INEGI

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The relevance of combination of data collection methods in the Business Surveys during and after the COVID-19 pandemic in Mexico

Session: Cross-cutting topics

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Abstract

The National Institute of Statistics and Geography (INEGI for its acronym in Spanish) presents the strategy of diversification of collection methods that have followed the business surveys in our country to maintain and increase the levels of response that positively affect the quality of the statistics generated.

Diversification of data collection methods represented a strength to face the health contingency caused by COVID-19 in our country, since it allowed a collection strategy to be designed and implemented during the pandemic based on the methods which do not involve interaction between people.

Acronyms of interest

1. **INEGI:** National Institute of Statistics and Geography.

2. **SNIEG:** National System of Statistical and Geographic Information.

3. **EEN:** National Business Surveys.

4. **EAIM:** Annual Manufacturing Industry Survey.

5. **EAEC:** Annual Survey of Construction Companies.

6. **EAT:** Annual Transportation Survey.

7. **EAC:** Annual Trade Survey.

8. **EASPNF:** Annual Private Non-Financial Services Survey.

9. **EMOE:** Monthly Survey of Business Opinion.

10. **ENEC:** National Survey of Construction Companies.

11. **EMIM:** Monthly Manufacturing Industry Survey.

12. **EMEC:** Monthly Survey on Commercial Enterprises.

13. **ECOVID-IE:** Survey on the Economic Impact Generated by COVID-19 on Businesses.

14. **CAWI:** Computer Assisted Telephone Interviewing.

15. **CATI:** Computer Assisted Telephone Interviewing.

16. **CAPI:** Computer Assisted Personal Interviewing.

17. **SIEUE:** Integrated System of Surveys in Economic Units.

18. **IETIC:** Individual Fieldwork Effectiveness Indicator.

19. **ICIC:** Field Information Quality Indicator.

I.   Introduction

The National Institute of Statistical and Geography (INEGI for its acronym in Spanish) presents the strategy of diversification of collection methods that have followed the business surveys in Mexico to maintain and increase the levels of response that positively affect the quality of the statistics generated.

In that sense, set of methods of information capture made up of the Computer-Assisted Internet Interview, the Computer-Assisted Telephone Interview, as well as the Computer-Assisted Personal Interview (CAWI, CATI and CAPI, respectively) stand out.

Diversification of collection methods represented a strength to face the health contingency caused by COVID-19 in Mexico, since it allowed a collection strategy to be designed and implemented during the pandemic based on the combination of CAWI and CATI methods mainly, since these do not involve interaction between people.

It should be noted that the use of CAWI is prioritized; however, during the contingency period respondents were also able to opt for the delivery data through CATI, as appropriate to the conditions in which they were operating at that time.

Likewise, the strategy was expanded when the health contingency allowed the interaction between people by adding to that combination the collection by CAPI, in such a way that respondents of the business surveys could continue to select the most efficient method to make their delivery of data to the INEGI.

In addition to the above, it was implemented to capture additional information to that recorded in the questionnaires, especially of employed personnel, the level of remuneration given the temporary closures and the hours worked in production processes, with which the methods of estimation of missing data were refined.

The generation and analysis of statistical accuracy indicators, the identification of study domains with reservation for the use of estimates, as well as the preparation and dissemination of notes to users on the accuracy of the data, were the additional results of the strategy of combining capture methods.

All the positive results obtained allow us to conclude that the strategy of combining imputation methods should prevail in post-pandemic times, however, it should be reviewed periodically.

II.   Background

Production of periodic statistics on the activity carried out by companies and establishments of the various economic sectors in Mexico began in the sixties of the last century.

In 1963 the Manufacturing Annual Survey (EAIM for its acronym in Spanish) emerged, being at that time the first regular survey carried out in economic units in the country; and in 1964 the Manufacturing Monthly Survey (EMIM for its acronym in Spanish) was designed and implemented, which came to complement the production of statistics of the Mexican industrial sector through short-term measurement.

It was not until 1983 when the Construction Companies National Survey (ENEC for its acronym in Spanish) and the Trade Enterprises Monthly Survey (EMEC for its acronym in Spanish) were launched.

In 1993 the Monthly Service Survey (EMS for its acronym in Spanish) emerged, a pioneer in the country and rarely carried out internationally.

The measurement of the situation of trade and construction activity in the country carried out by EMEC and ENEC respectively, was complemented in 1994 with the Annual Trade Survey (EAC for its acronym in Spanish) and in 2000 with the Construction Companies Annual Survey of (EAEC for its acronym in Spanish).

In 2004, the Annual Transport Survey (EAT for its acronym in Spanish) was launched, as well as the Monthly Business Opinion Survey (EMOE for its acronym in Spanish) which, unlike the surveys, allowed the generation of qualitative indicators on the behavior of economic activities.

It is important to mention that initially the EMOE focused on manufacturing industries, however, the sectorial coverage was expanded by adding construction and trade in 2011, as well as private non-financial services in 2017.

The recurrent measurement of the services sector was complemented in 2005 when the Annual Survey of Private Non-Financial Services (EASPNF for its acronym in Spanish) was first launched.

The following diagram shows the evolution of business surveys in Mexico.

Business Surveys Beginning
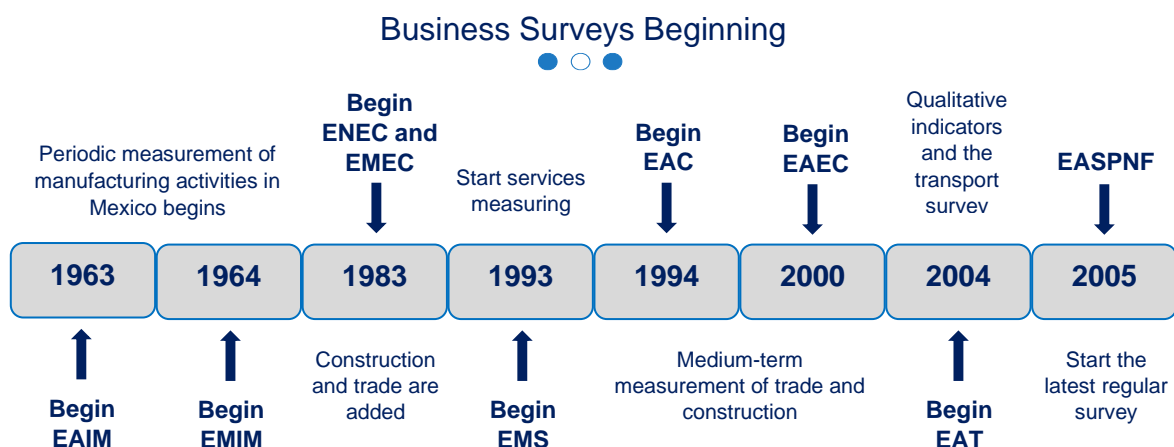
Throughout its long history, all surveys have constantly evolved to generate economic statistics in accordance with the reality of the country. In this sense, the specific activities measured in each sector were expanded, the statistical design was updated and, therefore, the sample size under study was increased; likewise, the current international and national recommendations were adopted, highlighting the implementation of the updated versions of the classifier of economic activities used for the capture, processing, and dissemination of the results.

III. Legal framework for the generation of surveys in economic units.

On April 16, 2008, the Law on the National Statistical and Geographic Information System was decreed, regulating Section B of Article 26 of the Political Constitution of the United Mexican States, which aims to regulate the National Statistical System itself, the rights, and obligations of the informants of the System, as well as the organization and operation of INEGI.

According to the Law, the National System of Statistical and Geographic Information (SNIEG for its acronym in Spanish) aims to provide the State and Society with quality, relevant, relevant, and timely information to contribute to national development.
According to the Law itself, the SNIEG is composed of four National Information Subsystems:

a) Demographic and social
b) Economic
c) Geographical, Environment and Territorial and Urban Planning
d) Government, Public Security and Delivery of Justice

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The National Economic Subsystem[1] should generate a set of key indicators related to the system of national accounts; science and technology; financial information; prices and work.

It is established that to generate the set of indicators indicated, information from the following sources will be used:

I. Economic and agricultural censuses.
II. An integrated system of surveys in economic units.
III. The administrative records that allow obtaining information on the matter.

The integrated system of surveys in economic units is defined as the set of surveys carried out in Mexico in a standardized manner, which are oriented to the production of basic economic information of the main characteristics of companies and establishments in the context of the SNIEG.

The main objectives of the integrated system are the following:

1) Carry out the business surveys with the criteria of technical and methodological homologation, focusing on the production of basic statistics towards the standardization of its processes.

2) Offer society the technical, regulatory, and methodological elements used in the different phases involved in the production of statistical information from surveys in economic units.

3) Encourage linkage with other systems and / or related projects such as the system of national accounts, economic censuses, and prices.

The conformation of the Integrated System in Economic Units (SIEUE) is described in the following diagram.

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[1] Described in Articles 23rd, 24th y 25th of SNIEG Law.

Conformation of the Integrated System

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Internal
Statistical Programs of Business
Surveys by INEGI

External
Business Surveys by State Units

- Construction
- Manufacturing
- Trade
- Services and Transport
- Business Opinion

Monthly and Annual Basis

- Research and Technological Development (National Council of Science and Technology)
- Financing of Companies (National Banking and Securities Commission)

The internal subsystem is made up of five programs and 10 statistical processes that oversee INEGI, which are described in the following table.

Programs		Processes	
Num.	**Description**	**Num.**	**Description**
1	Construction	1	National Survey of Construction Companies
		2	Annual Survey of Construction Companies
2	Manufacturing	3	Monthly Manufacturing Industry Survey
		4	Annual Survey of the Manufacturing Industry
3	Trade	5	Monthly Survey of Commercial Companies
		6	Annual Trade Survey
4	Services and Transport	7	Monthly Service Survey
		8	Annual Survey of Private Non-Financial Services
		9	Annual Transport Survey
5	Business opinion	10	Monthly Survey of Business Opinion

IV.   Evolution of the means of collection used by business surveys.

Since the beginning and for about four decades, surveys in economic units used exclusively paper questionnaire for data collect in the production of monthly and annual statistics.

Technological advances prevailing made it possible to promote the diversification of the means of collection, which were used in the field operations of business surveys.

In 2000 began the plan to develop a website that would allow digital means to data collect in a more agile way and ensuring to a greater extent the quality of the data collected from the economic units sampled in the surveys.

The plan yielded its first results in 2003 when the section entitled "For the respondent" was launched within the INEGI website, in which the electronic questionnaire capturer was made available for the use of respondents.

This system included a set of automated validations that contributed to the verification of the logical relationships between variables of the same questionnaire, thus ensuring the quality of the data reported by the respondents of the statistical programs and processes, at the very moment of the data provision.

Being an agile, safe and permanently available means, collection through the Computer-Assisted Internet Interview (CAWI) became the most efficient means of collection.

The use of the paper questionnaire and the collection through the Internet coexisted for some years, being until 2011 when INEGI´s Telephone Interview Center was inaugurated, which represented having a third means of collection designed, and implemented within the framework of the strategy of diversification of collection means promoted at the beginning of the 2000s.

The Computer-Assisted Telephone Interview (CATI) as a means of collection, was mainly intended for the collection of qualitative data, required in the production of the indicators of the EMOE.

It is worth mentioning that CATI interview has also been useful for the preparation of various special studies such as the Survey on the Effects of Earthquakes of September 2017 in Mexico, which offered qualitative information generated based on the opinions of entrepreneurs, to contribute to the making of timely decisions to address the emergency caused by such natural phenomena in the economic activities of companies and establishments.

In 2004, INEGI ventured for the first time into the use of electronic devices to carry out information surveys in economic units[2], this was through a personal digital assistant type computer device. This fact served to carry out the tests for use in short- and medium-term field operations, that is, for the monthly and annual surveys respectively, as well as for the special surveys carried out.

In 2012 devices with classmate architecture were used that are considered mini laptops convertible to tablet, which are easier to operate due to their size, more resistant for field work, with a keyboard that could be operated manually or by means of a touch screen and, above all, with greater processing capacity and storage of information for regular operations.
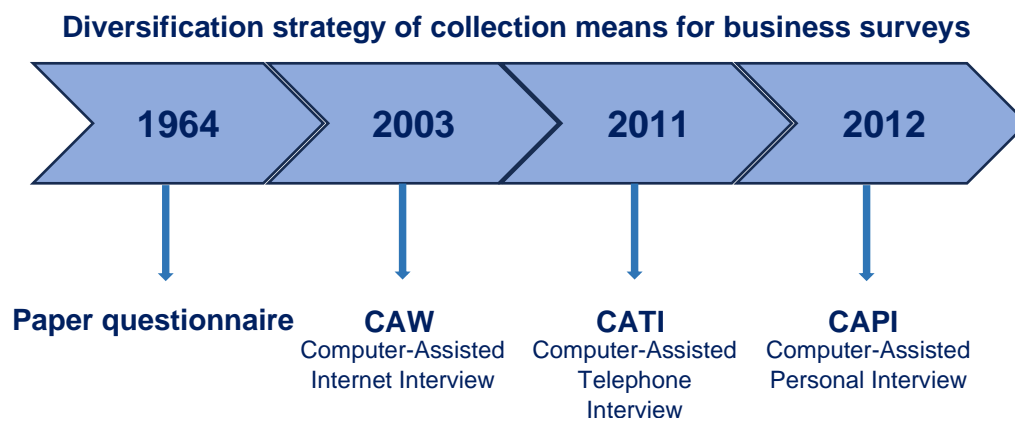
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[2] This was used in Economic Census of 2004.

The Computer-Assisted Personal Interview (CAPI) has been used since 2012 to collect data. In this sense, this interview completed the set of means of collection regularly used in the field operations of the statistical programs of business surveys.

V.   Field operational strategy.

The strategy of collection means diversification was initiated, designed, implemented and consolidated over a period of approximately 10 years, providing all respondents of the surveys in economic units the possibility of selecting the means of data supply to INEGI that best adhered to their operating conditions.

Diversification strategy of collection means for business surveys

1964	2003	2011	2012
Paper questionnaire	CAW Computer-Assisted Internet Interview	CATI Computer-Assisted Telephone Interview	CAPI Computer-Assisted Personal Interview

Diversification strategy of collection means was strengthened with a set of field operational actions that contributed to the consolidation of the strategy in an integral way.

a) Prioritize collection through Internet.

Since its launch in 2003, the strategy of considering the CAWI interview as a means of priority collection has been defined.

In this context, in the design and implementation on field operational strategy that is carried out annually, a set of actions were established to increase the use of the CAWI interview among all respondents, emphasizing those who use a different medium and, above all, establishing it as the main means for the provision of data from the new economic units that are incorporated into the survey samples.

Such a strategy is accompanied by an awareness campaign among potential respondents and those new ones, which aims to agree on the use of CAWI for the delivery data.

It is important to note that during this awareness campaign, the user and password keys are given to enter the collection system of the business surveys on the web site to all potential respondents (both existing and new).

The necessary advice is provided on the use of the Internet capturer, pointing out the great advantages of this means of data collection compared to the one used regularly by the informants.

The strategy defined for CAWI to be the means of collection for excellence in business surveys has paid off. Almost eight out of ten economic units of the sample deliver data to INEGI through the Internet. That is, considering an average sample size of 30,000 economic units, about 24,000 provide data to INEGI by this means of collection.

b) Evolve the activities of interviewers.

As part of the prioritization of collection through Internet, the preponderant function oversees the interviewers of the business surveys. Since the launch of this type of interview as a means of collection, the essential activities that they must attend under this framework were defined.

The main activity consists of regular monitoring data provision with the respondents themselves, becoming data managers through daily contact with the representatives of the companies and establishments responsible for the delivery.

In this context, it was established the sending of emails and the making of telephone calls to maintain permanent contact with respondents who are not visited regularly. Within this activity, the personal visit to the respondents at least twice a year stands out as part of the established comprehensive follow-up.

The periodic contact with respondents who regularly use the Internet for the provision of their data, allowed to integrate a database with email accounts and telephone numbers, which is kept permanently updated.

A relevant activity that is carried out within the framework of the follow-up to the capture through the Internet is the advice that all the interviewers provide to the respondents on the use of the capturer. This advice is offered permanently and is established as part of the field operational strategy for those who request it directly, as well as for new respondents that are given by changes in the economic units or by their incorporation into the sample of the surveys.

c) Implement additional indicators for operational monitoring.

Until before the diversification of the collection means for business surveys, the monitoring of the results of the field operation was given exclusively from the number of economic units captured in relation to the total sample.

It was not until 2013 that the operating conditions allowed to establish the follow-up not only to the number of questionnaires collected, but also two qualitative attributes that the information captured must meet were considered: Opportunity in the delivery

and quality of the data. In this sense, two indicators were established for field operational monitoring.

The first was the Indicator of Effectiveness of Individual Work in the Field (IETIC for its acronym in Spanish) that allows to know the results of the operational structure in the timely capture of information, through a monthly measurement mechanism, which also makes it possible to improve recovery levels.

The second is the Field Information Quality Indicator (ICIC for its acronym in Spanish) whose main objective is to assess the correct application of the basic criteria of field review to the information captured monthly by the operational structure, to know the status of the information in the capture stage and continuously improve the quality levels of the information provided by the economic units in sample.

## VI.   Combination of means of collection before the pandemic.

The strategy of diversifying the means contributed to the levels of information retrieval during the last 12 years.

As can be seen in the following graph, the diversification of means strengthened in the period 2009-2019, with CAWI, CATI and CAPI.

In this context, the use of the Internet was consolidated with the main means of capture in that period, increasing its level to 75% in 2018. This increase was reflected in the decrease in face-to-face interview, which went from representing 50% at the beginning of the period to around 25% in the last years of the series shown in the following chart.

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**Business surveys, according to collection mean
(Annual average)**

Percentage

Annual average (National Business Surveys)
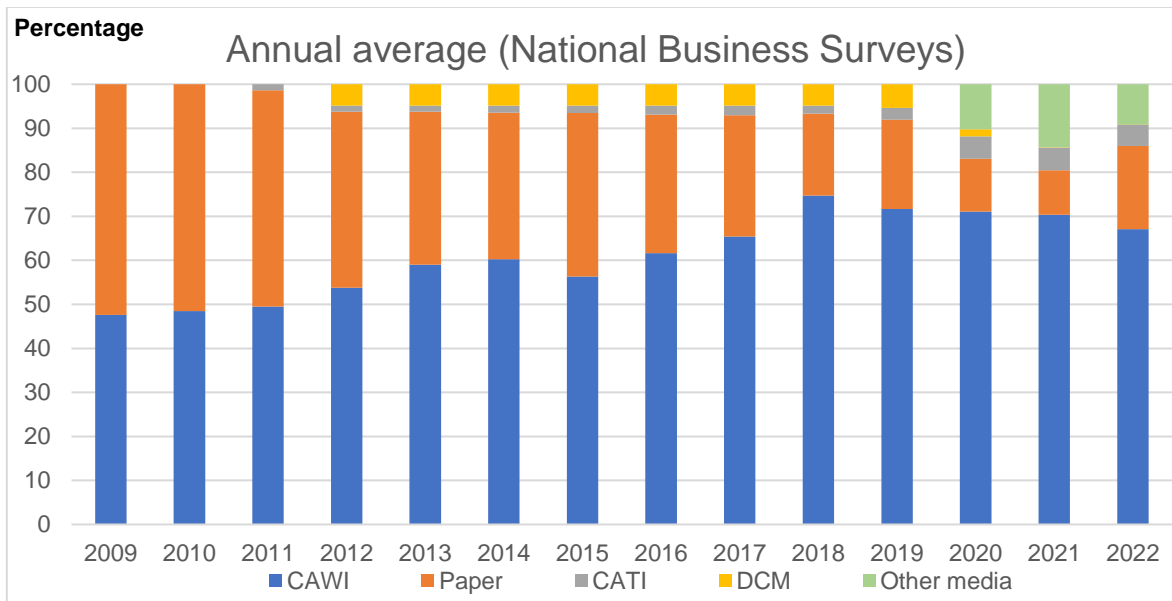
Source: INEGI.

The wide range of data collection media available for the supply of data by Business Survey respondents allowed respondents themselves to select the medium that best suited their operating conditions. The above, considering the established action of prioritizing the supply through the Internet described in the previous section.

In general terms, the field operational strategy to increase the use of Internet is addressed in three aspects.

1. The first one focused on the economic units that belong to the samples of the surveys and, that are captured through means other than CAWI. In this sense, the first follow-up visit that is made to all the respondents in question stands out, to notify them of the start of the field operation, which is regularly done in the first months of each year.

   This visit establishes the commitment to provide INEGI with the monthly data required to produce the business surveys. Also, as part of the defined field strategy, the respondent is encouraged to use the Internet to provide data.

The moment of the interview is used to promote CAWI and show the most important advantages that such a means of capture has compared to the other instrumented media. The objective is that year after year a greater number of respondents opt for the supply through the Internet.

2. In the second instance, in the case of the economic units that are incorporated in the sample, the line designed is that the provision of information through the

Internet as a means of single collection be established together with the new respondents. Only in very specific cases do the interviewers agree to the delivery by another means and integrate the documentation of such a decision to assess its relevance.

3. Finally, this first follow-up visit is also made with the respondents who provide their information through the online. In this sense, it seeks to endorse the use of this means to continue counting on the information of its economic units.

It should be noted that Internet users regularly endorse this means to deliver their data to the INEGI. However, if they request any changes, they are accepted on the condition that they return to the use of the Internet when possible or at the end of a period agreed with the interviewer.

In accordance with the above, the permanent availability of the means of collection (paper questionnaire, CAWI, CATI and CAPI) for data collection allows an efficient combination of these to maintain high levels of information collection, always tending to prevail the CAWI interview.

VII.   The data collection during the Covid-19 pandemic

The contingency by COVID-19 had a strong impact at a global level, representing a challenge of such dimensions that it required all the attention of organizations, institutions, and countries to generate proposals and implement actions to face it. About statistical and geographical activities, a set of field strategies was required to ensure the continuity of statistical programs to provide information that would allow timely decisions to be made in the various sectors of society.

In accordance with the above and based on the state of health emergency that COVID-19 caused, INEGI determined extraordinary measures regarding the operation of statistical programs and processes, among which are business surveys.

The specific actions that were established guaranteed as far as possible the essential operation of the production and dissemination of the statistical and geographical information that the country required at that juncture, while it was privileged to minimize the exposure of personnel and comply with the measures of the state of health emergency decreed by the Federal Government.

At the beginning of the pandemic, INEGI had to suspend information gathering activities through face-to-face interviews, following the General Guideline for the mitigation and prevention of COVID-19 in the generation of statistical and geographical information, published on July 2, 2020, in order not to expose staff to possible infections.

Derived from the above, it was not possible to continue collecting information through personal interviews, either using mobile computing devices or the use of paper questionnaires, since they involve interaction between people. In this context, only

the Internet and telephone calls remained in operation to deal with the situation arising from the pandemic.

The strategy designed by INEGI focused on strengthening the computer platform that supports Internet collection, to continue capturing 75% of the survey sample through this means. Likewise, collection efforts were redirected through telephone interviews, which represented the main means of contact to manage and capture the information of the remaining 25 percent.

It is important to note that while the collection efforts through CAWI and CATI were endorsed, the strategy was complemented by the adaptation of collection methods through the intensive use of information and communication technologies, motivating the use of digital technologies such as the use of email and social networks.

The collection of the business surveys by Internet and telephone interview represented modifications to the design of the capture and the processing and analysis of the production, to ensure the dissemination of monthly and annual statistics that denoted the reality of the economic activity of the country.

In accordance with the above, three updates were designed and implemented in the context of the production process of the business surveys, which relate to the design of the capture and the design of the processing and analysis of the production.

The implementation of changes because the effects on collection was applied in the monthly and annual processes, while the changes in the processing and analysis of the production were implemented exclusively in the monthly processes.

1. Privilege collection through on-line, telephone and digital technologies.

The use of the Internet and telephone interviews had already been used as means of collection by the business surveys prior to the health contingency, only various strategies were designed to privilege their use as a priority among all respondents, mainly with those who regularly provided data through the paper questionnaire.

Specifically, the following actions to privilege their use stand out:

- Updating and support of infrastructure to increase the number of users who enter data through Internet.
- Sending the questionnaires in editable formats (PDF and Excel files) to the respondents, in such a way that the face-to-face visits to the economic units were postponed.
- Assignment of telephone cards to field staff to give timely follow-up in the context of home-office.
- Follow-up through emails, video calls and/or phone calls.

This made it possible to ensure adequate levels of collection for the processing and analysis of the production of the surveys.

2. Use of new operational condition codes.

A permanent activity of the business surveys during the field collection is the verification of the operational condition of the economic units in sample, for which a set of operating codes that denote the specific situations is used.

The use of such operational condition codes makes it possible to identify the specific problem and, therefore, provide elements to apply the procedure of imputations of missing data.

The health emergency caused the need to design and implement new operating codes, to correctly identify the situation of the economic units derived from the contingency and to be able to define the correct imputation strategy belonging to the processing phase.

Of the set of operating codes designed and implemented until before the health emergency, two were identified whose use is associated with productive and operational activity: 07 Definitive closure and 10 Temporary closure.

Derived from the health contingency, it was necessary to resume the two previous operating codes and update their context according to the reality that originated the pandemic, remaining as described below: 07C Definitive closure for health contingency and 10C Temporary closure for health contingency.

Additionally, a third code, 22F Pending by risk area, was identified, which also merited an adjustment for use during the health emergency, remaining as 22F Pending due to health contingency.

The following table summarizes the changes to the field operating codes.

Code	Description	Contingency use
07C	Definitive closure for health contingency	Definitive code: For economic units with definitive closing of operations due to COVID-19 contingency.
10C	Temporary closure for health contingency	Transitory code: Assigned when the observation unit is closed and without activity during the reference period due to the COVID-19 contingency.
22F	Pending for health contingency	Pending code: To be assigned when at the closing date the economic units continue with their productive activity, but it was not possible to obtain information due to the COVID-19 contingency.

The previous change meant modifications to the Internet survey collection and field

operational strategy.

All the changes were implemented from the collection data of April 2020 and was made known to the entire operational structure by sending email and in virtual meetings with the entire operational structure.

According to the graph below, Internet is the most important means that business surveys must collect monthly information.

In the period January 2020 to December 2021, in which the main effects caused by the pandemic were presented, around 70% of the economic units captured used this means to provide the survey data. Secondly, the use of email or other digital media stands out with approximately 15%. It also highlights the elimination of the CAPI medium in those months.

Monthly collection of the Business Surveys by mean of collection

Business surveys, according to collection means
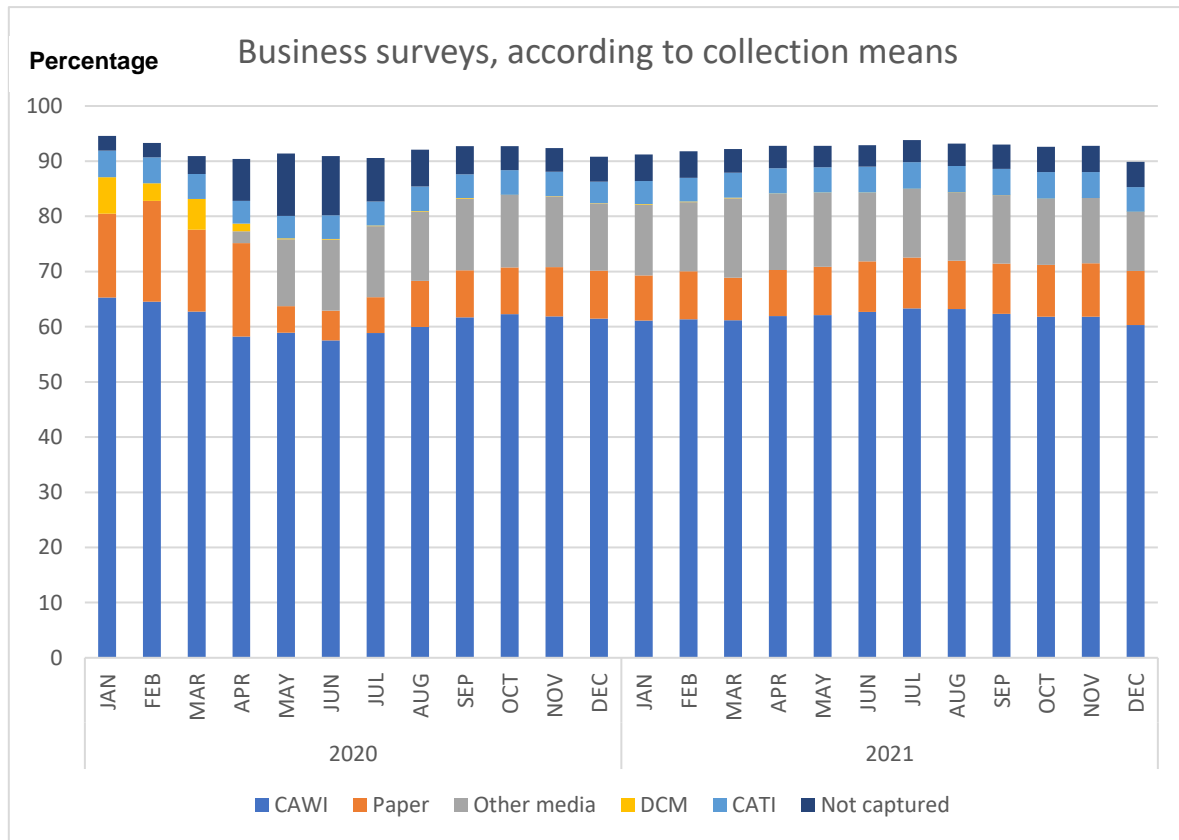
Source: INEGI.

3. Collection of special data for economic units with temporary closure due to health contingency.

Derived from the implementation of the new field operating codes, the 10C Temporary closure due to health contingency, actions were implemented to collect

information from the companies and establishments in sample, which during the contingency were identified with such a code.

The Additional Information Format was designed and implemented with the purpose of collecting data on the conditions of employed personnel, remuneration and incomes, in such a way as to provide relevant elements on the operational condition of the economic units with temporary closure for use during the processing phase.

Below is the number of economic units for which the additional information was collected, by study sector, for the period May-December 2020, which shows that as the months progressed, the collection of additional data for the economic units with temporary closure was reduced, especially since gradually the economic activities and field operations of the surveys were returning to normal.

Industry	2020							
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Construction	250	115	109	61	47	35	8	39
Manufacturing	434	259	179	72	73	65	12	87
Trade	547	341	235	98	75	67	15	97
Services	643	520	436	239	240	176	55	216
Business Opinion	22	14	12	5	6	7	1	7
Total	**1,896**	**1,249**	**971**	**475**	**441**	**363**	**91**	**446**

Source: INEGI.

Comparison between collection level by Internet and digital media

Percentage
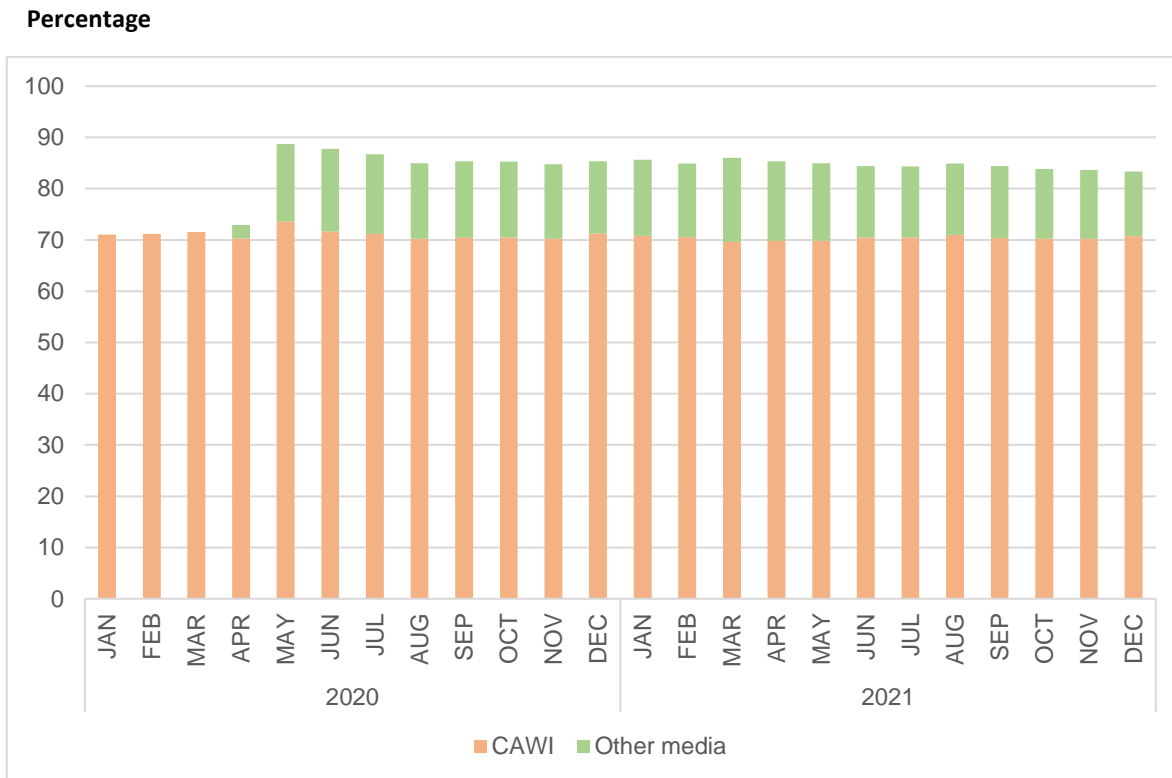
Source: INEGI.

During the period of the pandemic, digital media contributed decisively to the levels of collection. In the first months included in the previous graph, it is shown that digital media contributed with a 15% capture of the sample of business surveys and has remained stable throughout the period 2020-2021.

The great advance on Internet, together with the three strategies that influenced the collection design, contributed to the efficient development of the processing and analysis of the production, which ensured the continuity of the activities without registering any cancellation or modification of the dates previously established in the calendar of dissemination of statistical and geographical information of the INEGI.

Derived from the strategies implemented in terms of collection data, changes were made in the processing and analysis phases of production, which are described below.

a) Updating imputation methods for missing data on economic units.
b) Design and calculation of new quality indicators for the identification of domains with caution for the use of estimates.

The two strategies mentioned above were added to the strategies implemented in data collection phase, which together strengthened the production process so that

all statistical programs of business surveys continued to operate on a regular basis without any impact on the established dissemination dates.

The challenge of keeping the business surveys in regular operation was not the only one, since the need to produce timely information on the effects of the contingency caused by COVID-19 in companies in Mexico was added. In this sense, the Survey on the Economic Impact Generated by COVID-19 on Companies (ECOVID-IE for its acronym in Spanish) was generated to support decision-making in terms of public policies and offer elements of analysis for the realization of national and international studies.

The theme covered by ECOVID-IE, in general terms, is made up of qualitative information regarding the sanitary measures implemented by the company; operational actions implemented by the company; instrumentation of technical stoppages or temporary closure; affectations presented by the company due to the contingency; decrease in the main economic variables; support received; policies needed to support the company; and revenue expectation.

In accordance with the collection strategies of the business surveys, the means of recruitment was CATI, whose interviews were implemented through home office.

For this survey, three events were carried out, to know the evolution of the effects of the pandemic phenomenon[3].

VIII. The use of post-pandemic collection means

Little by little the economic activities, as well as the statistical and geographical activities themselves, have returned to the new normal, ending the COVID-19 health emergency on May 9, 2023, by the government of Mexico.

In this context, it highlights that in terms of the production of economic statistics in general and specifically for surveys in economic units, the production of all the economic indicators that were scheduled has been maintained on a regular basis, and that in the very complicated scenario that was lived they were decisive for decision-making by users of all sectors of national society.

This was possible thanks to the diversification and combination of collection means developed and consolidated prior to the arrival of the health emergency, which allowed the provision of basic data of the economic units to produce statistics of the sectors studied: construction companies, manufacturing industries, trade, and services.

INEGI had not considered a state of contingency as serious as that caused by COVID-19, however, the high level of collected data over the Internet and through

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[3] ECOVID-IE is available to be consulted on the next link on INEGI website:
https://www.inegi.org.mx/programas/ecovidie/

telephone calls allowed to adequately overcome the effects derived from the global pandemic.

Notwithstanding what has already been described, it was necessary to design and implement the set of field and processing strategies, which contributed to address the conditions for which greater effects were foreseen.

The main lesson was the resilience of the entire team that integrates the business surveys to quickly adjust to all the established changes.

Likewise, the intensive use of information and communication technologies for collection data, as well as the calculation of new quality indicators for the identification of domains with caution for the use of estimates and the dissemination of notes to users, must remain definitively in the business surveys.

At the beginning of the pandemic, the risk matrices of all the statistical programs of business surveys were updated, which until the arrival of COVID-19 had not considered such a complicated scenario for the development of statistical and geographical activities in charge of INEGI.

Action plans for contingencies of this nature and the like are now designed and structured, which represents one of the most important lessons for the performance of national statistical offices in the future.

IX.   Aftermath and future work

The availability of the CAWI, CATI, CAPI collection set, in addition to the use of paper questionnaires, represented the main strength to cope with the prevailing conditions during the months most affected by the pandemic. In this sense, it is concluded that the permanent availability of all collection means must prevail in the post-pandemic era, to provide informants with the alternatives of selecting the best means of providing information they consider.

The importance of timely, quality, open and disaggregated data and statistics has never been clearer than during the COVID-19 crisis. These data are critical to understanding, managing, and mitigating the human, social and economic effects of the pandemic.

The mechanisms in place ensured operational continuity by adapting and innovating data production methods and processes. Evaluations of statistical operations around the world show that investments and support for data innovations are urgently needed.

On the other hand, once the pandemic situation is over, it leaves us with the question of whether remote data collection will continue or remain a thing of the past. Disadvantages of remote data collection such as device connectivity in the field,

informant confidence and interviewer training have led to learning about opportunities to invest in improving the way we collect data remotely, which could open up opportunities to reach more people.

The implementation of field quality and statistical accuracy indicators have allowed us to measure the effectiveness of interviewers in applying basic field review criteria, recognize the work of operational staff in reviewing information, identify areas of opportunity in the review of information in the capture phase, and track trends in the status of quality.