# The Digital and Assistive Technologies for Ageing initiative: learning from the GATE initiative

The COVID-19 pandemic has highlighted the fragility of health and social care systems worldwide, particularly for marginalised groups, such as individuals with disabilities, and older people, including those living in long-term care facilities. However, conventional health-care systems have also struggled to provide health care to the general population. An urgent need exists to learn from the COVID-19 pandemic and reform the interaction between health care, society, and technology, at the population level.

COVID-19 has revealed that the true frontline of health care is at home. Home-based wellness and health-care programmes, and in particular rehabilitative and assistive care, have the potential to decrease costs and make effective interventions more accessible for all.

We are now in an era of assistive care and assistive living—whereby many people, of all ages, in good health, and those who are more frail, or with cognitive or functional impairments, are using a broad range of technologies to assist and enhance their daily living. Assistive living[1] is becoming an important part of population health and rehabilitation, which can help to maximise an individual's abilities, regardless of age or functional capacity. This encouraging shift in ethos has been strengthened by the response to the COVID-19 pandemic, in which a plethora of digital and remote technologies have been used.

Embracing the normalisation of technology as a part of everyday life, WHO is launching a new initiative: Digital and Assistive Technologies for Ageing (DATA). The WHO DATA initiative seeks to encourage the development, synthesis, and use of solutions that promote access to affordable, quality, digital and assistive technologies for people with impairment or decline in physical or mental capacity, with a particular focus on older people. Within WHO, DATA brings together perspectives from a number of different departments; including Ageing and Life Course, Digital Health and Innovation, Health Systems and Service Provision, and Health Products, and Policy and Standards. Working with service providers and users, industry, and civil society, DATA will span boundaries to produce more integrated and cohesive services for older people. The initiative builds on the successful WHO Global Cooperation on Assistive Technology (GATE) and healthy ageing initiatives, and similarly will be applicable low-income, middle-income, and high-income contexts.

The global experience of COVID-19 is also likely to accelerate the human rights-based case for access to life-saving and life-enhancing knowledge, services, and supports, which have become increasingly based on and implemented through technology, particularly since the start of the COVID-19 pandemic. Globally, inequalities in access to basic needs such as food, shelter, electricity, water, and sanitation facilities persists, but access to these resources, and to DATA, must be developed and secured on an equitable basis, whereby requirements are put in place to ensure that different people have the opportunities to experience similar benefits. For example, ensuring that all economic groups, people with different degrees of impairment (cognitive, sensory, physical, intellectual) and abilities have internet access will be essential to ensure that individuals benefit equally from DATA. Equitable access to resources is now a more realistic possibility due to increased affordability and usability of technologies, and an increasingly digitally literate global community. Digital technologies and the human interactions that power them are at the forefront of this shift.[2]

Opportunities to embrace innovative ways of living through DATA are rapidly increasing. Assistive technologies include essential and perhaps more familiar assistive products (wheelchairs, prosthetics, communication boards) that can be connected to the internet, both receiving and providing information to enhance their utility; exoskeletons that can restore functioning to paralysed limbs or enhance functioning in working limbs; and sensors that can be used in homes to detect temperature, movement, or energy use. Virtual or augmented reality games are now being used to treat pain and to enhance cognitive functioning for people with dementia.[3] New forms of holographic augmented reality are currently in development, which use light interference to create compelling three dimensional images, annotating and

guiding people through either familiar but forgotten, or completely new living spaces.

From physically-assistive robots to companion robots, people's expectations are changing, and with that, their willingness to engage in new modes of therapy and living. Artificial intelligence (mimicking human behaviour), machine learning (non-programmed learning using deductive algorithms), and deep learning (rule-based inductive learning) are aspects of computer and robotic functioning that will enable the use of global big data to benefit individuals' decision making. Many technological features are also synthesised in the daily use of smartphones: transforming text into voice, searching the internet, and teleconferencing with loved ones, health professionals, or work colleagues.

The challenge for the WHO DATA initiative is therefore to continue stimulating creativity and innovation but also to move beyond expensive prototyping, to affordable quality products and functionalities provided at scale, on open and accessible platforms that integrate not just technologies, but most importantly, human systems, ecologies, neighbourhoods, and values.

DATA will need to work with the users of such technologies, and where appropriate their family members, with member states, service providers and civil society, and with digital and assistive technologies, innovators, and industries to shape markets to address these challenges in a fair way.[4] DATA must therefore also take into account the central importance of data security, privacy, and confidentiality, and the many ethical and cultural challenges that new technologies present.[5] The need for greater interoperability at the product level and greater integration at the systems level will also require stronger governance.[6]

The COVID-19 pandemic, with the associated mortality and marked socioeconomic impact, has motivated communities to find new ways of living and ageing well, at home in our own communities. Community is central to human life, providing individuals with a sense of identity, belonging, coherence, and support in times of need. Connecting these human values and finding solutions through technological advancements and opportunities will be a key aspect of DATA.

We declare no competing interests.

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