Cross-organizational collaboration using federated learning to develop a clinical decision support system for the management of childhood obesity.

**Secur-e-Health project: towards federated learning for smart care of pediatric obesity**

**Background:** Childhood obesity is one of the most prevalent pediatric diseases worldwide, affecting over 340 million children and adolescents (WHO). As obesity prevalence is expected to double until 2035, early health interventions are of the utmost importance. Clinical decision support systems (CDSS) can optimize childhood obesity management. Federated learning (FL) methods allow the training of artificial intelligence (AI) models using data from multiple sources while maintaining data privacy and security. Secur-e-health project will use FL to train predictive models and provide healthcare professionals with CDSS to help selecting nutritional and exercise recommendations and consequently maximizing the adherence of patients to the therapeutic plan.

**Figure 1:** Elements and steps from the original health data to the distributed survival models.

**Methods**

**Conclusion:** Secur-e-Health aims to optimize adherence to childhood obesity recommendations, and thus achieve greater treatment success rates, and healthcare cost savings in the long term. The proposed solution will provide: (i) privacy-preserving cross-organizational analysis; (ii) predictive models integrating CDSS; and (iii) validation of the algorithms into AI-enabled digital care pathways.