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## 2. The story of human resolve

As much as we must acknowledge that humanity was deeply humbled by the ongoing pandemic, and that all-too-frequently we had to re-learn the collective lessons of declaring premature victory, we also need to emphasize the story of human resolve and our ability to “rise to the occasion” when facing overwhelming odds [5, 7–9]. The COVID-19 pandemic taught us much about being a true “global community” [10]. Within this general context, a thorough evaluation is warranted of the relationship between COVID-19 and IHS, including a detailed examination of all pertinent domains that directly or indirectly influence our ability to maintain human health and wellness. Using the expanded definition of ‘health security’ in the context of a global pandemic is especially important and central to highlighting the real-time impact of an emerging infectious disease (EID) on multiple other spheres of human life, with medical and direct healthcare aspects constituting only a small proportion of factors able to actively modulate wellness and health across the planet [11–18]. In fact, one might argue that a more comprehensive, inclusive, and multi-dimensional approach to the current pandemic contributed to a significant reduction in both human and economic costs of this once-in-a-century global event. And even more importantly, the above is a true reflection of human resolve and a testament to our collective accomplishments when we all work together as a community.

## 3. The COVID-19 pandemic as a transformational event

Global challenges, including a devastating pandemic, often force our existing systems, established patterns, and the way we operate in general, to rapidly evolve and change in response. While it is generally acknowledged that there is often an inherent “reluctance to change,” especially in the presence of contentment with the *status quo*, major transformational events are defined as such because they mandate change – and often in ways that are difficult to initially anticipate. Thus, the initial change can be – quite understandably – reactive. However, the longer-term response to the pandemic tends to be more deliberate as well as more constructive. This is especially true in the context of research, development, and distribution of therapies, vaccines, therapeutic devices; an acknowledgment of treatment limitations that are assessed within an ethical framework; as well as serious consideration of cultural, religious, and family centered approaches [19, 20].

## 4. Technology-driven transformation of healthcare

The early pandemic created a perfect milieu for various existing technologies to enter mainstream implementation and use [21]. Two particular technological advances worth mentioning in this context, both already well in the state of “transition into mainstream” irrespective of the ongoing pandemic, are tele-health and artificial intelligence [22, 23]. At the same time, the adoption process of novel technologies and approaches must also ensure that we carefully factor in appropriate patient safety considerations, any potential limitations, well-defined staff responsibilities, evolution of team roles, as well as adherence to protocols [24]. While such technologies very quickly become a part of the modern medical lexicon, widespread acceptance was often challenged, not just by individual human reluctance or aversion, but also by the simple reality that such digital tools, despite the need for rapid and widespread implementation, have not quite matured for the intended role(s) they were originally conceived to fulfill.

## **5. Post-pandemic recovery: toward sustainable future**

Although current events make it challenging to clearly picture the post-COVID-19 future, it is likely just a matter of time before we enter this new and eagerly awaited “state of the planet.” It will hopefully be a state where politics, economic health, violence, acute and chronic disease, racial disparities, health care access, the viability of health care systems, delivery of care, mental health, homelessness, and aging are seriously re-evaluated and addressed. It will be critically important that this future is constructed in a manner that The United Nations proposed in their landmark document discussing 17 sustainable goals for the future [18]. These suggestions are a roadmap to assist in overcoming challenges such as poverty, environmental concerns, various socio-economic injustices, the climate change, among other agenda points. Within this context, we must ask, “Is the social, economic, and political infrastructure of the planet ready for such demands?” There is no doubt that community participation on local, regional, national and international levels will be necessary for a successful and sustainable outcome for the planet and for the humanity [25]. Of additional importance, it is also vital that the knowledge of pandemic preparedness fundamentals becomes an established competency for those holding or running for political office, where ignorance and complacency toward implementing viable solutions for problems with established political, social, economic, and scientific evidence is simply not acceptable [5].

## **6. Humans and humanity**

As the pandemic continues beyond 2020 the world will likely see an imbalance between the vaccinated and the unvaccinated, the ‘pro-maskers’ and the ‘anti-maskers,’ the believers of science and the non-believers of science, the true warriors (health workers on the ground) and the media warriors (the speakers in media), the false news mongerers and the seekers of truth [11, 26, 27]. As we battled to save lives, the pandemic tested our resilience at an individual level and also tested our values as a global society. Sharing, caring, supporting, collaborating, empathy, compassion, resilience and resolve were actively tested, every minute of every day, at every location, and for every human being. Food, water, hospital beds, medications, and oxygen were simultaneously in high demand and in short supply [22].

Across intensive care units on every continent, critically ill patients fought for every breath, fought to live, fought for another opportunity to be with their loved ones. The entire humanity was fighting to survive as COVID-19 mercilessly affected individuals, families, nations, political and economic spheres. The pandemic changed geopolitical relationships, industry partnerships and economic projections. It changed and will continue to change the way things humans do well into the future, and potentially forever across some domains (e.g., pandemic preparedness and management) [5, 22].

When looking at the COVID-19 pandemic events from a truly global and comprehensive perspective, it is a giant test of how humans approach and embrace international health security. In the context of ‘health security,’ the actual degree of security is closely related to the overall degree of ‘health insecurity’ that exists around us. Maintenance of health security requires ongoing efforts and a constant focus on all mission-critical elements [18]. As this herculean task is being undertaken, the attainment of ‘health security’ thus becomes a careful balancing act that involves politics, competing interests, social, and economic considerations. Humanity plays a major role when we envision a ‘secured world.’ Here, IHS should be considered to be universal, and it should be the main sustainable goal that humans



should strive to attain and work toward consistently. As such, ‘health security’ is a long journey with only a few periodic punctuations that provide just enough time for self-reflection and re-orientation.

## **7. Synthesis**

Within the expanded IHS framework, the repose to the current pandemic has been a kind of one-size-fits-all public health policy without a strategic assessment of the local and regional situation. The relatively diminished capacity of peripheric surveillance and control systems has forced local governments to ‘copy and paste’ control strategies from abroad [22, 28]. However, when pursuing such course, we must remember that “one size does not fit all.” Moreover, quick, effective, and vigorous actions have been lacking.

Of importance, there is a tendency to extrapolate from previous scientific approaches to pandemic management that did not factor in the variables of the evolution of human social, political, medical, economic, and financial changes over time. Lessons of pandemic management in the 19th and 20th centuries, for example, need to factor in the reality that the 21st century IHS framework is vastly different and, inherently, more complex – both for better and for worse. Also, in the last few decades, there has been a dramatic disinvestment in the area of public health and the concept that investment in the workforce’s physical well being and mental health positively influences productivity has been either abandoned or significantly de-emphasized. Nevertheless, the immense costs for the global economy of the COVID-19 pandemic have changed this paradigm and forced all stakeholders to re-emphasize the need for robust and consistent public health funding. As a matter of fact, no other pandemic has affected the U.S. and the global economy with such historical precedent [29, 30], at least in absolute terms.

## **8. Conclusion**

The expanded and redefined scope of International Health Security provides a unique opportunity for the public health community to embrace a more holistic approach toward an area that was traditionally much more narrow in scope [18]. Our current crisis reminds us, on a daily basis, how unprepared we continue to be for the events of a Public Health Emergency of International Concern (PHEIC) [23, 31–33]. As we tackle one of the greatest challenges to IHS in recent decades (if not of the past several centuries) – the novel coronavirus 2019 (COVID-19) pandemic – it becomes increasingly important to shift our focus to a more global, yet significantly more granular and scientific, perspective on IHS threats and emergencies. Such a perspective permits quicker, more effective, and more equitable responses for future PHEICs. We hope that the foundation created by this Editorial team will provide a solid springboard for an insightful and captivating discussion in this rapidly developing and important area of academic international medicine and public health.

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