BIO-STREAMS: Multi-Pillar Framework for children's Anti-Obesity Behavior building on an EU biobank, Micro Moments and Mobile Recommendation Systems

Penio Kassari[1,2], Sofia-Maria Genitsaridi[1], Eleni Ramouzi[1], Eleni Giannopoulou[1], Eleni Kokkou[1], Marina Papadopoulou[1], Diamanto Koutaki[1], Garyfallia Stefanou[3], Christos Nikitas[4], Athanasios Bibas[4], Marios Prasinos[5], Theodora Brisimi[6], Stavros Pitoglou[7], Eleni Georga[8], Izidor Mlakar[9], Meropi Kontogianni[10], George Matsopoulos[11], Dimitris Koutsouris[11], Evangelia Charmandari[1,2], on behalf of BIO-STREAMS Consortium[12]

1. Center for the Prevention and Management of Overweight and Obesity in Childhood and Adolescence, Division of Endocrinology, Metabolism and Diabetes, First Department of Pediatrics, School of Medicine, National and Kapodistrian University of Athens, 'Aghia Sophia' Children's Hospital, Athens, Greece
2. Division of Endocrinology and Metabolism, Center of Clinical, Experimental Surgery and Translational Research, Biomedical Research Foundation of the Academy of Athens, Athens, Greece
3. ECONCARE - Health Research & Consulting, Athens, Greece
4. 1st Department of Otolaryngology, 'Hippocrateio' Hospital, Medical School, National and Kapodistrian University of Athens, Athens, Greece
5. Telematic Medical Applications LTD, Piraeus, Greece
6. Netcompany-Intrasoft SA, L-1253, Luxemburg
7. Computer Solutions Cyprus LTD, Nicosia, Cyprus
8. Unit of Medical Technology and Intelligent Information Systems, Department of Materials Science & Engineering, School of Engineering, University of Ioannina, Ioannina, Greece
9. University of Maribor, Maribor, Slovenia
10. Department of Nutrition and Dietetics, School of Health Sciences and Education, Harokopio University, Athens, Greece
11. Institute of Communication & Computer Systems (ICCS), Biomedical Engineering Laboratory, Athens, Greece
12. https://www.bio-streams.eu/consortium/

INTRODUCTION

The World Health Organization (WHO) European Regional Obesity Report 2022 stated that obesity rates have reached epidemic proportions across the European Union (EU). Obesity affects nearly one in three children (29% of boys and 27% of girls), and is associated with adverse psychological and psychosocial outcome and increased risk for noncommunicable diseases (NCDs). In addition, none of the 53 Member States are on track to meet the target of addressing the rise in the prevalence of obesity by 2025.

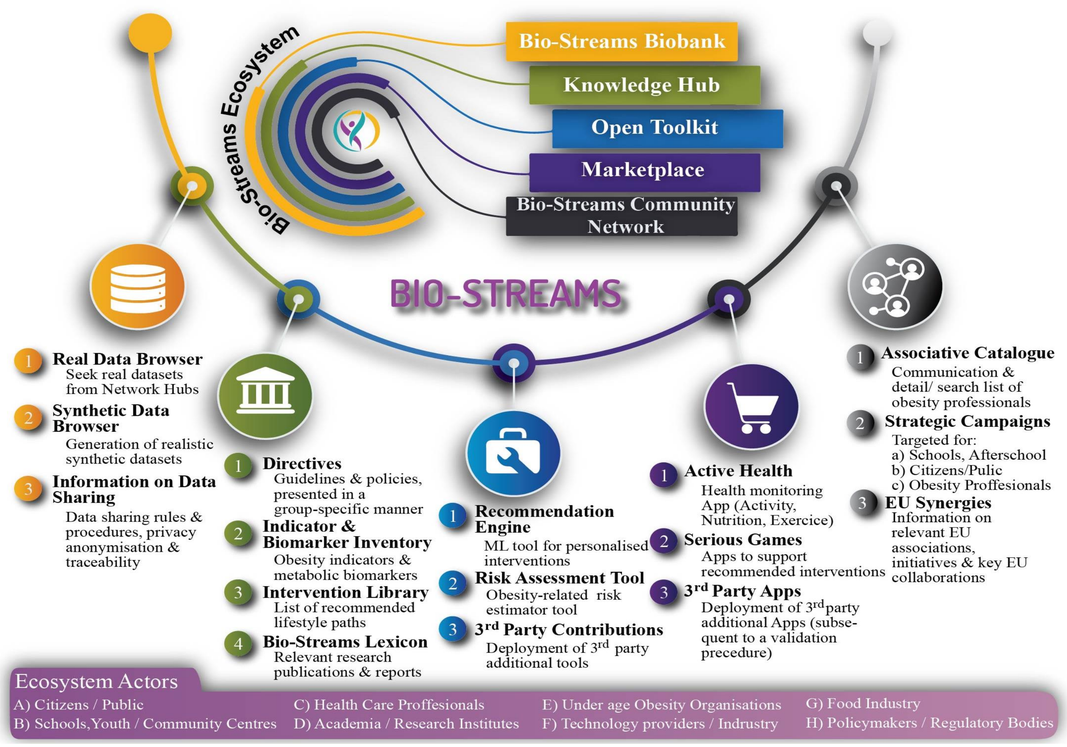
AIM

To address the childhood obesity epidemic, BIO-STREAMS, a 4-year (2023–2027) HORIZON European Research project (No101080718), brings together 30 partners from 15 countries across the EU, with the collaboration of 7 hospitals in 6 EU countries and 5 school sites in 5 EU countries, in order to design, develop and implement a holistic program for the effective management of childhood obesity.

METHOD

This solution is based on three areas:

1) The first EU Childhood/Adolescence Obesity Biobank (Bio-Streams Biobank): This is the first EU-wide center for sharing data related to childhood and adolescent obesity, aiming to standardize data collection and expand the data network across countries
2) The Bio-Streams Platform: This is an integrated digital platform offering personalized risk assessments, tailored prevention programs, a marketplace of mobile tools, including the Active Health App and a knowledge hub, all aimed at addressing childhood obesity effectively
3) An EU Community Network on Childhood/Adolescence Obesity (Bio-Streams Community Network): Coordinated via the Bio-Streams Platform, this network facilitates evidence-based knowledge communication to stakeholders, dissemination of best practices and weight-neutral approaches, community engagement campaigns for healthier environments and long-term behavioral change, as well as citizen access to local obesity professionals via the Bio-Streams Associative Catalogue



RESULTS

By establishing an EU-wide Knowledge Chain Model (KCM) on obesity for the underage population, Bio-Streams provides substantial solutions to childhood obesity and aims to shape healthier habits. Advanced machine learning models support the project, promising high-accuracy personalized advice. Furthermore, Bio-Streams strives to improve the quality of life for its target group and is set to be a valuable tool in clinical settings.

CONCLUSIONS

An integrated multi-layered approach using intelligent information systems, focusing on health data management, knowledge management, risk assessment, prevention, healthy living interventions, and community awareness and mobilization, is expected to contribute significantly towards promoting a healthier lifestyle, as well as designing the appropriate health policies for the prevention and treatment of obesity in childhood and adolescence.

ACKNOWLEDGEMENT

Funded by the HORIZON European Research and Innovation Action project under Grant Agreement No. 101080718.

MORE INFORMATION

https://www.bio-streams.eu/