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AI Report

Artificial Intelligence and the Delivery of Social Care Services to Vulnerable Groups

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Talal Faris is the Family and Community Division Manager at the Abu Dhabi Department of Community Development (ADDCD). Driven by making a positive impact on people's lives, Talal has led the development and implementation of multiple emirate-level strategies and policies while supporting the establishment of key social sector entities.

Prior to joining ADDCD, Talal was a Senior Program Associate at Hedayah Center, where he worked on local and international programs with strategic partners at both government and non-government levels. Talal earned an MPhil in Criminology from the University of Cambridge, an MA in International and Civil Security from Khalifa University, and a BSc in Criminology from Northumbria University.

The application of artificial intelligence (AI) within the social sector could revolutionize the delivery of services to society's most vulnerable people. But while the prospects for improving the quality of life of UAE citizens and residents through proactive, accessible, and high-quality services have never been so extraordinary, governance and regulation of this intersection will be key to making it work best for everyone.

The advance of machine learning and AI over the past decade has revolutionized the way the world operates. In addition to generic applications of AI tools in our daily life, more sophisticated tools are embedding themselves into key sectors in most countries. Healthcare professionals have used AI to diagnose skin cancer more quickly and effectively (Rigby, 2019), and educators are harnessing it to provide personalized learning opportunities that boost performance and improve grades (Shonubi, 2023). The increasing recognition that technology and AI can support many more specialized fields means that governments and the private sector must also consider leveraging AI to ensure that the most vulnerable in our communities have access to the social care services they need.

Every society has vulnerable people, and every individual is potentially vulnerable at one or more stages of their lives (OECD, 2015). While no single definition of vulnerable populations exists, these generally include youth, women, the elderly, people with disabilities, the socially-economically disadvantaged, refugees, and migrants. While the services required for each of these groups differ, all services still need to be "designed to create connectivity, alignment and collaboration within and between sectors" that are not only able to address multiple issues simultaneously, but also reduce costs and improve accessibility of services to vulnerable groups (Kodner, D.L. and Spreeuwenberg, C., 2002) (OECD, 2015).

Due to physical and/or psychological challenges, beneficiaries of social services often suffer from a lack of opportunities to fully integrate into society. Moreover, social service beneficiaries are often stigmatized and viewed negatively by society, with studies finding that those receiving welfare or suffering from a mental disability are generally perceived more negatively than others (Suomi, Schofield, Butterworth, 2020). This "welfare stigma" can lead to social exclusion, isolation, and self-stigmatization. This combination and internalization of stereotypes means that reaching those who are most vulnerable and ensuring they have access to key services requires innovative solutions.

> **While AI and technology can play a major role in ensuring creative solutions are introduced, given the pre-existing vulnerabilities and the actual or self-perceived stigma, this interaction must be conducted in a manner that ensures confidentiality, anonymity, and the overall safety of the beneficiary.**

The COVID-19 pandemic expedited the ways in which various sectors leveraged old and new technologies on a mass scale, with pharmaceutical companies even using AI and machine learning in the development of vaccines (Sharma et al, 2022). Technology was also used in social care services to deliver services to at-risk populations. While many benefited from the speed with which the world adopted technology during the pandemic, it is crucial that prior to becoming fully dependent on AI and technology, strong governance and regulations are put in place. Through clearly defined laws, policies, and standards, the merger of technologies into social service provision can be carried out in a way that remains ethical and safe for all parties. While many opportunities exist when discussing the merger of AI and social services, two focus areas will be examined within this paper: the use of big data to intervene early and prevent further exacerbation of vulnerabilities, and the merger of AI and robotics.

The power of big data. Through "big data" and the data science techniques of advanced analytics, predictive analysis can help identify risks and opportunities by finding patterns in data (IBM). By deploying AI techniques and machine learning algorithms, correlations can be found between different sets of data to help identify and address risks and protective factors within various beneficiary groups (Selwyn, 2018). Leveraging this data can help create preventative interventions that not only have the potential to be cost-effective in the long term, but also to safeguard vulnerable populations. The benefits of using data to help develop policies and programs are evident. However, this must be done in a manner that protects individuals' privacy and security and removes any potential biases.

Robotics, AI, and elderly-centric services. Robotics-based technology is a multi-billion-dollar industry and is regularly used within the healthcare, agriculture, and defense sectors. While the roles of robotics in these industries differ, robots are often used to perform specific duties to either support humans in being more effective and efficient or to carry out tasks with higher safety concerns. The integration of AI into robotics means these robots have the potential to accurately mimic the human mind and be taught to make decisions and solve problems (Martin, 2021). With some limitations, this advancement in technology allows the possibility to embed empathic behavior within AI, allowing for creative opportunities to address some of the key challenges facing the elderly today (Shahinyan, 2021). While this interaction has great potential in increasing accessibility of services, it must be used as a tool and not as a replacement for human connection. Additionally, privacy and security-related issues around the use of robotics must be well controlled.

> **Technology's increasing ability to gather and analyze large amounts of data is making the development of early, life-changing interventions far more feasible.**

Big data analytics refers to the various methods used to "collect, process, and derive insights from varied, high volume, high-velocity data sets...to inform better decision making" (Microsoft, 2023). The ability to analyze and predict human behaviors and outcomes by studying patterns and trends can make decisions more accurate and successful. Leveraging big data tools and predictive analytics within the social sector can have a crucial role in both early intervention and the prediction of future challenges. Early intervention tools can play a huge part in helping individuals and families maintain stability and avoid circumstances that could lead to them becoming vulnerable. For example, applications using predictive analysis could help prevent families from falling into financial troubles.

In addition to identifying patterns and trends at a macro level, analyzing personalized big data offers service providers the opportunity to intervene early and deliver services that are unique to the needs of the individual or family. Youth delinquency offers a good example of how big data analysis could be utilized. Using large, personalized data sets can help in identifying young individuals with multiple risk factors linked to youth delinquency, such as family problems, a history of substance abuse, or low school attainment (Brown, Cabral, Steenhausen, 2007). Through early-intervention programs that support and build resilience within these individuals, risk factors can be addressed and substituted with strong protective factors that prevent transition into adult offending. By using big data and advanced data analytic tools, the negative impact on individuals and society can be reduced significantly.

Data is knowledge and knowledge is power

While using big data and its analytical tools has its benefits, it also poses multiple risks, with privacy and security of information high on the list. Handling this data inappropriately has the potential to further marginalize and negatively impact the lives of social service beneficiaries. Another concern with big data is unintended or intended bias. Unintended biases may be one result of poor data collection or analysis methods.

However, more concerning is intended bias — bias that targets or excludes certain individuals based on race, age, or other demographic information (Bird and Bird, `). While AI leverages the large data sets that are available, using historical data on beneficiaries to understand patterns and trends also poses a risk of creating biases. The ever-evolving nature of society and communities requires data to be up to date and relevant to ensure that accurate assumptions can be made. These risks highlight the importance of having robust regulatory measures in place when it comes to using and storing individuals' information to ensure there is limited opportunity for it to be compromised or misused.

In addition to using AI and machine learning to create an ecosystem that can analyze patterns and trends at individual, family and community levels, AI merged with technology can play a direct role in delivering services to vulnerable populations, such as the elderly.

AI and robotics

Although social connections are key to the quality and length of an elderly person's life, in many countries and regions, up to one in three elderly people suffers from social isolation and feels themselves to be lonely (World Health Organization 4, 2022). This level of social isolation was sharply intensified by the movement restrictions imposed during the pandemic, which resulted in the closure of many settings that facilitated social connection for the elderly—such as day care and community centers (Armitage and Nellums, 2021).

With the increasing number of elderly people who feel isolated and lonely, coupled with the aging of the global population—the proportion of the world's population aged over **60** is expected to double by 2050—accessibility and scalability of innovative home-based services is crucial (World Health Organization 4, 2022). Evidence shows that increasing social engagement has a direct correlation with reducing the risk of dementia (Zhou, Wang, Fang, 2018). Additionally, increasing cognitive decline and social isolation have direct correlations with poorer mental health, increased depression, and anxiety (see figure 1). This evidence highlights the necessity of introducing innovative ideas and tools to prevent the development of more severe forms of neurological challenges, such as dementia, and to increase cognitive stimulation and engagement.

High-need older adults experiencing isolation are more likely to report worse physical and mental health outcomes compared with those who are not isolated.
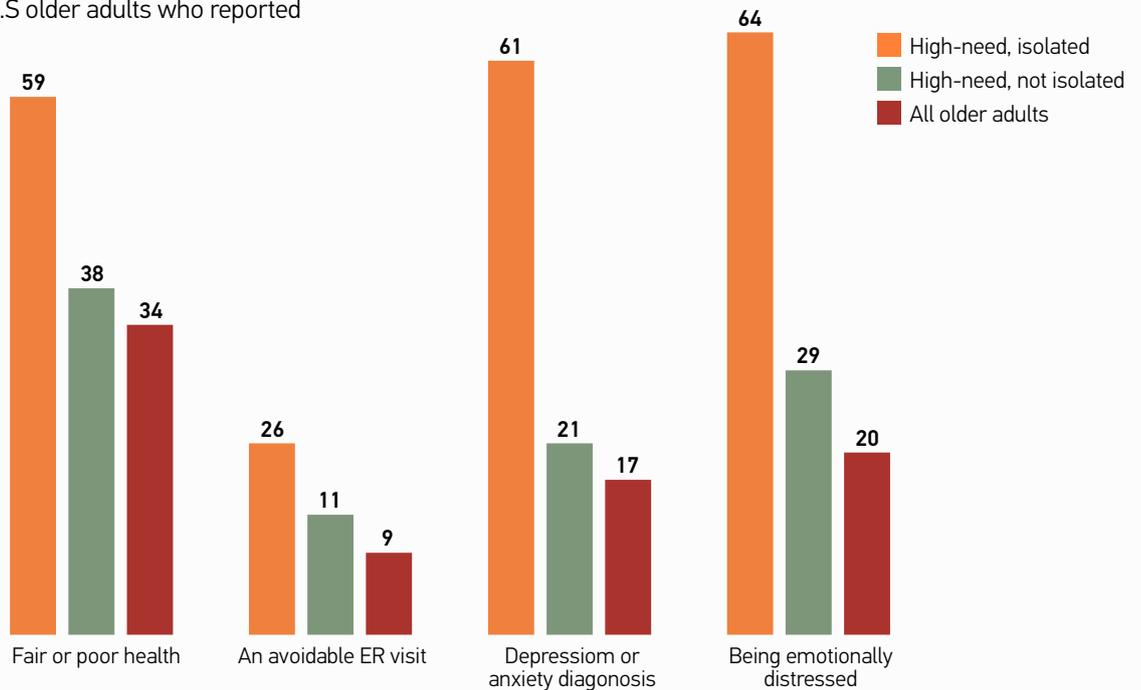
Percentage of U.S older adults who reported

Figure 1

* Signficant at the p<0.05-level; t-test comparisons are between gigh-need/ not high-need adults, and isolated/ not isolated high-need adults.
Notes: High-need older adults; three or more chronic conditions, or needed help with instrumental activites of daily living or limited in everyday activites.
Avoidable ER visit: Used the emergency room for care that could have been provided by a regular doctor.
Data: Commonwealth Fund 2021 Internatonal Health Policy Survey of Older Adults.

Sourcces: Cell Horstman and Corinne Lewis, " More COVID-19 Fallout: Social Isolation Assoclated with Poor Health and Emotional Distress," To the Point (blog), Commonwealth Fund, May 4, 2022. https://doi.org/10.26099/wy20-1611

One possible solution to both improve cognitive ability and reduce isolation is the adoption of robotics that use AI tools. While not a replacement for human interaction, socially assistive robots can be used to tackle isolation, detect early signs of mental health issues, and deliver interventions. Social companion robots can offer the social and emotional engagement that elderly people who are isolated and lonely require to ensure they are stimulated on a day-to-day basis. By embedding tools that can identify signs of cognitive slowing or deteriorating mental health, minor interventions can be delivered while also alerting relevant parties to intervene early.

The risks of merging AI and robots may not yet be as high as science fiction movies tell us, but there remain key considerations when using this technology—none more significant than the fact that robots are not humans. Human connections and meaningful relationships are scientifically proven to improve mental well-being and even boost the immune system (Wooll, 2021). It is therefore important to ensure that the industry does not create an overdependence on robotics that diminishes the role of homecare professionals.

Safety and privacy-related issues also remain pertinent, given the autonomous navigation and monitoring cameras that are often built into robots (Hung, Mann, Perry, Berndt, Wong, 2022). This underscores the need to ensure that appropriate data protection and privacy-related legislation are available to govern their usage.

Five key considerations when adopting AI and advanced technologies into social care services

Culture and personalization. Cultural perceptions, values, and the traditions of local communities must be considered when introducing new services into elderly care. Inter-generational communities, such as that of Abu Dhabi, may be less responsive to technology that provides opportunities to distance people from one another. Additionally, given the individualized nature of social care services, the "one

size fits all" concept is not applicable. Individual care plans mean the services that are appropriate to one beneficiary may not suit another, highlighting the need to ensure there is a range of services applicable to all contexts.

Regulation and governance. Ensuring that safe and high-quality services are being delivered through the regulation of social care professionals, facilities, and services is critical. Legislation, policies, and standards need to be in place prior to introducing any technology-based services to ensure that consistency and competency exists within the ecosystem. To safeguard those most vulnerable within our communities, oversight and audit mechanisms must also be in place to ensure the accountability of services providers. Furthermore, data protection must be at the core of all regulatory frameworks to safeguard the privacy and security of beneficiaries.

Ecosystem readiness. Social care services are rarely delivered in isolation and often interact closely with other sectors, such as health and education, to ensure holistic interventions are provided. This level of interaction underlines the need to ensure alignment between regulations and governance within supporting sectors. Furthermore, clearly defined roles and responsibilities across various sectoral interaction points must be in place to ensure continuity of services.

Piloting and scalability. While the willingness and readiness to introduce innovation into social services may exist, piloting at a smaller scale is still beneficial. Taking a new service from concept to implementation can often bring up challenges that impact the effectiveness of that service. Pilot schemes allow solutions to be developed to ensure beneficiaries will not be negatively affected by any obstacles and challenges. These schemes also support effectiveness and efficiency optimization, enhancing the ability to improve the scalability of services.

Equitable and inclusive services. Technology offers the opportunity to improve the accessibility of services, but ensuring inclusivity is a must. Various groups within our community, such as people with disabilities and the elderly, face preexisting accessibility challenges in their everyday lives. This demonstrates the need to ensure that technology-based services are designed to be inclusive without allowing historical data to cause bias in any decisions.

Next steps to scale up technology in social care services

> " Three main stakeholders exist within the ecosystem of social care services: the government, services providers, and the beneficiaries. Each has an important role in defining what, how, and when services are provided. "

Governments primary role is to set the agenda for social care services and ensure adequate regulation exists to support the implementation of that strategy. Governments must identify the potential intersections between technology and service delivery, and prioritize rollout based on the need and impact. Furthermore, to ensure safe and effective services, governments must work to develop clear roadmaps to tackle concerns over privacy and security by identifying gaps that compromise data protection, confidentiality, and service standards.

Service providers are tasked with creating business development plans aligned with strategic plans to ensure that ecosystem readiness will match the prioritization and demand for services set out by the government. Moreover, maintaining the delivery of context-specific services through qualified professionals that meet criteria and standards set by the government is key for services providers.

Beneficiaries of social care services play a key role in directing governments and services providers as to what types of services can be merged with technology. Strong engagement and feedback from beneficiaries via various platforms will ensure that the innovative services introduced not only match the needs of the beneficiaries, but also remain culturally appropriate.

The need to support the most vulnerable within our societies is constant. It is even growing in some areas and among some groups. This makes the accessibility and scalability of services vital. The way in which AI and technological advancements have been successfully embedded into most sectors highlights the opportunities and the need to expedite such developments within the social sector. As long as these technologies are regulated and governed properly, individuals of all ages can benefit from technology and AI-based services that address their key challenges and lead to a better quality of life.

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