INSTITUTO NACIONAL DE ESTADISTICA

Hotel Occupancy Survey (EOH)

Methodology

Year 2025

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1 Presentation

This publication presents the results of the Hostel Occupancy Survey (EOH).

The most important information from the survey is provided on a monthly basis, in accordance with INE dissemination rules.

The data provided reflects the two aspects considered in the tourism study: on the demand side, it offers information on travellers, overnight stays, and average stay, distributed by country of residence for non-resident travellers and the category of establishments they stay in, or by Autonomous Community or City of origin for Spanish travellers; on the supply side, it provides the estimated number of open establishments, estimated capacity, occupancy rates, and information on employment in the sector, according to the establishment's category.

This information is provided on a monthly basis, at national, autonomous community and city, provincial, tourist area and tourist spot level.

The National Statistics Institute would like to thank all the professionals, businesspeople and organisations related to the tourist industry for their collaboration, which is absolutely essential for conducting this survey.

2 Objectives

The main objective of the Hotel Occupancy Survey is to ascertain the behaviour of a series of variables that make it possible to describe the fundamental characteristics of the hotel sector, from the viewpoint of both supply and demand, thus meeting the needs of national institutions and the requirements of international organisations for knowledge regarding the sector.

3 Statistical Unit

The population under study is made up of all the hotel establishments existing in the national territory.

A **hotel establishment** is understood to be any unit producing hotel accommodation services (hotel, hotel apartment or aparthotel, motel, hostel, guest house), located in the same geographical location and in which one or more persons work on behalf of the same enterprise. Hotel establishments are classified according to their category into gold and silver, and within these by the number of stars. The category of the establishment is assigned by the Tourism Departments of the Autonomous Communities and varies from one community to another.

4 Scope of the Survey

All hotel establishments located in the national territory are investigated.

5 Definition of Variables

5.1 ESTIMATED HOTEL ESTABLISHMENTS OPEN

Number of hotel establishments open for the season estimated by the survey.

Hotel establishments open for the season are considered as those which are open during the reference month.

5.2 ESTIMATED ROOMS

Estimated number of rooms by the survey of the hotel establishments open for the season.

The room is defined as a room or a group of rooms constituting an indivisible unit intended to be rented for accommodation. Rooms can be single, double or multiple, depending on whether they are permanently equipped to accommodate one, two or more persons.

5.3 ESTIMATED BED-PLACES

Estimated number of bed-places by the survey of establishments open for the season.

The number of bed places is equivalent to the number of fixed beds in the establishment. Spare beds are not included, and double beds count for two bed-places.

5.4 TRAVELLERS ENTERED

All persons who stay overnight for one or more consecutive nights in the same accommodation.

Travellers are classified by their place of residence. In the case of Spanish residents, information is requested about their Autonomous City/Community of residence.

5.5 OVERNIGHT STAYS OR OCCUPIED BED-PLACES

An overnight stay is understood to be each night that a traveller stays at the establishment.

As with travellers entering, the occupied bed-places are broken down according to the place of residence.

5.6 AVERAGE STAY

This variable is an approximation of the number of days, on average, that travellers stay in apartments, which is calculated as the ratio between overnight stays and the number of travellers.

5.7 OCCUPANCY RATE BY ROOMS

Relationship, as a percentage, between the average daily number of rooms occupied in the month and the total number of rooms available in the same period.

5.8 OCCUPANCY RATE BY BED-PLACES

Relationship, as a percentage, between the total number of overnight stays and the product of the bed-places, including extra beds, by the number of days considered in the overnight stays.

From this definition it follows that an establishment may have an occupancy rate of less than one hundred percent and yet not have any vacant beds, since an establishment or a room or double bed may be occupied by only one person, resulting in a single overnight stay, and yet the establishment or room may have a greater capacity.

5.9 WEEKEND OCCUPANCY RATE BY BED-PLACES

Relationship, as a percentage, between Friday and Saturday overnight stays falling within the reference week and the product of the number of beds, including extra beds, for those two days, by the number of days to which the overnight stays refer, in this case two.

5.10 EXTRA BEDS

Extra beds are defined as all beds that are not fixed and are not included in the officially declared bed-places of the establishment as listed in the directory.

Fixed furniture in the establishment (sofa bed, pull-down bed, etc.) is only counted as an extra bed when it is actually used as such. Cots will also be considered extra beds.

5.11 STAFF EMPLOYED

Is defined as the group of people, both paid and unpaid, who contribute through their work to the production of goods and services in the establishment during the month that includes the survey reference period, even if they work outside the establishment's premises.

5.12 TOURIST RESORT

Municipality with a significant tourist offering concentration.

5.13 TOURIST AREA

Group of municipalities where the tourist influx is specially focused. Information is provided on the main areas of tourist interest.

In the document List of municipalities comprising each area the main areas of tourist interest are attached, together with the municipalities that make up these areas.

6 Survey Framework and Sample Design

The sampling frame is based on the directories of the regional tourism departments of the Autonomous Communities and other auxiliary sources, which contain, among other things, the following data for each establishment: name, address, category, opening period, number of beds and rooms.

These directories are continuously updated.

The survey's sampling design is a stratified random sample, where the strata are defined by the intersection of province, category, and size group. The stratification variable 'size group' is included in the survey design for the first time in 2025. Its aim is to achieve greater homogeneity among establishments based on the number of bed-places or capacity.

To form these size groups, the square root cumulative rule of the frequency distribution was applied (see Cochran 1977). This rule divides the establishments in each set formed by the province-category intersection into two subsets, with the first containing the establishments with the lowest capacity, and the second those with the highest.

When the number of establishments in the directory for province-category is fewer than 10, this rule is not applied.

The establishments that are studied exhaustively, and therefore belong to the sample with probability 1, are those in the 5-star gold category, and those relevant or with high capacity within each province-category intersection.

For the calculation of the sample size, an optimal allocation has been applied, requiring prefixed sampling errors for the stratified estimator of the total number of vacancies of 2.5% at provincial level and 3.5%, 4%, 4.5% and 5% at province level and 4 gold stars, 3 gold stars, 2 gold stars and all other categories, respectively.

The minimum sample size required in each province-category-size group strata is 5 establishments.

The definition of the strata as well as the sampling fractions are detailed in the document Sampling fractions.

The sample is selected within each strata in a systematic manner. Each month the sample is renewed by adding new establishments. The establishments in the sample

are maintained for 4 years, with approximately 25% being renewed (this applies to the sampling strata only).

7 Estimators

This section describes the expressions for the estimators, considering the information received from XML files.

The XML files are generated directly from the management systems of the establishments, following a schema and validations published by the INE. This file provides detailed information on traveller arrivals and overnight stays for each day of the reference month, broken down by traveller residence (Nomenclature of Territorial Units for Statistics [NUTS] III for residents in Spain, and by country for non-residents).

The **variables** used are:

- E = no. of establishments listed in the directory that are open in the month
- e = no. of establishments that respond to the survey using the usual questionnaire method (incidences 1 and 2)
- e' = no. of establishments that respond to the monthly survey through the usual method (incidents 1 and 2 in the monthly questionnaire)
- e'' = no. of establishments that respond to the survey by sending the XML file (incidents 1 and 2)
- c = no. of establishments in the sample that are closed within their opening period and that respond through the usual method (incidence 3)
- c' = no. of establishments in the sample that are closed within their opening period and that answer through the usual method (incidence 3 in the monthly questionnaire)
- D = number of days in the reference month (28, 29, 30, 31)
- Dfs = no. of Fridays and Saturdays in the reference month
- dm = no. of days the establishment has been open in the reference month
- P = no. of places according to directory
- P’ = no. of spare places used
- H = no. of rooms according to the directory
- V = number of incoming travellers
- VM = number of incoming travellers in the total month
- N = no. of occupied bed-places or overnight stays
- NM = no. of occupied bed-places or overnight stays in the total of the month
- EM = average stay
- T = staff employed
- B = no. of occupied rooms
- BD = no. of occupied rooms for double occupancy

– BI = number of occupied rooms for single occupancy
– GP = Occupancy rate by bed-places
– GH = room occupancy rate

The **subindices** used are:

– i = establishment
– j = province/island
– k = category (5, 4, 3, 2, 1 gold: silver)
– t = size
– m = type (professional situation, place of residence, etc.)

We distinguish two groups of estimators:

– Weekly information plus XML (for all strata)
– Weekly, monthly information plus XML (only 3, 4 and 5 gold star establishments)

Group A estimators: Weekly information plus XML (for all strata)

1. Estimated number of establishments open for the month

$$\hat{\boldsymbol{E}}_{\boldsymbol{jkt}} = \boldsymbol{E}_{\boldsymbol{jkt}} \frac{\left(\boldsymbol{e}_{\boldsymbol{jkt}} + \sum_{i=1}^{\boldsymbol{e''_{jkt}}} \frac{\boldsymbol{dm}_{\boldsymbol{ijkt}}}{\boldsymbol{D}}\right)}{\left(\boldsymbol{e}_{\boldsymbol{jkt}} + \boldsymbol{e''}_{\boldsymbol{jkt}}\right) + \boldsymbol{c}_{\boldsymbol{jkt}}}$$

2. Estimated number of bed-places of establishments open in the month

$$\hat{P}_{jkt} = \sum_{i=1}^{E_{jkt}} P_{ijkt} \cdot \frac{\left(\sum_{i=1}^{e_{jkt}} P_{ijkt} + \sum_{i=1}^{e''_{ijkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)}{\left(\sum_{i=1}^{e_{jkt}} P_{ijkt} + \sum_{i=1}^{e''_{jkt}} P_{ijkt}\right) + \sum_{i=1}^{c_{jkt}} P_{ijkt}}$$

3. Estimated number of arriving travellers during the month, by place of residence m

$$\hat{V}_{jktm} = \left[\left(\sum_{i=1}^{e_{jkt}} V_{ijktm} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e''_{jkt}} V_{ijktm}\right] \cdot \frac{\hat{P}_{jkt}}{\left(\sum_{i=1}^{e_{jkt}} P_{ijkt} + \sum_{i=1}^{e''_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)}$$

$$= \left[\left(\sum_{i=1}^{e_{jkt}} V_{ijktm} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e''_{jkt}} V_{ijktm}\right] \cdot \rho_{jkt}$$

where ρ_{jkt} is the elevation factor per bed-place in province j, category k and size t

4. Estimated number of occupied bed-places or overnight stays, by place of residence m

$$\hat{N}_{jktm} = \left[\left(\sum_{i=1}^{e_{jkt}} N_{ijktm} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e"_{jkt}} N_{ijktm}\right] \cdot \frac{\hat{P}_{jkt}}{\left(\sum_{i=1}^{e_{jkt}} P_{ijkt} + \sum_{i=1}^{e"_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)}$$

$$= \left[\left(\sum_{i=1}^{e_{jkt}} N_{ijktm} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e"_{jkt}} N_{ijktm}\right] \cdot \rho_{jkt}$$

where ρ_{jkt} is the elevation factor per bed-place in province j, category k and size t.

5. Estimated number of occupied extra bed-places

$$\hat{N'}_{jkt} = \left[\left(\sum_{i=1}^{e_{jkt}} N'_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e"_{jkt}} N'_{ijkt}\right] \cdot \rho_{jkt}$$

where ρ_{jkt} is the elevation factor per bed-place in province j, category k and size t.

6. Estimated average stay

   a) Average stay by province and category

$$\hat{ES}_{jk} = \frac{\sum_t \sum_m \hat{N}_{jktm}}{\sum_t \sum_m \hat{V}_{jktm}}$$

   b) Average stay by province and place of residence m

$$\hat{ES}_{jm} = \frac{\sum_k \sum_t \hat{N}_{jktm}}{\sum_k \sum_t \hat{V}_{jktm}}$$

7. Estimated staff employed

$$\hat{T}_{jktm} = \left(\sum_{i=1}^{e_{jkt}} T'_{ijktm} + \sum_{i=1}^{e"_{jkt}} T'_{ijktm}\right) \cdot \rho_{jkt}$$

   where $T'_{ijktm} = T_{ijktm} \cdot AC_{ijkt}$, with AC_{ijkt} percentage of the staff employed in the accommodation activity

   m = employment status

8. Estimated number of occupied rooms

   The number of rooms in open establishments has to be calculated beforehand

$$\hat{H}_{jkt} = \sum_{i=1}^{E_{jkt}} H_{ijkt} \cdot \frac{\left(\sum_{i=1}^{e_{jkt}} H_{ijkt} + \sum_{i=1}^{e"_{ijkt}} H_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)}{\left(\sum_{i=1}^{e_{jkt}} H_{ijkt} + \sum_{i=1}^{e"_{jkt}} H_{ijkt}\right) + \sum_{i=1}^{c_{jkt}} H_{ijkt}}$$

a) Total occupied rooms

$$\hat{B}_{jkt} = \left[\left(\sum_{i=1}^{e_{jkt}} B_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e"_{jkt}} B_{ijkt}\right] \cdot \frac{\hat{H}_{jkt}}{\sum_{i=1}^{e_{jkt}} H_{ijkt} + \sum_{i=1}^{e"_{jkt}} H_{ijkt} \cdot \frac{dm_{ijkt}}{D}}$$

$$= \left[\left(\sum_{i=1}^{e_{jkt}} B_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e"_{jkt}} B_{ijkt}\right] \cdot \beta_{jkt}$$

Where β_{jkt} is the elevation factor per rooms in province j, category k and size t.

Note: B_{ijkt} for establishments sending the questionnaire by XML is the sum of double rooms for double use, double rooms for single use and others.

b) Occupied rooms with double occupancy

$$\hat{BD}_{jkt} = \left[\left(\sum_{i=1}^{e_{jkt}} BD_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e"_{jkt}} BD_{ijkt}\right] \cdot \beta_{jkt}$$

Where β_{jkt} is the elevation factor per rooms in province j, category k and size t.

c) Occupied rooms for single occupancy

$$\hat{BI}_{jkt} = \left[\left(\sum_{i=1}^{e_{jkt}} BI_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e"_{jkt}} BI_{ijkt}\right] \cdot \beta_{jkt}$$

Where β_{jkt} is the elevation factor per rooms in province j, category k and size t.

9. Estimated occupancy rate

a) Occupancy rate by bed-places

$$\hat{GP}_{jkt} = \frac{\hat{N}_{jkt}}{D \cdot \hat{P}_{jkt} + \hat{N}'_{jkt}} \cdot 100$$

b) For the total of the province/island j:

$$\hat{GP}_{j} = \frac{\sum_k \sum_t \hat{GP}_{jkt} * \hat{P}_{jkt}}{\sum_k \sum_t \hat{P}_{jkt}}$$

c) Occupancy rate by room

$$\hat{GH}_{jkt} = \frac{\hat{B}_{jkt}}{D \cdot \hat{H}_{jkt}} \cdot 100$$

and for the total of a province/island j:

$$\hat{GH}_{j} = \frac{\sum_k \sum_t \hat{GH}_{jkt} * \hat{H}_{jkt}}{\sum_k \sum_t \hat{H}_{jkt}}$$

d) Weekend occupancy rate by bed-places

$$\widehat{GP}_{jkt}^{fs} = \frac{\hat{N}_{jkt}^{fs}}{D^{fs} \cdot \hat{P}_{jkt} + \hat{N}'^{fs}_{jkt}} \cdot 100$$

being

$\hat{N}_{jkt}^{fs} = \left[\left(\sum_{i=1}^{e_{jkt}} N_{ijkt}^{fs} \cdot \frac{D^{fs}}{2}\right) + \sum_{i=1}^{e"_{jkt}} N_{ijkt}^{fs}\right] \cdot \rho_{jkt}$, the number of bed-places occupied at weekends

$\hat{N}'^{fs}_{jkt} = \left[\left(\sum_{i=1}^{e_{jkt}} N'^{fs}_{ijkt} \cdot \frac{D^{fs}}{2}\right) + \sum_{i=1}^{e"_{jkt}} N'^{fs}_{ijkt}\right] \cdot \rho_{jkt}$, the number of spare bed-places occupied at weekends

For the total of the province/island j:

$$\widehat{GP}_{j}^{fs} = \frac{\sum_k \sum_t \widehat{GP}_{jkt}^{fs} * \hat{P}_{jkt}}{\sum_k \sum_t \hat{P}_{jkt}}$$

Group B estimators: Weekly, monthly information plus XML

The following variables are used:

– e' = no. of establishments that respond to the monthly survey (incidents 1 and 2 in the monthly questionnaire)

– e" = no. of establishments that respond to the survey by sending the XML file (incidents 1 and 2)

– c' = no. of establishments that are closed within their opening period (incidence 3 in the monthly questionnaire). It will always be less than or equal to c.

– dm = no. of days the establishment has been open in the reference month

– VM = number of incoming travellers in the total month

– NM = no. of occupied bed-places or overnight stays in the total of the month

– BD = no. of occupied rooms for double occupancy

– BI = no. of occupied rooms for single occupancy

1. Estimated number of establishments open for the month

$$\widehat{EM}_{jkt} = E_{jkt} \frac{\left(\sum_{i=1}^{e'_{jkt}} \frac{dm_{ijkt}}{D} + \sum_{i=1}^{e"_{jkt}} \frac{dm_{ijkt}}{D}\right)}{\left(e'_{jkt} + e"_{jkt}\right) + c'_{jkt}}$$

2. Estimated number of bed-places of establishments open in the month

$$\widehat{PM}_{jkt} = \sum_{i=1}^{E_{jkt}} P_{ijkt} \cdot \frac{\left(\sum_{i=1}^{e\prime_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D} + \sum_{i=1}^{e"_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)}{\left(\sum_{i=1}^{e\prime_{jkt}} P_{ijkt} + \sum_{i=1}^{e"_{jkt}} P_{ijkt}\right) + \sum_{i=1}^{c\prime_{jkt}} P_{ijkt}}$$

3. Estimated number of inbound travellers in the month

$$\widehat{VM}_{jkt} = \left(\sum_{i=1}^{e\prime_{jkt}} VM_{ijkt} + \sum_{i=1}^{e"_{jkt}} V_{ijkt}\right) \cdot \frac{\widehat{PM}_{jkt}}{\left(\sum_{i=1}^{e\prime_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D} + \sum_{i=1}^{e"_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)}$$
$$= \left(\sum_{i=1}^{e\prime_{jkt}} VM_{ijkt} + \sum_{i=1}^{e"_{jkt}} V_{ijkt}\right) \cdot \alpha_{jkt}$$

α_{jkt}, the elevation factor per bed-place in province j, category k and size t

The monthly estimator disaggregated by place of residence, m

$$\widehat{VM}_{jktm} = \widehat{VM}_{jkt} \cdot \frac{\hat{V}_{jktm}}{\sum_m \hat{V}_{jktm}}$$

4. Estimated number of occupied bed-places or overnight stays

$$\widehat{NM}_{jkt} = \left(\sum_{i=1}^{e\prime_{jkt}} NM_{ijkt} + \sum_{i=1}^{e"_{jkt}} N_{ijkt}\right) \cdot \frac{\widehat{PM}_{jkt}}{\left(\sum_{i=1}^{e\prime_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D} + \sum_{i=1}^{e"_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)} =$$
$$\left(\sum_{i=1}^{e\prime_{jkt}} NM_{ijkt} + \sum_{i=1}^{e"_{jkt}} N_{ijkt}\right) \cdot \alpha_{jkt},$$

Where α_{jkt} is the elevation factor per bed-place in province j, category k and size t.

The monthly estimator disaggregated by place of residence, m

$$\widehat{NM}_{jktm} = \widehat{NM}_{jkt} \cdot \frac{\hat{N}_{jktm}}{\sum_m \hat{N}_{jktm}}$$

5. Estimated number of occupied spare bed-places or overnight stays in said bed-places

$$\widehat{NM}'_{jkt} = \left[\left(\sum_{i=1}^{e_{jkt}} N'_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e"_{jkt}} N'_{ijkt}\right] \cdot \frac{\widehat{PM}_{jkt}}{\left(\sum_{i=1}^{e_{jkt}} P_{ijkt} + \sum_{i=1}^{e''_{jkt}} P_{ijk} \cdot \frac{dm_{ijkt}}{D}\right)}$$
$$= \left[\left(\sum_{i=1}^{e_{jkt}} N'_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e''_{jkt}} N'_{ijkt}\right] \cdot \varpi_{jkt}$$

6. Estimated average stay

   a) Average stay by strata

$$\widehat{ESM}_{jkt} = \frac{\widehat{NM}_{jkt}}{\widehat{VM}_{jkt}}$$

   b) Average stay by province/island and category:

$$\widehat{ESM}_{jk} = \frac{\widehat{NM}_{jk}}{\widehat{VM}_{jk}} = \frac{\sum_t \widehat{NM}_{jkt}}{\sum_t \widehat{VM}_{jkt}}$$

   c) Average stay by country of residence

$$\widehat{ESM}_{jm} = \frac{\widehat{NM}_{jm}}{\widehat{VM}_{jm}} = \frac{\sum_k \sum_t \widehat{NM}_{jktm}}{\sum_k \sum_t \widehat{VM}_{jktm}}$$

7. Estimated staff employed

$$\hat{T}_{jktm} = \left(\sum_{i=1}^{e_{jkt}} T'_{ijktm} + \sum_{i=1}^{e''_{jkt}} T'_{ijktm} \right) \cdot \varpi_{jkt}$$

   Where:

   $T'_{ijktm} = T_{ijktm} \cdot AC_{ijkt}$, with AC_{ijkt} percentage of the employed staff dedicated to the accommodation activity[1];

   ϖ_{jkt}, the elevation factor per bed-place in province j, category k and size t;

   m, professional situation.

8. Estimated number of occupied rooms

   The number of rooms in open establishments has to be calculated beforehand

$$\widehat{HM}_{jkt} = \sum_{i=1}^{E_{jkt}} H_{ijkt} \cdot \frac{\left(\sum_{i=1}^{e'_{jkt}} H_{ijkt} \cdot \frac{dm_{ijkt}}{D} + \sum_{i=1}^{e''_{jkt}} H_{ijkt} \cdot \frac{dm_{ijkt}}{D} \right)}{\left(\sum_{i=1}^{e'_{jkt}} H_{ijkt} + \sum_{i=1}^{e''_{jkt}} H_{ijkt} \right) + \sum_{i=1}^{c'_{jkt}} H_{ijkt}}$$

[1] In the case of establishments sending the XML file, it is assumed that this percentage is equal to 100

a) Total occupied rooms

$$\widehat{BM}_{jkt} = \left[\sum_{i=1}^{e'_{jkt}} BM_{ijkt} + \sum_{i=1}^{e''_{jkt}} B_{ijkt}\right] \cdot \frac{\widehat{HM}_{jkt}}{\left(\sum_{i=1}^{e'_{jkt}} H_{ijkt} \frac{dm_{ijkt}}{D} + \sum_{i=1}^{e''_{jkt}} H_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)}$$

$$= \left[\sum_{i=1}^{e'_{jkt}} BM_{ijkt} + \sum_{i=1}^{e''_{jkt}} B_{ijkt}\right] \cdot \delta_{jkt}$$

δ_{jkt}, the elevation factor per rooms in province *j*, category *k* and size *t*

Note: B_{ijkt} for establishments sending the questionnaire by XML is the sum of double rooms for double use, double rooms for single use and others.

b) Occupied rooms with double occupancy

$$\widehat{BDM}_{jkt} = \left[\left(\sum_{i=1}^{e_{jkt}} BD_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e''_{jkt}} BD_{ijkt}\right] \cdot \delta_{jkt}$$

δ_{jkt}, the elevation factor per rooms in province *j*, category *k* and size *t*.

c) Occupied rooms for single occupancy

$$\widehat{BIM}_{jkt} = \left[\left(\sum_{i=1}^{e_{jkt}} BI_{ijkt} \cdot \frac{D}{7}\right) + \sum_{i=1}^{e''_{jkt}} BI_{ijkt}\right] \cdot \delta_{jkt}$$

δ_{jkt}, the elevation factor for rooms in province *j* and category *k;*

9. Estimated occupancy rate

a) Net occupancy rate by bed-places

$$\widehat{GPM}_{jkt} = \frac{\widehat{NM}_{jkt}}{D \cdot \widehat{PM}_{jkt} + \widehat{NM}'_{jkt}} \cdot 100$$

For the total of the province/island *j*:

$$\widehat{GPM}_{j} = \frac{\sum_k \sum_t \widehat{GPM}_{jkt} * \widehat{PM}_{jkt}}{\sum_k \sum_t \widehat{PM}_{jkt}}$$

b) Net occupancy rate by rooms

$$\widehat{GHM}_{jkt} = \frac{\widehat{BM}_{jkt}}{D \cdot \widehat{PM}_{jkt}} \cdot 100$$

c) For the total of the province/island *j*:

$$\widehat{GHM}_j = \frac{\sum_k \sum_t \widehat{GHM}_{jkt} * \widehat{HM}_{jkt}}{\sum_k \sum_t \widehat{HM}_{jkt}}$$

8 Information Collection

The basic data query covers seven consecutive days of each month, randomly selected so that all establishments cover the entire month.

A second query is made on the total number of travellers accommodated, overnight stays caused and rooms occupied during the whole month to which the data refer, in the three-, four- and five-star gold strata.

The information is supplied on a monthly basis by the hotel establishments, by means of a questionnaire, to the National Statistics Institute. It is also possible to submit the information via electronic transmission by uploading an XML file or through an Internet connection using the ARCE system, by directly filling in the questionnaire on the screen.

9 Dissemination of Information

The information is presented at different levels of geographical disaggregation: national, autonomous city and community, provincial, zones and tourist resorts. Information is also disseminated by category.

The areas (set of municipalities) have been considered, as well as the municipalities in which the tourist influx is specifically located.

Provisional results for a reference month are published around the 23rd of the following month.

10 Statistical secret

Information can be given on all the strata (or geographical data groupings) in which the number of establishment with incidence 1 (open with activity) is the same or above 4.

So if, for example, in a province-category crossing, the statistical secrecy condition is not met, the establishments will be added to those of the next lower category (except 1 gold which is added to 2 gold), until the necessary condition is met to be able to provide data.

11 Coefficients of variation

Variation coefficients or relative sampling errors are calculated and published for the estimators of the total number of travellers who enter in the month, $\widehat{VM}_{jkt}$, and of the total number of occupied bed-places (overnight stays), $\widehat{NM}_{jkt}$, both in the case in which

the number of days that the establishment has been open in the reference month, dm, is considered, and in the case in which this data are not considered:

Be $\hat{Y}_{jktm}$ it the estimator of any of these variables, for each province, j, category, k, size t and modality (residents or non-residents), m.

The estimated relative sampling error (as a percentage) is calculated as follows:

$$\widehat{CV}\left(\hat{Y}_m\right) = \frac{\sqrt{\hat{V}(\hat{Y}_m)}}{\hat{Y}_m} * 100$$

where:

$$\hat{V}\left(\hat{Y}_m\right) = \sum_h \hat{V}(\hat{Y}_{jktm})$$

And h denotes the strata (jkt)

and $\hat{V}\left(\hat{Y}_{jktm}\right)$ shall be calculated as follows depending on the type of estimator.

<u>Group A estimators: Weekly information plus XML, without taking into account information on the number of days the establishment is open in the reference month, dm</u>

$$\hat{V}\left(\hat{Y}_{jktm}\right) = (1 - f_{jkt}) \cdot \frac{e_{jkt} + e''_{jkt}}{\left(e_{jkt} + e''_{jkt}\right) - 1} \cdot \frac{\hat{P}^2_{jkt}}{\left(\sum_{i=1}^{e_{jkt}} P_{ijkt} + \sum_{i=1}^{e''_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)^2} \cdot \sum_s \left(Y_{ijktm} - \hat{R}_{jktm}\, P_{ijkt}\right)^2$$

where

$$f_{jkt} = \frac{e_{jkt} + e''_{jkt} + c_{jkt}}{E_{jkt}} \qquad \text{and} \qquad s = e + e^{"},$$

therefore:

$$Y_{ijktm} = Y_{ijktm} \qquad \text{if } i \in e^{"}$$

$$Y_{ijktm} = Y_{ijktm} \cdot \frac{D}{7} \qquad \text{if } i \in e$$

$$\hat{R}_{jktm} = \frac{\sum_{i=1}^{e_{jkt}} Y_{ijktm} \cdot \frac{D}{7} + \sum_{i=1}^{e''_{jkt}} Y_{ijktm}}{\sum_{i=1}^{e_{jkt}} P_{ijkt} + \sum_{i=1}^{e''_{jkt}} P_{ijkt}}$$

Group B estimators: Monthly information plus XML (only 3, 4 and 5 star establishments), taking into account the information on the number of days the establishment is open in the reference month, dm

$$\hat{V}\left(\hat{Y}_{jktm}\right) = \left(1 - f'_{jkt}\right) \cdot \frac{e'_{jkt}+e''_{jkt}}{\left(e'_{jkt}+e''_{jkt}\right)-1} \cdot \frac{\widehat{PM}^2_{jkt}}{\left(\sum_{i=1}^{e'_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D} + \sum_{i=1}^{e''_{jkt}} P_{ijkt} \cdot \frac{dm_{ijkt}}{D}\right)^2} \cdot \sum_s \left(Y_{ijktm} - \hat{R}_{jktm} P_{ijkt}\right)^2$$

where

$$f_{jkt} = \frac{e'_{jkt}+e''_{jkt}+c'_{jkt}}{E_{jkt}} \qquad \text{and} \qquad s = e' + e'',$$

therefore:

$$Y_{ijktm} = Y_{ijktm} \qquad \text{if } i \in e''$$

$$Y_{ijktm} = YM_{ijktm} \qquad \text{if } i \in e'$$

$$\hat{R}_{jktm} = \frac{\sum_{i=1}^{e'_{jkt}} YM_{ijktm} + \sum_{i=1}^{e''_{jkt}} Y_{ijktm}}{\sum_{i=1}^{e'_{jkt}} P_{ijkt} + \sum_{i=1}^{e''_{jkt}} P_{ijkt}}$$

12 Linkage Coefficients

Methodological changes or extraordinary updates to the directories forming the survey framework may result in newly published data that are not directly comparable with previously published figures.

To prevent breaks in the time series and ensure comparability, linkage coefficients are calculated and applied to previously published data before the introduction of these changes.

Linkage Coefficients

Due to the strong seasonality of these series, different linkage coefficients are calculated for each month, ensuring that year-on-year variation rates remain consistent, even if month-to-month variations are not preserved.

For each month, the linkage coefficient of a variable X is obtained as the ratio between the estimated value of the variable in the given month of year T, considering all available information (including methodological changes and/or directory updates) and the estimated value of the same variable in the same month but without considering the new updates.

$$CX_{i,T} = \frac{X_{i,T}^{conmejoras}}{X_{i,T}^{\sin mejoras}}$$

where:

i =1… 12 months

$X_{i,T}^{conmejoras}$ = Estimated value of the variable X in month i of year T using all available information.

$X_{i,T}^{\sin mejoras}$ = Estimated value of the variable X in month i of year T without taking into account the updates.

Linked series

The linked and comparable series with the published data are calculated by multiplying the previously published series (before the introduction of improvements) by the linkage coefficient for the corresponding month.

$$X_{i,T-j}^{enlazada} = X_{i,T-j}^{pub} \times CX_{i,T}$$

where:

i = 1… 12 months

$X_{i,T-j}^{pub}$ = Estimated published value of the variable X in month i of the year $T-j$ (where $j \succ 0$)

$CX_{i,T}$ = Linkage coefficient for the variable X in month i

Since the linkage coefficients have been calculated independently for each geographical breakdown, category, or nationality, the linked series lose their additivity.

13 Empty strata treatment

A strata (province/island-category-size group) is considered empty when there are no questionnaires available for the sample selected in the strata. When this occurs, the procedure is as described below:

Empty strata with the weekly questionnaire

1. If a strata only contains refusals and closed establishments, the estimate is ZERO, since all refusals are assumed to be closed.
2. If there are only negatives, it is assumed that all the negatives are open (since we have no record of any closed ones) and said strata must be imputed as shown in point 4.

3. If an area or a point has open shops in a strata, but none are sampled, that strata is imputed according to the following point.
4. Once the donor strata has been selected (the search process is described below) and its estimators have been calculated, the imputation is made to the empty strata, according to the open positions in the directory of the empty strata, since we have assumed that there were no closed ones.

Assuming that strata kt' of province j is empty, and that we are going to impute it by the data of strata kt:

– The estimates for the variables: number of establishments open during the month, number of bed-places, and number of rooms in the establishments open during the month match the data in the directory.

– For the rest of the variables:

- We calculate the estimators for the non-empty strata:

$$\hat{V}_{jkt} = \sum_{i=1}^{e_{jkt}} V_{ijkt} \cdot \frac{D}{7} \cdot \frac{\hat{P}_{jkt}}{\sum_{i=1}^{e_{jkt}} P_{ijkt}}$$

- We calculate the estimators for the empty strata:

$$\hat{V}_{jkt'} = \sum_{i=1}^{e_{jkt}} V_{ijkt} \cdot \frac{D}{7} \cdot \frac{\hat{P}_{jkt}}{\sum_{i=1}^{e_{jkt}} P_{ijkt}} \cdot \frac{\hat{P}_{jkt'}}{\hat{P}_{jkt}} = \left(\sum_{i=1}^{e_{jkt}} V_{ijkt} \cdot \frac{D}{7} \cdot \frac{1}{\sum_{i=1}^{e_{jkt'}} P_{ijkt}} \right) \cdot \hat{P}_{jkt'}$$

The order of donor strata search is as follows:

1. Within the same category k
   - If t=1 is empty strata, the donor would be t=2. If it were also empty, it would be t=3.
   - If t=2 is empty strata, the donor would be t=1. If it were also empty, it would be t=3.
   - If t=3 is empty strata, the donor would be t=2. If it were also empty, it would be t=1.
   - In strata where there is no size distinction 1 and 2 (called sub-strata 0), there are only sub-strata 0 and 3:
     - If t=0 is empty strata, the donor would be t=3. In case it is also empty, (b) applies.
     - If t=3 is empty strata, the donor would be t=0. In case it is also empty, as described in (b) above would apply
   - In strata where there is only sub-strata 0 (i.e. there is no sub-stratification by size within the category), if it is an empty strata, then (b) would apply.

2. If no donor strata is found within the same category, search within the same province/island j with the following criteria:
   - If kt is the empty strata, the donor will be k't, for the next lower category.
   - If k't is also empty, the search criterion in k' described in a) applies. If no donor strata is found in k', we will search iteratively down to 1 silver, and if not, up to 5 gold.
3. The case where there is no donor strata within the same province/island is not considered

Special cases in the EOH taking into account the monthly questionnaire/module

The following cases will require specific treatment:

1. In a strata where:
   - (no. of establishments with inci1=1)≠0 (there may be other establishments closed, 3, or which are negative, 4)
   - and (no. of establishments with inci=1)=0 (there may be establishments that are closed, 3, or that are negative, 4).

   The information collected in the monthly questionnaire is used to calculate passenger and overnight stay totals. To distribute them by nationality and to calculate the remaining variables, it is necessary to find a "donor strata" from estimates obtained during the week. The donor strata shall be obtained by following the donor strata search criteria described above in the weekly questionnaires and shall be the first non-empty strata with passenger movement in the weekly questionnaire.
2. In a strata where:
   - (no. of establishments with inci1=1)≠0
   - and (no. of establishments with inci=1)=0)
   - and (no. of establishments with inci1=2)≠0 (there are more establishments in the strata, but some with incidences 2)

   The information collected in the monthly questionnaire is used to calculate passenger and overnight stay totals. To distribute them by nationality and to calculate the rest of the variables, it is necessary to look for a "donor strata" of estimates obtained with the week, but only to be applied to the establishment or establishments with monthly incidence=1. The donor strata will be obtained within the same province and will be the first non-empty strata (in information of the week) found following the order described above.
3. In a strata where there are no establishments with inci=1 in the weekly questionnaire and there is one or more with: inci=2 or 3 in the weekly questionnaire and inci=1 in the monthly questionnaire, the incidence in the weekly questionnaire will be reassigned as negative, 4. We will then find ourselves in case 1 or 2 and this case will be solved in one of these two ways. (This case will be checked first).

Empty strata in the monthly questionnaire

For strata where all monthly questionnaires have inci1=4, if there are weekly questionnaires with inci=1, they are estimated only with the information collected in the weekly questionnaires.