In search of an enabling social environment for health robots. An exploratory study in Tuscany

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The history of modern medicine is strongly intertwined with the processes of scientific and technological innovation. Over the decades, the development of new drugs, diagnostic and therapeutic technologies have made it possible not only to make treatments more effective but also to extend the capacity of health services to cope with increasingly diversified (i.e. formerly incurable diseases) and substantial (due to ageing and increasing chronicity) care needs. However, this process of expansion has led to an exponential increase in the costs of healthcare systems, because the cost of expanding medical applications is relatively higher than the increase in efficiency enabled by replacing old technologies with new ones (Lehoux et al., 2016). For these reasons, European and national institutions are strongly supporting the development of digital technologies, artificial intelligence, and robotics as an attempt to improve both the effectiveness and costefficiency of healthcare systems (Gómez-González & Gómez, 2023). Despite these efforts, in Europe, and even more in Italy, the actual deployment of these technologies is very heterogeneous due to territorial and sectorial differences. Applications such as telemedicine, also strongly promoted by the Italian NRRP (Betti & Maino, 2023), are so far in the early stages of diffusion in public health services (Parretti et al., 2023). As regards the medical applications of artificial intelligence and robotics, Italy stands out at the European level for the presence of several experiences of excellence (Bobini et al., 2022), even if mainly concentrated in a few 'privileged' settings (i.e. IRCCS). This relates to the extent of the changes needed to create a supportive environment for the embedding of these technologies in the daily organization of services, which are challenged in their configurations of professionals' and users' practices (Felt et al., 2020). In other words, the diffusion of these technologies requires a socio-technical transition, thus a mutual adaptation between technologies and existing social systems (Pekkarinen et al., 2020). Regarding robotics in particular, research in the field has detected that the receiving social environment is not so welcoming to such innovations. From the patients' and caregivers' point of view, the issue is the acceptability of the robots, but even more the level of usability (Vandemeulebroucke et al., 2018). In this sense, the dimension of the needed skills for the effective use of robots come into play, but also the level of personalisation of the device, and thus the users' involvement and voice in the design process (Glomsås et al., 2020). The same applies for professionals (physiatrists, nurses, therapists, etc.), who are also concerned for their prerogatives, which are threatened by the supposed 'mechanisation of care' and the related risk of becoming 'machine babysitters' (Hamblin, 2022). Lastly, healthcare managers often perceive several problems of organisational 'preparedness'. They are frequently concerned about the lack of workforce skills, the uncertainty, and the extent of the needed revision of the regulatory framework (legal liability, data management and security, instability of fundings, etc.), and of therapeutic protocols (Cresswell et al., 2018; Frennert et al., 2019). In this scenario, the NRRPfunded Fit4MedROB – Fit for medical robotics is an Italian multidisciplinary research project that aims to

define an enabling framework for accelerating the uptake of robotics in the national healthcare system. A branch of the project focuses on the analysis of regulatory, political, and organisational barriers and enabling factors. In the proposed contribution, the Author presents the first findings of this specific research component. The contribution discusses a qualitative case study conducted in Tuscany and based on a series of interviews and a focus group involving clinicians, trade union representatives, Third Sector operators and patient representatives with experience in the use of assistive robotics. The Tuscanian regional healthcare is historically one of the best in Italy in terms of effectiveness in guaranteeing the 'essential levels of care' (LEA) (Betti et al. 2023). Moreover, the region is third among the others for the number of companies operating in the robotics sector, with a consolidated experience in the use of robotics in surgery (e.g. Robot Da Vinci) and rehabilitation (Regione Toscana, 2024). At the same time, outside the hospital context, medical robots are still only used in a few accredited private health agencies (IRCCS), and in some limited homecare services carried out by the Third Sector (TS). For these reasons, Tuscany represents a good case study to understand the critical factors hindering a greater diffusion of these technologies. The study highlights that the preconditions for a wider diffusion of health robots have yet to be consolidated, even in a promising context such as Tuscany. In fact, the stakeholders' knowledge of these instruments is still to be enhanced, and even so the awareness of the regulatory, organisational and governance prerequisites for the use of these technologies to strengthen local services".