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## **SPECULATIVE DESIGN AS A TOOL FOR ANTICIPATORY INNOVATION IN GLOBAL HEALTHCARE**

The rapid technological progress of the post-pandemic era reveals deep vulnerabilities within global healthcare systems. Fragmentation, workforce shortages, cyber threats, and supply-chain fragility are not isolated failures but interconnected signals of a system under pressure [1-4]. These signals should be treated as design opportunities rather than crises, positioning speculative design as a critical tool for reimagining the future of healthcare [5].

In the aftermath of COVID-19, healthcare institutions face an urgent need for adaptive, human-centered transformation. Traditional design methods focus on immediate usability, whereas speculative design allows questioning of long-term trajectories and societal implications [5]. By visualizing alternative futures, designers help policymakers and healthcare providers anticipate rather than merely react to global disruptions [6].

To analyze the potential of speculative design as a methodology for identifying and addressing early signals of systemic healthcare issues, promoting resilient, equitable, and human-centered health ecosystems.

The analysis identifies key challenges shaping tomorrow's health systems:

- Fragmented healthcare infrastructures, producing inequities and inefficiencies [1];
- The rise of non-communicable diseases, now responsible for 75 % of deaths worldwide [2];
- Global shortages of healthcare workers, projected to exceed 10 million by 2030 [3];

- Cybersecurity risks and supply-chain instability, intensified by digital transformation [4];
- Insufficient preparedness for future pandemics (Fig.1).

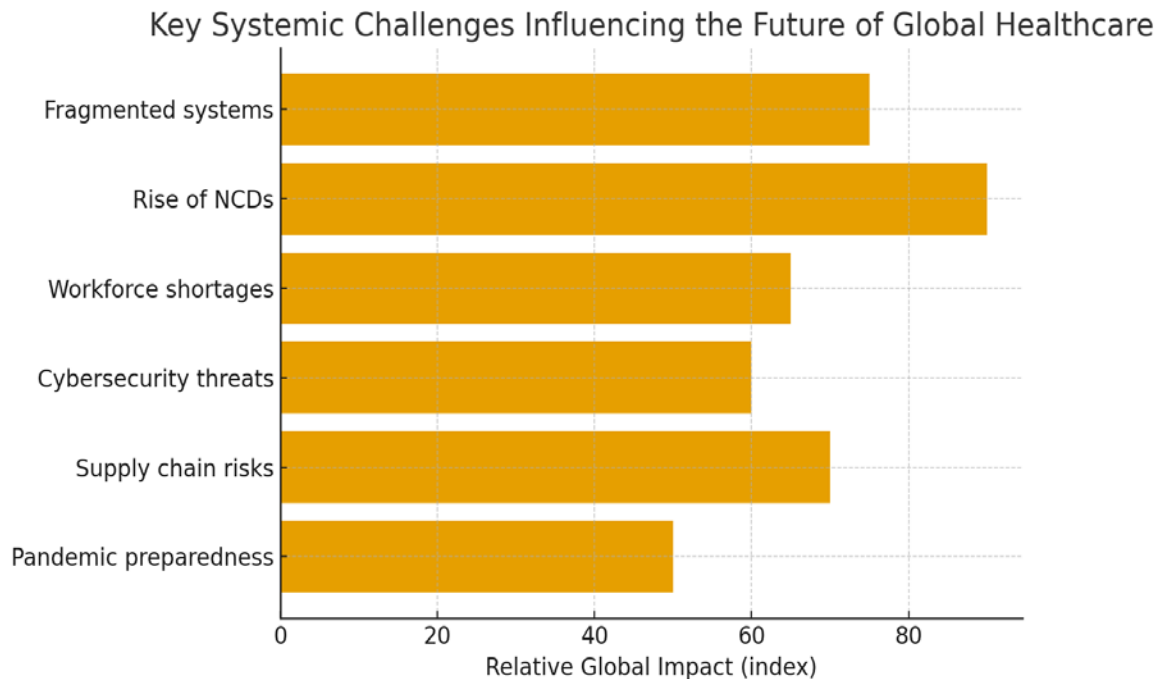


Figure 1 – Key systemic challenges influencing the future of global healthcare (based on WHO and Vox data, 2024)

These trends indicate an urgent need for anticipatory approaches. Speculative design – defined by Dunne and Raby as «a means to provoke reflection about alternative futures rather than predict them» [5] – offers a way to visualize complex possibilities. Through artifacts and narrative scenarios, designers can make abstract threats tangible and debatable.

Projects such as Mitigation of Shock by Superflux and the UK Government Office for Science’s co-design workshops [6] demonstrate how speculative design stimulates discourse and informs long-term policy. Similar principles could be applied to healthcare futures: envisioning autonomous care devices, decentralized health networks, or ethical frameworks for AI in diagnostics.

Speculative design bridges the gap between foresight and tangible action. By framing emerging global health challenges as design signals, it enables cross-disciplinary dialogue among designers, policymakers, and technologists (5–6). Integrating speculative design into public-health planning can strengthen preparedness, promote ethical innovation, and ensure that the healthcare of tomorrow aligns with human values rather than purely technological advancement.

### References

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