

Applications of Machine Learning in Medicine: A data-centric approach

The highly increasing volume of medical data along with the advancement of the Internet of Things (IoT) and computer processing power determine the future of healthcare. Big data analytics and artificial intelligence (AI) are two key components [1].

Machine learning (ML) is a branch of artificial intelligence (AI) which focuses on the use of data and algorithms to imitate the way that humans learn, and accuracy is gradually improving [2]. The application of ML in healthcare ranges from medical imaging to text mining to improve prognosis (detection), diagnosis, prediction and treatment in healthcare [3]. The success of ML highly depends on the quality of the input data.

The two ML related topics in MILA are “Developing ML models to predict Intensive Care Unit (ICU) readmission and associated factors” and “Developing a framework for effective use of ML in medicine in the context of cardiovascular disease (CVD).”

MILA

The **Medical Informatics Laboratory (MILA)** is an interdisciplinary and international research group studying:

- Data quality and FAIR data principles
- Systems medicine
- Machine Learning and cardiovascular diseases
- Application of ML in ICU readmission prediction

Ongoing Scientific Investigations

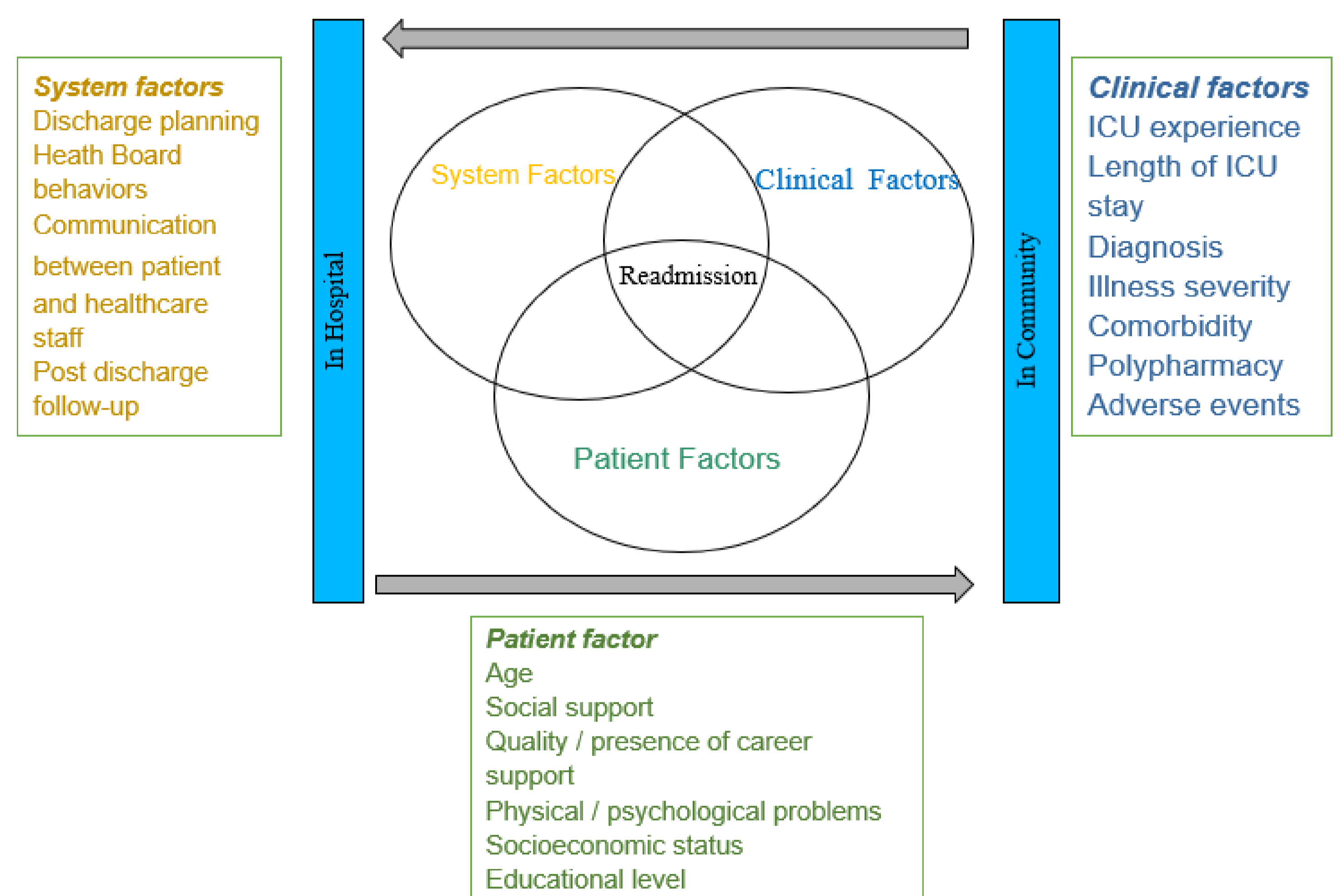


Figure 2: Conceptual framework for the range of factors that may contribute to unplanned ICU readmission. Figure taken from [4].

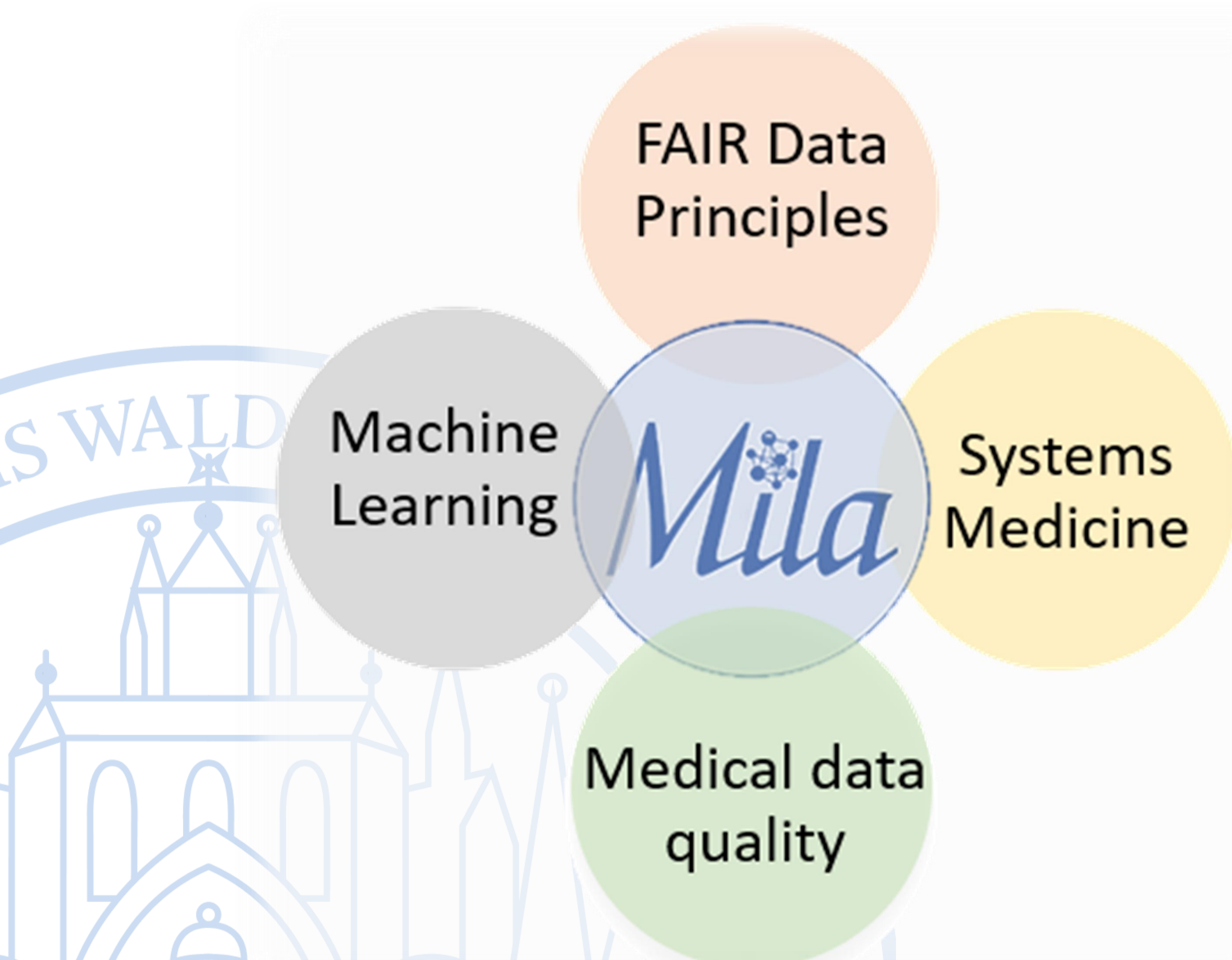


Figure 1: MILA research focus areas

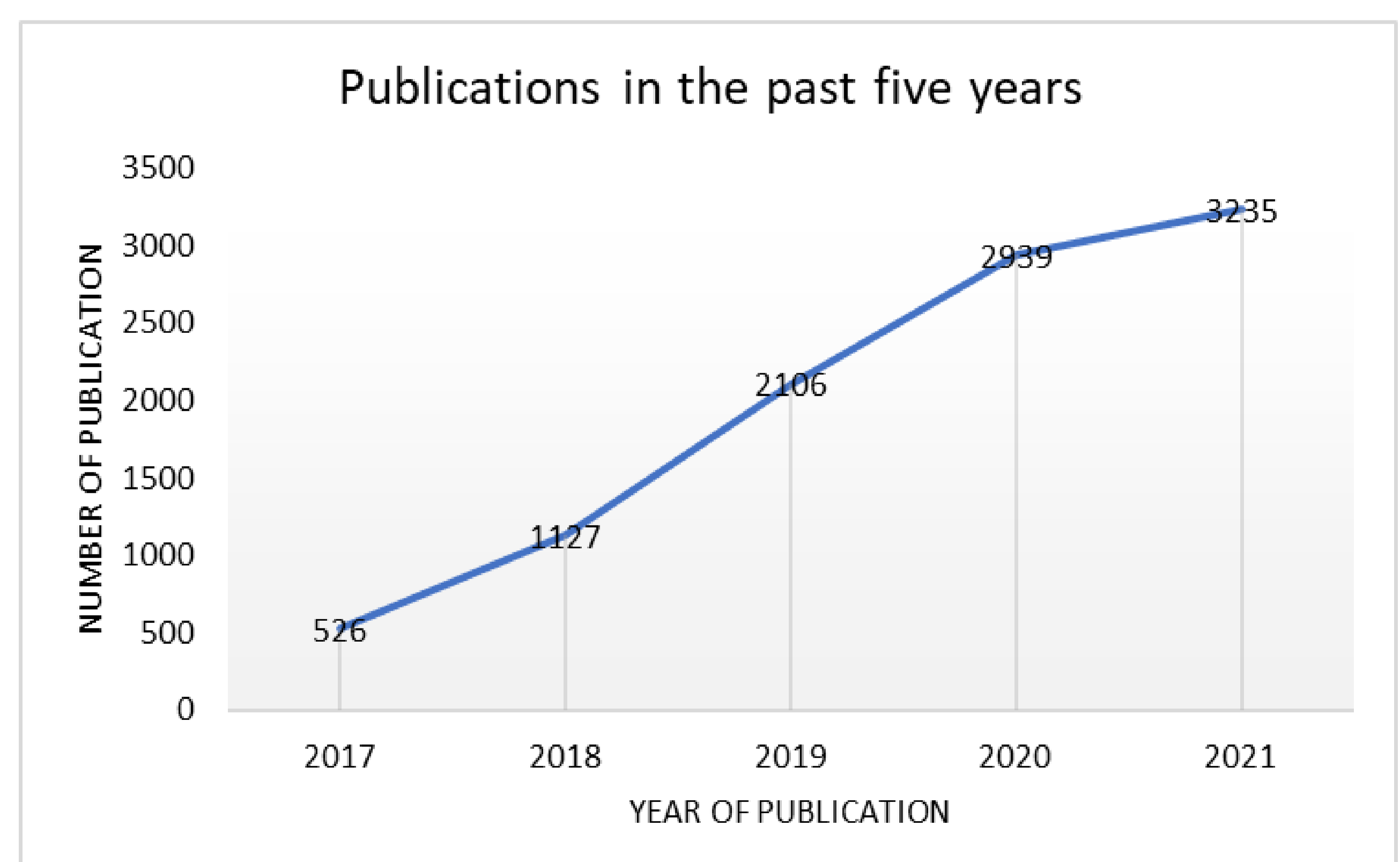


Figure 3: Annual publication trend in AI in Biomedical science [5]

References

[1] K. Shalaja, B., "Machine Learning in Healthcare: A Review," 2018 second ICECA, 2018, pp. 910-914, doi: 10.1109/ICECA.2018.8474918.

[2] Verma, V.K. and S. Verma, Machine learning applications in healthcare sector: An overview. Materials Today: Proceedings, 2021.

[3] <https://www.ibm.com/cloud/learn/machine-learning>

[4] Walsh, T.S., et al., *Preventing early unplanned hospital readmission after critical illness (PROFILE): protocol and analysis framework for a mixed methods study*. BMJ Open, 2016, 6(6): p. e012590.

[5] Shiferaw et al. Disparities in Regional Publication Trends on the Topic of Artificial Intelligence in Biomedical Science Over the Last Five Years: A Bibliometric Analysis, 2022, MIE 2022 conference (in press)