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Editorial

Data Science in Health Services

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Data have been fundamental to the scientific practice of medicine since at least the time of Hippocrates around 2500 years ago, relying on the detailed observation of cases and rigorous comparison between cases. When Clifton sought to revive the systematic recording of cases in 1731 [1], he explicitly intended that a group of clinicians would share their case summaries and seek patterns so as to improve both the diagnosis and treatment. The contributions to this Special Issue share that broad vision of data at the core of providing effective care to individuals and for populations.

Two of the articles are explicitly clinical, focusing on care for individual patients. Ebrahimvandi et al. [2] apply several machine learning algorithms to a dataset of 3.6 million deliveries to predict preterm births, achieving greater accuracy than in similar studies. The article also identifies several clinical and social factors that help to predict preterm births and assessed their independent and interactive effects. In a different clinical application, Rashid et al. [3] present a method for constructing computational models of patient-specific anatomical structures. Such models are used for computer-assisted precision surgery. The article improves existing modeling methods with a more flexible mathematical mesh that creates consistent boundaries between model components, eliminating gaps and overlaps.

One article bridges the gap between clinical and population health. Alanazi et al. [4] survey 210 diabetic patients in Saudi Arabia about actions they take to manage their diabetes such as glucose monitoring and physical activity. They find that the lack of effective e-health infrastructure contributes to poor diabetes management due to the need for manual processes and limited monitoring of patient compliance with advice.

The final two articles focus on data science in population health. Li et al. [5] examine Twitter data to construct near real-time monitoring of public sentiment for government policies to manage COVID-19 in the United States of America. They demonstrate that automatic monitoring is technically feasible and identify changes in sentiment over the period August 2020 and May 2021 as people adapt to both the presence of the epidemic and changing restrictions intended to control spread. The final article also takes a policy perspective on an important population health issue, that of obesity. Giabbanelli and Vesuvala [6] examine the ways in which a specific software tool supports and constrains the capacity of policy makers to think about complex health interventions.

Together, these articles demonstrate the breadth of data science uses in health services research. In many ways, some data science applications are natural extensions of systematic case collection and pattern analysis established as good practice centuries ago, albeit with a much larger sample of cases [2,5]. But data science also enhances the effectiveness of health systems and services by supporting more precise surgery [3], monitoring of health promotion programs [4], and even the way in which we think about the complexity of health systems [6].

Data Availability Statement: Data sharing not applicable.

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