GlobalCE

# Engineering Report

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### *New Normal and Year Reflections*

As I sat to write this column during the 2022 holiday season between Xmas, Hanukah, and the new year celebrations, one cannot ignore the changing behavior of humanoids as the year came to a close. The elevated feeling from experiencing ubiquitous kindness shared by and among people, that of caring for one another, of conveying the season's joy to others around us near and far, and the realization that we all share this planet. This was magnified, and subconsciously visibly appeared, during our serious conversations as well as within the small talks we carried. You could hear it, smell it, see it, and above all you could feel it. It seemed like everyone partakes in forwarding good wishes, joining in the sharing of fellowship, and gift exchange while getting prepared next to engage in making new year's resolutions. As the world population has surpassed at the end of the year 8 billion persons mark consequently to ongoing innovation, access to energy, food, water, and medical care becoming more reliable and available. Yet, the projected expectations for the more rapid growth[1] of the human population will contribute to the higher challenges we face together in order to meet our combined future needs as shown in figure 1 below.

Adopted from https://population.un.org/wpp/Graphs/Probabilistic/POP/TOT/900.

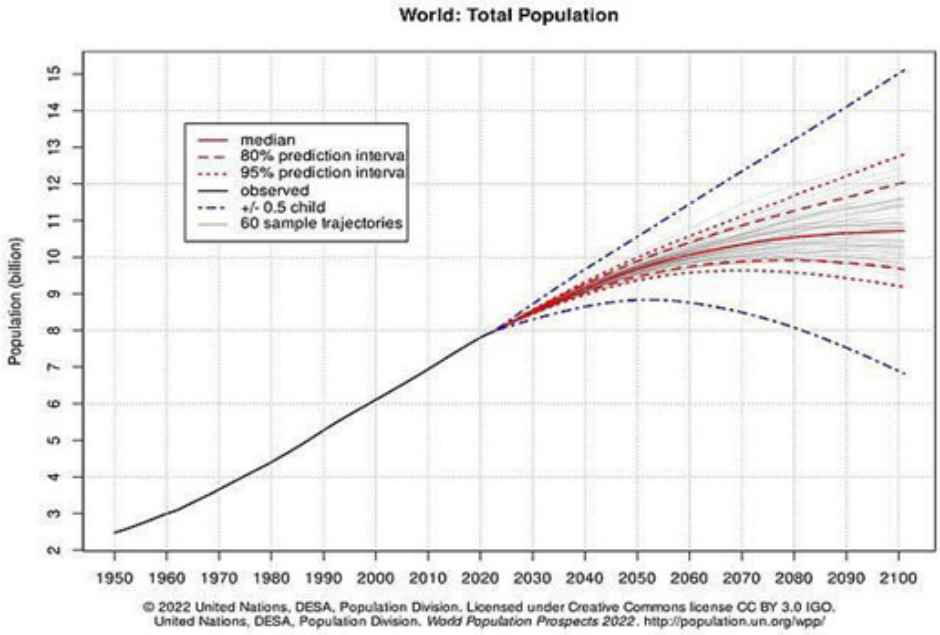


**FIGURE 1.** World Population surpassed 8 billion persons in 2022.

You could easily be confused that this beautiful seasonal period, as short as it may be, is normal compared with years past but in essence, this has been just a masking of the fear of the unknown - of uncertainty. Following three years of human suffering caused by the most devastating plague in the past 100 years that completely engulfed our globe and turned every normalcy on its head, the normalcy that until then we began to take for granted. Today, there are still regions where this disease is not contained.

Normalcy during this dreadful three-year period was only becoming a dream or a faint memory, with our aspiration not to forget the way we were. The normal world seems no more. Families lost loved ones, national economies were forced to shut down, schools were empty of students, social gatherings were curtailed, and travel was not an option. Grandparents could not hug their grandkids, and the only entertainment left to enjoy was from balconies or on the electronic display screens we kept becoming glued to at home. Science became somewhat of a political pawn, factories were closed, and the supply chain could not stand up to its gigantic challenge (we still are faced in some regions with the infant formula supply crisis) bringing the world to almost a standstill. Unfortunately, many difficult and sad lessons are still being debated and shared with the hope of never being faced with isolation and helplessness again.

Among the industries having a central role and perhaps the biggest impact on our lives is the healthcare delivery system. The system found itself in the middle of distress trying to meet the sudden rise in demand for its services and suffering from being unprepared, understaffed, and uncoordinated regarding its life-critical assets such as space, skilled personnel, drugs & vaccines, medical devices, and medical gases. That compelled healthcare systems to search for alternatives, workarounds, and innovative solutions to quickly produce the needed isolated patient care spaces, and obtain sufficient quality of personal protection equipment for their staff and patients, as well as mechanical ventilators, oxygen concentrators, and oxygen supply. Healthcare providers and their support teams became exhausted, and fatigued but could not, for several reasons, be easily replaced by others. As history and global markets showed us, we are not good at predicting our future. We generally look for a brighter future, one that would not teach words like "new variant" or "subvariant". What was normal before is no more, and in the vacuum, the new normal started to be created and has already begun to spread its roots.

As reported by KXAN[2] and the JAMA-Network Open publication "*Prevalence of and Factors Associated with Nurse Burnout in the US*", almost 3% of practicing nurses, in the US, ages 49 and younger left their practice during the 2021 pandemic year. The figure below shows that in a short period between 2020 and 2021 over 100,000 caregivers (about 3%) left the workforce. However, their jobs had to be covered by other staff especially as patient volume has increased due to the pandemic. This condition, as difficult as can be imagined, gave rise to the new normal where potential partial relief can be derived from a new closer training between members of the healthcare team such as nurses and clinical engineering professionals.

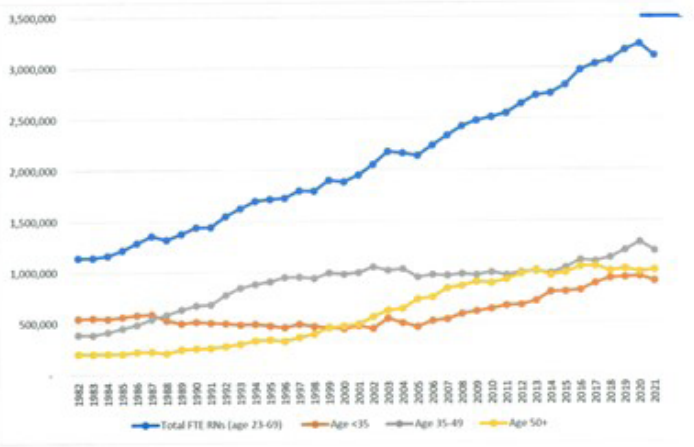


**FIGURE 2.** Over 100k nurses in the US left their job.

Clinical engineering professionals (engineers, technologists, and technicians) are team members of this stressed industry and are deserved to be counted within the silent hero's community that kept the healthcare delivery systems innovative, functioning, and safe under the extreme once-in-century challenge, brought about by the COVID-19 pandemic, and thus sustain the system of patient-ready and operationally safe technologies around the world.

The reality of the new normal was one of the reasons that in May 2022, T. Judd and I published in the National Academy of Engineering Perspectives an article discussing the *Growing Role of Clinical Engineering professionals in Merging Technology at the Point of Care* [3] sharing with nursing staff new responsibilities.

To meet the needs of the new normal we included in this article a Call for Action for clinical engineering practitioners to transition from focusing on strategies addressing the localized point of care to those that meet larger population health needs, taking a bigger role in the healthcare delivery team, achieve certain systems competencies, and have a stronger contribution to national health technology policies. Such as:

1. **Education of the workforce** to create greater collaboration and resiliency within and between health team members. Collaborative interdisciplinary educational training[4] will ensure the availability of systems skills needed to maximize the benefits of health technologies. With demonstrated competencies and internationally coordinated professional credentialing, CEs will be prepared to be equal partners with the other members of a healthcare team, participating in new clinical roles and workflows to free physicians and nurses for direct patient care.
2. **Participate in National health technology policy** decisions to address priority national challenges. Pandemic-related impacts necessitated the rapid implementation of national health technology policy in many countries.[5] This and experiences with other disasters (e.g., floods, wildfires, earthquakes, power outages) clearly show the need for international coordination of new national guidelines to sustain access to, availability of, and the transfer of critical healthcare technology tools. Clinical engineers can play an important role in informing and implementing such policies.
3. **Engage with National and international alliances and partnerships** to share expertise and lessons learned. Alliances, like the Global Clinical Engineering Alliance www.GlobalCEA.org, will coordinate meetings of healthcare stakeholders (e.g., clinicians, administrators, and ministry of health personnel with clinical engineers) to examine areas of concern where CEs can make a difference. For example, the Global Clinical Engineering Alliance has offered webinars, a virtual international congress, and a global CE summit to identify and rank common global challenges. Such alliances can help those in the health sector, industry, academia, and NGOs drive cost-effective and high-quality innovations in healthcare delivery and manage the performance of the technology used at both points of care and in regional and global populations.

As healthcare delivery systems around the world are increasingly dependent on technology[6] for the provisioning of their services, the expertise of clinical engineering professionals in the development, use, and management of this asset is critical for achieving the best outcomes. For both point-of-care and population health, a systems approach can improve the delivery of health services through education, workforce collaboration, inclusion in policy development, and engagement in partnerships. Records from the pandemic era show that these professionals have much to be proud of and appreciated as they delivered solutions critical to sustaining the lives of patients all over the world. Nevertheless, the new normal is expecting that clinical engineering professionals will continue to raise the bar on their commitment to pursue career-long continued education, credentialing, and active engagement in national associations and international alliances. As a result, credentialed Clinical engineering professionals will continue to be indispensable partners

in achieving healthcare missions. The approach described here shows a pathway to achieve the outcomes during the new normal era we all desire.

## REFERENCES


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