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**Project title: Advanced data-driven models integrating drug utilization to assess and predict the impact of medication adherence on Health Care System**

**Project description:** Medication adherence is a key determinant of the effectiveness of pharmacological treatments in chronic diseases, particularly among patients with multimorbidity and polypharmacy. Poor adherence to treatment is one of the leading causes of therapeutic failure, with negative consequences for clinical outcomes as for the economic sustainability of healthcare systems. In this context, the development of innovative methodologies of Drug utilization offers significant opportunities to promptly identify predictive profiles and determinants of poor adherence, helping to prevent major impacts on healthcare systems.

This research project aims will be to develop and validate data-driven models designed to profile and measure medication adherence through the application of advanced data-science techniques using health-related Big Data. The focus will be on the creation and validation of predictive algorithms in the field of drug utilization and pharmacoeconomics, using longitudinal analysis models and machine learning methods. The project will also integrate into the developed models the evaluation of the economic impact of different therapeutic strategies and the identification of cost-effectiveness scenarios associated with different medication adherence profiles, using Health Technology Assessment (HTA) methodologies.

The research activities will be carried out at the Laboratory of Drug Utilization and Pharmacoeconomics at the Department of Pharmacy of the University of Naples Federico II, in collaboration with international research institutes, promoting multidisciplinary integration.

## REFERENCES

- van Boven JFM, et al. Leveraging digital medication adherence technologies to enhance sustainability of European health systems: ENABLE's key recommendations. *Lancet Reg Health Eur.* 2024 Dec 3;48:101164.
- Khan R, et al. Investing in medication adherence improves health outcomes and health system efficiency. *OECD Health Working Paper* No. 105. 2018.
- Stirratt MJ, et al. Advancing the Science and Practice of Medication Adherence. *J. Gen. Intern. Med.* 2018, 33, 216–222.

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