



## EDITORIAL

# ZERO projects in intensive care units: Challenges during SARS-CoV-2 pandemic and future recommendations<sup>☆</sup>

## Proyectos Zero en las unidades de cuidados intensivos: retos durante la pandemia por SARS-CoV-2 y futuras recomendaciones

The Covid-19 pandemic led to a worldwide health and social crisis which directly affected the healthcare system.<sup>1</sup> In Spain, the first case was confirmed on 31<sup>st</sup> January 2020. Since then, the virus has spread rapidly, seriously affecting healthcare, with pressure on care, precarious supplies and resources, ever-changing staff and lack of specialised personnel to attend to the high percentage of patients admitted to intensive care units (ICU).<sup>2,3</sup> In Spain, to date, a total of 10,199,716 confirmed cases of Covid-19 have been reported, 37,113 of which required ICU admission.<sup>4</sup> In order to deal with this situation the Spanish Society of Intensive Care Medicine and Coronary Units (SEMICYUC for its initials in Spanish), the Spanish Society of Intensive care Nursing and Coronary Units (SEEIUC for its initials in Spanish) and the Pan-American and Iberian Federation of Critical Care Medicine and Intensive Therapy (FEPIMCTI for its initials in Spanish) published a contingency plan for ICUs<sup>5</sup> in April 2020. Months later, the same bodies presented a descaling plan to ensure appropriate response to possible Covid-19 outbreaks, maintaining the activity for non-Covid critical care patients and ensuring quality and safety standards.<sup>6</sup> In the latter plan the need to renew Zero projects to prevent healthcare-related infections (HRI) was emphasized.<sup>7–11</sup>

According to a national study, which includes all types of nosocomial hospital infections, the prevalence of HRI in Spain prior to the pandemic was 7%,<sup>12</sup> above the European average (5.7%), with a respiratory infection rate of 19.7%.

However, this rate increased throughout the world during the pandemic,<sup>13</sup> and more specifically in Spain, with 36.3% of ICU patients presenting with one or more infections.<sup>14</sup> During this period, based on a national incidence study of infections relating to invasive devices in critically ill patients admitted to the ICU for over 24 h,<sup>14</sup> 957 infections were recorded in 1525 patients, with 35% corresponding to mechanical-ventilation-associated pneumonia (MVP), 35% to primary bacteria (PB) of which 18% was vascular-catheter-associated (VAB) and 19% with urinary-tract-associated infections, related to the urethral catheterisation (UTI-UC). These data from the ENVIN<sup>14</sup> register confirm that during the pandemic the rates of different controlled infections doubled and on occasions tripled, reaching and/or surpassing the previous rates from the beginning of the Zero Projects,<sup>15</sup> proof of the need to renew the application of the recommendations of these Projects.<sup>7–11</sup>

Due to this, the main structural, technical and organisational factors of Spanish ICUs which could hinder adherence to the Zero Projects recommendations to prevent HRI were identified.<sup>6</sup> Regarding structural factors, it is of note that at the beginning of the pandemic, it was necessary to adapt additional spaces to care for critically ill patients. Many of these spaces were diaphanous areas where patients were divided into sections and personal protection equipment (PPE) was optimised. In these units contact isolation measures were further complicated and transmission between patients increased.<sup>6</sup> Regarding technical factors, many professionals from other care areas had to work in the ICUs. Since training in personal protection equipment and the clinical and epidemiological aspects of Covid-19 were prioritised, it was not always possible to train such a high number of professionals in the Zero Project measures.<sup>6</sup> Lastly, with regards to organisational aspects, for minimising patient exposure to Covid-19 and to optimise the use of PPE, tasks

DOI of original article: <https://doi.org/10.1016/j.enfi.2022.03.001>

<sup>☆</sup> Please cite this article as: Vázquez-Calatayud M, García-Díez R. Proyectos Zero en las unidades de cuidados intensivos: retos durante la pandemia por SARS-CoV-2 y futuras recomendaciones. *Enferm Intensiva*. 2022;33:55–57.

were organised to stay the shortest possible time in the care hub or area. Tasks were also grouped together, and the number of professionals required for them reduced to a minimum.<sup>6</sup>

Regarding future situations with similar epidemiological and clinical characteristics, conditions that would lead to a lack of compliance with the Project Zero recommendations should be avoided. In this regard, at the end of October 2020, the members of the Safety Programme Advice Board for critical care patients published a new document where the previously mentioned factors were reviewed and adaptation to the projects during periods of epidemics were proposed, to facilitate compliance and prevent non-compliance-associated morbi-mortality.<sup>16</sup>

Some of the proposals contained in this document<sup>16</sup> were highlighted, including the obligatory recommendations regarding hand hygiene for healthcare staff who use PPE and the 100% guarantee of alcohol-based product (ABP) dispensers in the new care areas. Recommendations for emergency uses, due to vital risk, encompassed maintaining the PPE equipment, changing or donning a single-use coat, rubbing PPE gloves with ABP and putting on sterile gloves on top of them. It is necessary for healthcare personnel to undertake training in all Zero Project recommendations and specific training for the support healthcare personnel who are incorporated into patient critical care during pandemic episodes and/or when the care burden is heavier.<sup>16</sup>

Against this backdrop, and considering the lessons learned during the pandemic, the following future recommendations required formulating:

- 1 *Immediately apply the new recommendations of the Zero Projects in the ICU.* Empower nurses adhering to the projects to guarantee correct communication and monitoring (security rounds, identification of errors, daily targets, etc.).
- 2 *Train all healthcare personnel, particularly those who have been incorporated into care for critically ill patients in the Zero Projects (using different teaching methodologies such as online teaching, cases, simulation, etc.).*
- 3 *Analyse the safety environment in every ICU, identifying barriers and limitations which impede the application of the Zero Project recommendations.* Communication of surveillance results from recent years.
- 4 *Adapt recommendations to the reality of each ICU.*
- 5 *Develop programmes for psychological support, self-control skills and active health surveillance programmes for ICU healthcare professionals.*

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