due to time from 2011-12 to 2019 or in CPI-CPHS commodity classification or in recall periods used. Next, we examine each of these potential sources of difference in detail.

### **4.4.1 Year of survey**

The difference in CPHS 2019 and CPI (Base Year 2012) weights may be due to changing household consumption patterns from 2011-12 to 2019. Households consumption patterns may change over time due to changes in income, preferences, household characteristics or inflation bias (Costa, 2001; Hamilton, 2001). Hence, in Table 4, we compare CPI to an earlier available year of the survey, 2015. As consumption patterns are expected to change over time, the exercise allows us to examine how closely the CPI weights (based on CES 2011-12) are aligned with household consumption patterns in 2015 as opposed to 2019.

Table 4 compares CPHS expense shares (2015) and CPI (Base Year 2012) weights for major categories for urban and rural sectors in India. We see that the CPI-CPHS 2015 difference is more than 1 percentage point for most commodities. In fact, the weights difference in CPI-CPHS 2019 (from Table 2) is lower than the weights difference in CPI-CPHS 2015 (from Table 4). That is, the CPHS weights are not closer to CPI 2011-12 in the first year of our CPHS sample, 2015, than they were in 2019.

**Table 4** CPHS expense shares (2015) and CPI weights, rural and urban India (exc Housing)

Table 4 compares CPHS expense shares (2015) and CPI (Base Year 2012) weights for major categories for urban and rural sectors in India. The CPHS expense shares are average per-capita expenses of a household on the specified commodity, as a proportion of ‘Total Expense’, averaged over the specified year. The ‘Total Expense’ in CPHS and CPI weights exclude ‘Housing’ here. The CPI-CPHS 2015 difference is more than 1 percentage point for most commodities and these differences are higher than CPI-CPHS 2019 difference in Table 2.

Category Share	CPHS 2015		CPI weights	
	Rural	Urban	Rural	Urban
Food	0.579	0.517	0.54	0.459
Clothing	0.046	0.045	0.074	0.07
Intoxicants	0.041	0.03	0.032	0.017
Household Goods & Services	0.029	0.039	0.038	0.05
Personal Care & Effects	0.055	0.058	0.043	0.045
Transport & Comm.	0.099	0.137	0.076	0.122
Cooking Fuel & Elec.	0.091	0.094	0.079	0.071
Recreation	0.02	0.029	0.013	0.025
Education	0.027	0.035	0.034	0.07
Health	0.014	0.015	0.068	0.061

#### 4.4.2 Commodity classification

Another difference in CPI-CPHS methodology which may result in differences in weights is the commodity classification. As discussed in Section 4.1, the CPI ‘Transport and Communication’ category includes expense on vehicles, which has a combined weight of 1.4 percentage points, which is not included in CPHS. Our mapped category does not include ‘Expense on Vehicles’. This could cause a difference between the weights in CPI and mapped the CPHS category. Similarly, durables like TV, radio etc are included in CPI category ‘Recreation and Amusement’ but excluded from CPHS. The combined weight of these categories is 0.28%.<sup>20</sup> While this difference in commodity classification could be one of the reasons for difference in weights, a closer look at the weight patterns show that the difference in commodity classification may not be a factor contributing to differences in weights. For instance, the overall weight of ‘Recreation and Amusement’ is higher in CPHS than in CPI, so once durable goods like Television, Camera etc are excluded from the CPI (in an attempt to make the CPI mapping closer

<sup>20</sup>Combined weight of ‘Television’, ‘VCR/VCD/DVD player’, ‘Camera and photographic equipment’, ‘PC, Laptop, other peripherals inc. software’ categories for All-India in CPI (Base Year 2012) series.

to the CPHS), the weight of the ‘Recreation and Amusement’ category in CPI would further reduce. This will increase the difference in the weights for CPI and CPHS for this category. The same reasoning holds true for the ‘Transport and Communication’ category.

There are minor differences in CPI-CPHS at item-level commodities; these are documented in detail in Appendix C. In addition to those, household expenses on commodities received under Public Distribution System (PDS) are not captured by the CPHS, but are captured by the CES. We do not expect this to make a large difference in household expense shares, as per capita expense on PDS commodities is small by design. To substantiate, the highest consumption among PDS commodities is “Rice” (by proportion of consuming households) with a per-capita monthly consumption of 1.67 kg in rural India in 2011-12 (National Sample Survey Office (Ministry of Statistics and Programme Implementation), 2014, pg: 22). At Rs.3/kg under the National Food Security Act (NFSA) since 2013, “Rice” from PDS entails an expense of Rs.5 per month per capita, which is less than 0.5% of total monthly expense.

#### **4.4.3 Recall period**

Recall period is the reference time used by a household consumption survey to record the consumption expense made by a household or individual on a commodity in that period. That is, the household survey enquires the expense made on a commodity in the last ‘x’ days by the household, where ‘x’ depends on the recall period. CES 2011-12 MMRP method (basis of CPI weights) takes a recall period of ‘last 7 days’ for food sub-groups like fruits and vegetables, edible oils, meat eggs and fish, spices, beverages, refreshments & processed food as well as pan, tobacco and intoxicants among non-food groups. It takes ‘last 365 days’ as the recall period for clothing, footwear, education, institutional medical care, and durables. For all other groups and sub-groups, CES 2011-12 MMRP takes ‘last 30 days’ as the recall period.

On the other hand, CPHS has a recall period of one-four months for each commodity. CPHS visits every household once every four months to collect household

expenditure data for each of the four months since it's last visit. Thus, the recall period in CPHS is one-four months for all commodities, but the frequency of data available is monthly. Additionally, there is data with a recall period of 'last 7 days' for 22 commodities in CPHS. These commodities are milk and milk products; meat, eggs, fish; bread, biscuits, chocolates, cakes, ice-creams; bread, biscuit, snacks; tobacco products, vegetables, potatoes and onions, petrol and diesel, etc. This data with 7-day recall is available only for the week preceding the date of survey and not at a weekly frequency. CPHS also publishes an 'Adjusted Monthly Expense' series for these 22 commodities. For this, the monthly expense series for these 22 commodities is adjusted to account for the difference in 7-day recall period. This is done by multiplying monthly expense series by an adjustment factor. The adjustment factor equals the ratio of 7-day recall expense multiplied by 4 (to scale week's expense up to a month) and the average of monthly expenses of the 22 commodities from previous 4 months.<sup>21</sup>

Thus, comparing monthly CPHS expense shares to CPI shares which have varying recall periods can create a difference in expense shares. In particular, data collected with longer reference periods may be affected by recall lapse. Recall lapse includes both the inability to remember the fact that a certain item was consumed but also the inability to remember the exact time when an item was consumed<sup>22</sup>. For high-frequency purchases such as milk and vegetables, a 7-day recall period gives higher consumption shares than for commodities with a 30-day recall period<sup>23</sup>. Thus, a difference in recall periods between consumption surveys can create differences in the expense shares for the same commodity.

To examine the difference in CPI-CPHS weights due to a difference in their recall period, we use the 'adjusted' monthly expense heads in CPHS. These 'adjusted' expense categories in CPHS are based on consumption of 22 selected commodities for which CPHS collects data with both 7 days and 30+ days recall periods. Thus,

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<sup>21</sup>To be precise, the adjusted monthly expenses are monthly expenses divided by an adjustment factor. The adjustment factor is the ratio of the average monthly expenses seen in the four observations of monthly expenses and the implicit monthly expenses derived by multiplying the weekly expenses by four.

<sup>22</sup>National Sample Survey Office (Ministry of Statistics and Programme Implementation), 2014.

<sup>23</sup>Ibid.

using the adjusted monthly expense series brings the recall period of CPHS closer to CPI's 7 day recall, for the selected commodities. Note that we cannot use the 'weekly' expense series (which have 7-day recall period) of CPHS directly for these commodities as they do not form a representative sample at monthly frequency, as the data is collected once from a household in every four months.<sup>24</sup> Hence, adjusted monthly expense series is the closest available comparison for CPI weights based on 7 day recall. Also, CPHS does not have a comparable recall period for CPI's 'last 365 days' for any commodity.

Of the 22 commodities in CPHS for which adjusted monthly expenses are available, there are 6 commodities with a common recall period of 7 days in CPI and CPHS. These are "Edible Oils", "Fruits", "Vegetables" (including potatoes and onions), "Milk and Products", "Meat, Eggs, and Fish", and "Intoxicants". Other commodities with a 7-day recall period in CPI, such as "Spices", "Beverages", and "Processed Foods", do not map well to CPHS adjusted monthly expense heads, and hence we omit them from our analysis. Similarly, adjusted monthly 'Food' expense is based on a mix of 7 days and 30+ days recall, as different food sub-groups have different recall periods.

In Table 5, we compare these adjusted monthly expenses in CPHS and CPI/CES to examine the effects of recall period on observed expense shares. The first two columns show CPHS adjusted monthly shares (as described above) and the next two columns show the CPI weights of the same commodities, using 7 day recall period. This allows us to compare CPI and CPHS with as close recall periods and commodity classifications as possible. All these expense shares are as a proportion of total per-capita expense, excluding expense on Housing.

From Table 5, we note that the 7 days recall expense shares (adjusted CPHS) differ from CPI by more than one percentage point for "Vegetables", "Meat, Eggs, Fish", and "Intoxicants" in both rural and urban and in "Milk and Products" and "Fruits" for urban region. The comparison illustrates that of the commodities where CPI uses a recall period of 7 days, differences from CPHS in some categories

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<sup>24</sup>It does form a representative sample for each 'wave', which is the block of four months used by CPHS to revisit every household. However, this is not directly comparable to CPI as CPI's weights are based on average monthly expense shares.

**Table 5** Adjusted-Monthly Expense Shares (7-day recall, exc. Housing), CPHS (2015 & 2019) and CPI

Table 5 compares the adjusted monthly expense shares in CPHS to their weights in CPI, for the commodities which have 7-day recall period in both CPI and CPHS. It shows expense shares as a proportion of total expense (exc. “Housing”). The CPI-Adjusted CPHS expense shares differ by more than one percentage point for “Vegetables”, “Meat, Eggs, Fish”, and “Intoxicants” in both rural and urban and in “Milk and Products” and “Fruits” for urban region. This indicates that recall period is not the only reason for difference in CPI-CPHS weights.

Category	Adjusted CPHS (2019)		CPI (Base Year 2012)	
	Rural	Urban	Rural	Urban
Edible Oils	0.041*	0.033*	0.042	0.028
Fruits	0.020	0.019	0.029	0.29
Milk and Products	0.082	0.076	0.077	0.053
Vegetables	0.097	0.082	0.075	0.044
Meat, Eggs, Fish	0.074	0.061	0.048	0.03
Intoxicants	0.045**	0.033**	0.032	0.017

\*excludes Ghee and Butter;

\*\*excludes Liquor in Restaurants

reduce after controlling for recall period. However, they persist and are higher than one percentage point in 3 commodities in both rural and urban sectors. Moreover, CPHS expense shares with 30-day recall (CPHS 2019 expense shares from Table 2) and with 7-day recall period (Adjusted CPHS 2019 in Table 5) are quite close. This indicates that recall period may not be a major reason for difference in CPI-CPHS weights, at least for the high-frequency consumption goods for which we comparable data.

#### 4.4.4 Socio-economic factors like Income

Another factor driving a change in household consumption patterns from CES 2011-12 to CPHS 2019 could be a change in consumer baskets due to changes in socio-economic covariates. While we are unable to control for these covariates directly due to unavailability of income and other covariates in CES 2011-12 data, we note that direction of change from CPI 2011-12 weights to CPHS 2019 expense shares is consistent with a rise in income and an increased preference for discretionary expenditure. For instance, Table 2 shows that expense shares on necessities like ‘Food’ and sub-categories like ‘Cereals and Pulses’ have fallen for rural sector from CPI 2011-12 to CPHS 2019. Discretionary purchases like ‘Intoxicants’,

‘Household Goods & Services’, ‘Personal Care & Effects’, ‘Transport & Communications’, ‘Recreation’ etc have increased for both rural and urban sectors. It has also increased for some sub-categories of ‘Food’ such as ‘Meat, Eggs, Fish’, ‘Sugar & Confectionary’, ‘Vegetables’ etc.

The evidence on this is confounded, however, due to changes in some categories like ‘Clothing & Footwear’ (which is a discretionary purchase but has decreased) and some ‘Food’ subcategories like ‘Prepared Meals’ and urban ‘Cereals and Pulses’. In general, the pattern of expense shares indicates that an increase in income could also have resulted in an increase in expense shares on discretionary purchases and fall in necessities.

## 5 Conclusion

This paper seeks to make some key methodological details of India’s Consumer Price Index salient to its users and researchers. We ask: how do the commodity weights in the CPI compare with those of NSS Consumer Expenditure Survey and the CPHS. In particular, we find that the CPI commodity weights differ from their empirical basis, the NSS Consumer Expenditure Survey 2011-12, due to the inclusion of imputed rent in Housing category in CPI. The Housing category is an important detail as its weight has impacted weights of all other categories.

We also compare CPI to a nationally-representative household survey, CMIE Consumer Pyramids Household Survey (CPHS), to examine CPI weights against current household consumption patterns. There is a difference in CPI-CPHS weights in most categories of household expense. However the differences in CPI-CPHS weights reduce after excluding ‘Housing’, similar to CPI-CES exercise. CPI weights exclusive of Housing category are closer to household expenditure as estimated by CES 2011-12 and CPHS 2019.

We note that there are differences in commodity weights between CPI (Base Year 2012) and CPHS 2019. We highlight some potential reasons that could contribute to these differences such as year of survey, recall period, ‘Housing’ weights, and commodity classification.

There is also an information delay inherent in consumer price indices which reweigh the index at a slower rate than change in consumption baskets. The latter are expected to change with time and changes in socio-economic covariates. It is, therefore, expected that CPI weights estimated from a survey in 2011-12 differ from households' consumption shares in 2019. This is important for CPHS users, especially for application of CPHS survey data to research on inflation.

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# Appendix

## A CPI-CES Mapping

**Table A.1** Food Group Classification

Group	Category	Sub-Group	Section
Food and Beverages	Food	Cereals and Products	Major Cereals and Products Coarse cereals and products Grinding Charges
Food and Beverages	Food	Meat and fish	Meat Fish, prawn
Food and Beverages	Food	Eggs	Eggs
Food and Beverages	Food	Milk and products	Liquid milk Milk products
Food and Beverages	Food	Oils and fats	Oils Fats
Food and Beverages	Food	Fruits	Fresh fruits Dry fruits
Food and Beverages	Food	Vegetables	Root Vegetables Leafy Vegetables Other Vegetables Vegetable products
Food and Beverages	Food	Pulses and products	Pulses Pulse products
Food and Beverages	Food	Sugar and Confectionery	Sugar Confectionery Ice-cream
Food and Beverages	Food	Spices	Spices
Food and Beverages	Food	Prepared meals, snacks, sweets etc.	Prepared tea and coffee Prepared meals Sweets and snacks
Food and Beverages	Beverages	Non-alcoholic beverages	Tea and coffee beverages Mineral water and other beverages

## B CPHS Survey Design

CMIE has been conducting a large longitudinal household survey, Consumer Pyramids Household Survey (CPHS) since 2009. Consumer Pyramids Household Survey (CPHS) is a continuous survey administered on a panel of sample households. It is a part of a larger survey by CMIE which collects data on household income, expenses, ownership of assets, access to basic household amenities, levels of education and financial inclusion, self-assessment of health and employment status. The

Consumption Pyramidsdx provides a detailed break up of the monthly consumption expenses of Indian households. The database contains data on 153 specific expense heads. The individual record level data of 150,000 households, has been available from 2014. This database also offers data on expenses incurred during a week on 33 expense heads. These are consumption goods or services on which expenses are made relatively more frequently and households have a better recall of these expenses.

CPHS covers all states and Union Territories of India, except Andaman & Nicobar Islands, Arunachal Pradesh, Dadra & Nagar Haveli, Diu & Daman, Lakshadweep, Manipur, Meghalaya, Mizoram, Nagaland, and Sikkim. The survey design of CPHS is explained below (Mahesh Vyas, 2020a):

Stratification: A multi-stage stratified survey design was deployed to draw the sample of households. The Primary Sampling Units (PSUs) were the villages and towns of the 2011 Census. The Ultimate Sampling Units (USUs) were the households from these PSUs. The broadest level of stratification is the Homogeneous Regions (HRs). A Homogeneous Region is a set of neighbouring districts within a state that has similar agroclimatic conditions, relatively similar urbanisation levels and relatively similar female literacy and are of a similar size in terms of households as per the 2011 Census. HRs are divided into rural and urban sub-strata. The urban region of a HR was further stratified into four strata. This further stratification of urban HRs was done because of the high variation expected in the characteristics of towns by their size. The average number of households in a village, as per the 2011 Census, was 282. In contrast, the average households per town was 10,197. All towns of an HR were stratified into four strata based on the number of households in the town in 2011, as follows: 1. Very large(VL) towns with more than 200,000 households in 2011 2. Large(L) towns that had between 60,000 and 200,000 households 3. Medium(M) sized towns with households between 20,000 and 60,000 4. Those with less than 20,000 households were the Small(S) towns The entire rural region, comprising of all villages as per Census 2011 falling within the HR form the rural stratum of the region. Each HR therefore consisted of five strata - a Rural stratum, a Very Large Towns stratum, a Large Towns stratum, a Medium-sized Towns stratum and a Small Towns stratum.

Household Selection: Households from the selected villages were selected through a Systematic Random Sampling process. The Systematic Random Sampling method entailed the selection of every  $n$  th household from a village street where  $n$  was a randomly selected integer between 5 and 15. The sample size per ultimate rural sampling unit (i.e. per sample village) was fixed at 16 households per selected sample village. Total number villages selected per rural Homogeneous Region was 30. Therefore, the sample size per rural Homogeneous Region was 480. The sample size per ultimate urban sampling unit (i.e. per CEB) was fixed at 16 households per selected sample CEB of a sample town. The number of CEBs per town was fixed at 21. Therefore, the sample size per town was 336.

Frequency: The CPHS visits each household three times a year. More specifically, it is interviewed every 16th week. On each visit it asks for consumption expenditure for each of the previous four months. This provides us with monthly household expenditure since 2014. CPHS also collects data on consumption expenditure over the week before the survey for 22 high-frequency commodities.

Household Weights: A sample of ' $n$ ' households from a population of ' $N$ ' households would have a probability of  $n/N$  to be selected. As the sample represents the entire population, every sample unit represents a fraction of the total population. This fraction is  $N/n$ . Every sample unit represents  $N/n$  households of the population. This is also the weight of the sample unit household. By scaling up each household's expense shares by the number of population households it represents, we get an estimate of population shares (Centre for Monitoring Indian Economy, 2020).

<b>Mapped Category</b>	<b>CPI</b>	<b>CPHS</b>
Cereals & Pulses	rice PDS, wheat/ atta PDS	
	rice – other sources, wheat/ atta other sources, other cereals, jowar& products bajra& products maize & products small millets & products ragi& products grinding charges	Expense On Cereals Wholegrain
	chira, muri, other rice products, maida, suji, rawa, cereal substitutes: tapioca, etc., gram products, besan other pulse products	Expense On Processed Cereals And Pulses
	sewai, noodles	Expense On Noodles And Pasta
	bread (bakery)	Expense On Bread
	biscuits, chocolates, etc	Expense On Biscuit
	arhar, tur, gram: split, gram: whole, moong, masur, urd, peas, khesari other pulses	Expense On Pulses
	Meat Eggs & Fish	goat meat/mutton, beef/buffalo meat, pork, chicken, others: Birds, crab, oyster, tortoise, etc., fish, prawn
eggs (no.)		Expense On Eggs
Sugar & Confectionery	sugar - PDS	
	sugar - other sources, gur, honey	Expense On Sugar And Other Sweeteners
	candy, misri	Expense On Chocolates And Cakes
	sauce, jam, jelly (gm)	Expense On Jam Ketchup Pickles
	ice-cream	Expense On Ice Creams
Prepared meals, snacks, sweets	tea: cups (no.), coffee: cups (no.) cooked meals purchased	Expense On Food In Restaurants
	prepared sweets, cake, pastry	Expense On Food In Restaurants, Expense On Mithai
	papad, bhujia, namkeen, mixture, chanachur	Expense On Salty Snacks
	other packaged processed food	Expense On Flakes Muesli And Oats, Expense On Ready To Eat Food
	cooked snacks purchased [samosa, puri, paratha, burger, chowmein, idli, dosa, vada, chops, pakoras, paobhaji, etc.]	Expense On Food In Restaurants, Expense On Other Foods
Non-alcoholic beverages	tea: leaf (gm)	Expense On Tea
	coffee: powder (gm)	Expense On Coffee
	mineral water (litre)	Expense On Bottled Water
	cold beverages: bottled/canned, fruit juice and shake (litre)	Expense On Beverages
	other beverages: cocoa, chocolate, etc	

<b>Mapped Category</b>	<b>CPI</b>	<b>CPHS</b>
Edible Oils & Fats	mustard oil, groundnut oil, coconut oil, refined oil [sunflower, soyabean, saffola, etc.], vanaspati, margarine	Expense On Edible Oils
	ghee	Expense On Ghee
	butter	
Milk & Products	milk: liquid (litre), milk: condensed/ powder, curd, other milk products	Expense On Milk And Milk Products
	baby food	Expense On Baby Food
Prepared meals, snacks, sweets	tea: cups (no.), coffee: cups (no.) cooked meals purchased	Expense On Food In Restaurants
	prepared sweets, cake, pastry	Expense On Food In Restaurants, Expense On Mithai
	papad, bhujia, namkeen, mixture, chanachur	Expense On Salty Snacks
	other packaged processed food	Expense On Flakes, Muesli And Oats, Expense On Ready To Eat Food
	cooked snacks purchased [samosa, puri, paratha, burger, chowmein, idli, dosa, vada, chops, pakoras, paobhaji, etc.]	Expense On Food In Restaurants, Expense On Other Foods
Non-alcoholic beverages	tea: leaf (gm)	Expense On Tea
	coffee: powder (gm)	Expense On Coffee
	mineral water (litre)	Expense On Bottled Water
	cold beverages: bottled/canned (litre), fruit juice and shake (litre)	Expense On Beverages
	other beverages: cocoa, chocolate, etc	

Mapped Category	CPI	CPHS
Fruits	banana (no.) jackfruit, watermelon, pineapple (no.), coconut (no.) green coconut (no.), guava, singara, papaya, mango, kharbooza pears/nashpati berries, leechi, apple, grapes, orange, mausami (no.), other fresh fruits	Expense On Fruits
	coconut: copra, groundnut	
	dates, cashewnut, walnut, other nuts raisin, kishmish, monacca etc. other dry fruits	Expense On Dry Fruits And Saffron
Vegetables	Potato, Onion	Expense On Potatoes And Onions
	Radish, Carrot, Garlic, Ginger, Palak/Other leafy vegetables, Tomato, Brinjal Cauliflower, Cabbage, Green chillies Lady's finger parwal/patal, kundru gourd, pumpkin, peas, beans, barbati lemon, other vegetables	Expense On Vegetables And Wet Spices
	pickles	Expense On Jam Ketchup Pickles
	chips	Expense On Salty Snacks
Spices	salt, jeera, dhania, turmeric, black pepper dry chillies, tamarind curry powder, oilseeds	Expense On Dry Spices

Mapped Category	CPI	CPHS
Intoxicants	country liquor, foreign/refined liquor or wine toddy, beer	Expense On Liquor, Expense On Liquor In Restaurants
	other intoxicants	
	pan; leaf, pan; finished ingredients for pan, hookah tobacco, zarda, kimam, surti other tobacco products	Expense On Other Tobacco Products
	bidi	Expense On Bidis
	cigarettes	Expense On Cigarettes

Mapped Category	CPI	CPHS
Clothing & Footwear	dhoti, sareeshawl, chaddar, lungi kurta-pajama suits; males shirts, T-shirts shorts, trousers, Bermudas baniyan, socks, other hosiery and undergarments etc. kurta, pajama suits; females frocks, skirts, etc. school/college uniform; boys. school/college uniform; girls coat, jacket, sweater, windcheater knitting wool cloth for shirt, pyjama, kurta, salwar, etc. cloth for coat, trousers, suit etc. clothing(first-hand) ; other clothing: second-hand gamchha, towel, handkerchief headwear, belts, ties	Expense On Clothing
	tailor, leather boots, shoes, leather sandals, chappals etc other leather footwear rubber/PVC footwear other footwear	Expense On Footwear
	washerman, laundry ironing	

## C CPI-CPHS Mapping

Mapped Category	CPI	CPHS
Transport & Comm.	motor car, Jeep, motor cycle, scooter bicycle (without accessories), tyres & tubes, porter charges, rickshaw (hand drawn& cycle) fare horse cart fare	
	school bus, van, etc	Expense On School Transport (Extracted from 'Expense on Education')
	petrol, diesel, lubricants for vehicle	Expense On Petrol And Diesel (extracted from Expense on Power and Fuel)
	Railway, bus / tram fare	Expense On Bus Train And Ferry, Expense On Outstation Taxi Bus_Train
	taxi, auto-rickshaw fare	Expense On Autorickshaw And Cab
	air fare (normal): economy class (adult)	Expense On Airfare
	mobile handset	Expense On Mobiles And Accessories (Extracted from Expense on Appliances)
	telephone charges : landline	Expense On Landline Phone (Extracted from Expense On Communication And Info)
	telephone charges : mobile	Expense On Cell Phone (Extracted from Expense On Communication And Info)
Cooking Fuel, Elec	internet expenses	Expense On Internet (Extracted from Expense On Communication And Info)
	LPG [excl. conveyance], kerosene - PDS kerosene -other sources, coke, firewood and chips coal Charcoal	Expense On Cooking Fuel
	electricity	Expense On Electricity
Recreation	Diesel [excl. conveyance] other fuel	
	newspapers, periodicals	Expense On Newspapers And Magazines (Extracted from Expense On Communication And Info))
	monthly charges for cable TV connection	Expense On Cable TV (Extracted from Expense On Communication And Info))
	CD, DVD, audio/ Video cassette etc., VCD/DVD hire (incl. instrument)	Expense On Electronic Storage Devices
	goods for recreation and hobbies, sports goods, toys, etc.	Expense On Toys
	cinema; new release (normal day), other entertainment, club fees	Expense On Entertainment
radio, tape- recorder, 2-in-1 television VCR/ VCD/DVD player camera & photographic equipment PC/Laptop/ other peripherals incl. Software, library charges, photography		

Mapped Category	CPI	CPHS
Housing	house rent, garage rent	Expense On House Rent
	residential building & land (cost of repairs only)	Expense On Water Charges
	water charges, watch man charges	Expense On Society Charges
Household Goods And Services	bedstead, almirah, dressing table, chair, stool, bench, table, other furniture & fixtures, carpet, daree & other floor mattings, bed sheet, bed cover, rug, blanket, pillow, quilt, mattress cloth for upholstery, curtains, tablecloth, etc. mosquito net, bedding; others	Expense On Furniture And Furnishings
	air conditioner; air cooler, inverter sewing machine Washing machine, electric fan	Expense On Household Appliances
	stove, gas burner	
	refrigerator, water purifier, other cooking / household appliances, other durables	Expense On Kitchen Appliances
	electric iron, hearer, toaster, oven, other electric heating appliances	Expense On Kitchen Appliances, Expense On Household Appliances
	stainless steel utensils, pressure cooker/ pressure pan, other meal utensils, other crockery & utensils, earthenware, glassware	Expense On Utensils
	electric bulb, tubelight, plugs, switches & other electrical fittings	Expense On Lighting
	washing soap/soda/ soda powder	Expense On Detergent Bars, Expense On Detergent Liquids And Powder
	other washing requisites	Expense On Detergent Bars, Expense On Detergent Liquids And Powder, Expense On Scourers
	mosquito repellent , insecticide, acid etc.	Expense On Other Housecare Products
	domestic servant /cook, sweeper	Expense On Domestic Help
	monthly maintenance chargez	Expense On Painting And Renovation
	bathroom and sanitary equipment, electric batteries, torch, lock, bucket, water bottle/ feeding bottle & other plastic goods coir, rope etc., incense (agarbatti), room freshener flower (fresh) ; all purposes, matches, candle, other petty articles, other consumer Services excluding conveyance	

Mapped Category	CPI	CPHS
Health	hospital & nursing home charges	Expense On Hospitalisation Fees, Expense On Doctors Physiotherapists Fee
	medicine(non-institutional)	Expense On Medicines
	other medical expenses (non- institutional)	
	doctor's / surgeon's fee- first consultation (non- institutional)	Expense On Doctors Physiotherapists Fee
	X-ray, ECG, pathological test, etc.(non- institutional)	Expense On Medical Tests
	family planning devices, spectacles	
Education	books, journals : first hand	Expense On School Academic Books, Expense On Fiction Non Fiction Books
	stationery, photocopying charges	
Personal Care and Effects	tuition and other fees (school, college etc.)	Expense On School College Fees
	private tutor/ coaching center	Expense On Private Tuition Fees
	toilet soap	Expense On Bathing Soap
	toothpaste, toothbrush, comb, etc.	Expense On Toothpaste, Expense On Toothpowder, Expense On Toothbrush
	powder, snow, cream, lotion and perfume	Expense On Powder, Expense On Creams, Expense On Deodorants And Perfumes
	hair oil, shampoo, hair cream	Expense On Hair Oil, Expense On Shampoo And Conditioner, Expense On Other Hair Cosmetics
	shaving blades, shaving stick, razor, shaving cream, aftershave lotion	Expense On Shaving Articles
	clock, watch, suitcase, trunk, box, handbag and other travel goods	Expense On Bags Wallets Watches Glasses
	sanitary napkins	Expense On Hygiene Products
	gold, silver, other ornaments	Expense On Gems And Jewellery
	barber, beautician, etc.	Expense On Parlor Spa
	umbrella, raincoat, lighter (bidi/cigarette/ gas stove) any other personal goods	

## D Comparison: CPHS 2015 & 2019 Expense Shares

We compare expense shares of these major categories implied by the original CPHS and the modified (CPI-mapped) classification for 2015 and 2019 CPHS data (after excluding expenses on ‘Housing’ from total expense). The change in expense shares due to mapping is the highest in ‘Food’, ‘Cooking Fuel & Electricity’ (erstwhile Power and Fuel), and ‘Transport and Communication’ (erstwhile Transport and Communication & Info). We exclude ‘Personal Care and Effects’ and ‘Household Goods and Services’ from this analysis, as they are not among the original CPHS

subcategories but are composed of multiple sub-categories from the original categorization.

Table D.2 shows that the remapping of CPHS to match its commodity classification to CPI has changed the expense shares of almost all categories. In particular, ‘Food’, ‘Cooking Fuel, Elec’, ‘Transport & Communication’, ‘Recreation’ ‘Intoxicants’ Comparing mapping differences between the 2015 and 2019 (ends of our sample) also allows us to notice trends in mapping differences; for instance, the difference between old and new mapping has increased from 3 percentage points in 2015 to 5.7 percentage points in 2019 in ‘Food’.

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**Table D.2** Category-wise HH expense Shares, Original and CPI-CPHS(\*) Mapping

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Table to compare all-India per-capita expense shares with original CPHS mapping and with CPI-CPHS mapping (as described in Section 4.1) in 2015 and in 2019. These expense shares exclude expense on Housing (‘Bills and Rent’ in original CPHS classification). The remapping has changed the expense shares of ‘Food’, ‘Cooking Fuel, Elec’, ‘Transport & Communication’, ‘Recreation’, and ‘Intoxicants’, which have seen a shift of more than a percentage point. The biggest change has been in ‘Cooking Fuel, Electricity’, which was called ‘Monthly Expense on Power and Fuel’ in the original mapping, and ‘Transport & Communication’. This is due to the sub-component ‘Petrol & Diesel’ which has been extracted from Power & Fuel and added to ‘Transport & Communication’. In ‘Food’, the expense shares have increased due to inclusion of ‘Food in Restaurants’ in the ‘Food’ group, which was not included in ‘Food’ in the original CPHS mapping.

Category	CPHS 2015	CPHS 2015*	CPHS 2019	CPHS 2019*
Food	0.51	0.55	0.42	0.49
Clothing	0.05	0.05	0.06	0.05
Intoxicants	0.03	0.04	0.03	0.04
Cooking Fuel, Elec	0.14	0.09	0.15	0.09
Transport Comm	0.07	0.11	0.07	0.14
Recreation	0.004	0.02	0.01	0.03
Education	0.03	0.03	0.031	0.03
Health	0.019	0.01	0.03	0.03

\*: Under CPI-CPHS commodity classification

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