Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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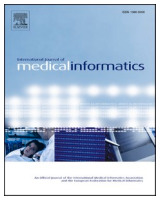

Leveraging data and information systems on the sustainable development goals

In September 2015, the 193 United Nations' member states agreed to continue working towards the Millennium Development Goals (MDG), which began in 2000. This commitment, included under the Sustainable Development Goals (SDGs), aims to achieve 17 goals and 169 targets by 2030. Of these, 12 goals, 33 targets, and 57 indicators have been identified as health-related SDGs [1]. According to the World Health Organization (WHO), life expectancy and healthy life expectancy have increased, but unequally. In addition, the COVID-19 pandemic is causing significant loss of life, disrupting livelihoods, and threatening the recent advances in health and progress towards global development goals [2]. The economic and societal impacts from the COVID-19 pandemic may be long lasting [3,4] and create inequities not only in vaccine accessibility but also on the technologies needed adapt to the new world such as vaccine passports [5], telehealth accessibility [6] and digital inequities [7].

Robust information systems and high-quality data are critical for governments and healthcare organizations to make informed decisions and track progress on the SDGs. However, important barriers must be overcome related to data coverage. As reported in 2019, most countries do not regularly collect data for over a half of the indicators [8]), data timeliness (the average for the most recent year available for health-related SDGs is 2017 [9]), and lack of funding (63 % of low-income and lower-middle-income countries need additional financing for data and statistics to face the challenges posed by COVID-19 [10]). Furthermore, the cost of collecting data to monitor the SDGs is expensive ($650 million per year [11]), but the cost of not obtaining timely, credible, reliable, and actionable data is even higher, as the COVID-19 pandemic has demonstrated.

In spite of the barriers, there has been substantial research and implementation into the role of informatics in addressing the Sustainable Development Goals. Several initiatives have focused on developing data resources to address specific health-related issues, such as road traffic injuries [12], public health monitoring [13,14]; coordination of routine health care [15,16]. Another focus is on increasing the accessible of the public to information and communication technology (ICT), as illustrated in works of Boman; Liaw; Tesfaye [17–19]. The integration of informatics, remote sensors, and geographic information systems to support environmental monitoring [20–22], and child movement to school [23]. Finally, the exchange of healthcare data poses challenges for strategic development, and this could be addressed by the development of robust ontologies and data models to improve that exchange [24,25].

This issue seeks to highlight innovative approaches and informatics methodologies for achieving SDGs and lessons learned from digital solutions. The thirty-three papers received from eighteen countries underwent a rigorous peer-review process, which identified eight papers for publication. The accepted papers cover a range of issues related to governance, emerging data solutions for modeling and analytics, standards and interoperability, and targeted interventions focused on clinical outcomes, noncommunicable diseases (NCDs), i.e., behavioral risk factors and cancer, and immunization. In one paper, colleagues from the UN Broadband Commission for Sustainable Development propose applying six practical building blocks (policy, legal framework, standardized infrastructure, interoperability, partnerships, and sustained financing) that would allow policymakers, private companies, donors, health consumers, and civil society to work together to strategically build health and care systems to help accelerate the achievement of the health SDGs, reduce the burden of NCDs, and aid countries on their path toward universal health coverage [26]. In another paper, Zahid et al. reviewed emerging information technologies for data modeling and analytics that may establish Data-Centric Healthcare (DCHC) for sustainable healthcare as envisioned. They identify requirements to create sustainability. These demands include user-centric design, data privacy and protection measures, transparency, interoperability, scalability, and compatibility within the solution [27]. Furthermore, colleagues from the University of Oslo describe a novel approach to disseminating standards through a digital platform, District Health Information Software 2 (DHIS2). Based on experience with 40 countries, Poppe et al. affirm that combining types of standards into one coherent package increases the value of adopting the standards [28].

This special issue includes two specific experiences related to NCDs. In one example from Italy, Possenti et al. describe two Behavioural Risk Factor Surveillance Systems (BRFSSs) in Italy that are used to monitor 19 indicators concerning nine health-related SDGs and to design, implement, monitor, and evaluate programs and policies at different levels (local, regional, national) for NCD prevention and health promotion [29]. Furthermore, Bertolet et al. present integrated customization of an Oncology Information System (OIS) implemented in a hospital in Spain, yet adaptable to other hospitals, that optimizes the department's performance by driving an automatized, paperless workflow and automated and effortless collection of structured data throughout the radiotherapy process [30]. This special issue also includes an example of a data-driven approach to improve clinical outcomes. Specifically, Giunta et al. assess an indicator of the quality of care in a tertiary referral hospital in Argentina, using data available from clinical records, and determine that efforts to improve must prioritize greater attention to patients' readiness for discharge, explore causes of preventable readmissions, and better support patient self-management [31]. Two papers related to immunization information systems (IIS) conclude this special issue. Abbott et al. share the experience of the

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American Immunization Registry Association (AIRA) and its Measurement and Improvement (M&I) Initiative, which, according to the authors, since 2015 has helped to reduce variability across IIS and strengthen immunization data in IIS that are more complete, accurate, and can be utilized with confidence [32]. Also related to immunization, Siddiqi et al. demonstrate how big immunization data from electronic records is leveraged in Sindh, Pakistan, to increase geographical coverage, to quantify the impact of provincial accelerated outreach activities, and to examine the impact of the COVID-19 pandemic on routine immunization coverage to help devise a tailored approach for future efforts [33].

Along with national data governance plans, well-defined and documented data processes, mechanisms to exchange data, and a data-driven culture to empower users, as proposed by the WHO [34], digital data solutions and digital data sources can help leverage and scale up the solutions and proposals presented in this special issue and to breach the gap to achieve and monitor the SDGs. For example, artificial intelligence has shown a 69 % positive impact (versus an 8% negative impact) toward accomplishing the SDG3 "Good Health and Well-being" [35]. Along with public data sets, digital data sources (e.g., electronic health records, mass media, internet media, search engines, social media, mobile data, and GPS mobility data) should be integrated and used to monitor real-time progress to achieve national and global health-related goals. Again, the risk of not using innovative approaches to achieve and monitor the SDGs is higher than not using data that is already available. With the proper governance and legal reforms (including ethical, privacy, and bias concerns), this approach can benefit governments and society.

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Disclaimer

DNO is a staff member of the World Health Organization and is himself alone responsible for the views expressed in this publication, which do not necessarily represent the decisions or policies of the Organization.

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