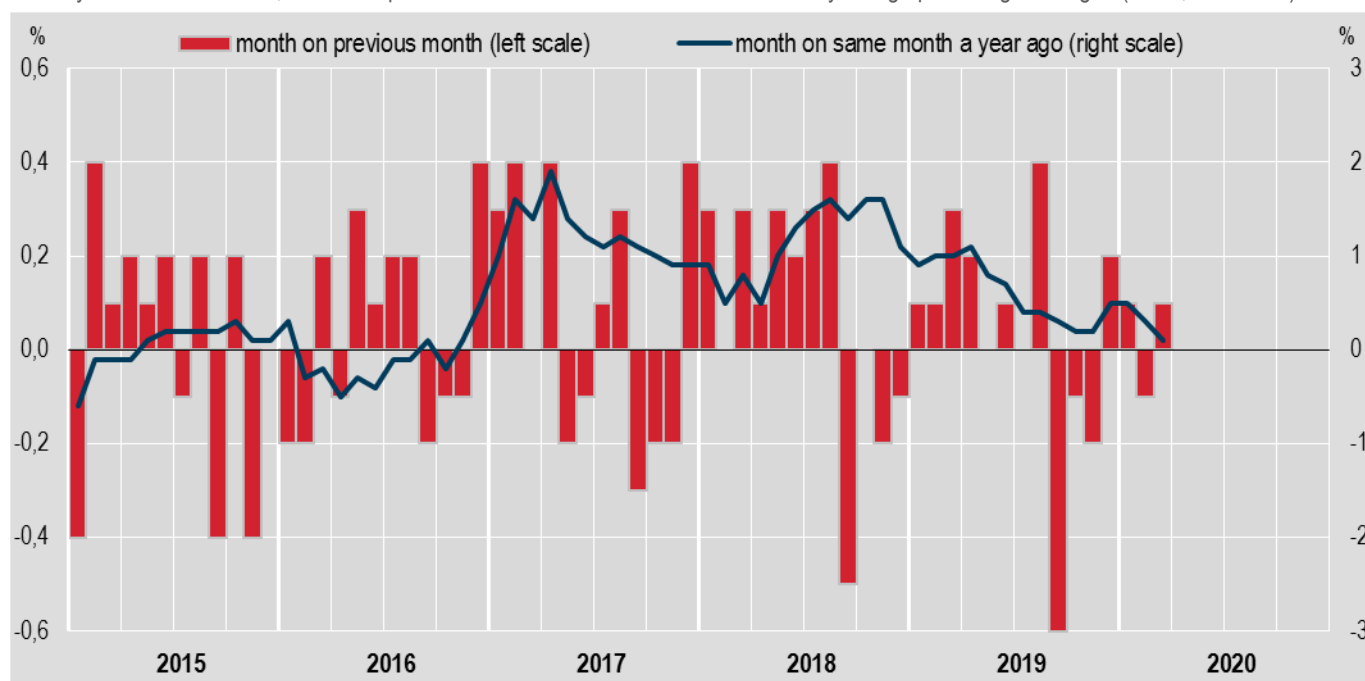March 2020

CONSUMER PRICES
Final data

- In March 2020 the Italian consumer price index for the whole nation (NIC) increased by +0.1% both on monthly basis and annual basis (from +0.3% in the previous month), confirming the flash estimate.

- The slowdown of the growth on annual basis of All items index was mainly due to the trend reversal of prices of Non-regulated energy products (from +1.2% to -2.7%) and to the deceleration of those of Services (from +1.0% to +0.8%); these dynamics were partially offset by the speed-up of prices of Processed food including alcohol (from +0.5% to +1.1%) and of Tobacco (from +1.5% to +2.5%).

- Core inflation (excluding energy and unprocessed food) and inflation excluding energy were +0.7%, both the same as in the previous month.

- The growth on monthly basis was mainly due to the increase of prices of Tobacco (+2.3%) and of Processed food including alcohol (+0.8%), partially offset by the decrease of prices of Non-regulated energy products (-2.2%).

- Prices of Grocery and unprocessed food increased by 0.3% on monthly basis and by 1.0% on annual basis (up from +0.3% in the previous month).

- In March 2020 the Italian harmonized index of consumer prices (HICP) increased by 2.2% on monthly basis, mainly for the conclusion of winter sales of Clothing and footwear. The HICP increased by +0.1% with respect to March 2019 (from +0.2% in the previous month), confirming the flash estimate.

- The estimates of NIC and HICP have been compiled in the context of the spread in Italy of the Covid-19 crisis and the consequent interruption of many retail trade activities supplying goods and services. The structure of Italian consumer price survey, based on the use of multiple sources to collect data, has allowed to contain the effects of the higher amount of missing observations. On pages 12-13 the methodological note describes the context and the choices adopted to deal with the issues emerged.

CHART 1. ITALIAN CONSUMER PRICE INDEX FOR THE WHOLE NATION (NIC)
January 2015 - March 2020, month on previous month and month on same month a year ago percentage changes (index, 2015=100)

TABLE 1. ITALIAN CONSUMER PRICE INDICES

March 2020, month on previous month and month on same month a year ago percentage changes (index, 2015=100)

	INDICES	Month on previous month	Month on same month a year ago
	March 2020	Mar-20 Feb-20	Mar-20 Mar-19
Italian consumer price index for the whole nation (NIC)	102.9	+0.1	+0.1
Italian harmonized index of consumer prices (HICP)	103.6	+2.2	+0.1

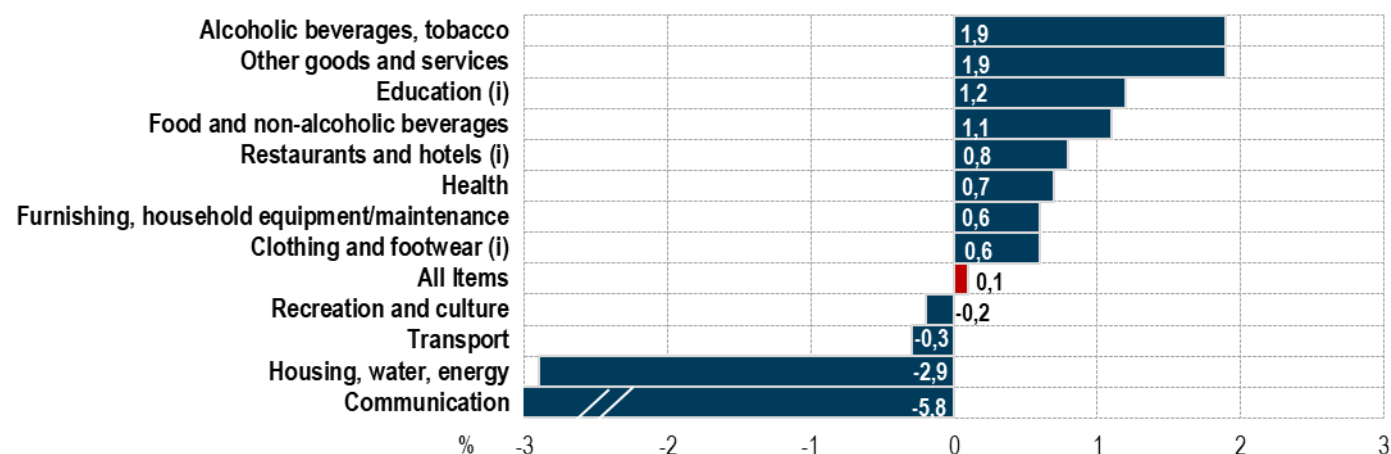## TABLE 2. ITALIAN CONSUMER PRICE INDEX FOR THE WHOLE NATION (NIC) BY ECOICOP DIVISION

March 2020, weights, indices, month on previous month and month on same month a year ago percentage changes (index, 2015=100)

DIVISIONS	Weights	Indices	Month on previous month		Month on same month a year ago	
			Mar-20 Feb-20	Mar-19 Feb-19	Mar-20 Mar-19	Feb-20 Feb-19
Food and non-alcoholic beverages	162,085	105.3	+0.2	-0.6	+1.1	+0.3
Alcoholic beverages, tobacco	30,742	109.8	+1.7	+0.8	+1.9	+1.1
Clothing and footwear	70,425	(i) 101.8	(i) +0.1	+0.3	(i)+0.6	+0.8
Housing, water, electricity, gas and other fuels	99,537	103.2	-0.1	0.0	-2.9	-2.8
Furnishings, household equipment and routine household maintenance	71,792	101.1	+0.1	-0.1	+0.6	+0.4
Health	87,672	101.5	0.0	-0.1	+0.7	+0.6
Transport	149,560	104.1	-0.6	+1.3	-0.3	+1.6
Communication	23,522	84.4	-0.9	+0.7	-5.8	-4.3
Recreation and culture	78,300	101.1	+0.8	-0.4	-0.2	-1.4
Education	10,401	(i) 84.9	(i) 0.0	0.0	(i) +1.2	+1.2
Restaurants and hotels	119,468	(i) 103.8	(i) 0.0	+0.6	(i) +0.8	+1.4
Miscellaneous goods and services	96,496	106.6	+0.6	+0.4	+1.9	+1.7
ALL ITEMS	**1,000,000**	**102.9**	**+0.1**	**+0.3**	**+0.1**	**+0.3**

(i) Index calculated by imputing elementary data (not available or not usable) representing 50% and more of the weight of the aggregate.

CHART 2. ITALIAN NATIONAL CONSUMER PRICE INDEX (NIC) BY COICOP DIVISION

March 2020, month on same month a year ago percentage changes (index, 2015=100)

(i) Index calculated by imputing elementary data (not available or not usable) representing 50% and more of the weight of the aggregate.

keyfigures

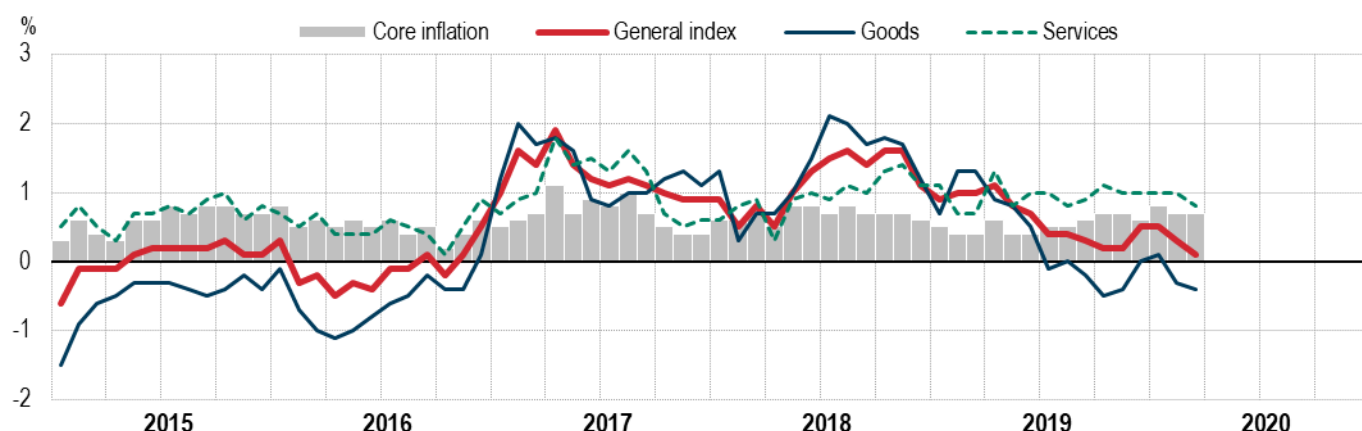**TABLE 3.** ITALIAN CONSUMER PRICE INDEX FOR THE WHOLE NATION (NIC) BY TYPE OF PRODUCTS

March 2020, weights, indices, month on previous month and month on same month a year ago percentage changes (index, 2015=100)

SPECIAL AGGREGATES	Weights	Indices	Month on previous month		Month on same month a year ago	
			Mar-20 Feb-20	Mar-19 Feb-19	Mar-20 Mar-19	Feb-20 Feb-19
Food including alcohol:	172,097	105.3	+0.2	-0.5	+1.1	+0.4
Processed food including alcohol	105,225	103.3	+0.8	+0.2	+1.1	+0.5
Unprocessed food	66,872	(i) 108.3	(i) -0.6	-1.6	(i) +1.0	+0.1
Energy:	87,308	101.8	-1.5	+0.9	-5.7	-3.4
Regulated energy products	28,674	100.2	+0.1	0.0	-9.4	-9.5
Non-regulated energy products	58,634	102.8	-2.2	+1.6	-2.7	+1.2
Tobacco	20,730	112.1	+2.3	+1.3	+2.5	+1.5
Non energy industrial goods:	255,811	100.3	+0.2	+0.2	+0.1	+0.1
Durable goods	90,385	98.5	-0.2	+0.1	-0.4	-0.1
Non-durable goods	63,871	101.0	+0.5	0.0	+0.7	+0.2
Semi-durable goods	101,555	(i) 101.5	(i) +0.3	+0.3	(i) +0.3	+0.3
Goods	**535,946**	**102.6**	**0.0**	**+0.1**	**-0.4**	**-0.3**
Services related to housing	71,957	102.7	+0.1	0.0	+0.4	+0.3
Services related to communication	17,464	91.6	0.0	-0.2	-2.6	-2.8
Services related to recreation, including repair and personal care	181,401	103.7	+0.3	+0.3	+0.8	+0.8
Services related to transport	73,198	105.4	+0.2	+1.3	+0.5	+1.5
Services - miscellaneous	120.034	104.1	+0.3	+0.1	+1.8	+1.6
Services	**464,054**	**103.4**	**+0.2**	**+0.4**	**+0.8**	**+1.0**
ALL ITEMS	**1,000,000**	**102.9**	**+0.1**	**+0.3**	**+0.1**	**+0.3**
All items excluding energy and unprocessed food (Core inflation)	845,820	102.6	+0.3	+0.3	+0.7	+0.7
All items excluding energy, food, alcohol and tobacco	719,865	102.3	+0.2	+0.3	+0.6	+0.7
All items excluding energy	912,692	103.0	+0.2	+0.2	+0.7	+0.7
Grocery and unprocessed food	195,117	104.6	+0.3	-0.4	+1.0	+0.3

(i) Index calculated by imputing elementary data (not available or not usable) representing 50% and more of the weight of the aggregate.

CHART 3. ITALIAN NATIONAL CONSUMER PRICE INDEX (NIC) BY TYPE OF PRODUCTS

January 2015 - March 2020, month on same month a year ago percentage changes (index, 2015=100)

TABLE 4. ITALIAN HARMONIZED CONSUMER PRICE INDEX (HICP) BY ECOICOP DIVISION

March 2020, weights, indices, month on previous month and month on same month a year ago percentage changes (index, 2015=100)

DIVISIONS	Weights	Indices	Month on previous month		Month on same month a year ago	
			Mar-20 Feb-20	Mar-19 Feb-19	Mar-20 Mar-19	Feb-20 Feb-19
Food and non-alcoholic beverages	172,583	105.6	+0.3	-0.6	+1.3	+0.5
Alcoholic beverages, tobacco	32,726	109.7	+1.7	+0.8	+2.0	+1.1
Clothing and footwear	81,640	(i) 106.7	(i) +31.1	+30.6	(i) 0.0	-0.4
Housing, water, electricity, gas and other fuels	106,004	103.3	0.0	0.0	-2.9	-2.9
Furnishings, household equipment and routine household maintenance	76,607	101.2	+0.9	+0.4	+0.9	+0.4
Health	43,328	103.4	+0.1	-0.1	+0.6	+0.4
Transport	159,074	104.1	-0.6	+1.3	-0.3	+1.6
Communication	25,035	84.5	-0.9	+0.7	-5.8	-4.3
Recreation and culture	61,687	101.5	+1.2	-0.6	-0.2	-2.0
Education	11,070	(i) 84.9	(i) +0.1	+0.1	(i) +1.2	+1.2
Restaurants and hotels	127,236	(i) 103.9	(i) 0.0	+0.7	(i) +0.8	+1.5
Miscellaneous goods and services	103,010	106.9	+1.3	+0.9	+2.1	+1.6
ALL ITEMS	**1,000,000**	**103.6**	**+2.2**	**+2.3**	**+0.1**	**+0.2**
All items at constant tax rates	1,000,000	103.3	+2.1	+2.2	0.0	+0.1

(i) Index calculated by imputing elementary data (not available or not usable) representing 50% and more of the weight of the aggregate.

TABLE 5. ITALIAN HARMONIZED CONSUMER PRICE INDEX (HICP). BY SPECIAL AGGREGATES

March 2020, weights, indices, month on previous month and month on same month a year ago percentage changes (index, 2015=100)

SPECIAL AGGREGATES	Weights	Indices	Month on previous month		Month on same month a year ago	
			Mar-20 Feb-20	Mar-19 Feb-19	Mar-20 Mar-19	Feb-20 Feb-19
Food, alcohol and tobacco:	205,309	106.3	+0.6	-0.4	+1.5	+0.6
Processed food (including alcohol and tobacco)	141,992	104.8	+1.1	+0.3	+1.6	+0.8
Unprocessed food	63,317	(i) 108.7	(i) -0.7	-1.7	(i) +1.3	+0.3
Energy:	90,763	101.9	-1.5	+0.9	-5.7	-3.4
Electricity, gas, solid fuels and heat energy	43,911	102.5	-0.1	0.0	-7.1	-7.0
Liquid fuels and fuels and lubricants for personal transport equipment	46,852	102.0	-2.8	+2.3	-3.5	+1.5
Non-energy industrial goods:	273,032	102.6	+8.1	+7.9	+0.2	0.0
Durable goods	94,862	98.5	+0.1	+0.2	-0.3	-0.2
Non-durable goods	60,083	103.8	+0.7	0.0	+1.0	+0.3
Semi-durable goods	118,087	(i) 105.2	(i) +20.8	+20.5	(i) 0.0	-0.2
Goods	**569,104**	**103.7**	**+3.7**	**+3.6**	**-0.4**	**-0.5**
Services related to housing	76,640	102.6	0.0	+0.1	+0.4	+0.5
Services related to communication	18,583	91.7	-0.1	-0.1	-2.7	-2.7
Services related to recreation, including repairs and personal care	171,582	(i) 104.2	(i) +0.3	+0.4	(i) +0.9	+1.0
Services related to transport	77,749	105.3	+0.2	+1.3	+0.5	+1.5
Services - miscellaneous	86,342	104.4	+0.5	+0.2	+2.1	+1.8
Services	**430,896**	**103.5**	**+0.3**	**+0.5**	**+0.8**	**+1.0**
ALL ITEMS	**1,000,000**	**103.6**	**+2.2**	**+2.3**	**+0.1**	**+0.2**
All items excluding energy and unprocessed food (Core inflation)	845,920	103.4	+2.8	+2.7	+0.7	+0.6
All items excluding energy, food, alcohol and tobacco	703,928	103.1	+3.2	+3.1	+0.6	+0.5
All items excluding energy	909,237	103.8	+2.6	+2.3	+0.8	+0.5

(i) Index calculated by imputing elementary data (not available or not usable) representing 50% and more of the weight of the aggregate.

revisions

TABLE 7. REVISIONS OF CONSUMER PRICE INDICES

March 2020, indices, month on previous month and month on same month a year ago percentage changes (index, 2015=100)

	FLASH ESTIMATES			FINAL DATA		
	indices	rates of change%		indices	rates of change %	
	March 2020	Mar-20 Feb-20	Mar-20 Mar-19	March 2020	Mar-20 Feb-20	Mar-20 Mar-19
Italian consumer price index for the whole nation (NIC)	102.9	+0.1	+0.1	102.9	+0.1	+0.1
Italian harmonized index of consumer prices (HICP)	103.6	+2.2	+0.1	103.6	+2.2	+0.1

COICOP: classification of individual consumption by purpose.

Core inflation: it is calculated by excluding unprocessed food and energy.

Durable goods: they include cars, furnitures and appliances.

ECOICOP: European classification of individual consumption by purpose, which provides a level of detail (the sub-classes) greater than the COICOP.

Food: in addition to products such as bread, meat, cheese, it includes non-alcoholic and alcoholic beverages. The *Processed food* destined for final consumption are defined as the result of a process of industrial transformation (such as fruit juices, sausages, frozen products). *Unprocessed food* are fresh food (such as fresh meat, fresh fish, fruit and fresh vegetables).

Grocery and unprocessed food: it includes, in addition to food, the goods for cleaning and ordinary maintenance of the house and personal hygiene and beauty products.

HICP: harmonized index of consumer prices for the countries of the European Union.

HICP-SA: Harmonized indices of consumer prices for special aggregates. They are indicators compiled according to a different classification scheme from the ECOICOP-HICP and from that used for the NIC indices by product type. The classification scheme and calculation method are common to those used by Eurostat. From the dissemination of January 2019 definitive data, coherently with Eurostat strategy, the method of calculation of the special aggregates of the Italian HICP has changed and they are obtained by aggregating the indices of the ECOICOP subclasses (previously, for the calculation of these indicators the class indices were used). Series of the new SA indices were recalculated from January 2017, replacing the old ones and they are available on http://dati.istat.it/.

HICP-CT harmonized index of consumer prices with constant taxation for the countries of the European Union.

Inflation: it measures the temporal changes of prices of a basket of products that represents all the goods and services intended for the final consumption of households and purchasable on the market through monetary transactions.

Non energy industrial goods: they include consumer goods excluding food, energy and tobacco products.

Non-durable goods: they include housecleaning detergents, personal care products and medicines.

Regulated energy products: they include the tariffs for electricity - regulated market and gas for domestic use.

Regulated products: they include regulated energy products and other regulated products.

Semi-durable goods: they include clothing, footwear, books.

Non-regulated energy products: they include fuels for motor vehicles, lubricants, non regulated fuels for domestic use and electricity - liberalized market.

NIC: italian consumer prices index for the whole nation.

Services related to housing: they include services for repair, cleaning and maintenance of the house, refuse collection, rents, maintenance charges in multi-occupied buildings, water supply and sewerage collection.

Services related to communication: they include telephone services and postal services.

Services related to recreational, including repair and personal care: they include holiday packages, accommodation services, restaurants, bars and the like, canteens, repair of audiovisual, photographic and IT equipment, clothing services, services for personal hygiene, recreational and cultural services and games of chance.

Services related to transport: include air, sea, rail and road transports, maintenance and repair of personal transport equipment, insurance connected with transport.

Services - miscellaneous: they include education, medical services, social protection, financial services; Legal services and accountancy; funeral services, insurance connected with health.

Short-term percentage change: change compared to the previous period.

Trend percentage change: change compared to the same period of the previous year.

methodological**note**

Introduction and regulatory framework

The consumer price indices measure the variations over time of the prices of a collection of products (basket) that represents all the goods and services intended for the final household consumption, obtainable on the market through monetary transactions (free transactions, own-consumptions, rents, etc. are excluded).

The system of consumer price indices consists of two different indicators[1]:

▶ **the Consumer Price Index for the whole nation (NIC)** is used as a measure of headline inflation;

▶ **the Harmonized index** of Consumer Prices (HICP), calculated according to the EU regulations in force, is used for the comparison of inflation between Member States and as a key indicator for the monetary policy of the European Central Bank. In compliance with the European legislation, and consistently with the standards provided by the regulations, the HICP index is also processed in the "constant taxation" version (HICP-CT).

The HICP index is calculated and issued on the reference base of 2015=100 (Regulation (EU) 2016/792 of the European Parliament and of the Council). The same reference year is also used for the NIC index.

The survey of consumer prices indices is governed by different laws and regulations that define the actors involved (Italian National Institute of Statistcs - Istat and Municipalities) and their relative functions:

- the Regio Decreto Legge n. 222/1927, that gives Istat the task, of promoting the formation of price indices in all municipalities with more than 100,000 inhabitants and in others municipalities chosen among the provincial capitals or those with more than 50,000 inhabitants that have adequate statistics offices;
- the Law n. 621/1975 amends the Regio Decreto Legge n. 222/1927 with regard to the municipalities which are responsible for conducting the consumer price survey, as follows: "among the municipalities referred to in art. 1… must be understood to include all the provincial capital municipalities and those with over 30,000 inhabitants who have a suitable statistical office";
- **D.lgs n. 322/1989**, that governs the survey, processing, analysis and dissemination activities, and archiving statistical data performed by public authorities and bodies of statistical information, for the purpose of creating the single direction, organizational consistency and the streamlining of flows at a central and local level;
- the Regulation (EU) 2016/792, concerning the harmonized index of Consumer Prices and the House Pice index (HPI).

Survey coverage and organization

Data contributing to the calculation of monthly consumer price indices are collected using different sources: the *local survey*, carried out by municipal statistics offices, under Istat supervision and coordination; the *central survey* carried out directly by Istat or through different data providers; the *scanner data*; the *administrative sources*.

In 2020, the weight of the products exclusively collected through the local survey is equal to 58.6% and that of products collected through the central survey is 22.7%. In addition to these two ways the acquisition of elementary prices (for grocery products) is carried out through scanner data with regard to the retail trade modern distribution channels that are hypermarkets, supermarkets, discounts, small sales areas and specialist drug (for 10.5% in terms of weight), where traditional data collection is no longer carried out. For some products (weighing 3.9%), prices are collected in a mixed way. Finally, an administrative source is used: the database of fuel prices of Ministry of Economic Development whose weight is equal to 4.3%.

In 2020 the geographical basis of the survey is made up of 80 municipalities which contribute to the indices calculation of all the product aggregates included in the basket - and of other 12 municipalities participating in the survey for a subset of products which includes local tariffs (water supply, solid waste, sewerage collection, gas for domestic use, urban transport, taxi, car transfer ownership, canteens in schools, public day nursery, etc.) and some local services (sport events, cinemas, theatre shows, secondary school education, canteens in universities, etc.).

In the 92 municipalities (80 for the full basket and 12 for a subset of products) taking part in the 2020 survey, prices are collected in about 43,000 statistical units (including outlets, enterprises and institutions) and rents are collected for about 8,000 dwellings. 384,000 price quotes are sent by Municipal Offices of Statistics to Istat each month (458,000 in 2019; the decrease is due to the switch of prices collection to the acquisition of scanner data for discounts, small sales areas and specialist drug).

Following the annual update of the municipal survey plans, 9.4% of the current price quotes are new (2.5% in 2019): of these, 1.6% are price quotes of new products, while the remaining 7.8% refers to products already in 2019 basket.

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[1] A third indicator, the "household of workers and employees consumer price index" (FOI), which refers to the consumption of the whole households headed by an employed worker, is also calculated (as a satellite index of NIC) and released by Istat on monthly basis.

In 2020, prices/quotes collected each month directly by Istat are more than 121,000, thereof: about 120,000 via web, also using web scraping techniques or collecting data from different providers, about 400 quotes directly provided by insurance companies (which refer to protection against most risks connected to property, such as fire, theft and other damages and are used for the Housing insurance services price index compilation) and over 700 detected by internal sources.

Regarding scanner data[2], starting from January 2020, Istat introduces two innovations: the first, the enlargement of the sample of outlets to include other retail trade channels (discounts, outlets withsmall sales areas surface between 100 and 400 s.m. and specialist drugs); the second, the adoption of the dynamic approach to the selection of the elementary items.

In agreement with retail trade chains (RTCs) and with the fruitful collaboration of the Association of Modern Distribution and Nielsen, Istat receives scanner data for 3,962 outlets (2,146 in 2019), including 511 hypermarkets, 1,504 supermarkets, 516 discounts, 1,000 outlets with surface between 100 and 400 s.m. and 431 specialist drug. These outlets belong to the main 25 RTCs and they cover the entire national territory. Istat receives scanner data on a weekly basis at item code level. The sample of outlets is stratified by provinces (107) and retail trade channels (5).

More than 17 million price quotes are collected each week to estimate inflation. For each barcode (GTIN), prices are calculated taking into account turnover and quantities (weekly price=weekly turnover/weekly quantities). Monthly prices are calculated as the arithmetic mean of weekly prices weighted with quantities.

Concerning the selection of the sample of items, a dynamic approach has been adopted. Specifically, in each month a sample of GTINs is selected within each outlet and ECR[3] market (representative of elementary aggregates). A set of filters have been implemented to select the matched sample each month comparing the current month with the preceding month. In January, the sample includes more than 10 million references thereof about 30 million elementary prices enter the indices compilation.

Scanner data indices of ECR market are calculated at outlet level as unweighted Jevons index (geometric mean) of GTINs elementary indices. The ECR market indices are then linked to the base period (December of the previous year). In turn, provincial indices of ECR market are calculated as the weighted arithmetic means using sampling weights of outlets and turnover by retail trade channel. Finally, provincial indices of aggregate of products are calculated as the weighted arithmetic mean of ECR markets using expenditure shares (referred to one year before) for the weights.

Concerning automotive fuels, the use of the data base supplied by the the Ministry of Economic Development (firstly introduced in 2017) has improved the territorial coverage of the index which at present includes all 107 Italian provinces; in 2020, almost 72,000 price quotes are monthly used to estimate inflation and they come from about 13,500 fuel stations on the territory,that is 62.5% of the ones present in Ministry database.

Calculation of indices

Weighting structure

Not all goods and services included in the basket have the same importance in households' budget. Consequently, for the compilation of the consumer price index, weights are used that reflect the expenditure shares of different products on final consumption expenditure.

Specifically, for HICP the weighting coefficients are determined of the values on the basis of the household final consumption expenditure as derived from National Accounts (for 2020 data refers to year 2018). Additional information used to define weights is originated from the Household Budget Survey, from other Istat surveys and from external sources[4], which have an auxiliary function, such as Ac Nielsen and GfK Italia S.r.l

To properly calculate the weighting coefficients, the expenditure shares are price-updated to the computation base period of indices (December 2019) using the price changes measured between the year 2018 and December 2019. Table 1 shows the 2020 weighting structures by expenditure division of NIC and HICP.

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[2] The use of scanner data for the estimation of inflation concerns 79 indices of aggregate of products belonging to 5 ECOICOP Divisions (Food and non-alcoholic beverages, Alcoholic beverages and tobacco, Furnishings, household equipment and routine household maintenance, Recreation and culture, Miscellaneous goods and services).

[3] ECR markets are the lowest level of the ECR classification (classification shared by industrial and distribution companies) and they have been linked to the aggregates of products of ECOICOP classification.

[4] It should be noted that, due to the unavailability of sufficiently robust estimates of provincial consumption, in the first stage of indices aggregation the consumer price indices, chief towns of provinces contribute to the calculation of regional indices taking into account the relative importance of the province in the region in terms of population. For the calculation of this set of weights, which are based on provincial population data, in 2020, data coming from demographic balance - resident population of 2018, December, 31, have been used.

*methodological***note**

TABLE 1. WEIGHTS USED TO CALCULATE CONSUMER PRICE INDICES BY EXPENDITURE DIVISION.
Year 2020, percentage values

EXPENDITURE DIVISIONS	NIC	HICP
Food and non-alcoholic beverages	16.2085	17.2583
Alcoholic beverages, tobacco	3.0742	3.2726
Clothing and footwear	7.0425	8.164
Housing, water, electricity, gas and other fuels	9.9537	10.6004
Furnishings, household equipment and routine household maintenance	7.1792	7.6607
Health	8.7672	4.3328
Transport	14.956	15.9074
Communication	2.3522	2.5035
Recreation and culture	7.83	6.1687
Education	1.0401	1.107
Restaurants and hotels	11.9468	12.7236
Miscellaneous goods and services	9.6496	10.301
ALL ITEMS	**100.0000**	**100.0000**

Aggregation of national and territorial indices

The consumer price indices are calculated through subsequent aggregations of the indices of product aggregates compiled at provincial level.

In detail, the *national All-items index* is compiled as follows:

▶ the provincial indices of product aggregates are aggregated to build the corresponding regional indices. The weighting coefficients used are based on the weight of each provincial capital in terms of resident population;

▶ the regional indices of product aggregate are aggregated to build the corresponding national indices. The weighting coefficients used are based on the weight of each region in terms of household consumption;

▶ the All-items index is obtained as the weighted average of the national indices of product aggregates. The weighting coefficients used are based on expenditure shares of each product aggregate.

The *All-items index at provincial, regional and macro-regional level:*

▶ the All-items indices *by regions and macro-regions* are obtained as the weighted average of the regional indices of product aggregates. The weighting coefficients used are based on the weight of each component in terms of household consumption, defined at regional and macro-regional level.

▶ The All-items indices *by provinces* are compiled as the weighted average of provincial indices of product aggregates. The weighting coefficients used are based on the weight of each aggregate of product in terms of household consumption, defined at a regional level.

Classification of consumer prices indices

Classification of consumption so far used for HICP and NIC is the international classification ECOICOP (European Classification of Individual Consumption by Purpose), whose hierarchical structure has 4 levels of disaggregation: Divisions, Groups, Classes and Subclasses of product.

The classification ECOICOP was adopted in 2016, in compliance with the new European framework regulation on harmonized indices of consumer prices and the house price index, (2016/792).

For the calculation of Italian consumer price indices, subclasses of product are further broken down in Consumption segments and Product aggregates.

Consumption segments are the most disaggregated level for which NIC indices referring to the entire national territory are disseminated. Concerning HICP indices, the level of detail of the dissemination is that of the classes of product (the dissemination of HICP subclass indices is expected to start in 2020). At local level (geographical area, region, province), NIC indices are published up to the product groups.

HICP indices by special aggregates (**HICP-SA**) are released too. HICP-SA indices are calculated using the same classification scheme and method adopted by Eurostat (therefore different from the method used for the calculation of NIC indices by types of product), in order to guarantee comparability among the Italian HICPs and the HICP of the other EU countries and the HICPs for the EU and the euro area produced by Eurostat[5]. From the dissemination of January 2019 definitive data, coherently with Eurostat strategy, the method of calculation of the special aggregates of the Italian HICP has changed and they are obtained by aggregating the indices of the ECOICOP subclasses (previously, for the calculation of these indicators the class indices were used). Series of the new SA indices were recalculated from January 2017, replacing the old ones.

Survey and calculation of prices indices of seasonal products

From January 2011, the prices of *Fruit*, *Vegetables*, *Clothing* and *Footwear* are collected and processed in accordance with Regulation (EC) no 330/2009 of 22 april 2009, which sets out minimum standards for dealing with seasonal products in the HICP[6]. The same method is also used for the NIC[7]. In particular, the European Regulation defines as *seasonal product* those that consumers may not purchase for certain periods of the year, or they may purchase in modest or insignificant volumes. It also establishes that in a given month seasonal products are considered *in season* (at least one month) or *out of season*.

On the basis of this standard, Istat defines a monthly calendar for the whole year, which establishes, in a given month, when each specific product belonging to the above mentioned product groups or classes must be considered *in season* or *out of season*. The adoption of a seasonality calendar entails that the local consumer price survey is carried out only in months when the product in question is defined as *in season*, while prices of *out of season* products will be estimated on the basis of a method that is consistent with standards contained in the aforementioned European Regulation.

Flash estimates of HICP: accuracy and computation methodology

Flash estimate of Italian HICP (and NIC) are usually published on the last working day of the reference month according to the Eurostat release calendar of HICP flash estimate for euro area. Final data are generally published around 15 days later.

The aim of the inflation flash estimates is to provide a timely information on inflation, predicting as accurately as possible the final HICP (and NIC) annual rate of change released about two weeks later. The analysis of their revisions represents an important tool to evaluate the correct balancing between the two quality dimensions, timeliness and accuracy.

In line with the Eurostat Statistics Explained on Inflation – methodology of the euro area flash estimate, this section analyses the accuracy of the Italian HICP flash estimates and describes the methodology used in their computation.

Accuracy of flash estimates

Table 2 compares the final HICP annual rates of change and the flash estimates for the same reference month. Over the last thirteen months, the maximum difference between the final HICP (all items and the flash estimate) all items annual rates of change was -0.2 percentage points in November 2019.

Over the same period, with reference to the main special aggregates, the widest differences between final HICP annual rates of change and the flash estimates concerned Processed food (including alcohol, tobacco) (-0.6 percentage points in November 2019), and consequently Food, including alcohol and tobacco (-0.4 percentage points in November 2019 and in February 2020), and Energy (-1.2 percentage points in April 2019).

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[5] HICP-SA indices have been released starting from data referred to February 2013.
The description of product classes which are included in the special aggregates is available on Eurostat web site at the following link: http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=COICOP_5&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC.
The HICP-SA calculation method is described in the HICP Compendium which is downloadable at the following link: http://ec.europa.eu/eurostat/documents/3859598/5926625/KS-RA-13-017-EN.PDF/59eb2c1c-da1f-472c-b191-3d0c76521f9b?version=1.0.
Back series starting from January 2001 are published on I.Stat, the warehouse of Istat statistics, inside the theme "Prices".
[6] It has been adopted starting from data referred to January 2011.
[7] It is used for FOI indices, too.

The highest frequency of revisions is observed for Processed food, including alcohol and tobacco (in all 13 months, due to the use in the flash estimate of scanner data referred to the prices of grocery products from the modern retail trade distribution of one/two weeks compared to the three weeks included in the final index) and for Non energy industrial goods (8 months out of 13, mainly due to the seasonal sales dynamics of Clothing and footwear and to the availability for the flash estimate, for some durable goods, of the data referring to one or two weeks compared to the three included in the final index); the partial information available has a higher impact on the flash estimate and therefore it turns out to be less accurate.

TABLE 2. FLASH ESTIMATES AND HICP ANNUAL RATES FOR THE ALL-ITEMS AND MAIN SPECIAL AGGREGATES
March 2019 – march 2020, percentage values (base 2015=100)

Special aggregates		Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
Food including alcohol and tobacco:	Flash	1.5	0.6	0.8	0.7	1.2	1.4	1.1	1.2	1.3	1.2	1.2	1.0	1.6
	HICP	1.4	0.6	0.7	0.6	1.1	1.1	0.8	1.0	0.9	1.1	1.1	0.6	1.5
Processed food (including alcohol, tobacco)	Flash	1.3	0.5	0.9	0.8	0.9	1.0	1.1	1.1	1.4	1.1	1.4	1.3	1.7
	HICP	1.0	0.4	0.7	0.6	0.7	0.7	0.7	0.8	0.8	0.9	1.0	0.8	1.6
Unprocessed food	Flash	1.9	0.9	0.8	0.5	1.7	1.8	1.1	1.2	1.2	1.3	1.0	0.3	1.3
	HICP	1.9	0.9	0.8	0.5	1.6	1.8	1.1	1.2	1.2	1.3	0.9	0.3	1.3
Energy	Flash	5.6	6.2	4.5	2.6	-1.0	-2.0	-2.9	-4.8	-4.7	-2.2	-2.1	-3.4	-5.7
	HICP	5.6	5.0	4.5	2.6	-1.9	-2.0	-2.9	-4.8	-4.7	-2.2	-2.1	-3.4	-5.7
Non energy industrial goods	Flash	-0.1	-0.5	-0.3	-0.5	-0.6	0.1	-0.1	-0.1	0.3	0.0	-0.2	0.0	0.2
	HICP	-0.2	-0.5	-0.2	-0.5	-0.8	0.0	-0.2	-0.2	0.2	0.1	-0.2	0.0	0.2
Services	Flash	0.6	1.4	0.9	1.0	1.0	0.9	0.9	1.2	1.2	1.1	1.1	1.0	0.6
	HICP	0.7	1.5	0.8	1.0	1.0	0.9	1.0	1.2	1.1	1.0	1.1	1.0	0.8
All-items	**Flash**	**1.1**	**1.2**	**0.9**	**0.8**	**0.4**	**0.5**	**0.3**	**0.2**	**0.4**	**0.5**	**0.5**	**0.3**	**0.1**
	HICP	**1.1**	**1.1**	**0.9**	**0.8**	**0.3**	**0.5**	**0.2**	**0.2**	**0.2**	**0.5**	**0.4**	**0.2**	**0.1**
All items excluding energy and unprocessed food (Core inflation)	Flash	0.5	0.6	0.5	0.5	0.4	0.7	0.6	0.8	0.9	0.7	0.7	0.7	0.7
	HICP	0.5	0.7	0.5	0.5	0.4	0.6	0.5	0.7	0.7	0.7	0.6	0.6	0.7
All items excluding energy, food, alcohol and tobacco	Flash	0.3	0.7	0.5	0.4	0.4	0.6	0.5	0.8	0.8	0.6	0.5	0.6	0.5
	HICP	0.3	0.7	0.5	0.4	0.4	0.6	0.5	0.7	0.7	0.6	0.5	0.5	0.6
All items excluding energy	Flash	0.7	0.6	0.6	0.5	0.5	0.8	0.6	0.8	1.0	0.8	0.7	0.6	0.8
	HICP	0.6	0.7	0.5	0.5	0.5	0.7	0.5	0.7	0.8	0.7	0.6	0.5	0.8

The Mean Absolute Deviation (MAD) provides another way to measure accuracy. It is calculated as the average of the differences in absolute value between the final HICP annual rates of change and the flash estimates over the last thirteen months. Figure 1 shows the MAD for the all-item index and the main special aggregates. Over the last thirteen months Processed food (including alcohol tobacco) (0.292 percentage points), Food including alcohol and tobacco (0.177 percentage points) and Energy (0.162 percentage) recorded the highest MADs.

FIGURE 1. MEAN ABSOLUTE DEVIATION BETWEEN FLASH ESTIMATES AND HICP ANNUAL RATES.
March 2019 – March 2020, percentage points

methodological**note**
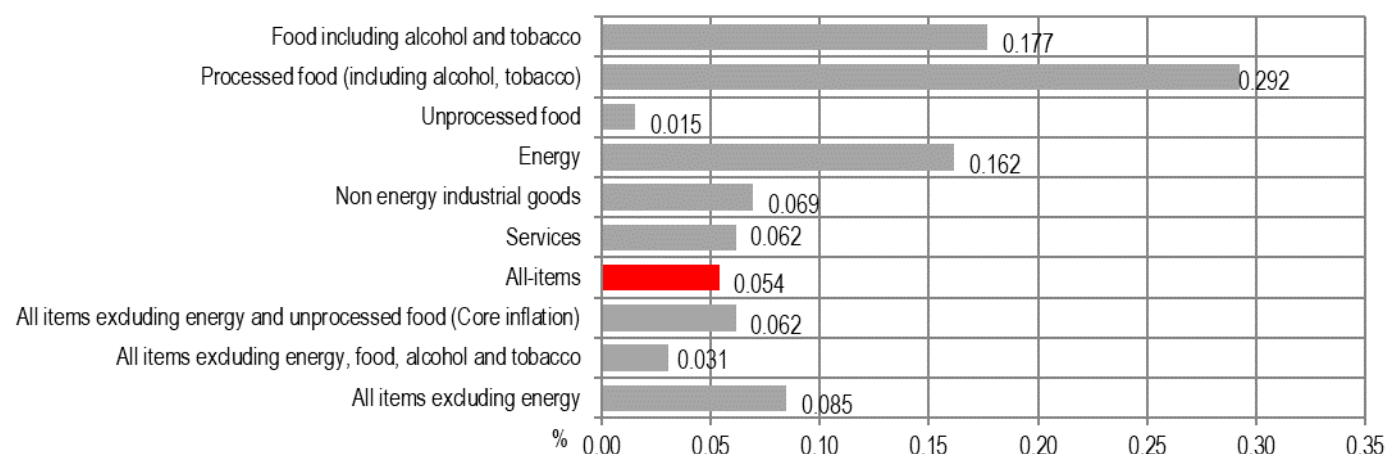
The Covid-19 crisis and the compilation of consumer price indices

The spread of Covid-19 and the restrictive measures adopted by Italian government to hinder its further diffusion caused, in March, important issues to the production of the consumer price indices.

Major problems concern the data collection in the field in charge of the Municipal Statistical Offices. As regards the products for which the data collection is still carried out in the physical shops (accounting for about 50% of the total basket), it has been stopped since the 11th of March. Anyway in March data collection was carried out in the first ten days - with the exception of few provinces of the north of Italy – which provided sufficient information for estimating consumer price indices at provincial, regional and national level.

Concerning the other data sources (centralized data collection, scanner data, data providers and administrative data), at present there are no difficulties in obtaining the information needed for the index compilation. However, the introduction of restrictions in the movement of people and the closure of outlets required the adoption of specific solutions for the calculation of the involved price indicators.

Specifically, for the estimate of March of the Italian Harmonized index of consumer prices, as well as the other national CPIs, imputation procedures have been used to deal with the higher number of missing observations, in compliance with the guidelines provided by Eurostat in agreement with the Member States.

These guidelines set out three main principles to follow:

1. fixed weight approach for the elementary aggregates in the basket,

2. compilation of all the indices of the ECOICOP and the further sub-levels indices laid down by the national classification,

3. minimization of the number of price imputations.

In compliance with the guidelines, imputation procedures have been used to estimate both the prices of existing products that could not be collected, and the prices of products that are not available in the market (as in the case of flight or other touristic services) or that are available in negligeable quantities.

In these cases, the prices are updated by using an appropriate monthly rate of change or by applying to the prices observed one year ago the annual rate of change of an aggregate consisting of all price indices compiled by using mostly observed prices.

The choice of the appropriate rate of change for the imputation of each missing observation is made case by case, taking into account different aspects, such as the incidence of missing prices in the stratum, its position in the classification structure, the price volatility of the products also in terms of seasonality.

Consequently, the following threefold approach has been adopted:

a) whenever is possible, the imputation is based on the monthly rate of change of the same aggregate of products in another geographic area, or the most similar aggregate of product in the same classification level, or the monthly change of the index of the higher aggregation level in the classification structure;

b) alternatively, the imputation is carried out considering the average rate of change of all the indices that are not affected (at least not widely affected) by missing observations;

c) finally, missing prices can be estimated by carrying forward the last available price.

Regarding the expenditure aggregates most affected by the missing price issues, the adopted solutions are the following:

a. for fresh food, for which prices are normally collected twice a month, the monthly price is estimated using the first collected price in case of unavailability of the second price information;

b. for clothing and footwear, missing prices are estimated using the monthly rate of change of the product offers in the provinces where the price collection has been carried out. In these cases, the usual rules for the imputation of seasonal products have been applied

c. for pharmaceutical products dispensed without medical prescription and for other medical products, the imputation of missing prices is based on the monthly rate of change of the product offers collected in the provinces where the price collection took place;

d. for furnishing and other services for the house, considering the stickiness of their prices, missing observations are imputed on the basis of the last price information available (carry forward method);

e. the carry forward method is also used for the imputation of the prices of restaurants, cultural and recreational services.

Specific solutions following the European guidelines have been implemented for tourism services and for transport services, for which prices have been collected in advance.

In more details, concerning passenger transport by railway, by road, by sea and inland waterway, the combined passenger transport and other transport services as well as the accommodation services, which proved to be substantially reduced but not completely cancelled (in March) by the restrictive measures issued, the prices collected in advance, when corresponding to actually usable services, have been used in the compilation of the corresponding indices.

On the contrary, regarding passenger transport by air and package holidays, which were more deeply affected by the measures adopted and by the limitations in the movement of people, taking into account the updated guidelines of Eurostat concerning products whose prices show a seasonal behaviour and changing some choices adopted for the flash estimate, missing prices are imputed by applying to the prices observed one year ago the annual rate of change of the all items index calculated excluding these two aggregates.

All the indices that are compiled using a share of imputations equal to at least 50% in terms of elementary prices and/or in terms of weight are flagged by "i" (imputed data) on the tables of this press release, on I.Stat and other publications (on "Rivaluta" these indices are not available and more aggregate rates of change have to be used for indexation aims).

Dissemination: timing and database

Consumer prices indices dissemination by Istat occurs in two successive dates according to a different release method of the data: flash estimate and definitive estimate.

The dissemination of flash estimate of the NIC indices (general, by expenditure division, by product type and by purchase frequency) and the (general) HICP index occurs at the end of the reference month, while that one of the definitive data of the indices, NIC and HICP, occurs no later than the middle of the month following the reference month. The publication times are established by a https://www.istat.it/it/informazioni-e-servizi/per-i-giornalisti/appuntamenti/calendario-diffusioni-ed-eventi agreed upon with Eurostat, in the month of December of each year, for the next year, and according to the dissemination standards (SDDS – Special Data Dissemination Standard) defined by the International Monetary Fund.

Starting from the publication of the data of January 2019, the direct dissemination of the municipal indices of consumer prices is carried out by the authorized municipalities simultaneously with the dissemination of the definitive indexes by Istat.

The indices, for both flash and definitive estimates, are issued through the "Consumer prices index" press release on the Istat website at https://www.istat.it/en/archivio/consumer+prices.

The series of the updated indices are published, in conjunction with the issue of the press release, on the Istat data warehouse within the theme Prices - Consumer prices. Together with the monthly indices, the short-term and trend percentage variations, the average annual indices, the average annual variations and the annually calculated weights are issued.

Information on the consumer price indices is available in on the EconomicTrends.Stat database, that collects and organizes the short-term statistics produced by Istat, and offers itself as a study tool for policy makers, social workers, scholars and citizens.

Information on the historic series of all indices, beginning from 1861 to 2015, is available on the Istat website at Time Series.

Summary data and studies on consumer prices and on the basket of goods and services are in addition contained in some editorial publications issued by Istat annually, such as the Statistical Yearbook, the Annual Report and publication Noi Italia.

In compliance with European Regulation No. 792/2016, the data of the survey on consumer prices is transmitted to Eurostat twice per month. The main indicators, archived in the Eurostat database, are accessible at http://ec.europa.eu/eurostat/data/database (Theme "*Economy and finance*", topic "*Prices*").

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