

Comparing Exposure to Psychosocial Risks: Face-to-Face Work vs. Telework

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ABSTRACT

Background: *In recent years, substantial changes have occurred in the work organization and arrangements. One of the main ones has been the popularization of teleworking among non-manual workers. This paper aims to assess the exposure of psychosocial risks among non-manual Spanish wage-earners, depending on the working modality (mainly telework, combining teleworking with onsite work, or onsite work).* **Methods:** *Based on an online survey conducted between April and May 2021, a cross-sectional study was carried out among n=11,519 members of a trade union where Psychosocial Risks (PSR) were measured through COPSOQ Questionnaire Scales. All analyses were performed stratifying by sex.* **Results:** *Women who combine telework and face-to-face work (aPR: 1.21; 95%CI 1.07-1.37) and men who mainly telework (aPR: 1.26; 95%CI 1.11-1.43) and that combine (aPR: 1.27; 95%CI 1.11-1.45) are more exposed to quantitative demands than men and women who do not telework. On the other hand, women who telework, either entirely (aPR: 0.89; 95%CI 0.82-0.97) or combining (aPR: 0.89; 95%CI 0.81-0.98), are less exposed to emotional demands than women who do not telework, and the same occurs among men who mainly telework (aPR: 0.84; 95%CI 0.76-0.92). Telework and horizontal or vertical social support are not associated, except for supervisor support among males, nor with work-life conflict.* **Conclusions:** *Except for quantitative demands, employees who combine telework and face-to-face work are less exposed to psychosocial risks than those who mainly telework or work face-to-face only. More studies with a gender and class perspective are needed in this area.*

1. INTRODUCTION

The COVID-19 pandemic has profoundly impacted work and non-work roles, fundamentally altering the traditional work environment. With the necessity to adapt to remote work, many workers have

had to blur the boundaries between their professional and personal lives, transforming their homes into dual-purpose spaces serving residences and offices [1]. Consequently, a pressing need arises to redefine these boundaries and confront the ensuing challenges to achieve a harmonious work-life balance.

According to estimates by the Publications Office of the European Union [2], approximately half of Europeans worked remotely, at least partially, in response to the COVID-19 crisis, representing a significant increase from the pre-pandemic figure of 12%. By 2022, however, this proportion has receded to 30% (including hybrid modality).

Digitalization has undoubtedly facilitated greater autonomy and connectivity within the workplace. Still, it may also trigger the “need to work faster and to face tighter deadlines” [3, 4] and potentially increase the risk of presenteeism.

While the trend towards flexible work arrangements has been ongoing for several years, it has accelerated due to the pandemic. New flexible work designs [5] have been implemented. Work flexibility encompasses variations in location (flexplace), work schedule (flexitime) [6], and tasks. Research suggests that flexitime and flexplace are positively associated with job satisfaction [7, 8], which, in turn, is related to autonomous motivation. Conversely, these flexible arrangements may lead to presenteeism due to chronic illness [9] or infectious illness [10], as workers can fulfil their responsibilities without commuting and without concern for spreading infections to colleagues. Moreover, flexitime allows for later starts and earlier finishes, facilitating work even when individuals are partially unwell [11].

The sudden transition to remote work has presented challenges in attaining a work-life balance, mainly due to the diverse experiences resulting from variations in work modalities among household members. These challenges exist alongside more traditional structural factors such as gender and social class [12, 13]. Ultimately, work-life balance reflects the collective outcome of individuals’ effectiveness and satisfaction in their professional and personal roles [14].

Research findings regarding vulnerability and health impairment are inconclusive, as both positive and negative effects on workers’ health have been observed [15, 16]. This may stem from the risk of work encroaching on non-work time, as work can be conducted from any location without time constraints, thereby facilitating the intrusion of work into non-work hours [17] and hindering a proper split between work and personal time and

potentially, which can lead to poor psychological detachment [18]. The possibility of choosing working hours has a minimizing effect on the perception of the mental demands that the job entails [19]. This, combined with the fact that employees often feel “privileged” to have the opportunity to work from home, can lead them to work while ill to maintain this work modality [20]. Consequently, decreases in absenteeism cannot be solely interpreted as indicative of positive health status among teleworkers [21].

Given the existing gaps in the literature, it becomes necessary to obtain evidence of the impact of working from home on the workers’ well-being, to understand the current situation better, and to design suitable and efficient strategies to improve their lives and working conditions. Hence, this study aims to evaluate the exposure to psychosocial risks among non-manual wage-earning workers in Spain, explicitly emphasizing working modalities (mainly telework, combining teleworking with onsite work, or onsite work), considering potential sex inequalities [22].

2. METHODS

2.1 Design, Study Population, and Sample

Based on an online survey, a cross-sectional study was carried out among the *Comisiones Obreras* (CCOO) members, the largest trade union in Spain. For this study, we selected non-manual workers over 16 years old who reside in Spain and have been working in a salaried job for at least 1 hour during the week preceding the survey. The sample consists of $n=11,519$ workers. All study procedures were approved by the Ethics Committee of the Autonomous University of Barcelona (reference CEEAH/3445). Participants signed a written informed consent.

2.2 Data Collection

Data was obtained between April and May 2021 from an online self-administered questionnaire. The trade union emailed participants, whose participation was confidential and voluntary.

2.3 Variables

2.3.1 Dependent Variables – Psychosocial Risk Factors (PSR)

PSR was measured through scales of the COP-SOQ Questionnaire (Copenhagen Psychosocial Questionnaire) for Spain [23]. In this study, we used eleven scales grouped into four domains: quantitative demands, work pace, and emotional demands (Psychological Demands at Work); influence and possibilities for development (Work Organization and Job Contents); social support from colleagues and social support from supervisors (Interpersonal Relations and Leadership); job insecurity, labour market insecurity, insecurity over working conditions and work-life conflict (Work Individual Interface). See Table 1S (supplementary material) for more details on the scales.

2.3.2 Explanatory Variables

The primary explanatory variable was working modality (teleworking, combining teleworking with onsite work, onsite work), and the stratification variable was sex (men, women). Adjustment variables were age (16-34; 35-49; 50 years old or more), occupational group (based on the National Classification of Occupations-CNO11), contract (permanent, temporary, and without contract), and living arrangements (cohabitation with children 0-12 years old; cohabitation with elderly people 70-80 years old; cohabitation with people >80 years old; cohabitation with sick or disabled people).

2.4 Analysis

Firstly, a descriptive analysis was performed by sex. Secondly, multivariate analyses were performed using robust Poisson regression models to calculate prevalence ratios (PR), with their 95% confidence intervals (95%CI), to estimate the exposure to psychosocial risk factors according to the working modality, stratifying by sex and adjusting by the rest of the explanatory variables. All the analyses were performed using STATA version 15.

3. RESULTS

Almost half of women (47.8%) are between 35 and 49 years old (Table 1), representing a limited percentage of women under 34 (9.2%). The vast majority (78.9%) work with a permanent contract. The highest percentages are found for women who telework (90.2%), followed by those who combine work modalities (84.2%). The most prevalent occupations among women are “scientists, academics and similar professionals” (48.5%) and “accountants, administrative workers and other office employees” (36.3%). Moreover, around 30% of women live with children under 12 years old, with higher percentages among those who telework (33.2%). Around 4% of women live with people between 70 and 80. With people over 80, these percentages are slightly higher among women who telework (4.3%) in the first case and women who combine work modalities (5.6%) in the latter. Finally, 17% of women live with sick or disabled people, with slight differences according to the working modality.

Most men (52.4%) are more than 50 years old, with a minority (6.6%) under 34 years old (Table 2). Most (88.6%) work with a permanent contract, from whom 93.7% telework and 89.9% combine work modalities. The most prevalent occupations among men are “scientists, academics and similar professionals” (57.2%) and “technicians and professional support staff” (23.2%). As for women, around 30% of workers live with children under 12 years old, with higher percentages among men who telework (31.8%). Around 3% of the men live with people between 70 and 80 years old, and with people over 80, these percentages are slightly higher among men who do not telework. Finally, 13.9% of men live with sick or disabled people, with slight differences according to the working modality.

Tables 3 and 4 show the prevalence of exposure to each psychosocial risk and the adjusted prevalence ratios (aPR) by sex and working modality.

Women combining telework and face-to-face work (Table 3) are more exposed to quantitative demands than women who do not telework (aPR: 1.21; 95%CI 1.07-1.37). On the other hand, women who telework, either entirely (aPR: 0.89; 95%CI

Table 1. Sample description. Women.

	Women			
	Mainly telework n (%)	Combine n (%)	No telework n (%)	Total n (%)
Age				
16-34	92 (8.6)	57 (6.1)	424 (10)	573 (9.2)
35-49	571 (53.2)	440 (47)	1972 (46.6)	2983 (47.8)
≥50	411 (38.3)	440 (47)	1832 (43.3)	2683 (43)
Type of contract				
Permanent	978 (90.2)	790 (84.2)	3188 (74.9)	4956 (79)
Temporary	106 (9.8)	148 (15.8)	1065 (25)	1319 (21)
Without contract	0	0	1 (0.02)	1 (0.02)
Occupational group				
Directors and managers	4 (0.4)	4 (0.4)	25 (0.6)	33 (0.5)
Scientific and intellectual professionals	397 (36.6)	412 (43.9)	2237 (52.6)	3050 (48.5)
Technicians and mid-level professionals	204 (18.8)	156 (16.6)	560 (13.2)	920 (14.7)
Accountants, administrative workers and other office employees	479 (44.2)	366 (39)	1432 (33.7)	2277 (36.3)
Living with children under 12 years old				
Yes	319 (33.2)	246 (30)	1160 (31.3)	1725 (31.4)
No	642 (66.8)	573 (70)	2549 (68.7)	3764 (68.6)
Living with people 70-80 years old				
Yes	41 (4.3)	32 (3.9)	152 (4.1)	225 (4.1)
No	920 (95.7)	787 (96.1)	3557 (95.9)	5264 (95.9)
Living with people over 80 years old				
Yes	30 (3.1)	46 (5.6)	171 (4.6)	247 (4.5)
No	931 (96.9)	773 (94.4)	3538 (95.4)	5242 (95.5)
Living with sick or disabled people				
Yes	165 (17.2)	140 (17.2)	628 (17)	933 (17.1)
No	796 (82.8)	673 (82.8)	3061 (83)	4530 (82.9)

0.82-0.97) or combining (aPR: 0.89; 95%CI 0.81-0.98), are less exposed to emotional demands than those who do not telework. Moreover, women who mainly telework are more exposed to low influence over their work (aPR: 1.24; 95%CI 1.08-1.41) and to low development possibilities (aPR: 1.20; 95%CI 1.08-1.34) than women who do not telework. Finally, women who mainly telework (aPR: 1.4; 95%CI 1.25-1.56) are more exposed to job loss insecurity, while women who combine

telework and face-to-face work (aPR: 0.83; 95%CI 0.72-0.96) are less exposed than those who do not telework. Women who mainly telework (aPR: 1.22; 95%CI 1.13 to 1.33) are more exposed to labour-marked insecurity, and women who combine (aPR: 0.94; 95%CI 0.89-0.99) are less exposed to working conditions insecurity than those who do not telework.

Concerning men (Table 4), those who telework entirely (aPR: 1.26; 95%CI 1.11-1.43) or combined

Table 2. Sample description. Men.

	Men			
	Mainly telework n (%)	Combined n (%)	No telework n (%)	Total n (%)
Age				
16-34	79 (8.5)	41 (5)	218 (6.5)	338 (6.6)
35-49	410 (44.3)	306 (37.6)	1374 (40.9)	2091 (41)
≥50	437 (47.2)	466 (57.3)	1769 (52.6)	2672 (52.4)
Type of contract				
Permanent	871 (93.7)	736 (89.9)	2939 (87)	4546 (88.7)
Temporary	58 (6.2)	83 (10.1)	438 (13)	579 (11.3)
Without contract	1 (0.1)	0	0	1 (0.02)
Occupational group				
Directors and managers	7 (0.8)	8 (1)	36 (1.1)	51 (1)
Scientists, academics and similar professionals	553 (59.5)	491 (60)	1893 (56.1)	2937 (57.3)
Technicians; professional support staff	215 (23.1)	180 (22)	795 (23.5)	1190 (23.2)
Accountants, administrative workers & other employees	155 (16.7)	140 (17.1)	653 (19.3)	948 (18.5)
Living with children under 12 years old				
Yes	257 (31.8)	208 (28.9)	829 (28)	1294 (28.8)
No	552 (68.2)	512 (71.1)	2130 (72)	3194 (71.2)
Living with people 70-80 years old				
Yes	23 (2.8)	15 (2.1)	107 (3.6)	145 (3.2)
No	786 (97.2)	705 (97.9)	2852 (96.4)	4343 (96.8)
Living with people over 80 years old				
Yes	18 (2.2)	25 (3.5)	115 (3.9)	158 (3.5)
No	791 (97.8)	695 (96.5)	2844 (96.1)	4330 (96.5)
Living with sick or disabled people				
Yes	109 (13.5)	94 (13.1)	419 (14.2)	622 (13.9)
No	699 (86.5)	625 (86.9)	2532 (85.8)	3856 (86.1)

with face-to-face (aPR: 1.27; 95%CI 1.11-1.45) are more exposed to quantitative demands than men who do not telework.

On the other hand, men who mainly telework (aPR: 0.84; 95%CI 0.76-0.92) are less exposed to emotional demands than men who do not telework. Finally, men who mainly telework are more exposed to job loss insecurity (aPR: 1.21; 95%CI 1.07-1.37) and to labour marked insecurity

(aPR: 1.13; 95%CI 1.03-1.24) than those who do not telework, while men who combine are less exposed to job loss insecurity (aPR: 0.85; 95%CI 0.73-0.99).

Nevertheless, statistically significant differences are not found in the exposure to work pace, work-life conflict, and social support according to the working modality, neither among men nor women.

Table 3. Prevalence and prevalence ratio of the exposure to psychosocial risks according to the working modality. Women.

	Women		
	Exposure (%)	aPR (95%CI)*	p-value
High quantitative demands			
No telework	33.2%	ref	-
Mainly telework	36.8%	1.06 (0.94 to 1.20)	0.319
Combine	40.1%	1.21 (1.07 to 1.37)	0.002
High work pace			
No telework	51.1%	ref	-
Mainly telework	55.2%	1.05 (0.95 to 1.16)	0.347
Combine	46.3%	0.90 (0.80 to 1.01)	0.063
High emotional demands			
No telework	79.3%	ref	-
Mainly telework	69.1%	0.89 (0.82 to 0.97)	0,009
Combine	70.7%	0.89 (0.81 to 0.98)	0,013
High work-life conflict			
No telework	59.8%	ref	-
Mainly telework	61.1%	1.02 (0.93 to 1.12)	0.654
Combine	57.6%	0.98 (0.89 to 1.09)	0.738
Low influence			
No telework	23.3%	ref	-
Mainly telework	32.3%	1.24 (1.08 to 1.41)	0.002
Combine	22.2%	0.90 (0.77 to 1.07)	0.229
Low development possibilities			
No telework	35.3%	ref	-
Mainly telework	49.1%	1.20 (1.08 to 1.34)	0.001
Combine	34.4%	0.94 (0.82 to 1.07)	0.321
Low social support from colleagues			
No telework	42.4%	ref	-
Mainly telework	43.7%	1.01 (0.90 to 1.13)	0.886
Combine	41.9%	1.00 (0.89 to 1.12)	0.991
Low social support from supervisor			
No telework	53.1%	ref	-
Mainly telework	50.6%	0.92 (0.83 to 1.02)	0.098
Combine	48%	0.92 (0.82 to 1.02)	0.128
High job loss insecurity			
No telework	35%	ref	-
Mainly telework	45.8%	1.4 (1.25 to 1.56)	<0.001
Combine	27.3%	0.83 (0.72 to 0.96)	0.011

	Women		
	Exposure (%)	aPR (95%CI)*	p-value
High labour market insecurity			
No telework	64.4%	ref	-
Mainly telework	78.0%	1.22 (1.13 to 1.33)	<0.001
Combine	65.1%	1.05 (0.95 to 1.15)	0.364
High working conditions insecurity			
No telework	42%	ref	-
Mainly telework	48.8%	1.03 (0.98 to 1.08)	0.237
Combine	35.5%	0.94 (0.89 to 0.99)	0.032

**Adjusted by age, type of contract, occupational group, and living arrangements (cohabitation with children 0-12 years old; with elderly people 70-80 years old; with people >80 years old; with sick or disabled people).*

Table 4. Prevalence and prevalence ratio of the exposure to psychosocial risks according to the working modality. Men.

	Men		
	Exposure (%)	aPR (95%CI)*	p-value
High quantitative demands			
No telework	32.1%	ref	-
Mainly telework	39.8%	1.26 (1.11 to 1.43)	<0.001
Combine	40.3%	1.27 (1.11 to 1.45)	<0.001
High work pace			
No telework	40.7%	ref	-
Mainly telework	41.2%	0.97 (0.86 to 1.10)	0.663
Combine	38.1%	0.93 (0.82 to 1.07)	0.313
High emotional demands			
No telework	76.4%	ref	-
Mainly telework	65.4%	0.84 (0.76 to 0.92)	<0.001
Combine	70.8%	0.91 (0.83 to 1.01)	0.064
High work-life conflict			
No telework	54.3%	ref	-
Mainly telework	54.4%	0.98 (0.88 to 1.09)	0.734
Combine	56.2%	1.04 (0.93 to 1.16)	0.522
Low influence			
No telework	22.4%	ref	-
Mainly telework	21.5%	1.00 (0.84 to 1.18)	0.988
Combine	19.3%	0.94 (0.78 to 1.13)	0.515
Low development possibilities			
No telework	37.9%	ref	-
Mainly telework	41.8%	1.11 (0.98 to 1.26)	0.1
Combine	36.2%	0.98 (0.86 to 1.12)	0.782

Table 4 continues

Table 4. Prevalence and prevalence ratio of the exposure to psychosocial risks according to the working modality. Men. (*continued*)

	Men		
	Exposure (%)	aPR (95%CI)*	p-value
Low social support from colleagues			
No telework	39.0%	ref	-
Mainly telework	36.5%	0.95 (0.83 to 1.08)	0.419
Combine	35.3%	0.90 (0.78 to 1.03)	0.128
Low social support from supervisor			
No telework	51.5%	ref	-
Mainly telework	46.7%	0.89 (0.80 to 1.00)	0.055
Combine	48%	0.94 (0.84 to 1.06)	0.308
High job loss insecurity			
No telework	35%	ref	-
Mainly telework	42.1%	1.21 (1.07 to 1.37)	0.002
Combine	30.1%	0.85 (0.73 to 0.99)	0.031
High labour market insecurity			
No telework	67.2%	ref	-
Mainly telework	75.4%	1.13 (1.03 to 1.24)	0.01
Combine	67.7%	1.03 (0.93 to 1.14)	0.593
High working conditions insecurity			
No telework	43%	ref	-
Mainly telework	42.3%	0.98 (0.93 to 1.04)	0.487
Combine	38.1%	0.96 (0.91 to 1.02)	0.225

*Adjusted by age, type of contract, occupational group, and living arrangements (cohabitation with children 0–12 years old; with elderly people 70–80 years old; with people >80 years old; with sick or disabled people).

4. DISCUSSION

This study has allowed us to assess the distribution of psychosocial risk exposures among non-manual Spanish wage-earners, according to the working modality and stratified by sex one year following the onset of the COVID-19 pandemic.

Examining the relationship between demands and work pace, we find that men who mainly telework and both men and women who combine telework and face-to-face work show higher quantitative demands than those who do not telework. Most studies around this topic, also considering other countries, find that the workload has increased for a substantially more significant proportion of women than men, mainly attributed to increased

domestic responsibilities [24]. Telework appears to increase workload, extended and irregular working hours, and perpetual availability requirements, all of which represent prominent risk factors, particularly relevant within the context of the COVID-19 pandemic [25, 26], a phenomenon that had already been observed before the pandemic [27, 28].

Regarding work-life conflict, it is notable that while the percentages are slightly higher for women compared to men, there are no differences based on the working modality. Conflicting results from other literature suggest that working from home may positively impact well-being by enhancing the ability to balance family life [29]. The reduction in work-family challenges stems from employees' perception of having control over their work location, timing, and

processes. Kossek et al. [30] found that employees with a greater perception of job control exhibited significantly lower turnover intentions, family-work conflict, and depression. Telework may necessitate the integration of childcare and household responsibilities due to the challenges in delineating boundaries between work and personal life [31]. Over the past two decades, telework has undergone significant changes owing to technological advancements and its expansion to numerous occupations, necessitating careful consideration when interpreting these findings. Children's presence often prompts a redistribution of household chores within couples, emphasizing gender disparities and exacerbating work-to-family issues [32]. Women, who typically have a higher involvement in childcare, face a greater need to strike a balance [33], as evidenced by studies reporting increased work-to-family conflict, stress, and anguish among women [34, 35]. Recent research has also indicated an increase in domestic work among mothers working from home, particularly in routine childcare, compared to mothers who do not telework [36]. However, a more equitable allocation of cleaning and routine childcare is observed when comparing fathers commuting to employer facilities with those working from home. In Spain, women have experienced a lesser impact from lockdown situations, likely due to their heavier care workload. This contributes to women's significantly lower incidence of permanent and full-time contracts, ultimately leading to partial or total withdrawal from the labor market [37]. Nevertheless, studies have demonstrated that implementing planned, agreed, and prepared remote working measures under the "new normal" conditions has reduced work-family conflict [38].

While the observed differences are not statistically significant for social support, there is a pattern in which those who telework have better support, especially men. Our findings show that both women and men report lower levels of social support from supervisors when not teleworking. Additionally, when it comes to social support from colleagues, men experience lower levels when not teleworking, whereas women report diminished support when primarily teleworking. Literature frequently highlights negative emotions such as social isolation and loneliness

among teleworkers, affirming the significant social aspect of emotions [39]. Moreover, research underscores that computer-mediated communication, as opposed to face-to-face interaction, can detrimentally impact the emotional well-being of workers [40].

In terms of limitations, it is a cross-sectional study, which doesn't allow for the assurance of either the directionality of the relationships or their causality. Specific associations between working modalities and psychosocial risks explored herein may hint at reversed relationships. For example, when considering influence, although the versatility to integrate diverse working modalities may likely lead to heightened influence, an alternative viewpoint suggests that individuals with greater influence possess a heightened ability to alternate between in-person work and teleworking. Analogous reasoning can be extended to assessments of possibilities for developmental or job insecurity. As a result, our investigation principally focuses on associations that conform to a cause-and-effect logical sequence: the modality of work (cause) and exposure to psychosocial risks (effect). It is also important to acknowledge that the participants in this study were affiliated with the CCOO trade union. While the sample size is substantial, and this trade union encompasses all sectors of economic activity, we must refrain from asserting the sample's representativeness for the entire Spanish working population.

On the other hand, the analysis of exposure to PSR, according to the work modality, was conducted by adjusting for occupational groups to obtain conclusions that, as much as possible, could be explained independently of the occupation. The categorization used for this variable was based on the Spanish national occupational classification (CNO-11) at the 1-digit level, which is broad and, in some cases, might "hide" unequal distributions in some occupations that could explain part of the results. For example, the finding of higher emotional demands in women who work at their employer's premises may be confounded by a higher frequency of non-manual women with occupations in the healthcare sector, where telework is not possible, and where there are usually higher emotional demands. However, beyond the already mentioned large sample size, it is worth noting that, to the best of our knowledge, our

study is the first to analyse the exposure to psychosocial risks according to the working modality for the non-manual Spanish population and also consider potential differences based on a fundamental axis of inequality in the labor market, such as sex.

5. CONCLUSIONS

This study examines the exposure to psychosocial risks based on working modality, notably incorporating the combination of telework and face-to-face work into its analysis to understand better the effect of the different types of telework widely spread since the COVID-19 pandemic. A key finding of this study reveals that employees, irrespective of sex, who combine telework and face-to-face work are generally less exposed to psychosocial risks than those who mainly telework or those who work onsite, except for quantitative demands. Specifically, telework is associated with a lower exposure to emotional needs, but, on the other hand, it is associated with higher work demands (especially when combined with onsite work). Furthermore, the exposure to psychosocial risks varies by sex across different working modalities. Women primarily engaged in telework exhibit elevated levels of job insecurity across all dimensions, alongside challenges related to work pace, influence, and development possibilities. Similarly, men primarily engaged in telework also show a higher prevalence of job insecurity.

These findings can be valuable from an occupational medicine standpoint, considering that these remote working arrangements present a challenge for preventive services and occupational physicians, who traditionally operate within physical workplaces. The results highlight the importance of assessing the exposure to psychosocial risk factors among teleworkers to mitigate them, especially those concerning quantitative demands, thereby preventing potential adverse health effects.

SUPPLEMENTARY MATERIAL: TABLE S1

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DECLARATION OF THE USE OF AI: We declare that we have not used AI for any of the stages of the article.

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