1 Title of the idea and proposing services

NUTRI-LOOP

A Closed-Loop Community-to-Clinic Model for Childhood Obesity Prevention and Management

Internal services: Nutrition (lead), Primary Health Care, Paediatrics, Public Health (SSP), Community Care Units (UCC), Research. **External partners[1]:** Matosinhos Municipal Council (CMM); Directorate-General of Health, National Programme for the Promotion of Healthy Eating (DGS-PNPAS); Institute of Public Health, University of Porto (ISPUP). **Potential European partners[1]:** Mediterranean (e.g. Andalusia, Spain) and Nordic (e.g. Gothenburg, Sweden) pilot consortia.

2 Team

Lead promoter: Head of the ULSM Nutrition Department. **Management, coordination and ethics:** Nutrition and Research Departments. **Operational team[1]:** nutritionists, public health physicians and nurses, family health teams, paediatricians, school and community health nurses (UCC), nutrition, education and sport technicians (CMM), epidemiological researchers (ISPUP) and nutrition policy experts (DGS-PNPAS).

3 2027 topics addressed

Main alignment: Horizon Europe, Cluster 1 Health (Work Programme 2026-2027), Destination 1, "Staying healthy in a rapidly changing society" (behavioural interventions, NCD prevention in schools and communities), and Destination 4, "Ensuring access to innovative, sustainable and high-quality healthcare" (integrated care models). **Expected outcomes:** evidence on multilevel (environmental, clinical) interventions against childhood obesity; governance tools linking local authorities, public health and hospitals; cost-effective, scalable strategies against NCDs from childhood.

4 Clinical problem or need

Childhood obesity is a major public health challenge of the 21st century and the main predictor of metabolic, cardiovascular and psychosocial comorbidities in adulthood. In Matosinhos, overweight and obesity in school-age children exceed national averages, aggravated by socioeconomic asymmetries that limit access to healthy food and structured physical activity. The response is fragmented: school health promotion, epidemiological surveillance and clinical care remain insufficiently coordinated, so children at risk progress silently to severe obesity before reaching specialised care, a late, unsustainable burden on the NHS (SNS) that falls hardest on the most vulnerable children and widens health inequalities from childhood.

5 Idea

NUTRI-LOOP will create and test a pioneering closed-loop model for child and adolescent obesity, coordinated by the Nutrition Department as an integrated care pathway across school, community, primary care, public health and hospital care, in five axes:

(1) Healthy food environments and youth co-creation: school bars and canteens adapted under current legislation and DGS guidance, nutritional nudging and a Youth Advisory Board (children, adolescents, parents) co-designing school interventions. **(2) Smart screening and interoperable digital platform:** anthropometric screening, clinical and social risk stratification, automatic referral and longitudinal outcome monitoring. **(3) Clinical fast track (Via Verde) for paediatric obesity:** an optimised multidisciplinary pathway (family health teams, Nutrition, Paediatrics) for complex cases. **(4) Social prescribing for healthy lifestyles:** family health teams, nutritionists and paediatricians formally prescribe physical activity programmes run by the municipal sports network. **(5) Impact, cost-effectiveness and return on investment:** clinical, behavioural, organisational and economic results, including avoided costs, resource use, adherence and return on investment for the health system and local authorities.

A **Sustainability and Scale-up Package** embeds the interventions in municipal programmes and the Via Verde and referral circuits in ULSM's regular operation, and delivers a European Implementation Manual, a Replication Toolkit and policy recommendations for local, national and European authorities. **Indicators:** prevalence of overweight and obesity, time to specialised referral, adherence to prescribed physical activity, school food quality, health service use and return on investment.

What changes: children and families receive consistent, coordinated messages across school, community and health services, one integrated pathway and access to physical activity regardless of household income; professionals gain closer integration across health care, public health, schools and municipality, a social prescribing tool with territorial impact and a direct clinical referral channel; ULSM moves from reactive care to a proactive, data-integrated population health system, scalable nationally (DGS-PNPAS) and in Europe, with the cost-effectiveness evidence other systems need to adopt it. **Innovation:** environmental, digital, clinical and community interventions integrated in one child- and family-centred pathway.

6 What already exists

Local data: epidemiological history of children's nutritional status (municipality with ULSM) and food consumption data (Public Health, UCC, Nutrition). **Partnerships:** cooperation formalised in the Local Health Plan between ULSM and CMM; active protocols with ISPUP (epidemiological research, Geração 21 cohort) and DGS-PNPAS (national nutrition policy). **Prior experience:** CMM-UCC-Nutrition school health projects (menu control, Mediterranean diet, food literacy) and established primary-to-hospital referral circuits (Family Medicine, Nutrition, Paediatrics). **Infrastructure:** ULSM Research Department (project management), clinical record platforms, municipal sports facilities and pools (Matosinhos Sport) and school canteens under municipal management or supervision, suited to nudging.

Transnational validation: core pilot (Matosinhos, original closed-loop model); Mediterranean pilot (e.g. Andalusia), comparing similar proximity-based health systems and Mediterranean diet policies; Nordic pilot (e.g. Gothenburg), testing nudging and social prescribing where diet, climate and school structures differ (e.g. Sweden's universal free school meals). **European alignment:** builds on STOP and CO-CREATE, aligns methods and indicators with PAS GRAS, PREVENT and SP-EU, and adopts WHO Europe COSI and JA Best-ReMaP indicators for European comparability.

[1] External entities and international partners are substantiated technical proposals to ensure the feasibility and scientific competitiveness of the European consortium. No formal contact or consultation has yet taken place; opening contacts depends on prior validation and authorisation by the Board of Directors.