

## A PANDEMIC HEALTH RISK MANAGEMENT MODEL FOR THE PROTECTION OF WORKERS: THE ISTAT EXPERIENCE<sup>1</sup>

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### 1. Introduction

The 2020 SARS-CoV-2 pandemic emergency pushed public Administrations to adopt gradual and timely managerial, organizational and technical choices for the health and safety protection of workers from this new risk. The National Institute of Statistics – Istat faced this extraordinary moment by ensuring the continuity of the official statistics activities in a sustainable way, thanks to the smart-working. During many moments of interaction and/or discussion, different aspects, even marginal, have been examined in depth, implementing innovative solutions in a plurality of areas. In this sense, an innovative work was realized on the organization, the adoption of specific guidelines, the continuous update of risk assessments and protection measures for workers. The health prevention activities carried out by the employer and by the competent doctor were considerable and unique. The monitoring and the traceability of all workers were realized with original questionnaires to identify the “*fragile workers*” and the situations requiring specific prevention measures. The questionnaires were proposed to all Istat employees by email and dynamically updated (Camisasca *et al.*, 2021).

The aims of this work are to show an innovative model for pandemic health risk management to ensure workers health and safety in offices and remote activities<sup>2</sup>.

After briefly mentioning the Regulations in force during the health emergency, the following paragraphs will deal with the study case examined and the measures implemented by the employer with the technical support of the prevention and protection service and the competent doctor, through the electronic questionnaires proposed to all workers. For this purpose, the questionnaires and the other prevention and protection measures have proved to be a useful tool for the preventive containment of COVID-19 spread in the Istat offices. It will be also explained in detail the data analysis and how the questionnaires were constructed. Furthermore,

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<sup>1</sup> This article is the result of the common contribution of all and, therefore, the individual contribution is considered equal and equivalent to that of the other co-authors.

<sup>2</sup> ITALIAN LEGISLATIVE DECREE n. 81, 2008 April 9.

it will be examined how the different questionnaire sections allowed acquiring the data for the personnel with the fragility tracing. Finally, the conclusive paragraphs report the results achieved and some final considerations on the work done.

## 2. Materials and methods

In Italy, the pandemic effects due to the new *SARS-CoV-2* coronavirus have caused a health emergency, which has been immediately faced with a series of urgent measures since the declaration of the state of emergency on January 31, 2020. Several Decrees of the President of the Council of Ministers - DPCM<sup>3</sup>, regional ordinances and decrees of the Ministry of Health have been necessary to determine a containment of epidemiological effects, for instance, special health surveillance measures and travel ban especially for subjects with *COVID-19* symptoms. For this aim the employer, in agreement with the Istat competent doctor, proposed three questionnaires for all Istat workers. In the Table 1 are grouped the typologies of specific questions proposed in the three questionnaires.

**Table 1** – *Typologies of specific questions proposed in the three questionnaires.*

Type of specific questions	Number of questions 1st Questionnaire	Number of questions 2st Questionnaire	Number of questions 3st Questionnaire
- personal data and information on the employee and his/her work situation	16	14	10
- personal medical history	5	5	1
- cohabitant medical history	10	2	2
- travel and transfer	-	8	4
- cases of exposure to contact	-	6	4
- evaluation of personal symptoms	2	5	1
- evaluation of cohabiting symptoms	2	5	-
- any clarification notes	5	7	2
- making / booking anti <i>COVID-19</i> vaccine	-	-	2

Source: *Questionnaire proposed by the Istat competent doctor.*

Each one of the three questionnaires consists of about 40 questions that aimed to verify potential cases of susceptibility or hypersensitivity due to pathologies or pharmacological treatments. In the Table 2 are reported the grouping created by competent doctor evaluation and colour classification assigned to Istat workers with the related specific prevention and protection measures.

<sup>3</sup> Italian Decree Of The President Of The Council Of Ministers - Dpcm, 11 March 2020; Italian Law Decree N. 125, 2020; Italian President Of The Council Of Ministers, Minister Of The Economy, Minister Of Labor And Social Policies, Minister Of Economic Development, Minister Of Health, And Social Partners, 2020.

**Table 2** – Grouping created by competent doctor evaluation and colour classification assigned to Istat workers for prevention and protection measures.

Group	Prevention and protection measures
Green	<ul style="list-style-type: none"> <li>- Favourable outcome to the offices access maintaining general precautions adopted by Istat;</li> <li>- favourable outcome to the Istat offices access on condition of traveling with your own vehicle; on days when it is not possible to use the vehicle keep the work from remote;</li> <li>- favourable outcome to the offices access on condition to access to the Institute at times when there is evidence of decreased travel by the general population;</li> <li>- limit activities in the presence of other colleagues or outsiders and always maintain social distancing over 2 meters, preferring more activities in conference call.</li> </ul>
Yellow	<ul style="list-style-type: none"> <li>- Strictly comply the measures of greater protection already arranged within the Institute and limit the interaction with colleagues or external parties to the indispensable even in common areas;</li> <li>- strictly comply with the measures of greater protection already established within the Institute and limit the interaction with colleagues to the indispensable even in the common areas; grant access to the Institute at times when there is evidence of decreased travel by the general population.</li> </ul>
Red	<ul style="list-style-type: none"> <li>- Go on to remote work and non-presence in the Institute until the declared cessation of the national emergency;</li> <li>- go on to remote work and non-presence in the Institute by scheduling up to 2 weekly accesses until declared end of national emergency;</li> <li>- go on to remote work and non-presence in the Institute; for mandatory access (one per week) plan the use of their own vehicle or grant access to the Institute at times when there is evidence of decreased travel by the general population;</li> <li>- go on to remote work and no presence in the Institute by scheduling up to a maximum of 2 accesses per week on condition of granting access to the Institute at times when there is evidence of decreased travel by the general population until declared end of national emergency;</li> <li>- go on to remote work and no presence in the Institute except for limited access up to 2 days a week until declared end of national emergency;</li> <li>- go on to remote work and no presence in the Institute by planning up to a maximum of 3 accesses per week on condition of granting access to the Institute at times when the decrease in movements of the general population is proven until declared end of national emergency.</li> </ul>
Black	- Questionnaire NOT completed.

Source: Prevention and protection measures obtained from the questionnaire conducted by the Istat competent doctor.

The first and second questionnaires of the antiCOVID-19 tracing activity were conducted in 2020 while the third questionnaire was conducted after the opening of the vaccination campaign in the 2021 and on a very small sample of “*fragile / susceptible workers*” only. The second questionnaire was supplemented with other questions concerning both “*travel and transfer*” and “*cases of exposure to contact*” due to changes in epidemiological scenarios. The third questionnaire was proposed only to the “*fragile / susceptible*” sample, identified by the Istat competent doctor,

and it included free questions on the antiCOVID-19 vaccination in view of the gradual return of employees to the office.

The analysed data are provided in aggregate and anonymous form so it is not possible to trace and to identify the employee who completed the electronic questionnaires. They are structured in compliance with privacy regulations and professional confidentiality. The questions allowed the competent doctor to ascertain possible exposures to risk factors, such as close contacts with positive people and to have information about the use of public transport for home-work routes. Health protection measures were adapted to the level of risk and extended to the entire family. Thanks to the questionnaires it was possible to classify all Istat employees into four groups, each one identified by a colour (Green, Yellow, Red, Black) with specific prevention and protection measures (for the Green Group no additional measures, for the Yellow Group measures that reduce interactions, for the Red Group prevalence of remote work, finally the Black Group refers to non-respondents).

### *2.1. Prevention and protection measures*

The competent doctor developed the questionnaires as a useful tool for the preventive containment of COVID-19 spread, as a specific health prevention and protection measure to identify and trace “*fragile / susceptible workers*” with the aim of classifying them according to specific prevention measures, also in order to return to the office.

More general and specific protection measures of organizational and technical nature were introduced by the Institute to reduce the probability of infection and to prevent the origin of epidemic outbreaks (Iavicoli *et al.*, 2020). The main measures are summarized briefly below in Table 3. The specific document “*Mandatory prevention measures to limit the risks from the new coronavirus for the Istat’s Roman offices*” has been elaborated, disseminated and used for information. It contains all the mandatory measures for Istat workers and for outsiders (visitors, contractors, suppliers, etc.). The information section played an important role, both in the first and second questionnaires. This section provided the general definitions of “*close contact*” and the modalities for office accessing, the general and specific protection measures within the Institute, infographics on the management procedures of a symptomatic person, instructions for the correct washing of hands, instructions for the correct use of disposable gloves, instructions for the correct use and removal of the surgical face masks with filter.

**Table 3** – *Main general and specific organizational and technical prevention and protection measures adopted.*

- Specific questionnaires proposed by the competent doctor
- Interpersonal distance of at least two meters
- Working methods in smart working and teleworking to reduce contact opportunities
- Minimization of the use of public transport and preference for less crowded hours
- Use of respiratory protections (FFP2 masks, surgical face masks), gloves where necessary
- Temperature control at entrances
- Regulation of access and presence in the Institute of external personnel
- Preparation of mandatory paths
- Contingent use of lifts and bathrooms one person at a time
- Distancing of workers' workstations in rooms, to maintain social distancing
- Regulation of internal travel, meetings, internal events, training and missions
- Contingent access to common areas
- Hygiene, frequent hands washing
- Cleaning, sanitizing and disinfecting work environments, surfaces and toilets with effective products
- Rooms ventilation and periodic sanitization of the ventilation systems
- Use of the Green Pass as a safety measure

Source: Istat, Risk assessment document for internal use, 2020-2021.

### 3. Results

The implemented prevention and protection measures ensured the maximum protection of Istat workers and the continuation of all the official statistics activities during the pandemic. The tracing activity was possible thanks to specific questionnaires proposed to all employees and a direct contact with workers in order to define specific and accurate prevention measures, where necessary. The first and second questionnaires of the antiCOVID-19 tracing activity were conducted in 2020 while the third in 2021 and only on a very small sample of “*fragile / susceptible workers*” of the Red Group. The questionnaires results and data analysis on the workers population are provided anonymously with a general overall summary in aggregate form in the next subparagraphs.

#### 3.1. 1st and 2nd questionnaire results

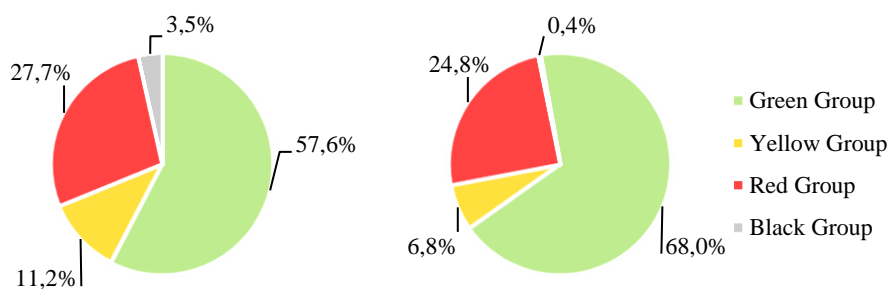
The results of the antiCOVID-19 questionnaires for the tracing activity are shown in Table 4. The table shows that survey participation was massive. Almost all workers joined aware of the strong protection value of the proposed survey tool.

**Table 4** – Questionnaire results of Istat workers (Absolute values and %). Year 2020.

Group	1st Questionnaire		2nd Questionnaire	
	Total	Per 100 Istat Workers	Total	Per 100 Istat Workers
Green	984	57,6	1.140	68,0
Yellow	191	11,2	113	6,8
Red	472	27,7	415	24,8
Black	59	3,5	6	0,4
Total Istat Workers	1.706	100,0	1.674	100,0

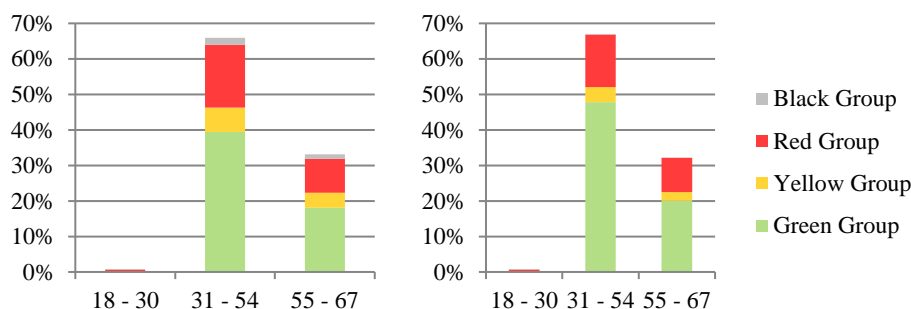
Source: Questionnaires data processing conducted by the Istat competent doctor

Istat workers distribution shows a female prevalence (61% Female, 39% Male). In the two surveys, the respondents number is similar, although slightly lower in the second (Istat workforce decreased during the months of the year (from 1.706 to 1.674, due to retirements, temporary detachments, etc.)). In addition, the Red Group distribution slightly decreased (from about 28% to about 25%) as shown in Figure 1. In the Red Group, the most stringent prevention measures have reached the highest protection level. After the analysis of the second questionnaire (conducted only on the Red Group) the competent doctor carried out additional investigations, also through direct contacts with some workers, in order to accurately evaluate every single peculiar situation.

**Figure 1** – Istat workers were classified in different categories on the basis of the survey results conducted by the competent doctor: 1st Questionnaire (left) and 2nd Questionnaire (right) (Values %). Year 2020.

Source: Questionnaires data processing conducted by the Istat competent doctor

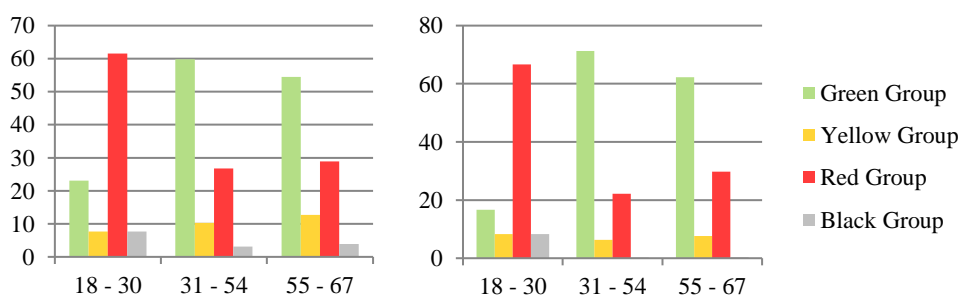
**Figure 2** – Istat workers were classified in different categories on the basis of the survey results conducted by the competent doctor, by age groups: 1st Questionnaire (left) and 2nd Questionnaire (right) - % values on the total number of workers. Year 2020



Source: Questionnaires data processing conducted by the Istat competent doctor

In Figures 2 and 3, the population subdivision is also shown by multi-year age groups. The second questionnaire shows that the percentage of workers in the Green Group has increased compared to the first, at the expense of the Yellow Group, as a result of the resolution of some “border line” cases to be investigated, which in a first analysis had been assigned to other Groups, as shown in Figure 2. Figure 3 shows how the relative distribution by age Groups is similar in the 31-54 and 55-67 years’ classes.

**Figure 3** – Istat workers were classified in different categories on the basis of the survey results conducted by the competent doctor, by age groups: 1st Questionnaire (left) and 2nd Questionnaire (right) (for 100 workers of the same age group). Year 2020



Source: Questionnaires data processing conducted by the Istat competent doctor

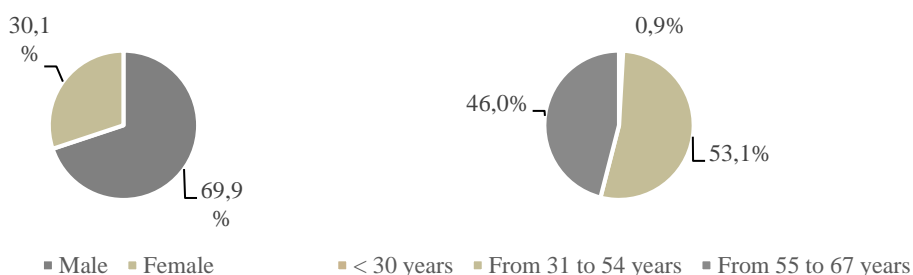
The workers of the Green Group prevail and as the ones of Yellow Group, require more limited protection measures. The situation is clearly reversed in the 18-30 age

Group where the Red Group becomes considerable. Data showed clearly how the youngest workers were the most fragile, therefore it was necessary to implement more stringent protective measures.

### 3.2. 3rd questionnaire results

The third questionnaire was proposed in June 2021 and conducted only on about 226 “fragile / susceptible workers” (Red Group).

Figure 4 – 3rd Questionnaire Istat workers grouped by gender (left) and grouped by age (right) (Values %). Year 2021

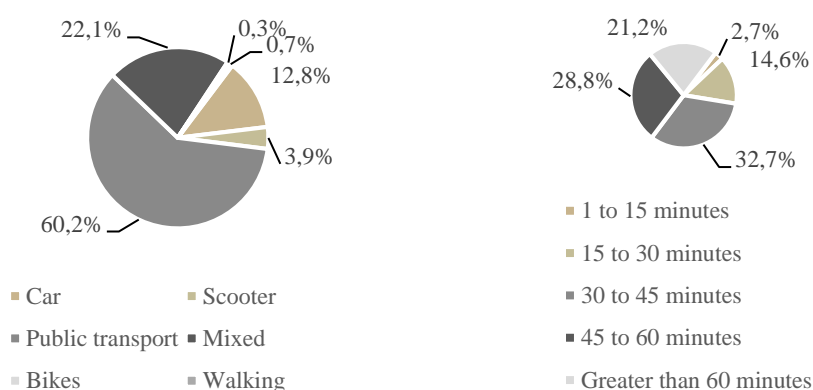


Source: Questionnaire data processing conducted by the Istat competent doctor

In addition, the third questionnaire reports the results about free questions on the antiCOVID-19 vaccine. In Figure 4 the graphs show the male prevalence (about 70%) in the Red Group and the greatest concentration of “fragile / susceptible workers” aged between 31 and 54 years (over 53%), followed by the class between 55-67 years represented by 46%, while the class 18-30 years is the smallest compared to the total of “fragile / susceptible workers” (about 1%). Figure 5 shows that the most “fragile / susceptible workers” use either public transport (over 60%) or mixed transport (car, scooter, etc.) (over 22%) and take 30 to 45 minutes (32,7%) to go to work and followed by those who take 45 to 60 minutes (28,8%).

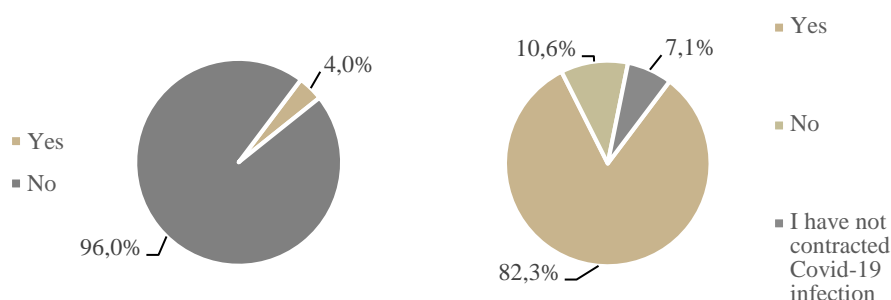


**Figure 5 – 3rd Questionnaire Istat workers grouped by means of transport used (left) and by time taken (right) to arrive to the office (Values %). Year 2021**



Source: Questionnaire data processing conducted by the Istat competent doctor.

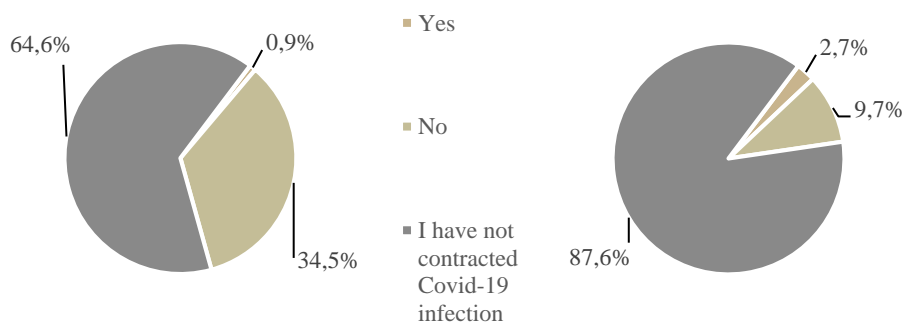
**Figure 6 – 3rd Questionnaire Istat workers who have or have not contracted COVID-19 infection in the last 12 months (left) and who making / booking or not the anti-COVID-19 vaccine (right) (Values%). Year 2021**



Source: Questionnaire data processing conducted by the Istat competent doctor.

In Figure 6 the graphs show (left) that about 4% of “*fragile / sensitive workers*” (Red Group) contracted COVID-19 infection, while (right) the sample majority (about 82%) made / booked the antiCOVID-19 vaccine in 2021. Only about 11% of the sample answered negatively and about 7% of the sample did not intend to answer the proposed question. The Figure 7 graphs show that only 0,9% of “*fragile / susceptible workers*” (Red Group) who contracted COVID-19 infection had to resort to hospitalization for the necessary care. About 2,7% among those who contracted the infection, presented after-effects of the disease post recovery.

**Figure 8** – 3rd Questionnaire Istat workers who have been hospitalized or not for COVID-19 in the last 12 months (left) and who have contracted COVID-19 infection with after-effects of the disease (right) (Values %). Year 2021



Source: Questionnaire data processing conducted by the Istat competent doctor

#### 4. Conclusions

The pandemic risk management from *SARS-CoV-2* required the use of innovative, timely tools, never adopted before in these contexts for which there were not previous consolidated reference experiences. These tools permitted the risk assessment and the definition of efficient prevention and protection measures. The pandemic required a significant effort, the employer had to realize structural (sanitization, temperature check, separation of paths, etc.), health (health surveillance through the tracing of the “*fragile / susceptible workers*”) and management (employees’ placement, for example one per room, prohibition of holding meetings, etc.) actions. Moreover, the measures have been adopted on the basis of the epidemiological evolution following its severity. It was extremely effective to integrate existing risk analysis methods and prevention measures of containment and exposure reduction with original questionnaires of traceability of all workers by the competent doctor. The prevention and protection measures implemented during the pandemic, in fact, guaranteed the maximum protection of Istat workers by preventing the development of infections in the work environment and the continuation of all activities on official statistics.

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## SUMMARY

The SARS-CoV-2 pandemic emergency pushed public Administrations to adopt managerial, organizational, and technical choices for the health and safety protection of workers. In this extraordinary context, Istat enhanced its IT support, ensuring full operation in a sustainable way with smart working. All this influenced the sociability of the employees by developing interactions via web with discussion moments on different aspects in a plurality of areas. The health prevention activity was innovative and unique, carried out through the monitoring and tracing of all workers, with the use of questionnaires created ad hoc that allowed the competent doctor to identify fragile workers and situations susceptible to COVID-19 contagion for which further risk reduction measures have been adopted. The aim of this work is to illustrate an innovative model of health risk management aimed at identifying and monitoring risk conditions and defining protection measures with important actions by the employer. All of this to ensure maximum health and safety protection of workers who have

worked, both at the offices and remotely. Istat implemented the Prime Ministerial Decree and other Regulations issued on the coronavirus spread containment, furthermore, proposed to Istat workers two questionnaires, prepared by the competent doctor. Each questionnaire included about 40 structured questions aimed at verifying, in compliance with privacy regulations, any susceptibility or hypersensitivity cases due to previous or current pathologies, to pharmacological treatments interacting on the immune system, to possible exposures to risk factors (such as close contacts with positive cases, the use of public transport for home-work routes). The questionnaires results, anonymous and aggregated, and data analysis on the working population, are provided with an overall summary. The questionnaire made it possible to group Istat employees into four groups, each identified by a colour, characterized by specific prevention measures for the return to the office. The population surveyed was comparable in the two surveys; the distribution in the Red Group recorded a slight decrease (from about 28% to about 25%). For this Group, the most stringent prevention measures reached the highest level of protection. After the analysis of the second questionnaire, the competent doctor carried out additional investigations to accurately evaluate every single peculiar situation of the workers.

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