

## ARTICLES

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# STAY AT HOME: WORKERS' PERFORMANCE DURING THE COVID-19 PANDEMIC

*Fique em casa! O desempenho dos trabalhadores durante a pandemia de Covid-19*

*¡Quédate en Casa! El desempeño de los trabajadores durante la pandemia de COVID-19*

Ana Nery Alves Daniel<sup>1</sup> | [ananery.ad12@gmail.com](mailto:ananery.ad12@gmail.com) | ORCID: 0000-0002-9710-5508  
Elias Pereira Lopes Júnior<sup>2</sup> | [elias.junior@ufca.edu.br](mailto:elias.junior@ufca.edu.br) | ORCID: 0000-0001-7288-9329

<sup>1</sup>Corresponding author

<sup>1</sup>Serviço Federal de Processamento de Dados, Regional Fortaleza, Fortaleza, CE, Brasil

<sup>2</sup>Universidade Federal do Cariri, Programa de Pós-Graduação em Administração, Juazeiro do Norte, CE, Brasil

## ABSTRACT

The COVID-19 pandemic has made telework an imperative measure, and countless companies have adopted it urgently, without planning. This research aims to identify, from the perception of the employees of the Brazilian state-owned enterprise Serpro, the factors that impacted telework performance during the COVID-19 pandemic. A quali-quantitative study was carried out, using an online questionnaire and data systematization through factor and cluster analysis, and semi-structured interviews interpreted through content analysis. The results showed that telework may not be beneficial in some contexts and may even reduce employee performance, depending on the work environment at home and the nature of the task performed. The findings showed several factors that affect performance in telework, collaborating for future evaluations about the applicability and effectiveness of this regime at Serpro and other companies.

**Keywords:** performance, workers, telework, COVID-19, Serpro.

## RESUMO

O cenário pandêmico da Covid-19 tornou a adesão ao teletrabalho uma medida imperativa, e inúmeras empresas o fizeram em caráter de urgência, portanto, sem planejamento. Esta pesquisa tem como objetivo identificar, a partir da percepção dos funcionários do Serpro, os fatores que impactaram no desempenho do teletrabalho durante o surto da Covid-19. Realizou-se um estudo de caráter quali-quantitativo, recorrendo à aplicação de questionário online, utilizando Análises Fatorial e de Cluster, bem como entrevistas semiestruturadas, por meio de Análise de Conteúdo. Os resultados demonstraram que o teletrabalho pode não ser benéfico em alguns contextos e até diminuir o rendimento do funcionário, a depender principalmente do ambiente de trabalho em casa e da natureza da tarefa realizada. Os achados evidenciaram uma série de fatores que afetam o desempenho no teletrabalho, colaborando, nesse sentido, para avaliações futuras acerca da aplicabilidade e efetividade desse regime no Serpro e em outras empresas.

**Palavras-chave:** desempenho, trabalhadores, teletrabalho, Covid-19, Serpro.

## RESUMEN

El escenario de pandemia de COVID-19 ha convertido el teletrabajo en una medida imperativa e innumerables empresas lo han implementado con carácter de urgencia y, por tanto, sin planificación. Esta investigación tiene como objetivo identificar, a partir de la percepción de los funcionarios del Serpro, los factores que impactaron el desempeño del teletrabajo durante el brote de COVID-19. Se realizó un estudio cuali-cuantitativo, con la aplicación de un cuestionario en línea, utilizando análisis factorial y de conglomerados, así como entrevistas semiestructuradas, mediante análisis de contenido. Los resultados mostraron que el teletrabajo puede no ser beneficioso en algunos contextos e incluso reducir el desempeño del empleado, dependiendo principalmente del ambiente de trabajo en el hogar y de la naturaleza de la tarea realizada. Los hallazgos mostraron una serie de factores que afectan el desempeño en el teletrabajo, colaborando así con futuras evaluaciones sobre la aplicabilidad y efectividad de este régimen en el Serpro y otras empresas.

**Palabras clave:** desempeño, trabajadores, teletrabajo, COVID- 19, Serpro.

## INTRODUCTION

In Brazil, the debate on efficiency and performance in public administration gained visibility with the Master Plan for the Reform of the State Apparatus (Brasil, 1995). This reform emphasized cost reduction and service agility, encouraging the greater use of IT and more flexible work arrangements. The first state-owned enterprise to adopt teleworking in Brazil was the Federal Data Processing Service (Serpro), which launched a pilot project with eighteen employees in 2005 (Filardi, Castro, & Zanine, 2020).

With around 8,000 employees and less than 3% working remotely (Serpro, 2021), the company had to reassess this percentage in response to the COVID-19 pandemic. In March 2020, all employees were required to work from home to mitigate contagion during the outbreak.

The urgent shift to teleworking presented challenges for both employees and managers, who needed to maintain productivity and ensure the timely fulfillment of organizational demands. In the public sector, the focus of this study, achieving successful outcomes entails meeting deadlines while aligning with society's expectations regarding service quality (Bezerra et al., 2017).

The relationship between teleworking and individual performance has been a topic of growing interest, especially since the COVID-19 pandemic. Recent studies examine how teleworking affects employee well-being and productivity. For instance, a 2023 study found that teleworking intensity and employees' preference for remote work positively influence well-being, which, in turn, impacts individual performance (Urien, 2023). Other studies indicate that remote work can enhance job satisfaction and motivation, particularly when employees perceive favorable teleworking conditions (Anakpo, Nqwayibana, & Mishi, 2023). However, challenges such as increased stress and workload can negatively affect productivity (Anakpo, Nqwayibana, & Mishi, 2023).

These findings highlight that the relationship between teleworking and individual performance is complex and influenced by multiple contextual and individual factors. The literature still lacks conceptual studies that examine how different variables shape performance rather than directly measuring productivity. Based on Serpro employees' perceptions, this study seeks to identify the factors that influenced work performance during teleworking amid the COVID-19 outbreak.

To achieve this objective, the research combined a literature review, documentary analysis, and an empirical study at Serpro, aiming to deepen the understanding of the phenomenon and provide insights into the viability of teleworking across different contexts. These reflections may inform future decisions regarding the maintenance and expansion of telework in Serpro and other governmental agencies.

## THEORETICAL FRAMEWORK

### Individual performance at work

According to [Bendassolli \(2012\)](#), performance has both practical and academic significance. In the organizational context, it is associated with value generation, whereas from an academic perspective, it includes individual, interpersonal, and situational psychosocial dimensions. However, the scientific literature has historically prioritized the evaluative dimension of performance and its metrics, often neglecting a broader conceptual definition. This gap emphasizes the need for research, particularly within Brazilian literature, that explores performance as a substantive construct.

[Sonnentag and Frese \(2002\)](#) present three major conceptual perspectives on job performance: the individual perspective, the situational or contextual perspective, and the performance regulation perspective (Table 1). These perspectives provide a comprehensive framework for assessing performance, as they are not mutually exclusive but rather complementary.

Table 1. Investigation of work performance

	INDIVIDUAL DIFFERENCES PERSPECTIVE	SITUATIONAL PERSPECTIVE	PERFORMANCE REGULATION PERSPECTIVE
Guiding question	Which individuals perform better than others? What differentiates their performance from others?	In what situations do individuals perform better? Is there a work context that encourages better performance?	What happens when a person is performing? What processes or mechanisms are involved?
Main predictors and empirical findings	Cognitive abilities, motivation, personality traits, tenure at the company, and professional experience.	Characteristics of the work context and organizational environment, possible stressors, and motivational agents.	Factors influencing individual information processing; Necessity of defining the appropriate hierarchical level of analysis for each variable.
Practical implications for improving performance	Encourage the development of training programs and informal learning incentives, personnel selection, and exposure to specific and particular experiences.	Investment in continuous work redesign, taking advantage of potential.	Goal orientation, continuous provision of task-related feedback, behavioral modeling actions, training actions, continuous work redesign, and improvement of the execution process.

Note: [Sonnentag and Freese \(2002\)](#) adapted from [Coelho Jr. \(2011\)](#).

## Telework and performance

Teleworking emerged in the 1970s during the oil crisis as a strategy to reduce gasoline consumption associated with traffic congestion and long commutes (Bailey & Kurland, 2002). Initially, its primary benefits were believed to be related to employee transportation. In Brazil, telework first gained traction in the private sector and has expanded into the public sector over the past decade (Haubrich & Froehlich, 2020). The state-owned enterprise Federal Data Processing Service (Serpro) was the first governmental organization to adopt teleworking in 2006.

Despite its advantages, teleworking presents challenges such as fewer opportunities for professional growth, increased household energy costs, data vulnerability, and social isolation (Hau & Todecast, 2018). To mitigate these issues, leaders must implement management practices suited for remote work. Contreras, Baykal, and Abid (2020) highlight the importance of managers adapting to virtual environments to ensure sustainable performance and foster a productive, collaborative remote workspace. In this context, the concept of e-Leadership plays a crucial role, emphasizing the use of technology to motivate and guide teams, enhancing engagement and productivity.

## Teleworking during the pandemic

On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic and recommended urgent prevention measures, including teleworking as a key strategy to contain the virus (WHO, 2020). As a result, organizations worldwide rapidly adopted remote work on a large scale (Contreras, Baykal, & Abid, 2020). According to Bouziri et al. (2020), more than 3.4 billion people across 84 countries were placed in home isolation, forcing millions to transition to remote work. The authors emphasize the importance of assessing the risks and benefits of this abrupt shift, considering the unique challenges of the context.

During the pandemic, teleworking exposed many employees to inadequate home environments, particularly in terms of ergonomics and technological infrastructure. With schools closed, families had to balance childcare and professional responsibilities, increasing the risk of overload and anxiety (Bouziri et al., 2020). This overlap of multiple responsibilities and lack of proper structure heightened psychosocial risks, leading to stress and mental exhaustion.

Pires et al. (2021) note that isolation can contribute to anxiety, depression, loneliness, and emotional instability, further exacerbated by the fear of infection. To mitigate these effects, companies must adopt ongoing strategies to enhance the benefits of teleworking while addressing its challenges. This includes providing psychological support, establishing effective communication channels, and creating dedicated spaces for employees to seek professional guidance in times of crisis (Bouziri et al., 2020).

To facilitate remote work, companies implemented changes in information security and invested in communication technologies and remote collaboration tools. Employees, in turn,

had to quickly develop new technological skills, adapt to different forms of team interaction, and integrate their professional and personal routines. As a result, the home environment became a shared space for work, education, domestic tasks, and leisure activities (Losekann & Mourão, 2020).

## METHOD

The research adopted an explanatory approach to identify and justify the factors influencing the teleworking performance of Serpro employees during the pandemic. It also includes a descriptive component, presenting the theoretical characteristics of previous studies (Vergara, 2016). By combining quantitative and qualitative methods, the performance assessment relied on employees' self-perceptions of their productivity rather than solely on specific indicators.

### Quantitative stage

This research adopts a quantitative approach, employing statistical techniques such as exploratory factor analysis (EFA) and cluster analysis to simplify the analysis of the online questionnaire. EFA reduces the number of observed variables by grouping them into correlated factors, while cluster analysis classifies responses into homogeneous groups, facilitating pattern identification (Malhotra, 2001). The questionnaire, consisting of 25 statements on a five-point Likert scale, was administered via Google Forms between August and September 2021. The questions were drawn from related studies and validated through a pre-test with thirteen participants. EFA identifies underlying relationships among variables, while Cluster Analysis segments respondents into groups with similar characteristics, enabling a more detailed understanding of factors affecting telework performance, such as well-being, distance, and infrastructure. The analysis was conducted using SPSS (v25), Google Sheets, and Excel.

### Qualitative stage

This study also adopts a qualitative approach, using semi-structured interviews to explore the behavioral and emotional perceptions of Serpro employees regarding teleworking during the COVID-19 pandemic. Data analysis was conducted through transcription, considering contextual elements and recurring themes in participants' statements to deepen the understanding of the phenomenon. The study focused on employees in the Fortaleza region due to the accessibility and relevance of the phenomenon (Vergara, 2016), with five hundred employees considered for the research. Data collection included documentary research, an online questionnaire, and interviews.

In the qualitative stage, content analysis (Bardin, 1977) was applied, involving skimming, organizing the material, coding, and interpreting the results. The transcription and analysis were supported by Atlas.ti (v9) and Web Captioner software. This approach provided deeper insights into the meanings and relationships expressed in the interviews.

Semi-structured interviews consisted of nine items for employees without management positions and ten items for those in managerial roles. These interviews were conducted online via Google Meet. Before implementation, the interview script underwent a pre-test phase with six Serpro employees, leading to adjustments before finalization. The script was developed based on aspects outlined in Table 2. All interviews were recorded with prior consent, obtained through a signed informed consent form. The qualitative approach is justified as it captures nuances, meanings, and contextual factors that cannot be easily quantified, providing a richer and more detailed understanding of employees' experiences.

Table 2. Basic aspects of the interview script

AUTHOR	DEFINITIONS
Bouzuri <i>et al.</i> (2020)	Impacts of the COVID-19 pandemic
Sonnentag and Frese (2002)	Perspectives that guide work performance: individual and contextual perspectives
Morgeson and Humphrey (2006); Golden and Gajendran (2019)	Structural characteristics of work: social and knowledge characteristics.

## RESULTS

### Analysis of quantitative results

The results obtained from the online questionnaire with 162 respondents revealed a sample consisting of 102 males (63.0%) and 60 females (37.0%). A preliminary data verification found no missing values. Regarding tenure at the company, the most common periods were (a) between 6 and 15 years (79 respondents, 48.8%) and (b) over 25 years (44 respondents, 27.2%). Most Serpro employees reported having a non-academic specialization (known as *lato sensu* in Brazil), with 71 respondents representing 43.8%.

In terms of commuting, just over half of the respondents (55.6%) reported that their travel time to the company was up to 15 minutes. Regarding the work environment, 80.2% viewed their environment as suitable for teleworking. A significant majority (96.9%) indicated that they did not work remotely prior to the pandemic. Regarding pandemic-related variables, 35.8% of respondents reported belonging to a COVID-19 risk group, whereas 45.1% indicated that they live with individuals in a risk group. Those deemed at risk include individuals with chronic diseases such as diabetes, hypertension, asthma, and chronic obstructive pulmonary disease, along with smokers, individuals over 60 years old, pregnant and postpartum women, and children under five years old.

## Exploratory factor analysis

Exploratory factor analysis (EFA) was performed on the research data using the principal components analysis method with Varimax orthogonal rotation and the criterion of eigenvalues greater than 1 (Corrar et al., 2011). This process resulted in three factors that explained 71.81% of the total variance. The Varimax orthogonal rotation test showed no significant correlation between the extracted factors, confirming their independence. The reliability analysis using Cronbach's alpha indicated the need to remove thirteen variables, as their reliability indices fell below the 0.7 threshold (Hair et al., 2009). Given the exploratory nature of the factor analysis, there was no predefined expectation regarding the number of factors to be extracted; the identified factors emerged solely from the data analysis.

The Kaiser-Meyer-Olkin (KMO) index reached a value of 0.868, indicating good suitability for EFA, while Bartlett's sphericity test showed satisfactory significance ( $p < 0.001$ ), supporting the grouping of questions into three factors. This result was further confirmed by the Scree Plot, which indicated that only three factors had eigenvalues greater than 1. The reliability of the constructs, as assessed by Cronbach's alpha, showed satisfactory values: 0.893 for the well-being construct, 0.899 for the distance construct, and 0.767 for the infrastructure construct (Corrar et al., 2011). The constructs were named as follows: Well-being (variables Q.1, Q.2, Q.3, Q.4, Q.24, and Q.25); Distance (variables Q.6, Q.7, Q.8, Q.11, and Q.12); and Infrastructure (variables Q.16 and Q.17) (Table 3).

Table 3. Impact factors of teleworking on performance

VARIABLE	FACTOR LOADING	FACTOR
Q1. I am more focused, which improves my performance	0.796	Well-being
Q2. My overall stress has decreased, improving my performance	0.788	
Q3. My work-life balance has improved, which has improved my performance	0.875	
Q4. Spending more time with my family has improved my performance	0.872	
Q24. My performance at home is better than at in-person work	0.660	
Q25. I am satisfied with my performance working at home	0.545	
Cronbach's alpha	0.893	
Explained variance (%)	29.35	

(continua)



(conclusão)

Table 3. Impact factors of teleworking on performance

VARIABLE	FACTOR LOADING	FACTOR
Q6. The physical distance from the company negatively affected my performance	0.649	Distance
Q7. Working apart from my team has hindered my performance	0.856	
Q8. Working apart from colleagues has hindered my performance	0.842	
Q11. Non-face-to-face communication between team members has hindered my performance	0.813	
Q12. Non-face-to-face communication with my boss has hindered my performance	0.821	
Cronbach's alpha	0.899	
Explained variance (%)	27.91	Infrastructure
Q16. The permanent lack of access, due to teleworking, to some environment/system/platform/tool used in the company has hindered my performance	0.880	
Q17. Infrastructure instability due to teleworking has hindered my performance	0.842	
Cronbach's alpha	0.767	
Explained variance (%)	14.54	

Table 3 shows that all variables achieved satisfactory factor loadings above 0.5 (Corrar et al., 2011). The well-being construct is the most significant in the analysis, accounting for 29.35% of the total variance. This construct comprises variables representing a sense of satisfaction, reflecting a greater balance between professional and personal life. The distance construct is the second most influential factor (27.91% of the total variance) and captures the impact of variables related to physical absence during the teleworking regime. The infrastructure construct accounts for 14.54% of the total variance explained and consists of variables that reflect aspects of hardware and software support essential for the operation and maintenance of teleworking.

The well-being construct was derived from variables with significant factor loadings related to quality of life and job satisfaction, encompassing elements such as concentration, stress reduction, and work-life balance. Sonnentag and Frese (2002) discuss environmental characteristics that can influence work performance, emphasizing that these factors can act as either positive or negative agents. However, the results obtained in the EFA indicate that these elements function more as positive influences.



The most relevant variables for the distance construct address the potential impact of physical separation on employee performance. Morgeson and Humphrey (2006) highlight the importance of task interdependence within teams and social support, emphasizing the effects of limited interactions both within and across work teams. The infrastructure construct reflects the stability of services and tools essential for performing work, a factor also emphasized in the study by Losekann and Mourão (2020).

## Cluster analysis

Cluster analysis was applied to identify similarities among the 162 responses obtained from the online questionnaire. This analysis followed variable reduction using Varimax rotation, which classifies objects into relatively similar groups (Malhotra, 2001).

For the cluster analysis, only the variables that are part of the factors generated after Varimax rotation and whose reliability indices were identified in the EFA detailed in the previous section were considered. A preliminary data analysis was conducted to identify potential missing values or outliers. No missing values were found in the sample. However, seven outliers were noted and subsequently removed from the model. Therefore, the cluster sample consisted of 155 observations.

The Two-Step Cluster technique was used to evaluate whether the two identified groups were satisfactory. Applying Euclidean distance measurement, the analysis yielded a silhouette cohesion and separation measure above 0.5 for  $K=2$ , indicating good cluster adequacy. The non-hierarchical K-means clustering method was then used to allocate observations and assess variable significance for effective group classification. After ten iterations, all variables were significant at  $p < 0.001$ .

The K-means analysis assigned each observation to one of two clusters, and a one-way ANOVA compared group means. Group 1, composed of 34 respondents, showed lower mean scores on questions related to the well-being factor, suggesting a less positive perception of its contribution to performance. Responses for this construct ranged from 2.29 (lowest) to 3.41 (highest), indicating well-being had a limited impact on this group's performance. In contrast, Group 2, with 121 respondents, had higher mean scores for well-being (4.04 to 4.78), suggesting a significant and positive impact on performance.

Regarding the distance factor, Group 1 participants had a neutral perception of physical distance's impact on performance, with values up to 2.79, indicating distance was not a major constraint. Group 2 participants perceived distance even less negatively, with a maximum value of 1.74, suggesting minimal impact.

Both groups reported low averages for the infrastructure factor, indicating limited issues with technological services. Group 2 had an even lower average and greater variation, implying fewer infrastructure-related problems than Group 1. Thus, infrastructure had a less negative effect on performance in Group 2.

Demographically, most participants in both groups were male. Group 1 had an older age profile than Group 2. The proportion of respondents identifying as part of a risk group was 35%

in both clusters, while those living with individuals in risk groups accounted for 44% in Group 1 and 45% in Group 2.

It was possible to highlight the percentage distribution, by level of agreement, of the responses from groups 1 and 2 regarding the statement that teleworking performance is better than face-to-face work. The percentage of observations disagreeing with the statement regarding teleworking performance being better than face-to-face work is higher in group 1 than in group 2. Therefore, it was considered relevant for the research to identify the percentage of disagreeing observations in group 1 by functional area.

The discordant percentage distribution of Group 1 for the same statement was evidenced, excluding the sectors that make up the company's core area (DIDES/SUPDG and DIDES/SUPDR), to identify which sector had the greatest disagreement about the performance in teleworking being better than in face-to-face work. The DIRAD/SUPCS sector, which is related to the company's logistics management demands, registered the greatest disagreement when the core area sectors were disregarded.

The data crossing process also evidenced the percentage by level of agreement of employees satisfied with their work performance while teleworking. It was possible to observe a higher percentage of satisfaction with teleworking performance in Group 2, with almost 80% agreement. Satisfaction with telework performance was lower in areas other than the company's core area. This conclusion converges with the result obtained regarding the statement that performance is better in teleworking than in face-to-face work, in which there was also greater disagreement in Group 1. By excluding the slice corresponding to the core area from the analysis, the concentration of disagreement was also in the logistics sector (DIRAD/SUPCS). These results reflect the impact of the task's nature on telework performance, an aspect defended by [Coelho Jr. \(2011\)](#).

## Analysis of qualitative results

The selected group consisted of seventeen employees, with a nearly equal distribution of men and women, the latter holding a slight majority at 52.94%. Most interviewees (58.82%) were between 38 and 47 years old, followed by those over 47 (35.29%), with only one participant between 28 and 37.

Regarding education, 17.64% of interviewees reported pursuing a graduate degree. In terms of proximity to the company, just over half (58.28%) stated they lived nearby, a proportion similar to those who had children at home (52.94%). Additionally, 64.70% indicated they were either part of a COVID-19 risk group or lived with someone who was. Among the interviewees, 41.17% held management positions, and none had prior experience with remote work before the pandemic.

Applying content analysis ([Bardin, 1977](#)), the data were coded and categorized into three final categories: situational, organizational, and professional perspectives. According to [Sonnetag and Frese \(2002\)](#), the situational perspective is a key framework for analyzing work performance. Intermediate categories associated with the external environment were grouped

under this perspective, which was further divided into four subcategories: work-life fusion, suitable environment, emotional aspects, and quality of life.

The “work-life fusion” category captures employees’ difficulties in balancing work and home life during isolation. Interviewees reported role conflicts, not only among those with young children but also among those living with family members who required their attention. This led to a loss of focus, exacerbated by the extended availability of the company network, which blurred the boundaries between work and personal time, often leading employees to work outside official hours, even unintentionally, by performing simple tasks such as checking emails.

The “suitable environment” category addresses the challenges of adapting home spaces for telework. A major issue cited was the need to organize and separate family members, as well as allocate equipment for work and online classes, which many found stressful. Beyond spatial constraints, access to appropriate work tools and infrastructure posed additional challenges, sometimes incurring significant costs. Employees outside the company’s technology sector particularly reported difficulties with communication tools.

A dedicated workspace is essential for minimizing distractions while teleworking. Research indicates that remote workers who implement strategies to separate work and family life experience lower levels of work-family conflict (Bezovski, Temjanovski, & Sofijanov, 2021).

Something else comes up, you know? Then you get up and go, which interrupts the work activity. In the office, the focus is on work. Before, at 6 o’clock in the evening, I would be looking at personal things. Today, at 9 o’clock in the evening, browsing online, I end up checking the company email to see if anything has arrived. I end up mixing things up (interviewee I5).

Intra-organizational responses to COVID-19, including those at the team and management levels, have impacted employee productivity in the public sector (Ha, Raghavan, & Demircioglu, 2022). Managers should be able to propose suitable teleworking arrangements, while the company should ensure the provision of necessary equipment. Creating a comfortable and ergonomic telework environment is essential for maintaining a healthy workspace (Bezovski, Temjanovski, & Sofijanov, 2021).

We had to reorganize our home until we figured out what was best. In the end, I stayed in the living room, my husband in the bedroom, and my children in their bedroom. I had to buy a laptop so I could work, as well as suitable chairs so my children could take online classes (interviewee I4).

Regarding the intermediate category “emotional aspects,” the feelings brought about by the pandemic are examined. Many interviewees reported a persistent fear of infection, anxiety over having sick friends and relatives, and a sense of loneliness due to reduced interaction with colleagues and some family members. The company’s support, including access to qualified health professionals such as social workers and doctors, was essential.

Mäkineniemi, Oksanen, and Mäkikangas (2021) found that perceived organizational support was directly and negatively associated with exhaustion and stress, and it also moderated the relationship between loneliness and stress. These findings expand the understanding of personal demands, suggesting that loneliness can be considered a personal demand in itself. Additionally, peer support positively influences employees' psychological well-being and may have impacted their performance (Mousa & Abdelgaffar, 2021).

There was a strong emotional shock because COVID-19 was closely linked to lethality, so the care I provided was to try to show the importance of the person having as much peace of mind as possible. (...). Many people did not come to me directly for emotional reasons but rather because they needed to request a chair, so they referred them to us to assess their health as a whole. And I thanked God that these people passed by us, because when it was time to ask for the chair, they ended up venting about their emotional issues too and we ended up helping (interviewee I4).

The intermediate category, "quality of life," highlights the most frequently cited advantages of teleworking during the pandemic. Interviewees emphasized benefits such as flexible hours, time and cost savings, and increased time with family. The time previously spent commuting was now optimized, allowing for greater productivity at work and more personal time. Financial savings were particularly significant for those living farther from the company. Other advantages mentioned included improved nutrition, reduced stress, and increased productivity, as the work environment at home involved fewer interruptions than the office.

One key benefit of teleworking is the flexibility it provides, enabling employees to manage their time and energy more efficiently, adjust priorities, and engage in multiple social roles. This also leads to financial savings, albeit modest, as workers no longer need to commute (Novianti & Roz, 2020).

For me, it has improved in terms of controlling interruptions. I have better control over when to respond if someone calls me. At the company, I could barely concentrate; people would call me all the time to ask questions or ask for guidance. At home, I am much more productive (interviewee I6).

Pérez, Sanchez, and Carnicer (2002) state that teleworking requires greater preparation and supervision from management to effectively monitor tasks remotely. This assertion highlights the importance of clear organizational guidelines to ensure the viability of telework. This need became evident throughout the categorization process, leading to the identification of the following intermediate categories: "working hours control guidelines," "communication guidelines," and "task management guidelines."

The category "working hours control guidelines" underscores the importance of providing employees with clear guidance on managing their teleworking hours. Most interviewees noted that when working from home, it is easy to lose track of time, often resulting in either excessive or insufficient work hours. While teleworking was implemented as an exceptional measure, employees emphasized the necessity of at least basic guidelines – not for rigid control, but to establish healthy boundaries that make remote work sustainable.

When you are at the company, you notice people going home, it becomes empty, they turn off the air conditioning, and then you realize it is time to leave. At home, everything is undefined. It is difficult to disconnect. (interviewee I14).

Telework offers greater flexibility compared to in-person work, which is perceived positively by public sector employees and contributes to better workload balance (Novianti & Roz, 2020). According to Mousa and Abdelgaffar (2021), teleworking can also help reduce burnout, as employees gain greater control over their tasks and achieve a better balance between work and personal responsibilities.

The intermediate category, “communication guidelines,” encompasses aspects ranging from interaction with the organization to relationships with management, work teams, and other departments. Communication experiences varied among interviewees, with both positive and negative aspects depending on individual circumstances. Employees working outside the company's core areas reported greater difficulties with remote interactions. Those in people management, in particular, noted a lack of preparation for handling multiple online tools, which initially felt overwhelming and disrupted communication flow in the first few months. Other departments also mentioned delays in decision-making processes in remote settings, particularly in logistics, where in-person feedback is essential.

While telework offers benefits such as flexibility, greater control over job functions, and reduced turnover among public sector employees, these advantages may be offset by professional isolation and diminished organizational commitment. Additional challenges include weakened interpersonal relationships, reduced visibility for career advancement, and a lower sense of belonging (Mousa & Abdelgaffar, 2021).

It's easier to discuss work problems with my boss. When I work remotely, he's online all day, which makes it easier in that sense. But, I miss the communication between departments- those meetings with various teams from the sector together like we used to have (interviewee EI9).

The intermediate category, “task management guidelines,” addresses aspects related to monitoring remote teams. The most frequently mentioned points include team supervision, task tracking, and excessive meetings. Some interviewees noted a lack of clear guidelines on how managers should oversee their teams. The implementation of telework led to increased managerial control, which, in some cases, involved intrusive and uncomfortable practices that restricted employees' autonomy and contributed to burnout (Maillot, Meyer, Prunier-Poulmaire, & Vayre, 2022).

Too many meetings. Too many! Some are necessary, but others take up the time we need to be productive. Systematization and control should be in place to limit the number of meetings (interviewee I14).

Sonnentag and Frese (2002) classify the “individual perspective” as a view that examines employee performance from a personal standpoint, encompassing technical and behavioral skills that influence productivity. The analysis revealed that other elements may also be directly

linked to behavioral aspects, particularly those related to the nature of the tasks performed. Consequently, the “Professional Perspective” was subdivided into the intermediate categories of “behavioral aspects” and “nature of the task.”

The intermediate category, “behavioral aspects,” captures employee characteristics frequently mentioned in the interviews, which played a crucial role in the transition to telework. Employees with higher adaptability, concentration, and a more independent and organized work profile reported fewer difficulties during this period. Conversely, some interviewees expressed a heightened sense of self-demand while working from home, feeling pressured to always perform better. Resistance to change was also noted, particularly when employees had to adapt to unfamiliar tools and technologies.

Ha, Raghavan, and Demircioglu (2022) found that team adaptation, team effort, and organizational adaptation are positively associated with employee productivity, whereas management support and proactivity are negatively associated. Although team effort increased significantly, employees’ perceived productivity and the organization’s proactivity in maintaining new work methods negatively impacted overall productivity.

I find it very easy not to lose my train of thought. I’m here to do other things, but I can go back and continue my train of thought where I left off. This helps me deal with interruptions. And I also don’t need someone on my back to get things done. I go after it and do it. I’m very independent (interviewee I3).

The categorization and analysis of the semi-structured interviews revealed several aspects that intersect with the theoretical concepts explored in this research. These findings may influence performance and introduce perspectives that diverge from those previously discussed (Table 4). From the situational perspective, the teleworking context significantly impacted employees’ routines, particularly by blurring the boundaries between work and personal life. While most interviewees stated that this change affected their quality of life without compromising their performance, some reported that the overlap of work and home responsibilities made it difficult to maintain professional focus, ultimately reducing their performance.

Contrary to initial assumptions, those who experienced this impact were not parents but rather single employees who assumed continuous household responsibilities. Additionally, employees highlighted challenges related to work equipment, such as computers and chairs, which, in some cases, had to be purchased by the employees themselves due to communication issues with the company regarding acquisition.



Table 4. Category vs. Guiding vision

CATEGORY	GUIDING VISION	AUTHORS
Situational Perspective	External context and characteristics of the work environment	Brant and Mourão (2020)
	Fusion of work and personal life	Pires <i>et al.</i> (2021)
	Infrastructure	Sonnentag and Frese (2002)
	Emotional instability	
	Levels of anxiety and stress, fear, loneliness	
	Employee satisfaction	
Organizational Perspective	Adaptation to new forms of communication	Brant and Mourão (2020)
	Greater preparation and supervision by management to monitor tasks and the team	Contreras, Baykal and Abid (2020)
	Work overload and undefined schedules	Pérez, Sánchez and Carnicer (2002)
Professional Perspective	Social characteristics of work	Coelho Jr. (2011)
	Personality factors	Morgeson and Humphrey (2006)
	Nature of the task	Sonnenag and Freese (2002)

From a situational perspective, two key aspects frequently emerged from the interviews: emotional well-being and quality of life. Regarding the former, several employees reported feelings of fear, anguish, anxiety, and dissatisfaction due to the lack of interaction with coworkers – a consequence of the COVID-19 pandemic. From the organizational perspective, employees expressed difficulty defining their working hours and disconnecting from their workstations. Some emphasized the need for the company to establish clear guidelines on working hours, particularly for those exceeding their daily workload.

The professional perspective emphasized behavioral skills that were essential for supporting remote work. Attributes such as organization, autonomy, proactiveness in seeking new tasks, and ease of concentration were key differentiators in maintaining and enhancing work performance. Conversely, employees resistant to change reported difficulties in adapting to telework and its associated adjustments.

## CONCLUSIONS

This study successfully achieved its main objective of identifying the factors that influenced the performance of the Brazilian state-owned enterprise Serpro employees working remotely due to the COVID-19 pandemic. The research unfolded in two stages. The first involved



extracting factors with satisfactory indices through exploratory factor analysis (EFA), leading to the identification of three constructs: well-being, distance, and infrastructure. The second stage explored subjective dimensions using thematic categorical analysis, revealing three key perspectives relevant to the study: situational, organizational, and professional.

The study's main academic contribution lies in advancing research on work performance as a construct rather than merely an indicator within performance evaluations. It also deepens the analysis of the relationship between telework and performance, emphasizing factors that shaped this relationship during the COVID-19 pandemic.

The findings indicate that telework is often associated with improved quality of life and performance, but it may not always be beneficial. Its impact largely depends on the home work environment and the nature of the tasks performed, potentially even hindering performance in some contexts.

The study also highlights the need for clear management and communication guidelines to ensure the smooth functioning of remote work. Notably, the greatest communication challenges were found in the company's non-core technology sectors, emphasizing the importance of closely monitoring the difficulties faced in these areas.

This research has some limitations. Although the sample size is representative, it should be expanded for better generalizability. Additionally, the infrastructure construct was measured by only two variables (Q.16 and Q.17), which may have weakened its relationship with the indicator, despite a satisfactory Cronbach's alpha. Furthermore, the exclusion of 48% of the questionnaire items limited the scope of the data and may have influenced the results.

Future research should explore specific aspects of non-core sectors in technology companies, identifying potential management and communication gaps that hinder telework performance. Expanding the research beyond technology firms could also uncover additional constructs affecting telework outcomes.

This study offers theoretical and conceptual contributions by enhancing the understanding of factors influencing telework performance, such as well-being, infrastructure, and distance, and demonstrating, through cluster analysis, that different employee profiles experience telework in distinct ways. From a practical standpoint, it provides insights for developing more effective organizational policies, improving technological infrastructure, implementing employee well-being programs, and devising management strategies to mitigate the challenges of physical distance, ultimately preparing organizations for future remote work models.

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## **CONFLICTS OF INTEREST**

The authors have no conflicts of interest to declare.

## **AUTHOR CONTRIBUTION**

Ana Nery Alves Daniel: Conceptualization, data curation, formal analysis, research; methodology; software; visualization; writing – original draft; writing – review & editing.

Elias Pereira Lopes Júnior: Conceptualization, formal analysis, research; methodology; supervision; validation; visualization; writing – original draft; writing – review & editing.