

## How to compute a Consumer Price Index in the context of the Covid-19 crisis ?

### Provisional estimate-May 2020

The health crisis and the lockdown measures in the context of the Covid-19 crisis have important impacts on the measures of short term statistics such as the Consumer Price Index (CPI). These statistics are all the more important to understand economic stakes during this period.

On the one hand, **in order to preserve price collectors but also consumers and salesmen, INSEE has adjourned the collection of prices by INSEE collectors in physical outlets since March the 16<sup>th</sup>**. These prices collected on the field are only one data source among others used to compute the CPI; however, they represent more than four tenth of the CPI, in term of consumption share.

On the other hand, CPI aims to describe an average measure of price changes for all the purchased items. The basket of products is renewed yearly but it remains fixed during a year; the slow changes in the consumption structure ensure that this basket fixity is globally neutral on the inflation measure. **The current health crisis disrupts deeply and suddenly the household consumption structure during the lockdown** either because the consumption was prevented by the impossible move of households (transport, tourism), or because outlets are closed (the implementing order of 15 March 2020 related to measures for the struggle against the Covid-19 spreading defines the first necessary outlets that were allowed to remain opened during the lockdown), or because confronted to the crisis, the households decide to adapt their consumption habits (food, for instance).

In compliance with [Eurostat guidelines](#), shared with the different European countries, INSEE carried out new collection methods and adapted imputation methods.

### 1 – How to measure inflation when the price collection in the field is adjourned?

#### 1.1 – To mitigate the adjournment of price collection on the field in May, INSEE carried out new kinds of price collection.

Usually, about 160 000 prices are collected each month by INSEE's price collectors in physical outlets. INSEE uses other data sources but this on-the-field collection represents more than four tenth of the CPI basket. They are particularly important for fresh food produces, food sold in other outlets than super and hypermarkets, clothing and footwear, furniture, sustainable goods, other manufactured products (except cleaning and maintenance products and articles for personal hygiene and beauty products), other services (hotel and restaurant, services provided by craftsmen, cleaning services, hairdressing, mechanic...).

This price collection on the field has been adjourned since the 16<sup>th</sup> March. As it was also done in other European countries and in compliance with the European guidelines, INSEE tried to compensate the

consequence of the missing manual price collection for the month of May by developing new types of collection.

- When outlets usually visited by price collectors have a website and are still opened or at least offer an online trade, price are collected online. Products concerned are mainly fresh food produces, meat, cheese, bread sold in super and hypermarkets, food products sold in minimarkets, hard-discounters... as well as clothes, sustainable goods and some other manufactured products.
- Some scanner data were usually unused (for clothes or sustainable goods sold in super and hypermarkets or for some small shops); they are used in order to register the prices of products that belong usually to the CPI basket.
- From May 2020 on, a price collection by phone was gradually performed for services and in some small shop (bakery, butchery, cheese shop, fish shop, greengrocer's...).

This alternative price collections do not mitigate completely the adjournment of price collection on the field : the number of prices used in order to compute the CPI is really below the usual standards and consequently, all the estimation are very less precise.

## **1.2– The CPI is usually built from various data sources, most of which were not impacted by the health crisis.**

In order to compute the French CPI, INSEE uses different data sources. Prices collected on the field by price collectors are impacted by the health crisis but it is not the case for the other data sources that remain available.

- The use of scanner data is not impacted by the health crisis. Scanner data are used in order to follow manufactured food, cleaning and maintenance products and articles for personal hygiene and beauty products sold in super and hypermarkets (one tenth of the index in term of consumption share) as well as medicine sold in pharmacy.
- Prices are also collected online; this online price collection was carried out even during the lockdown. Online price collection is used mainly for transport services, tourism, communication services, gas, electricity, insurances, financial services, some manufactured goods and cultural services.

For transport and tourism, prices are usually collected in advance and are registered in the index, the month when the service is provided; the prices of these services when they have been cancelled because of the health crisis were withdrawn from the price sample for May.

- Some prices are collected thanks to dedicated surveys like rents (the rents and charges survey, the social housing landlord survey); the prices of the rents and charges survey obtained from households were collected by phone.
- Some prices come from administrative data, mandatory declarations or are official tariffs; in this case, data collection was not impacted by the health crisis; it is the case for fuel prices, health service prices, tobacco prices...

### 1.3– To what extent does the CPI for May 2020 measure correctly the end of the lockdown?

The Consumer price index tracks averaged changes in the prices over a given month. However, depending on the products, the price collection does not occur usually every day of the month. It is carried out according to different collection calendars defined in order to take into account different constraints. For instance, in order to collect a price in a given outlet, the opening days have to be taken into account; or in order to reflect properly the shift in the calendar of the sales or of the holidays, the collection calendar is adapted.

Because of these issues, prices taken into account for the May index that came from scanner data or from the alternative collections (collection online, by phone) occurred from the 27<sup>th</sup> of April to the 22<sup>nd</sup> of May; prices for tourism were collected from the 18<sup>th</sup> of April to the 15<sup>th</sup> of May. Contrariwise, price collection for transport, health services or fuel was carried out during the whole month.

Because of these different collection calendars, sometimes shifted with reference to the calendar month, the share of prices collected during the lockdown period is less important than the real one in May (the lockdown was partially removed the 11<sup>th</sup> of May). Moreover, some outlets that were closed during the lockdown but have been opened since the 11<sup>th</sup> of May were not visited by price collectors because of the adjournment of price collection on the field and their prices were not collected by phone or online either.

Last, as for every provisional estimate, the whole observations are not known when the estimate is calculated. The incompleteness of the data is more important than usual because of the numerous statistical treatments to perform due to the Covid-19 imputations.

## 2 – How to measure inflation when whole parts of the consumption disappear?

The implementing order of 15 March 2020 related to measures for the struggle against the Covid-19 spreading defined the first necessary outlets that were allowed to remain opened during the lockdown. If a part of the consumption that was purchased in the closed outlets might be purchased online, some other consumption segments simply disappeared (shows, tourism, restaurants, hairdresser, cars, guiding lessons...) and remain for some of them null.

Moreover, even if they did not disappear, the share of numerous consumption segments in the consumption decreased heavily, like fuel or more generally transport services. However, the consumer price index which is a fixed-basket index (a Laspeyres-type index) uses a fixed consumption structure, updated each year. The assumption is that this structure slowly evolves and is usually true. But it does not fit the huge shock that occurred on consumption structure during the health crisis<sup>1</sup>.

In compliance with [the methodological guidance note of the compilation of the HICP in the context of the covid-19 crisis](#) by Eurostat,

- The CPI remains a fixed-basket index and the weights for each consumption segments remain unchanged (that is to say the one observed for the year 2019): for instance, whereas the household food expenditures increase with the lockdown, the food weight remains the one observed before the health crisis.
- When a consumption segment is not transacted any more, its price cannot be observed; the sub-index is consequently imputed (i) either with the price changes of similar product or of the nearest

<sup>1</sup> INSEE published with the definitive Index release of April an alternative exploratory index that used the consumption structure observed during the health crisis.

higher aggregate (ii) or with the all-item index, (iii) or scarcely, in duly justified circumstances, by carrying forward the last observed price. Moreover, when the price of a product follows a highly seasonal pattern, the imputation reproduces the past seasonality. The three methods were used.

**Finally, the share of imputation due to the Covid-19 is about 41% in the May all-item index; these imputations include both missing data due to the adjournment of the price collection and the disappearance of some consumption segments.** They did not take into account the usual imputation made for a provisional estimate (because some information are not available yet).

Figure 1 : imputation rate, in terms of consumption, according to the type of products

May index	Imputation rate
<b>Food</b>	<b>44</b>
Fresh food	57
Other food	41
<b>Tobacco</b>	<b>2</b>
<b>Manufactured products</b>	<b>49</b>
<b>Energy</b>	<b>7</b>
<b>Services</b>	<b>44</b>
<b>All-item CPI</b>	<b>41</b>
<b>All-item HICP</b>	<b>45</b>

Note: Here are only registered the imputations linked to missing data due to (i) a non-observation of prices because of the adjournment of the price collection in the physical outlets, because of the lockdown, (ii) the lack of transaction for some consumption segments in the context of the Covid-19 crisis (extraordinary closure of some outlets, for instance) .