An analysis of the demand for sub-municipal data from the Population and Housing Census

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Abstract

Starting in 2018, the Italian National Institute of Statistics - Istat launched the new Permanent Census of Population and Housing, thus moving from the traditional census to a combined census based on the integration of administrative and sample data.
This change of strategy has an important impact on the data offered: due to the methodological complexity required by the new census approach, it is indeed not possible to guarantee data at the highest territorial detail in continuity with past censuses.
As requests for data from the 2011 Census often present a high degree of classificatory and spatial detail, it seemed appropriate to assess whether the dissemination plan for census data can meet the expectations of specialised users of sub-municipal data processing, according to Principle n. 11 of the European Statistics Code of Practice.
To this end, a fact-finding survey was conducted by interviewing advanced users who had previously requested the 2011 Census data at the sub-municipal level, intending to assess satisfaction with the quality of the data received and the characteristics of future requests referring to the new Permanent Census.
The analysis shows that NSIs have to concentrate great efforts, both in data collection and in defining statistical methodologies, so that the provision of sub-municipal data related to censuses is relevant to user needs.

Keywords: Advanced users, custom data processing, data dissemination, data quality, population census, relevance, spatial data, survey, users' needs.

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1. Introduction

The demand for quantitative information at a high level of territorial detail has been satisfied over time by the results of the decennial Census, the only statistical survey capable of producing data at the sub-municipal level. In response to this demand, up to the 2011 Census of Population and Housing, the Italian National Institute of Statistics – Istat disseminated data on more than 400,000 enumeration areas and satisfied requests for specific processing received through its Contact Centre service (Istat 2022; Istat 2021).

In Italy, since 2018 Istat has abandoned the traditional census to start the new Permanent Population and Housing Census[2], a "combined" census based on the integration of administrative and sample data (Falorsi 2017). The new strategy has a strong impact on data supply due to the methodological and computational complexity required by the new census approach. Indeed, the process of producing the results of the new Permanent Census will not be able to provide data at the highest territorial detail in continuity with past censuses.

Unlike past censuses, for which users could request customised processing of sub-census data, with the new census a set of results will be defined, growing over time, that users use to get the information they are interested in. It is therefore important that this set is as close as possible to users' expectations.

Indeed, the European Statistics Code of Practice (last revised in 2017) sets out the principles to be applied to ensure and strengthen both trust and quality in the European Statistical System (ESS and Eurostat 2017). Among the principles of the Code - largely inspired by the Fundamental Principles of Official Statistics adopted by the United Nations General Assembly in 2014 - Article 11 emphasises the relevance of statistics and the need to meet the needs of users:

2 Since 2018, Istat has been conducting in Italy the Permanent Census of Population and Housing. The traditional decennial census essentially based on collecting data from people, has been replaced by a census based on a system of registers supported by sample surveys. Every year counts at municipal level are disseminated according to the Basic Register of Individuals (BRI), the Basic Register of Places (BRP) and a Population Coverage Survey (PCS). BRI contains information on some demographic variables such as gender, place and date of birth, citizenship, place of residence, derived by administrative data. BRP contains addresses, Enumeration Areas (EAs) and if possible, geographical coordinates. All other census variables not included in the registers are collected with the traditional census questionnaire each year on household samples on representative sets of municipalities. From the integration of the data in the registers and the data collected on the sample households, census results are produced every year for different information details at the various territorial levels. This change required the adoption of new methodological and IT architectures with the aim of providing accurate, timeliness and consistent figures for the users.

- Procedures are in place to consult users, monitor the relevance and value of existing statistics in meeting their needs, and consider and anticipate their emerging needs and priorities. Innovation is pursued to continuously improve statistical output.
- Priority needs are being met and reflected in the work programme.
- User satisfaction is monitored on a regular basis and is systematically followed up.

Within this framework, Istat conducted the study presented here to gain a clear view of what the expectations of stakeholders are concerning high spatial detail data. To this end, advanced users who had requested the 2011 Census data at the sub-municipal level were interviewed to assess satisfaction with the quality of the data received (Department of Public Service/*Dipartimento della Funzione Pubblica* 2004) and the characteristics of future requests for the new Permanent Census.

At the same time, research was conducted on NSIs' experiences in other countries regarding user surveys on the level of satisfaction with or requirements for census data with a high spatial detail. Unfortunately, no user analysis comparable to the one described in this article was found.

2. Satisfaction surveys on statistical products and services conducted by NSIs

In many countries, National Statistical Institutes (NSIs) conduct user satisfaction surveys of products and services on a regular or occasional basis.

Attention to users and their needs has a long tradition and has consolidated over time to the point of changing the relationship between institutions and users themselves. The latter are no longer seen as mere recipients of the actions of the statistical institute, but as stakeholders from whom to learn to improve the quality of products and services. Their opinions can help identify the factors where the largest gap is registered between what the institution achieves and what users need or expect to receive.

The most important aspects that are measured through user ratings are timeliness, relevance of the data offered and, in general, the quality of the statistics produced, which must meet the information needs of society. Indeed, user feedback could be integrated into the data production processes and planning of official statistics. Users should be placed at the centre of statistical production: their needs should be understood, their opinions sought and considered, and their use of statistics supported.

The NSIs of certain countries[3] - *e.g.* Albania, Bulgaria, Canada, Estonia, Greece, Ireland, and Slovenia - collect information from users in an anonymous form, according to a continuous flow when accessing the institutional website or dissemination web platform, after consultation or downloading of statistical data. Periodically, this information is processed for internal use and in some cases presented in technical reports available on the web.

In other countries - *e.g.* Cyprus, Ghana, Rwanda, Serbia, Spain, Tanzania, and the United Kingdom - specific surveys are occasionally conducted on samples of advanced users from different economic sectors, including central or local government, academia, business, the voluntary sector, precisely to gather feedback from users with high statistical and IT skills who can use the data for policy, study and planning purposes.

3 In the references at the bottom of the article are the links to the websites of each country cited.

These surveys mostly consider the entire statistical output and no specific attention has ever been paid to population and housing census results or data with a high spatial detail. It was therefore not possible to observe any analysis experience on advanced users similar to that reported in this work, which is the first on a specialised user that requires and uses census data with high information and spatial content. The return of the information from this survey, even if it refers to a limited sample size, is crucial for guiding future choices in terms of the production process and planning the release of official statistics.

3. Knowledge objectives

The cornerstones of the "Population Census - User Satisfaction Survey" (Carbonetti *et al*. 2022) were built on precise questions:

- Did the data provided fully satisfy the demand?
- Did the data provided make it possible to realise the objectives of study, research, analysis, and planning that the users had set themselves?
- Did the data provided stimulate new and different projects not initially envisaged?
- Did the level of detail and quality of the data provided, sometimes limited by privacy constraints, really meet the users' needs?
- Were the data also used through the use of GIS?
- Has the data received been integrated with other sources available to the user?
- Will users in the future need to request new supplies of similar or more detailed data from a spatial or classification point of view?

This last question is linked to the opportunities that the new Permanent Population and Housing Census will be able to offer. There is a strong expectation on the part of external users of highly detailed and timely spatial information that can be obtained every year thanks to the new census operation put in place.

The Istat Contact Centre monitors and testifies to the need for "continuity" expressed by specialist and loyal user segments that, thanks to the population census, benefit from spatial information down to the smallest detail, in historical series, filling documentary "gaps" that other surveys, due to their methodology, cannot cover.

The experience gained in this context stimulated the idea of a survey of all users who purchased customised elaborations on the 15th Census of Population and Housing from 2015 to 2021 with the following peculiarities:

- high spatial detail (sub-municipal: by census area or by enumeration area);
- high information detail (often involving crossings of census variables not included in the Italian Dissemination Plan);
- absence on Istat's dissemination platform.

The survey was therefore conducted on a particular user group, interested in data with a high information content in both spatial and classificatory terms. The requests themselves imply particular characteristics of the users in terms of:

- finality;
- specialisation in data processing;
- attention to quality;
- propensity to demand for new data.

Therefore, given the peculiarities of the data requested and the characteristics of the users who requested them, a need for knowledge emerged to study the specific user segment and try to assess:

- relevance and satisfaction of the data provided;
- achievement of goals and any other objectives;
- possibility of future requests for similar data or different details.

Trusting in a significant response rate, the return of the survey aims to "identify" the information needs of census data, also in the perspective provided by the new Permanent Census of Population and Housing in Italy, which renews its offer from year to year, to assess how far Istat will be able to satisfy the need for information with a strong spatial detail.

4. Handling of customised processing requests

Since the implementation of the 2011 Census of Population and Housing planned the adoption of a sample strategy based on short/long forms (Borrelli *et al.* 2011; Carbonetti and Fortini 2008; Carbonetti *et al.* 2008) for the determination of the census results referring to the different spatial and classificatory levels it was decided to use "constrained weighting estimators" that required the calculation of specific "carry-over weights to the universe", associated with the statistical units, and calculated separately for individuals, households, and dwellings.

The methodology put into production allowed for the consistent determination of all the census crossings scheduled by the Italian Diffusion Plan, concerning the calibration constraints, the different classification hierarchies (data breakdowns) and different spatial levels (Borrelli *et al.* 2012; Carbonetti 2009; Carbonetti and Verrascina 2010).

The weak point of the estimation methodology adopted lies in a certain "rigidity" about the set of census crossings and spatial levels predefined by the Italian Diffusion Plan. Each census crossing not included in the Italian Diffusion Plan required an evaluation of compatibility with the System of Constraints adopted for the calculation of the carry-over weights to the universe; in the event of non-compatibility, one had to proceed to the calculation of appropriate *ad hoc* weights, a different weighting system based on a specific system of constraints. This is what happened with customised processing requests: requests for the supply of data referring to census crossing are often not foreseen in the publication plan and refer to municipal or sub-municipal domains.

To meet these requests, the Census Department developed in 2015 a generalised methodology based on the reweighting procedure, which allows, starting from the calibration weights already prepared, to recalculate a new system of weights, depending on the request taken in charge, useful for producing the required crossings as consistent as possible, at the various levels of classificatory and/or spatial aggregation, with what has already been published (small deviations are due solely to rounding).

Thus, already in the second half of 2015, the Institute was able to support customised processing requests received through its Contact Centre. For

each request, a feasibility analysis was carried out in computational terms and a cost estimate was drawn up in terms of working hours to carry out the requested processing and delivery time. When the user, informed by the Istat Contact Centre of the outcome of the assessment, accepted the cost estimate, the Census Department proceeded with the necessary processing to complete the requested delivery within the stipulated time.

In some situations, methodological and thematic experts provided crucial technical and scientific support to assess the relevance of the request concerning the stated objectives and to inform users about the risks of too much detail in terms of data fragmentation (the main risk was that of privacy violation). This activity sometimes led to redesigning the initial requests together with the user.

5. Survey design

5.1 Questionnaire

The questionnaire was designed to collect useful data to meet the information needs set out in paragraph 3. It includes:

1. two closed-ended questions on the user's profile and the reason for the data request;
2. a box for the description of the field or topic for which the data were requested;
3. six closed-ended questions on the use of the data, their level of quality and the possibility of making similar requests about the results of the new Permanent Population and Housing Census;
4. a question on the overall quality of the service received from Istat;
5. a final box in which to report critical issues or provide suggestions.

The individual questions and, in the case of closed-ended questions, the possible answer options are listed in the Annex at the bottom of this article.

5.2 User list

As mentioned above (see paragraph 3), the field of observation for the survey was restricted to users of the Istat Contact Centre who, between 2015 and early 2021, purchased customised processing of 2011 Census of Population and Housing data, referring to sub-municipal domains (census areas; enumeration areas) for census crossings involving at least one estimated variable[4].

4 A sample strategy based on short/long form was adopted for the 2011 Census of Population and Housing. In provincial capitals and municipalities with more than 20,000 inhabitants (486 in total), the census design provided for the long form questionnaire to be administered only to suitably selected samples of households, while the non-sampled households were surveyed using the short form questionnaire. In all other municipalities, the survey was conducted using only the long questionnaire. To produce the final results, for the sampled municipalities the data referring to the variables present in the long questionnaire were estimated, while those relating to the variables present in both models were derived from a counting operation; in the non-sampled municipalities, on the other hand, all data were the result of a counting operation.

The survey was aimed precisely at users specialised in advanced data processing - who are the main stakeholders of census data - to study, based on an analysis of their needs, the relevance of the data that will be produced and offered with the Permanent Census. The need to focus on such a small set of users led to the consideration of a limited but highly representative (reasoned) sample of users for the purposes of the study.

Therefore, regarding the period defined above and for the set of users specified, the number of requests for customised paid processing received by the Contact Centre was 77: for 14 of these the cost estimate was not accepted and, consequently, the data were not provided; for 19 others, instead, these were requests with an accepted estimate but referring to users who had already acquired data on the occasion of previous requests. Thus, excluding users who did not receive data due to non-acceptance of the cost estimate and cases of subsequent requests referring to the same user, the final number of potentially eligible users[5] for the survey is 44. Table 5.1 shows the different cases just described also concerning the year in which the request reached the Contact Centre (in the case of several requests made by the same user, reference is made to the year of the last request).

Table 5.1 - Number of Contact requests received, not executed, multiple. Number of users potentially eligible for the survey, by year of Contact request
(absolute values)

Requests for processing of sub-municipal data estimates from the 2011 Census	Year of request to Contact Centre							
	2015	2016	2017	2018	2019	2020	2021	**Total**
No. of requests received by the Istat Contact Centre	9	17	12	15	12	10	2	**77**
No. of requests not supplied due to non-acceptance of the cost estimate	2	5	3	2	-	1	1	**14**
No. of requests following a request already provided for the same user	2	7	3	3	3	1	-	**19**
No. of users who made one or more requests with reference to the year of the one/ last request (users eligible for the survey)	5	5	6	10	9	8	1	**44**

Source: Istat - Directorate for Communication, Information and Services to Citizens and Users - Management and Dissemination Service

5 The user is only declared definitively eligible if there are valid contact details to reach him/her and involve him/her in the survey.

5.3 Survey technique

For the data collection phase, the CAWI (Computer Assisted Web Interviewing) methodology was adopted, a data collection technique based on the completion of a web-based questionnaire provided via a link to a website. With the support of the Institute's IT services[6], the questionnaire described in the Annex was prepared in electronic format on the LimeSurvey application[7]. Users potentially eligible to participate in the survey were sent an information letter (see paragraph 6) via e-mail in which, after explaining the purpose of the survey, a link was provided to access the LimeSurvey service where they could fill out the questionnaire themselves.

6 The electronic questionnaire was carried out using the LimeSurvey application with the contribution of Andrea Nunnari (Istat, Directorate for Information Technology).

7 LimeSurvey is an application that allows the creation of online questionnaires and statistical surveys.

6 Stages of the survey

The first operation conducted was to find all the contact information (email address; telephone number) of the advanced users assumed to be eligible for the survey (44). Subsequently, the following "information letter" was sent out in which the user was informed of the reason for the survey, even years after they had requested the data, and invited to answer the questions in the questionnaire accessible through the web application link given at the end of the letter.

> *Dear user,*
>
> *following the dissemination of the results of the 15th Census of Population and Housing in 2011, the National Statistical Institute provided data referred to thematic crossings and spatial domains that were not included in the Italian Dissemination Plan and therefore not available on the Institute's dissemination platforms.*
>
> *Since you have requested customised processing of 2011 Census data through the Istat Contact Centre, we would like to ask for your willingness to participate in a survey whose sole objective is to assess the degree of satisfaction and the level of use of the data provided in order to accurately plan the future production of census data with a high level of informative detail.*
>
> *Thanking you in advance for your attention, we ask you to answer the following short questionnaire.*
>
> **Survey access link**

Following the sending of this letter, the contact e-mail of 7 users was found to be incorrect or non-existent. After the patient work to retrieve the new contact information, almost all critical cases were resolved except for two users who were not found. Consequently, the final target of the survey was set at 42 eligible users (Table 6.1).

The survey started in the last week of May 2021 and lasted approximately one and a half months. After two reminders to non-respondents, the survey ended in the second week of July. After a strong start in the first week (response rate of 47.6%), following the first reminder sent by e-mail to all users (which took place 10 days after the start of the survey), the response rate increased to 64.3%. After the second reminder, sent only to non-respondents exactly 4 weeks after the start of the survey, the response rate increased by approximately 12 percentage points to a final figure of 76.2% (32 out of 42 respondents).

Of the 42 users invited to participate, 32 responded positively (76.2% response rate). Ten users (23.8%) did not participate. Taking the year of the last request to the contact centre as a reference, no relationship is observed between the number of years since the last request and the response rate. A negative effect was expected from the memory of the data request, which might have led to a lower propensity to participate in the survey in the case of very old requests. Instead, it can be seen that (Table 6.1) for 2017, 2020 and 2021 requests, participation was 100%, while lower response rates were recorded for 2016 (50%) and 2019 (55.6%).

This therefore suggests that, also in the future, in the case of surveys on the satisfaction of services provided by Istat to external users, the time factor does not seem to affect the response rate, so it is always possible to retrieve information from users who came into contact with Istat several years earlier.

Table 6.1 - Number of initial users, unreachable users, users contacted for the survey, and responding users, by year of request to the Istat's Contact Centre

Requests for processing of sub-municipal data estimates from the 2011 Census	Year of request							
	2015	2016	2017	2018	2019	2020	2021	**Total**
No. of users who made at least one request with reference to the year of the one/last request (users eligible for the survey)	5	5	6	10	9	8	1	**44**
No. of "unreachable" eligible users	*1*	*1*	-	-	-	-	-	***2***
No. of users contacted for the survey	*4*	*4*	*6*	*10*	*9*	*8*	*1*	***42***
Number of users who participated in the survey (respondents)	3	2	6	7	5	8	1	**32**
Response rate (%)	75.0	50.0	100.0	70.0	55.6	100.0	100.0	**76.2**

Source: Istat - Directorate for Communication, Information and Services to Citizens and Users - Management and Dissemination Service

7 Analysis of responses

The answers provided by the users who took part in the survey were analysed from different perspectives to study them:

- the type of user, the reasons and purposes for requesting such specific processing;
- the degree of satisfaction with the level of spatial and classificatory detail of the data provided for the purposes for which they were requested;
- the enhancement of the data provided through GIS tools or integration with other sources or archives;
- the degree of satisfaction with the quality of the data received;
- the possibility of requesting new supplies of similar or different data in the future;
- the degree of satisfaction with the service received from the Istat Contact Centre.

7.1 Type of user, reason for request and purpose

Table 7.1 shows the data for the first two questions of the questionnaire: about the type of user, 62.5% belonged to the category "Research Institution, University, School", 28.1% to the sector "Enterprise, Self-employed" and only 9.4% to "Public Administration". Among the reasons for requesting data, 68.7% were for "Analysis and research", 21.9% for "Commercial purposes" and 9.4% for "Policy planning".

Table 7.1 - Distribution of respondents by "Type of user" and "Reason for request"

Type of user	Reason for request				**Total**	%
	Analysis and research	Commercial purposes	Policy planning	Other		
Research Institution, University, School	20	-	-	-	**20**	62.5
Enterprise, Self-employed	2	7	-	-	**9**	28.1
Public Administration	-	-	3	-	**3**	9.4
Other	-	-	-	-	**-**	-
Total	**22**	**7**	**3**	**-**	**32**	
%	68.7	21.9	9.4	-		**100.0**

Source: Authors' processing of survey results

The cross-analysis of the user type with the reason for the request shows a strong association between the two characteristics; finally, there is a strong concentration of cases (29 out of 32) amounting to 90.6% in the first two categories of user type and reason for the request.

Using the information collected with the third question, to which 30 users (93.7%) responded, it was possible to obtain an overview of the purposes for which users requested the provision of data. The prevailing purpose is to conduct spatial analysis, in different areas or for different purposes, to assess:

- socio-economic transformations;
- mobility in the territory;
- urban expansion and urban transformations;
- phenomena of social segregation (e.g. in schools);
- housing needs;
- energy needs for the definition of appropriate energy strategies.

The spatial analyses described by users also concerned more general public administration or commercial objectives (geo-marketing). Finally, in some cases, the data were used to carry out spatial classifications for specific objectives, including electoral ones.

7.2 Satisfaction of spatial and classificatory detail of data

This section analyses the answers to the fourth question on the degree of satisfaction with the level of informative, spatial and classificatory detail of the data provided, concerning the purposes for which they were requested (Table 7.2).

Table 7.2 - Distribution of respondents by "Reason for request" and "Level of satisfaction with the information detail of the data provided"

Reason for request	Satisfaction with the information detail of the data provided			Total	%
	Yes, fully	Yes, but they would have liked more detailed data	No		
Analysis and research	3	17	2	**22**	68.7
Commercial purposes	5	1	1	**7**	21.9
Policy planning	1	2	-	**3**	9.4
Total	**9**	**20**	**3**	**32**	
%	28.1	62.5	9.4		**100.0**

Source: Authors' processing of survey results

90.6% of the respondents were satisfied with the level of informative detail of the data received. In particular, 28.1% of users were fully satisfied, especially those who used the data for commercial purposes, while 62.5% would have liked more informative detail, especially those who requested the data for analysis or research purposes.

In particular, among respondents who were generally satisfied (29 out of 32) with the informative detail of the data received (including those who would have liked more detailed data), 69.0% used it for analysis or research purposes, 20.7% for commercial purposes, and 10.3% for policy planning.

Finally, 9.4% of users were dissatisfied with the information detail of the data received, in particular, due to the inadequate spatial level or the impossibility of cross-referencing the data received with other information.

7.3 Enhancement of provided data

The results of the analysis of the answers to the two questions concerning the use of data received with GIS[8] tools and integration with other statistical sources respectively are presented here. Table 7.3 shows the summary of the cross-referenced answers with the different types of users observed. Table 7.4 shows the results of the cross-referencing of the answers with the different reasons for which data were requested.

8 GIS (Geographic Information System) systems are computerised information systems that enable the acquisition, recording, analysis, visualisation, restitution, sharing and presentation of information derived from geographical data.

As a common datum between the two tables (shown in the last two rows), it can be noted that: 62.5% of the respondents used the data with GIS tools, while 37.5% did not use them in such systems; 65.6% of the users integrated the received data with data from statistical sources or administrative archives, while 34.4% did not use them in an integrated manner.

Table 7.3 - Distribution of respondents according to "Use of data with GIS tools" and "Integration with other sources" by "Type of user"

Type of user	Use of GIS tools		Integration of sources		Total	%
	Yes	No	Yes	No		
Research Institution, University, School	12	8	12	8	**20**	62.5
Enterprise, Self-employed	8	1	8	1	**9**	28.1
Public Administration	-	3	1	2	**3**	9.4
Other	20	12	21	11	**32**	
Total	**62.5**	**37.5**	**65.6**	**34.4**	**32**	
%	68.7	21.9	9.4	-		**100.0**

Source: Authors' processing of survey results

Table 7.4 - Distribution of respondents according to "Use of data with GIS tools" and "Integration with other sources" by "Reason for request"

Reason for request	Use of GIS tools		Integration of sources		Total	%
	Yes	No	Yes	No		
Analysis and research	14	8	13	9	**22**	68.7
Commercial purposes	6	1	7	-	**7**	21.9
Policy planning	-	3	1	2	**3**	9.4
Total	**20**	**12**	**21**	**11**	**32**	
%	62.5	37.5	65.6	34.4	**32**	**100.0**

Source: Authors' processing of survey results

Cross-referencing the answers with the "Type of user", it can be observed (Table 7.3) that among those who have used data with GIS tools (20 out of 32), 60% belong to the category "Research Institution, University, School" while the remaining 40% refer to the type "Enterprise, Self-employed"; no user from the group "Public Administration" declared having used data through GIS.

As regards the possibility of integrating the data with other administrative sources or archives, among those who stated that they had done so (21 out of 32), 57.1% belonged to the "Research Institution, University, School" sector, 38.1% to the "Enterprise, Self-Employed" context and the remaining 4.8% to the "Public Administration" context.

Cross-referencing the answers with the "Reason for request" (Table 7.4) shows that among those who used the data in GIS, 70% requested it for "Analysis and research" while the remaining 30% acquired it for "Commercial purposes"; none of those who used the data for "Policy planning" used it in GIS. As regards the integration of data with other sources or administrative archives, 61.9% requested them for "Analysis and research", 33.3% for "Commercial purposes" and the remaining 4.8% for "Policy planning".

Table 7.5 shows the results of cross-referencing the answers to the two questions concerning the use of data received with GIS tools and its integration with other sources. 53.1% of the interviewed users (17 out of 32) showed advanced specialisation in data processing, applying them either through GIS or in an integrated way with other data sources. 9.4% (3 out of 32) used them only through GIS and another 12.5% (4 out of 32) exclusively in an integrated manner with other data; the remaining 25% (8 out of 29) stated that they did not use the data either with GIS tools or in an integrated manner with other data.

Table 7.5 - Distribution of respondents according to "Use of data with GIS tools" and "Integration with other sources"

		Integration of sources		
		Yes	No	**Total**
Use of GIS tools	Yes	17	3	**20**
	No	4	8	**12**
	Total	**21**	**11**	**32**

Source: Authors' processing of survey results

Returning now to the set of respondents who stated that they integrated the data received with other statistical sources (21 out of 32), in 19 cases the sources or archives used were specified. These are grouped as follows:

- Sources of economic data: Internal Revenue Service, Bank of Italy, Ministry of Economy and Finance, Chamber of Commerce;

- Institutional sources: Istat, Eurostat, Ministry of the Interior;
- Sources of data on housing and buildings: Topographic Databases, Land Registry, Military Geographic Institute (IGM), Real Estate Agencies;
- Sources of school data: Italian National Institute for the Evaluation of the Education and Training System (INVALSI);
- Internal or Local sources.

7.4 Data Quality Satisfaction

This section analyses the answers to the question on the degree of satisfaction with the level of quality[9] of the data provided about the purposes for which they were requested and acquired.

Table 7.6 shows that 53.1% of the respondents were "fully" satisfied with the quality of the data received, 40.6% were "only partly" satisfied, and 6.3% were negative about the quality of the data acquired.

Table 7.6 - Distribution of respondents on "Level of satisfaction with data quality" by "Reason for request"

Reason for request	Satisfaction level of data quality			Total	%
	Fully	Partially	No		
Analysis and research	9	12	1	**22**	68.7
Commercial purposes	5	1	1	**7**	21.9
Policy planning	3	0	0	**3**	9.4
Total	**17**	**13**	**2**	**32**	
%	53.1	40.6	6.3		**100.0**

Source: Authors' processing of survey results

Cross-referencing the answers with the reason for the request, the users who used the data for analysis or research purposes are those who would have needed data characterised by a higher level of quality. This indicates a strong focus and expectation of academic and research users towards high-quality data, precisely because of the specificity of their study and analysis objectives.

9 In terms of relevance, accuracy, punctuality, clarity, comparability and consistency.

An analysis of the comments left by users who were partially satisfied with the quality of the data they received (12 out of 13) showed that rather than expressing an opinion on one of the aspects characterising the quality of the data, they specified difficulties or impossibilities in carrying out in-depth studies for all or some of the set study, analysis or research objectives. These hindrances were declared not because of the quality of the data, but for different reasons, including:

- unavailability of more detailed (informative or spatial) data;
- limited comparability of data with other sources or other census occasions for classification purposes.

7.5 Future requests

Let us now analyse what users have indicated about the possibility of making new requests for census data to Istat in the future.

Regarding the possibility of requesting new data from previous Population and Housing Censuses up to 2011, 78.1% responded that they would, while the remaining 21.9% did not exclude this possibility. None of the respondents stated that they would no longer request data from past censuses.

The next question referred instead to the possibility of requesting data from the new Permanent Census of Population and Housing in Italy. In particular, users were asked whether they would like to request the same census data supply as in the past or whether they would like to request data with a different classification or spatial detail. It should be noted that, as this was a multiple-choice question, several users gave more than one answer and the data had to be read in a different way than before.

From the results shown in Table 7.7, it can be observed that 50% of the respondents will confirm for the Permanent Census the same request made in the past or even other data, 43.8% will request, also or only, data referring to different details, 31.3% will request, also or only, data referring to different thematic crossings (other census topics). In addition, 12.5% of the respondents will request, also or only, other types of data, and finally 6.3% will not request any kind of data provision referring to the Permanent Census.

Table 7.7 - Number of observed answers to the question (multiple choice) whether the same or different data will be requested for the Permanent Census than in the past (separate answers)

Users' intentions to request the same or different data for the Permanent Census as for previous censuses		
Possible answers (multi-response question)	No. of responses	%
Yes, the same data supply	16	50.0
Yes, but data referring to different details	14	43.8
Yes, but data referring to different thematic crossings	10	31.3
Others	4	12.5
No, I will not ask for new data	2	6.3

Source: Authors' processing of survey results

As the user could provide more than one answer, these were reclassified (Table 7.8) to have a better indication of the possibility of future requests for Permanent Census data. In particular, 25% of the users will ask for the same data and nothing else, 40.6% will be interested in data with different information details, 25% will ask for both the same data as requested in the past and data for different details or census crossing, 3.1% will ask for other types of data without specifying the detail and, finally, 6.3% will ask for nothing. In summary, 93.7% will still ask for sub-municipal data concerning the Permanent Census of Population and Housing.

Table 7.8 - Number of observed answers to the question (multiple choice) whether the same or different data will be requested for the Permanent Census than in the past (re-classified responses)

Users' intentions to request the same or different data for the Permanent Census as for previous censuses		
Possible answers	No. of responses	%
It will only require the same data supply	8	25.0
It will only require data referring to different details or different thematic crossing	13	40.6
It will require the same supply of data and data referring to different details or different thematic crossings	8	25.0
It will require more data without specifying	1	3.1
It will not require new data	2	6.3
Total	**32**	**100.0**

Source: Authors' processing of survey results

Users belonging to the types "Research Institution, University, School" and "Enterprise, Self-employed" expressed a clear intention (around 90%) to request the same data supply and/or data with different details and/or different thematic crossings for the Permanent Census than in the past. This result indicates the need to ensure continuity in statistical production and the

provision of census data with a high spatial detail. This is the only way to enable specialised users to continue their studies and research over the years and to guarantee a comparison with the past.

The analysis of the types of additional data that users are interested in obtaining from the Permanent Census shows that there is a strong need for data on enumeration areas and, in the case of dwellings and buildings, also georeferenced to the address. There is also a need for more integrated data, especially for dwellings and buildings.

Finally, several themes were indicated for which users expect to have data available with the Permanent Census. They include the occupation of the employed; commuting matrix between municipalities; type of system and type of fuel for heating and hot water; air-conditioning systems; and structural variables on unoccupied dwellings.

7.6 Contact Centre service satisfaction

In the last question of the questionnaire, the user was invited to express an opinion on the quality of the service received from the Istat Contact Centre. Tables 7.9 and 7.10 show the answers regarding the different degrees of satisfaction with the Istat service cross-referenced, respectively, with the "Type of user" and the "Reason for request".

As a datum in common between the two tables (reported in the last two rows) it should be noted that: 28.1% of respondents considered themselves fully satisfied with the service, 56.3% were satisfied, 15.6% were not very satisfied and no one declared themselves totally dissatisfied. It can therefore be assumed that 84.4% (27 out of 32) appreciated the service of the Istat Contact Centre at all stages of processing the customised processing, from the first contact to the sending of the data files. Around this general figure is the percentage of users who declared themselves satisfied depending on the type or reason for which the data were requested and used.

The cross-reference of the answers with the "Type of user" (Table 7.9) shows that 80% of the users belonging to the category "Research Institution, University, School" (16 out of 20), 88.9% of the type "Enterprise, Self-employed" (8 out of 9) and all users belonging to the category "Public Administration", were generally satisfied.

Table 7.9 - Distribution of respondents on "Level of service satisfaction" by "Type of user"

Type of user	Level of satisfaction with the Contact Centre service				Total	%
	Fully satisfied	Satisfied	Not very satisfied	Totally dissatisfied		
Research Institution, University, School	5	11	4	-	**20**	62.5
Enterprise, Self-employed	4	4	1	-	**9**	28.1
Public Administration	-	3	-	-	**3**	9.4
Total	**9**	**18**	**5**	**-**	**32**	
%	28.1	56.3	15.6	-		**100.0**

Source: Authors' processing of survey results

On the other hand, cross-referring the answers with the "Reason for request" (Table 7.10), 81.8% of the users who requested the data for "Analysis and research" (18 out of 22), 85.7% of those who requested it for "Commercial purposes" (6 out of 7) and all of those who used it for "Policy planning" were satisfied.

Table 7.10 - Distribution of respondents on "Level of satisfaction with the service" by "Reason for request"

Reason for request	Level of satisfaction with the Contact Centre service				Total	%
	Fully satisfied	Satisfied	Not very satisfied	Totally dissatisfied		
Analysis and research	6	12	4	-	**22**	68.7
Commercial purposes	3	3	1	-	**7**	21.9
Policy planning	-	3	-	-	**3**	9.4
Total	**9**	**18**	**5**	**-**	**32**	
%	28.1	56.3	15.6	-		**100.0**

Source: Authors' processing of survey results

At the end of the questionnaire, the respondents were allowed to point out any critical issues they had encountered or make suggestions for improving the data delivery and service of the Istat Contact Centre. Below is a summary of the comments left by the respondents (16 out of 32) grouped according to three different areas.

- Indications of supplies for the future:
  - structural data on housing and buildings;
  - data on non-residential buildings;
  - expansion of the information collected by the Permanent Census.

- Criticalities of the Contact Centre service:
  - excessively long time for the release of the supply;
  - excessive bureaucracy in practice;
  - high cost.
- Proposals for improving the service:
  - greater accessibility of micro-data;
  - possibility to interact with the technical services of Istat that produced the data;
  - lowering costs for students, Ph.D. students, and young people.

8. Analysis of the continuity of demand for census information

In this area, a study was conducted on the expected level of "continuity" of future requests, in terms of thematic content, compared to the past, through analysis of census crossings requested by users in the past and based on responses to the questionnaire on the possibility of requesting Permanent Census data.

The first step involved a careful review of all requests for customised processing of 2011 Census data, received by the Contact Centre from 2015 until early 2021, for the 44 users who received the data (see paragraph 5.2). The census crossings requested were subsequently classified by different census topics. Following this, for each of the 44 users considered in the analysis, the different types of data requested were identified (in many cases users requested data for different topics), also grouping those requests associated with the same user that arrived in different years during the period considered (2015-2021).

In this way, it was possible to assess, for each census topic, what proportion of the total number of users who acquired the data was requested.

The same analysis was also conducted on the 32 users who answered the questionnaire to assess which types of data those who took part in the survey requested. For these users, question 9 of the questionnaire defined the topic of data they could request for the Permanent Census, possibly with a different detail. This information, cross-referenced with that relating to the census topics of data requested in the past, gave useful indications as to which topics will have a greater propensity to be requested from Istat in the coming years, as the Permanent Census consolidates its data production and dissemination process. The results of the analysis are summarised in Table 8.1.

Taking census topics F - "Structural characteristics of dwellings" as an example, the following information can be read in Table 8.1:

- 31.8% of users who made requests to the Istat Contact Centre (14 out of 44) from 2015 to early 2021 asked for supplies that included data on the "structural characteristics of dwellings";
- 31.3% of the users who participated in the survey (10 out of 32) had requested data on the "structural characteristics of dwellings" in the past;

- 71.4% of the users who acquired data on the "structural characteristics of the dwellings" took part in the survey (10 out of 14);
- 90% of respondents who have asked for data on the "structural characteristics of dwellings" in the past (9 out of 10) will also ask for it concerning the Permanent Census.

Table 8.1 - Number of total Contact Centre users and survey respondents classified by the different types of census data asked in the past and to be asked again in the future

	Census topics	Contact Centre users	% of total users (44)	Interviewed users	% of total respondents (32)	Response rate of respondents by topic	Respondents requesting data on the same topic	Confirmation rate of the census topic
A	Education	7	15.9	6	18.8	85,7	2	33.3
B	Current activity status	8	18.2	5	15.6	62,5	3	60.0
C	Employment characteristics	25	56.8	20	62.5	80,0	15	75.0
D	Family type	7	15.9	5	15.6	71,4	3	60.0
E	Ownership/right of use of housing	6	13.6	4	12.5	66,7	3	75.0
F	Structural characteristics of dwellings	14	31.8	10	31.3	71,4	9	90.0
G	Heating systems and fuel	14	31.8	10	31.3	71,4	7	70.0
H	F and G	8	18.2	6	18.8	75,0	5	83.3
I	F or G	20	45.5	14	43.8	70,0	11	78.6
L	Buildings	3	6.8	2	6.3	66,7	1	50.0
M	Foreigners	8	18.2	8	25.0	100,0	7	87.5
N	Commuting	1	2.3	1	3.1	100,0	1	100.0

Source: Authors' processing of survey results

9. Concluding remarks

The survey described in this article was the first conducted by Istat on a specific target of users, intending to assess the match between user demand and the supply of reliable and timely statistics, according to principles of the European Statistics Code of Practice. An attempt was made to measure the extent to which essential information for different actors in the economy, research and institutions is met by that produced by Istat, whose main vocation is to produce and disseminate data and analysis on relevant phenomena in an accessible and clear manner.

The evaluation was equally extended to the user support service offered by the Istat Contact Centre which, in the extensive and articulated data dissemination system, represents the main channel for requesting personalised processing.

The results of the survey provide a well-established positive opinion among specialist users, many of whom have become loyal over time, on which to draw for further reflections/planning between the production and dissemination of statistical information.

Moreover, the results of the survey made it possible to define the set of census data referring to the sub-municipal levels that are highly expected by users to conduct studies and research, also with the use of GIS and integration with other data sources. The data most frequently requested - and which will continue to be requested by users - concern the population's level of education, current activity status, status in employment (position in the occupation), type of work (occupation) or sector of economic activity (industry) of employed, type of family and structural characteristics of dwellings.

It follows that Istat must concentrate more effort, both in the data collection phase and in the phase of defining statistical methodologies, so that the supply of sub-municipal census data for the new Permanent Census is relevant to users' needs.

As we have not found in other foreign countries a user survey similar to the one presented in this article, we suggest that this type of comparison with specialised users (the census stakeholders) and analysis of user needs should be done in advance by all NSI of countries that intend to innovate their census strategy in favour of greater integration of administrative and sample data, to properly assess the impact on data supply concerning relevance to user expectations.

Annex – Istat's user Satisfaction Questionnaire

This section describes the questions and possible answers of the questionnaire used by Istat for the survey presented in this article.

1. At the time of your request, what type of user did you belong to?

- ○ Research Institution, University, School
- ○ Enterprise, Self-employed
- ○ Public Administration
- ○ Other (specify)

2. Can you indicate the main reason for your request for data?

- ○ Analysis and research
- ○ Commercial purposes
- ○ Policy Planning
- ○ Other (specify)

3. Can you briefly explain the objectives for which you used the data provision?

Short description of the topic of the analysis/research or presentation of the abstract of the work carried out

4. Did the level of spatial detail as well as the classificatory level (*e.g.* 5-year or 10-year "age class"; 6-mode or 17-mode "level of education"; 3-mode or 21-mode "sector of economic activity") of the data provided meet your needs?

- ○ Yes, fully
- ○ Yes, but I would have had more opportunities with more detailed data
- ○ No (specify)

5. Has the data received been used with GIS tools?

- ○ Yes
- ○ No

6. Has the data received been integrated with other statistical sources?

- ○ Yes (please specify)
- ○ No

7. Did the level of quality (in terms of relevance, accuracy, timeliness, clarity, comparability and consistency) of the data provided meet your needs?

- o Yes, fully
- o Only partly, because I would have needed data with a higher level of quality (please specify the reasons)
- o No (specify reasons)

8. Do you think that in the future you will make new requests for the supply of census data to Istat, also about Censuses other than that of 2011?

- o Yes
- o No
- o I don't know, but I don't rule it out

9. Concerning the new Permanent Population and Housing Census, do you think that in the future you will be able to request the same type of data as in the past or will you need to request data with a different classification or spatial detail? [Multiple answers are possible].

- o Yes, the same data supply
- o Yes, but data referring to different details
- o Yes, but data referring to different census topics
- o Yes, but other data (please specify which types of data you may require)
- o No, I will not ask for new data

10. How would you rate the overall quality of the service you receive from Istat?

- o Fully satisfied
- o Satisfied
- o Not very satisfied
- o Totally dissatisfied (specify why)

11. If you wish, you can leave a comment, point out any critical issues or make suggestions to improve the service.

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