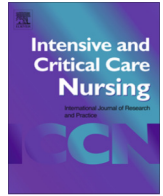




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Editorial

Human biases and the SARS-CoV-2 pandemic

**Human biases and the SARS-CoV-2 pandemic**

First we joke, then we underestimate . . . and meanwhile Covid-19 wins

It is Tuesday, 24 March 2020 in Spain. Not a month has passed since the first positive Covid-19 case was detected in Spain and 39,673 cases have been confirmed, although the real number of cases is undoubtedly higher. The number of total deaths is now 2,696. An editorial in this journal alerted a few weeks ago about the importance of appropriate protection of health care professionals from exposure to critically infected patients (Jansson et al., 2020). However, in Spain alone, a total of 5,400 health care professionals have been infected by SARS-CoV-2.

Why are we having trouble incorporating data into our knowledge? confirmation bias

Disbelief in the facts represented by the data is evident. In Spain, despite information from other countries such as China, South Korea and Italy, why were messages of calm issued by the authorities until just a few days ago? Why were projections and modelling of the number of cases and deaths in the coming weeks not taken into account? Instead, similarity judgements were made: this is a flu-like virus, so it can be managed like flu. Perhaps when everything is over, we may be able to respond to these questions better.

Leaving economic and political reasons aside, one possible answer may be the way in which we inform ourselves and make decisions, which is influenced by cognitive biases. One such bias is confirmation bias, the tendency to favour, search for, interpret and remember information that confirms our own beliefs. Confirmation bias has the following characteristics:

- Professionals selectively and systematically recall information, i.e., they do not pay attention or systematically analyse all available data
- Professionals persevere in their beliefs even when they are not proven to be effective or have even been shown to be ineffective (no evidence-based measures are applied)
- Professionals may also interpret ambiguous evidence in a way that supports their position

These traits are even more vigorously expressed in situations where the emotional component is high. Epidemiologists, health

officials and politicians, all human, are hampered by their biases. While they may try to maintain that they are rational, scientific and logical, this is not completely true. What mainly guides people, including professionals, are hopes, dreams and emotions (Blumenthal-Barby and Krieger, 2015).

When making predictions and judgements in conditions of uncertainty, professionals do not seem to calculate probabilities or apply statistical predictions. Rather, their declarations are based on a limited number of heuristics that sometimes give rise to reasonable judgements and other times lead to serious and systematic errors (Saposnik et al., 2016), as illustrated by SARS-CoV-2 contagion in Spain. All those irrationalities and errors that we observe and will further see in the coming days derive from the inner workings of the human mind. However, knowing this, professionals need to take steps to be less affected by biases in their decision making.

How to overcome cognitive biases and improve decision making during the SARS-CoV-2 pandemic

At times like this, it is important to listen to other opinions and consider them in relation to our own information and hypotheses. Spain has been ineffective in analysing the evidence generated from the experiences of countries ahead of us in the contagion curve and has been led by biases. Any process that involves different and even discordant voices will improve the decision-making process, while we should also avoid the Dunning-Kruger effect, i.e., overestimating knowledge about a topic when a little is known about a topic, exemplified by supposed experts making blunt statements of the type “*what we absolutely must do is this or that . . .*”. We need to leave aside statements of this kind and be guided as much as possible by the existing evidence as expressed in formal protocols, guidelines or recommendations, always based on the highest quality scientific evidence. High-quality evidence tends to minimise methodological biases. Minimal bias in decision making at this time can be favoured by making use of different strategies at the level of healthcare experts (Table 1) (Dobler et al., 2019).

Extreme situations are developing in Spanish hospitals and intensive care units due to the care logistics and isolation demands associated with growing numbers of affected patients. A care overload will inevitably be associated with an increase in errors linked to care (Oliveira et al., 2016; Novaretti et al., 2014; Aiken et al., 2014), while patient care by non-experts in the area will undoubtedly be associated with poorer health outcomes (Faisy et al., 2016).

Table 1
Possible solutions to overcome biases.

Educational strategies	<ul style="list-style-type: none"> • Recognising that bias can impact on decision making (short training sessions in units) • Discussing strategies to mitigate the effects of bias (meetings with team members and simulation training)
Real-time workplace strategies	<ul style="list-style-type: none"> • Using checklists before accessing the room containing the patient with Covid-19 • Reviewing compliance with recommendations within units
Real-time strategies for individual decision makers	<ul style="list-style-type: none"> • Reflecting on published evidence by healthcare professionals • Seeking evidence to support decisions in opposition to an initial decision before making a final decision

An increase in anxiety and psychological disorders will undoubtedly be observed among professionals, due to the stresses of their care role as well as personal repercussions deriving from biological exposure to SARS-CoV-2, the probability of being infected and the associated anguish. While all these situations represent favourable situations for biases that affect decision-making, we need to use the best evidence available regarding how to deal with and avoid biases in identifying and addressing decisions.

Disclosure

Any conflict of interest regarding this manuscript.

References

- Jansson, M., Liao, X., Rello, J., 2020. Strengthening ICU health security for a coronavirus epidemic. *Intensive Crit. Care Nurs.* 57., <https://doi.org/10.1016/j.iccn.2020.102812>.
- Blumenthal-Barby, J.S., Krieger, H., 2015. Cognitive biases and heuristics in medical decision making: a critical review using a systematic search strategy. *Med. Decis. Making.* 35 (4), 539–557.
- Saposnik, G., Redelmeier, D., Ruff, C.C., Tobler, P.N., 2016. Cognitive biases associated with medical decisions: a systematic review. *BMC Med. Inform. Decis. Mak.* 16 (1), 138.
- Dobler, C.C., Morrow, A.S., Kamath, C.C., 2019. Clinicians' cognitive biases: a potential barrier to implementation of evidence-based clinical practice. *BMJ Evid. Based. Med.* 24 (4), 137–140.
- Oliveira, A.C., Garcia, P.C., Nogueira, L.S., 2016. Nursing workload and occurrence of adverse events in intensive care: a systematic review. *Rev. Esc Enferm. USP.* 50 (4), 683–694.
- Novaretti, M.C., Santos Ede, V., Quitério, L.M., Daud-Gallotti, R.M., 2014. Nursing workload and occurrence of incidents and adverse events in ICU patients. *Rev. Bras Enferm.* 67 (5), 692–699.
- Aiken, L.H., Sloane, D.M., Bruyneel, L., Van den Heede, K., Griffiths, P., Busse, R., Diomidous, M., Kinnunen, J., Kózka, M., Lesaffre, E., McHugh, M.D., Moreno-Casbas, M.T., Rafferty, A.M., Schwendimann, R., Scott, P.A., 2014. Tishelman C, van Achterberg T, Sermeus W; RN4CAST consortium. Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study. *Lancet.* 383 (9931), 1824–1830.
- Faisy, C., Davagnar, C., Ladiray, D., Djadi-Prat, J., Esvan, M., Lenain, E., Durieux, P., Leforestier, J.F., Marlet, C., Seijo, M., Guillou, A., 2016. Nurse workload and inexperienced medical staff members are associated with seasonal peaks in severe adverse events in the adult medical intensive care unit: a seven-year prospective study. *Int. J. Nurs. Stud.* 62, 60–70.

Josep M. Garcia-Alamino
Programme in Evidence Based Health Care, University of Oxford, Oxford, UK
E-mail address: josepmariagarciaa@gmail.com