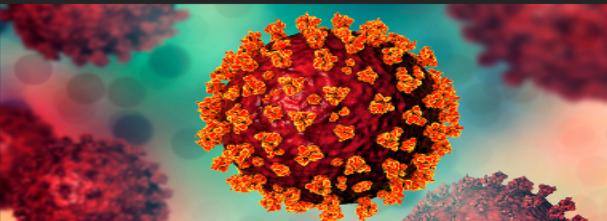


ECERPH 2021



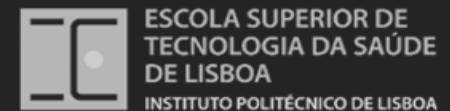
International Journal of
Environmental Research
and Public Health



Assessment and Impact of the risk of Exposure of Portuguese Biomedical Scientists in the context of COVID-19: An exploratory study

Ana Tavares¹, Fernando Bellém², Renato Abreu¹,

Céu Leitão¹, Nuno Medeiros^{1,3} & Luís
Calmeiro^{4,5}



¹ H&TRC—Health & Technology Research Center, ESTeSL - Lisbon School of Health Technology, IPL- Polytechnic Institute of Lisbon, Portugal, ana.tavares@estesl.ipl.pt;

² ESTeSL, IPL; ³ IHC — NOVA FCSH Institute of Contemporary History, New University of Lisbon, Portugal ;

⁴ School of Applied Sciences, Abertay University, Dundee, United Kingdom; ⁵Institute of Environmental Health, Faculty of Medicine, University of Lisbon, Portugal.

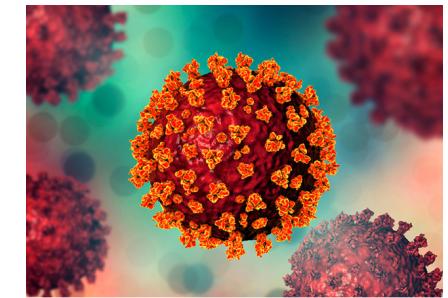


Background

- COVID-19 is a new and emerging public health concern, caused by SARS-CoV-2, a new corona virus.
- Health professionals are in the frontline of the fight against this pandemic; hence, there is an undeniable risk of being infected, and through this infection they may introduce or amplify outbreaks in their health units.
- The purpose of this study is to characterize and assess Biomedical Scientists' risk of COVID-19 exposure and stress appraisals in relation to their contact with infected patients.



ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA
INSTITUTO POLITÉCNICO DE LISBOA



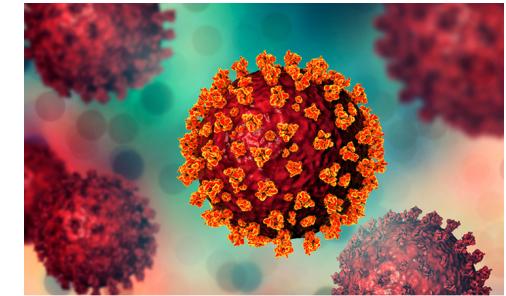
ECERPH
2021

Materials and Methods

- Cross-sectional, survey-based study.
- A sample of 233 Portuguese Biomedical Scientists (76.4% females) were recruited through social networks and professional associations.
- Data were collected via a structured on-line questionnaire, which included the WHO's Risk Assessment and Management of Exposure Survey (WHO, 2020) and the Stress Appraisal Measure (SAM; Peacock & Wong, 1990).



ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA
INSTITUTO POLITÉCNICO DE LISBOA



ECERPH
2021

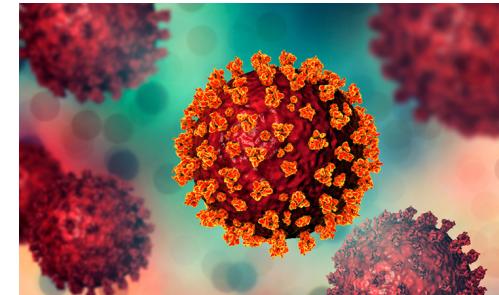
Materials and Methods

- WHO's Risk Assessment and Management of Exposure Survey (WHO, 2020):

- Community exposure to COVID-19 virus
- Occupational exposure to COVID-19 virus
- Risk categorization of healthcare workers exposed to the COVID-19 virus



ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA
INSTITUTO POLITÉCNICO DE LISBOA



ECERPH
2021

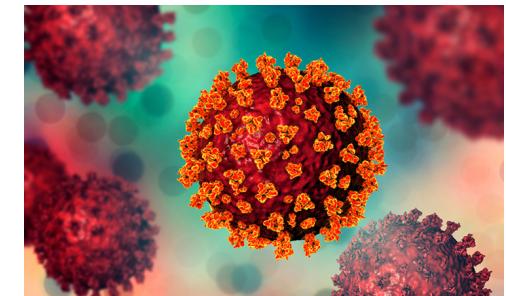
Materials and Methods

- Stress Appraisal Measure (SAM; Peacock & Wong, 1990):
- 3 primary cognitive appraisals:
 - Threat
 - Challenge
 - Centrality
- 3 secondary cognitive assessments:
 - Control by the same
 - Control by others and
 - Uncontrollability

It consists of 28 items that represent the participants' thinking in relation to a specific situation, in this case, working in a context of exposure to COVID-19.



ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA
INSTITUTO POLITÉCNICO DE LISBOA



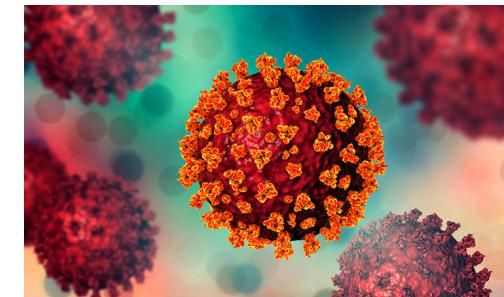
Materials and Methods

Data Analysis

- Descriptive statistics were calculated for all variables.
- Absolute and relative frequencies were used for categorical variables.
- Means and standard deviations were computed for continuous variables.
- Exposure to COVID-19 virus and risk of COVID-19 infection were calculated according WHO's Risk Assessment and Management of Exposure Survey indications.



ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA
INSTITUTO POLITÉCNICO DE LISBOA



ECERPH
2021

Results

Participants worked mainly in outpatient settings (45%) and in emergency services (28%).

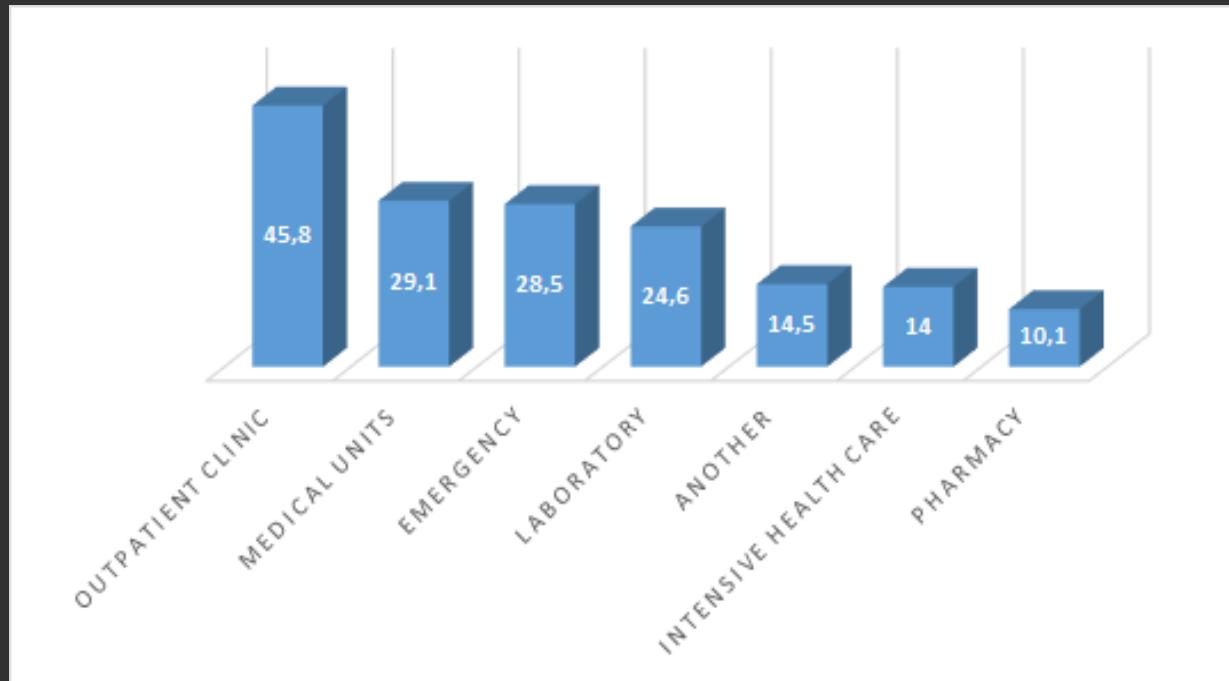
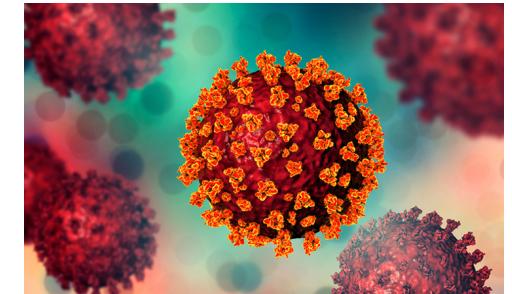


Figure 1 - Workplaces of the participants



Results

Most participants were biomedical scientists in radiology (28.5%), clinical analysis (26.3%), cardiopneumology (12.3%) and pharmacy (10, 1%).

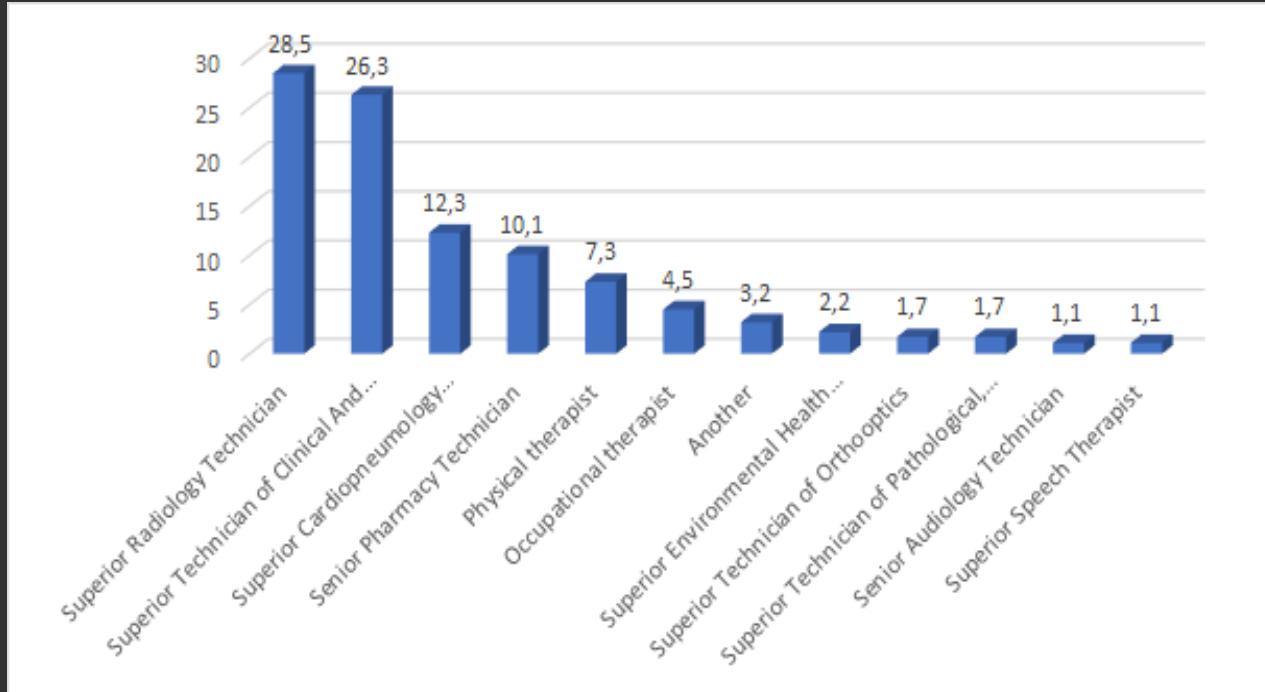
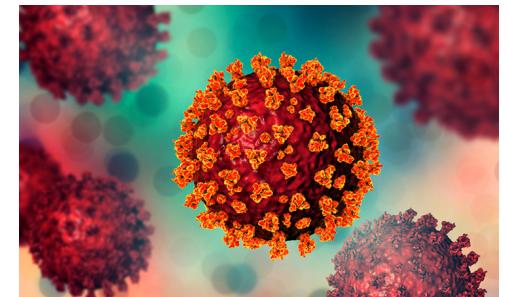
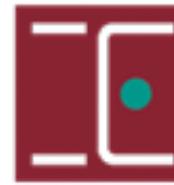


Figure 2 - Biomedical scientist profession

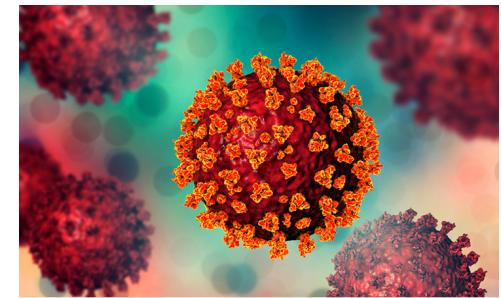


Results

- 22.9% of participants were exposed to COVID-19 through community exposure, while 39% were exposed in a professional context.
- 89 (50%) directly provided some healthcare to a confirmed patient with COVID-19.
- Although 94.9% reported using personal protective equipment (PPE) while providing healthcare or diagnostic and therapeutic tests to a COVID-19 patient, 83.6% were at high risk of COVID-19 infection.



ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA
INSTITUTO POLITÉCNICO DE LISBOA



ECERPH
2021

Results

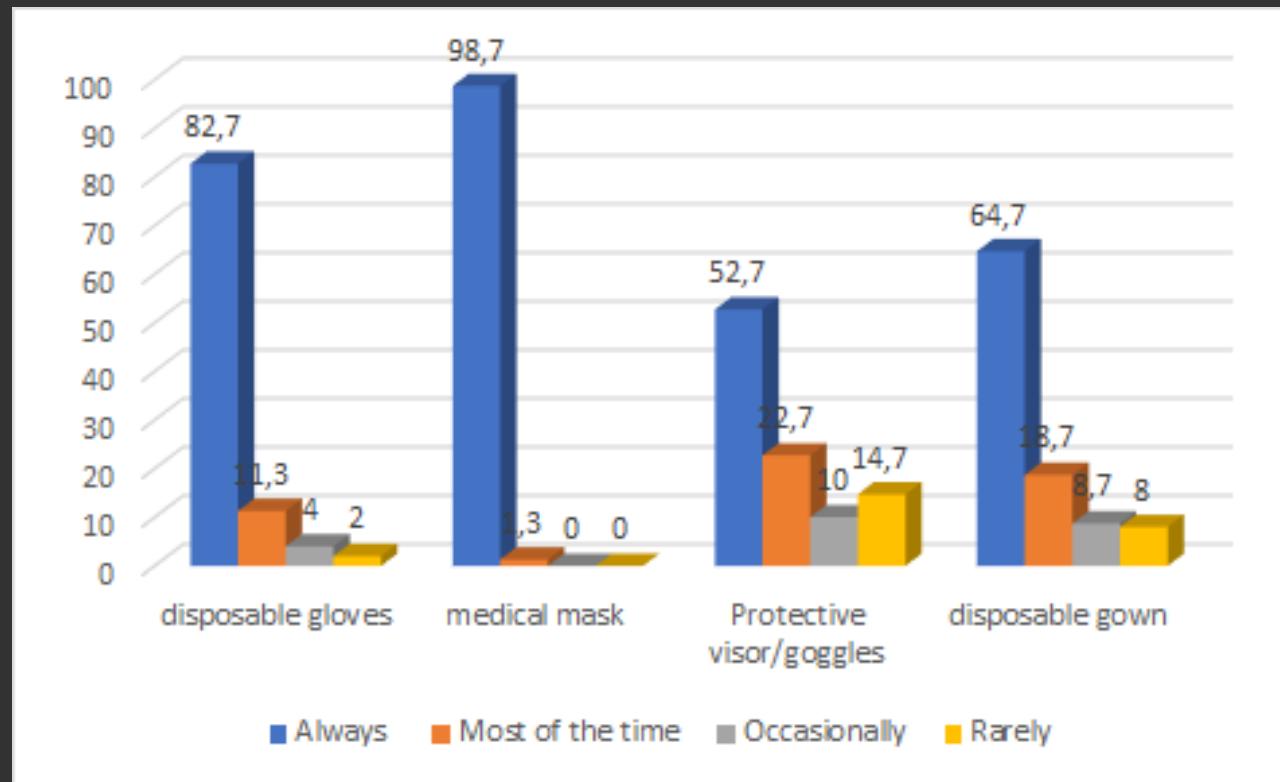
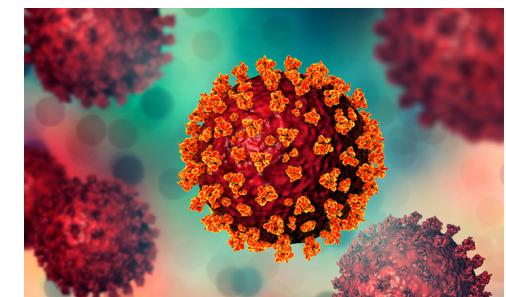


Figure 3 - Frequency of use of PPE by biomedical scientists



Results

According to the biomedical scientist exposure risk categorization to COVID-19, it was found that 83.6% had a high risk and 16.4% a low risk.

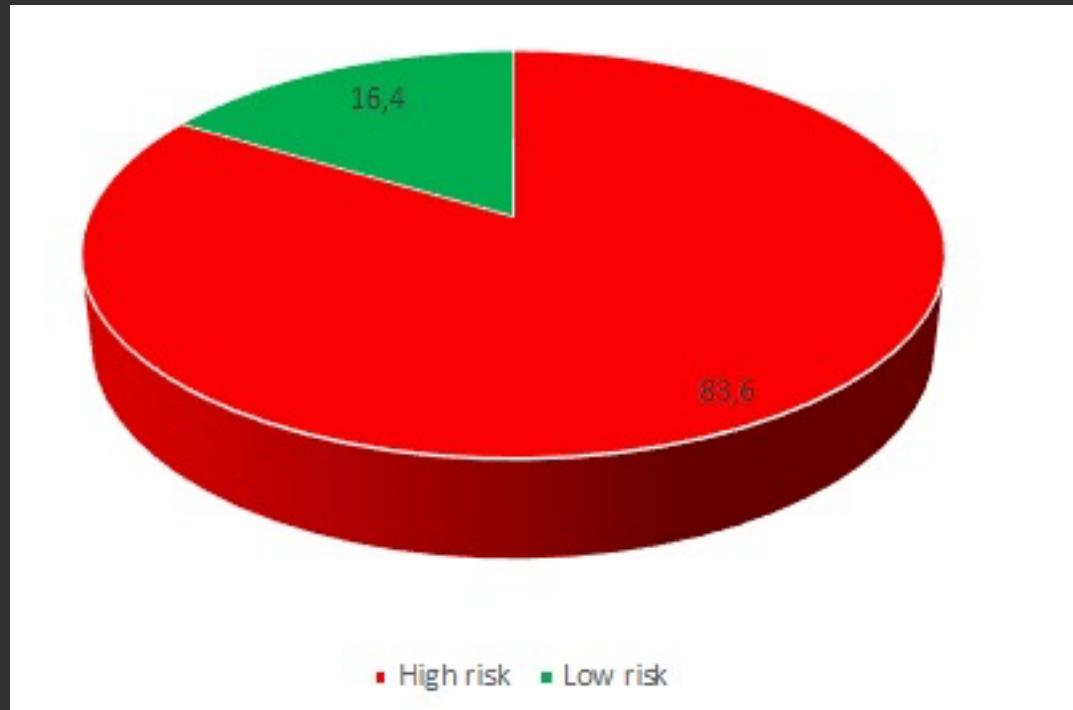
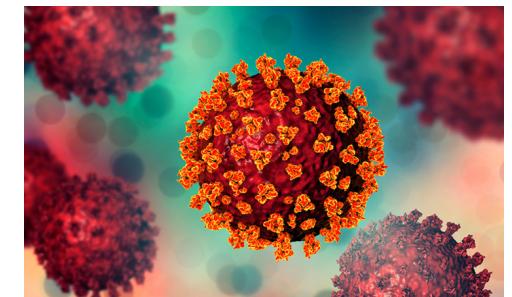


Figure 4 - Biomedical scientists exposure risk categorization to COVID-19



ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA
INSTITUTO POLITÉCNICO DE LISBOA



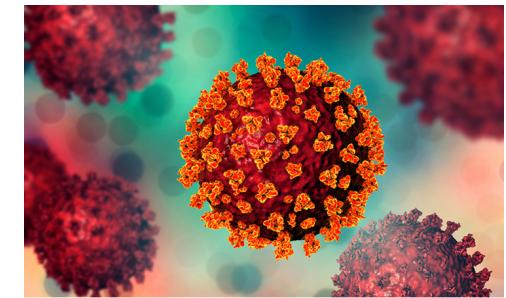
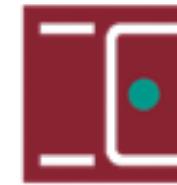
ECERPH
2021

Results

Concerning stress appraisals, results suggest moderate perceptions of stress and threat, but also moderate perceptions of control over the situation.

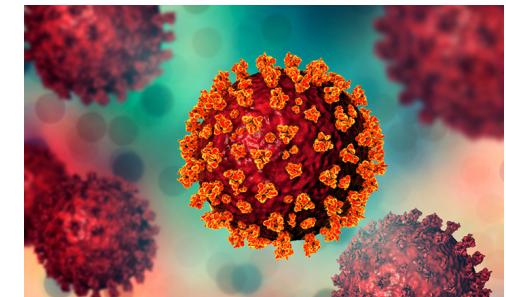
Table 1: Stress perceptions and primary and secondary cognitive appraisals (means and standard deviations) of biomedical scientists as a function of risk exposure to patients with COVID-19.

Variables	Risk			<i>t</i> -value	<i>p</i> -value
	All	Low	High		
Threat	3.10 (0.88)	3.01 (1.01)	3.12 (0.86)	-0.58	.59
Challenge	2.94 (0.88)	3.14 (0.99)	2.90 (0.86)	1.20	.23
Centrality	3.31 (0.91)	3.29 (1.11)	3.32 (0.88)	-0.12	.90
Uncontrollability	2.69 (0.82)	2.80 (0.91)	2.67 (0.80)	0.65	.52
Controllable-by-others	3.02 (0.93)	3.20 (0.84)	2.98 (0.94)	1.02	.31
Controllable-by-self	3.63 (0.68)	3.73 (0.62)	3.60(0.69)	0.80	.42
Stress	3.40 (0.81)	3.41 (0.78)	3.39 (0.82)	0.10	.92



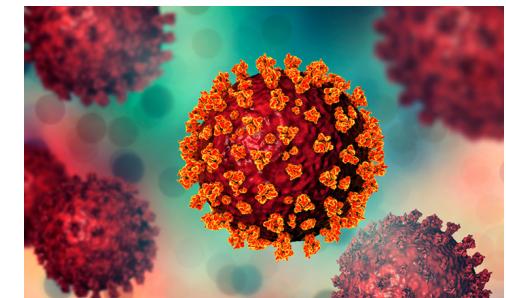
Discussion

- Biomedical scientists are at high risk of exposure to COVID-19 infection, either through direct contact with patients infected with COVID-19 or through contact while handling biological substances.
- These results are similar to those presented by Ashinyo et al. (2020) who estimated an occupational risk of 80.4%.



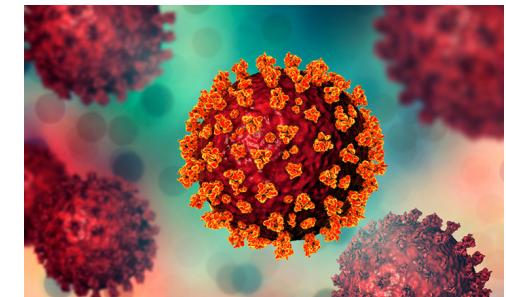
Discussion

- The results depict a complex and textured reality:
- There are mostly moderate perceptions of stress and threat.
- There are also moderate perceptions of control over the situation.
- These moderate appraisals are a probable emanation of a greater level of protection provided by PPE-related measures combined with the recognition of the unpredictable and contingent nature of the COVID-19 pandemic.



Conclusions

- The vast majority of Biomedical Scientists is at high risk of occupational exposure.
- Perceptions of stress and threat, however, are moderate, possibly filtered by a general sense of safety, as the risk can be reduced by consistent and appropriate use of PPE.
- Recommendations for protection rules must: a) reinforce concrete measures of support and working conditions offered by healthcare organizations, and b) adopt a policy encouraging the development of personal agency.





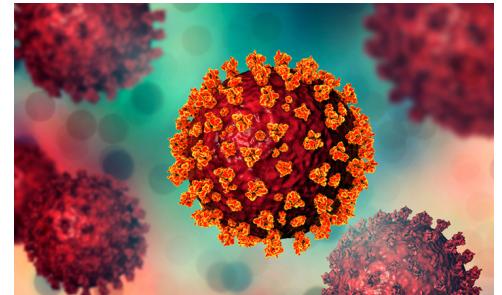
ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA
INSTITUTO POLITÉCNICO DE LISBOA



Thank you for your Attention!

- **Acknowledgements**

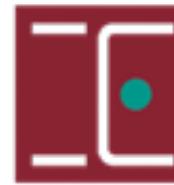
The authors are grateful to Professor Fernando Mendes from ESTESCoimbra for his help with the data collection and to the STSS and SINDITE professional associations for their cooperation.



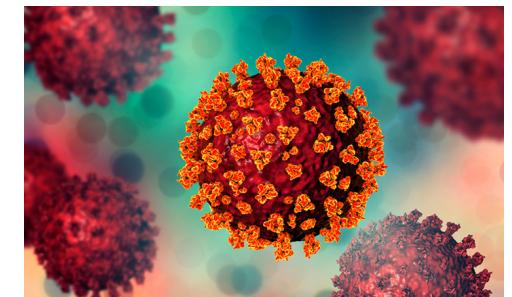
ECERPH
2021

References

- 1. World Health Organization W. Modes of transmission of virus causing COVID-19 : implications for IPC precaution recommendations. Scientific brief. 2020. <https://doi.org/10.1056/NEJMoa2001316.5>.
- 2. Lumley SF, O'donnell D, Campbell M, Sims E, Lawson E, et al. Differential occupational risks to healthcare workers from SARS-CoV-2 observed during a prospective observational study. *Elife*. **2020**;9:1–37.
- 3. Black JRM, Chris B, Przewrocka J, Dijkstra KK, Swanton C. COVID-19: the case for health-care worker screening to prevent hospital transmission. *Lancet*. **2020**;395(January):1418–20.
- 4. European Centre for Disease Prevention and Control. Infection prevention and control for COVID-19 in healthcare settings [Internet]. Elsevier's Novel Coronavirus Information Center.
- 5. Guimarães A. Covid-19: mais de 3.300 profissionais de saúde infetados em Portugal [Internet]. Portugal: Emissão TVI24; 2020. Available from: <https://tv24.iol.pt/sociedade/coronavirus/covid-19-mais-3-300-profissionais-de-saude-infetados-em-portugal>
- 6. Centers for Communicable Disease and Prevention. New jersey department of health (NJDOH) monitoring and movement guidance for healthcare personnel (HCP) exposed to confirmed cases of COVID-19 [Internet]. New Jersey; 2020. Available from: https://www.nj.gov/health/cd/documents/topics/NCOV/Guidance%20for%20HCW%20EXPOSURE%20Monitoring%20and%20Movement%20NJDOH%20DOC%203_9_20_.pdf
- 7. Centers for Disease Control and Prevention (CDC). Interim operational considerations for public health management of healthcare workers exposed to or with suspected or confirmed COVID-19: non-U.S. healthcare settings [Internet]. 2020. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/non-us-settings/public-health-management-hcw-exposed.html#figure>
- 8. Lazarus RS. *Stress and Emotion: A New Synthesis*. Springer Publishing Company; 2006.



**ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA**
INSTITUTO POLITÉCNICO DE LISBOA



**ECERPH
2021**

References

- 9. Glaziou P. Sample size for a prevalence survey, with finite population correction [Internet]. Sampsize.sourceforge.net. 2017 [cited 2020 May 25]. Available from: <http://sampsize.sourceforge.net/iface/index.html#prev>.
- 10. Fidalgo V. Técnicos de saúde são os mais infetados com coronavírus. Cofina Media. 2020; Retrieved from <https://www.cmjornal.pt/sociedade/detalhe/tecnicos-de-saude-sao-os-mais-infetados-com-coronavirus> (accessed on 6th April 2020).
- 11. World Health Organization. Risk assessment and management of exposure of health care workers in the context of COVID-19. 2020. <https://apps.who.int/iris/handle/10665/331496>
- 12. Peacock EJ, Wong PTP. The stress appraisal measure (SAM): A multidimensional approach to cognitive appraisal. *Stress Med.* **1990**;6(3):227–36.
- 13. Ashinyo ME, Dubik SD, Duti V, Amegah KE, Ashinyo A, Larsen-Reindorf R, et al. Healthcare Workers Exposure Risk Assessment: A Survey among Frontline Workers in Designated COVID-19 Treatment Centers in Ghana. *J Prim Care Community Heal.* **2020**;11:1–10.
- 14. Joyce P. Governmentality and risk : setting priorities in the new NHS. *Social Health Illn.* **2001**;23(5):594–614.
- 15. Delogu B. On the Concept of Risk and Its Application in Risk Analysis. In: *Risk Analysis and Governance in EU Policy Making and Regulation*. Springer; 2016.
- 16. Calò F, Russo A, Camaioni C, De Pascalis S, Coppola N. Burden, risk assessment, surveillance and management of SARS-CoV-2 infection in health workers: A scoping review. *Infect Dis Poverty.* **2020**;9(1):1–11.



**ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
DE LISBOA**
INSTITUTO POLITÉCNICO DE LISBOA

