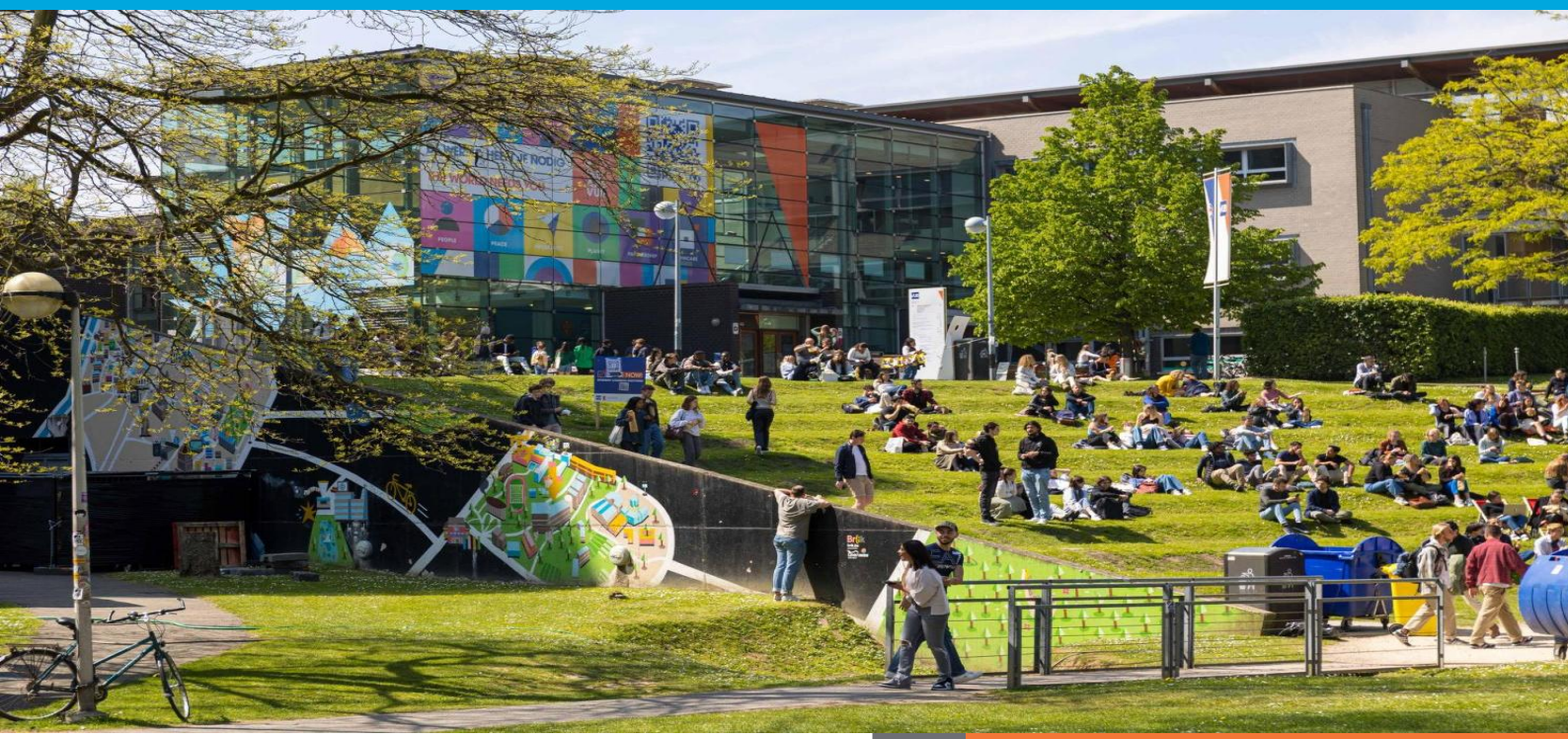
2025

BAPH - Abstract Book



BAPH
Belgian Association of Public Health

The Galilee building, Brussels, Belgium

Symposium "From Environment to Individuals: Pathways to Sustainable Health Promotion and Prevention"

6/6/2025

TABLE OF CONTENTS

About BAPH 4

Committees 5

Scientific committee 5
Organising committee 5
Volunteers 5

Winners 5

Best Presentation 5
Best RAPID-fire PRESENTATION 5

Program 6

Keynotes speakers 7

WORKSHOP 8

PRACTICAL WORKSHOPS 8

ROUND TABLE 8

Abstracts 9

Oral presentations 9

Chapter 1 : Health Behaviors 9

ABSTRACT 1 : Impact of Nutri-Score on Food Purchases: A four-country analysis of household grocery data spanning 6 years of purchases 9

ABSTRACT 2 : Objective measurement of physical activity and sedentary time in children and adolescents in Belgium. 11

ABSTRACT 3 : An Umbrella Review of Cancer Screening Among Migrant Populations: Barriers, Facilitators, and Differences 12

Chapter 2: Health and environment 14

ABSTRACT 1 : No Walk in the Park: Understanding the Diverse Pathways Through Which Green Spaces May Contribute to Cancer Survival Community Health Workers: improving access to healthcare for socio-economic vulnerable groups 14

ABSTRACT 2 : Environment-epigenome interaction in the male germ line and risk for offspring health. 17

ABSTRACT 3 : Residents' health near international airports: key lessons for the Brussels case study 19

Chapter 3 : Heatlh at work and school 21

ABSTRACT 1 : Implementing health promotion interventions at the workplace: what are the opportunities and challenges in the context of the Belgian public health system? 21

ABSTRACT 2 : Exploring the mediating factors in the telework burnout relationship: optimizing teleworkers' mental health 23

ABSTRACT 3 : Strengthening Mental health And Resilience Through Schools (SMARTS) 25

RAPID-fire presentations 26

Chapter 1 : Exposome 26

ABSTRACT 1 : Genetic and epigenetic informative biomarkers for a next-generation risk assessment of the exposome and an improved health 27

ABSTRACT 2 : Bridging the gap between the environment and human health: the microbiome as a biomarker of health and exposure in population-based health studies 29

ABSTRACT 3 : Integrating Environmental and Individual Approaches to Sustainable Prevention of Burnout 30

ABSTRACT 4 : The Key Role of Exposome in Building a Healthier Population 32

ABSTRACT 5 : The use of probabilistic methods in exposome research 33

ABSTRACT 6 : Exploring the link between microplastic exposure and sensitization in children using data dimensionality reduction: an observational study in Croatia 34

ABSTRACT 7 : BEL-PASS study: Objective measurement of physical activity, sedentary behaviours and sleep in the adult population in Belgium 36

Chapter 2 : Equity and Health 38

ABSTRACT 1 : Demedicalized and Decentralized HIV testing project in Brussels and Wallonia for people with a migrant background, especially Subsaharian African Migrant: a community based approach 38

ABSTRACT 2 : Health in all policies: how does the justice system take prison health into account in its policies? 40

ABSTRACT 3 : Providing group classes in Adapted Physical Activity for vulnerable groups as close as possible to where they live 41

ABSTRACT 4 : Situational Analysis in Flanders: Self-Management and Digitalization for People with Type 2 Diabetes 42

ABSTRACT 5 : Eliminating hepatitis C through both an individual and a structural approach: the example of the Translation project 45

ABSTRACT 6 : Demographic Determinants in Assisted Dying Trends: A 21-Year Analysis of Euthanasia Cases in Belgium (2002–2023) 46

Chapter 3 : Community-based health promotion 48

ABSTRACT 1 : Exploring the use of meal delivery services and dietary implications through agent-based modelling 48

ABSTRACT 2 : Patient and public involvement for quality at the hospital level: from ambiguous objectives to organizational robustness 50

ABSTRACT 3 : The impact of school-based greenspace on Flemish adolescents' mental well-being – an observational study 51

ABSTRACT 4 : Why am I hungry ? "On the road to the planet of happy eaters! » Learning to regulate yourself to bettre understand your Baby, Approach as a Lever for Early Childhood Obesity Prevention, A psycho-nutritional approach 52

ABSTRACT 5 : Cooking in the urban kitchen: A photo-elicitation study exploring the impacts of apartment living on food practices in Belgian cities 54

ABSTRACT 6 : 'Did you hear it?' A citizen-science project on environmental noise and the use of hearing protection in Flanders 56

ABSTRACT 7 : From isolated initiatives to a national network strengthening physical activity promotion: a story of collaboration 57

ABOUT BAPH

The Belgian Association of Public Health (BAPH) is a scientific, not-for-profit organization. It aims to create links, interaction and synergy for better public health practice and research. Through its dissemination and discussion fora, researchers and practitioners are networked for mutual complementarity.

Members of the BAPH are professionals working on issues that affect the community and public health, be they public health practitioners or researchers and academics. Members have ties to all Francophone and Flemish universities, and membership is also open to public health students.

The BAPH develops a network that creates links and synergies and helps researchers and students find resources, internships, etc

For more details about the event, click here.

COMMITTEES

SCIENTIFIC COMMITTEE

Pierre Smith (Chair), Jelle Van Cauwenberg, Svetlana Malysheva, Léna Frateur, Johan Bilsen, Johan Van der Heyden, Amina Jirari, Amélie Van Vyve, Sherihane Bensemmane

ORGANISING COMMITTEE

Léna Frateur (Chair), Brecht Devleesschauwer, Johan Van der Heyden, Karin De Ridder, Laura Van den Borre, Pierre Smith, Sherihane Bensemmane, Svetlana Malysheva, Xavier Leus

VOLUNTEERS

Dagmar Annaert, Laura Bonacini, Amina Jirari, Kirstein-Jodee Taroma, Flora Mbela Lusendi, Amélie Van Vyve, Flore Vermijs

WINNERS

BEST PRESENTATION

Elke Goldden, University of Antwerp, Belgium



Elke Godden is a Human Health Engineer and Postdoctoral Researcher at the University of Antwerp. Her research explores how public policies and food environments influence consumer behavior, with recent work focusing on front-of-pack labeling systems such as Nutri-Score. Elke has published in journals including Appetite and Food Policy, and contributes to science communication platforms to help bridge research and public understanding.

Oral presentation: *Impact of Nutri-Score on Food Purchases: A four-country analysis of household grocery data spanning 6 years of purchases*

BEST RAPID-FIRE PRESENTATION

Marie Guichardon, Sciensano, Belgium



Marie has a master's degree in public health. She is a physical activity researcher passionate about how physical activity environments influence health. Her work focuses on examining physical activity patterns in Belgium and investigating the role of physical activity as a critical determinant of health.

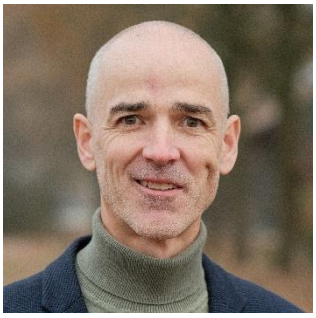
Rapid-fire presentation : *EL-PASS study: Objective measurement of physical activity, sedentary behaviours and sleep in the adult population in Belgium*

PROGRAM

9h00	Registration and welcome coffee
9h30	Introduction of the day by the BAPH
09h45	Keynote 1: Jos Bessems (VITO) One Health Meets the Exposome
10h15	Keynote 2: Prof. Stephan Van den Broucke (UCL) Health Promotion: 40 years of mainstreaming and capacity building within public health
10h45	Coffee break
11h15	Practical workshops 1. Wagyl: Experience the One Health approach through a serious game (Nathan Charlier and Xavier Laguesse, ESPRIst-ULiège) 2. Implementing environmental health in general practitioner consultations (Dr Sebastien Cleeren and Dr Elisabeth Defourny, SSMG) 3. Workshop by Centres Locaux de Promotion de la Santé (CLPS)
12h15	Lunch break
13h15	*Rapid-fire presentations*
14h15	*Oral presentations*
15h15	Coffee break
15h45	*Round table with Minister Yves Coppieters, Prof. Stephan Van den Broucke (UCL), Dr. David Hercot (Vivalis*
16h15	Closing remarks

KEYNOTES SPEAKERS

Jos Bessems (VITO)



He was toxicological risk assessor for over 25 years, contributing to Guidance Documents for REACH, World Health Organization IPCS and OECD - OCDE. He worked at TNO and RIVM (Netherlands), later moved to the European Commission's Joint Research Centre (Italy) where he prepared a strategy on toxicokinetics and systemic toxicity.

In 2017 he started as Senior R&D at VITO in the 'human biomonitoring domain', providing science-to-policy support to Flemish Departement Omgeving, European Commission's DG Environment, European Environment Agency. Under Horizon Europe, Jos contributes to PARC (Partnership for the Assessment of Risks from Chemicals) and is leading a Task in the ONCOSCREEN project that is developing a European "shield" against colorectal cancer. Lastly, he is leading the Belgian contribution to EIRENE, preparing under Horizon Europe a distributed research infrastructure in the exposome research domain.

Prof. Stephan Van den Broucke (UCL)



He is professor of Health Psychology at the Université catholique de Louvain, and Associated Professor at the Université Laval. His research expertise includes public health psychology, health promotion, health literacy, patient education, and public health capacity building. He is currently guest professor at the Babes-Bolyai University and at the Katholieke Universiteit Leuven (KU Leuven).

He gave policy advice to authoritative bodies on public health in Belgium, the European Commission, the Sultanate of Oman, and the Open Science Foundation, as well as the World Health Organization and the European Food Safety Authority (EFSA). He is an elected Board member of the International Union for Health Promotion and Education (IUHPE). He is also president of the HealthNest consortium for health literacy in Belgium.

WORKSHOP SESSION

PRACTICAL WORKSHOPS

1. Wagyl: Experience the One Health approach through a serious game (Nathan Charlier and Xavier Laguesse, ESPRIst-ULiège)
2. Implementing environmental health in general practitioner consultations (Dr Sebastien Cleeren and Dr Elisabeth Defourny, SSMG)
3. The Role of Centres Locaux de Promotion de la Santé (CLPS) in Implementing One Health as a Second-Line Service (Stéphanie Lizin and Ashley Puiatti)

ROUND TABLE

Round table with Valérie Xhonneux on behalf of Minister Yves Coppieters, Prof. Stephan Van den Broucke (UCL), Dr. David Hercot (Vivalis) and Dr Sébastien Cleeren (SSMG)

ABSTRACTS

ORAL PRESENTATIONS

CHAPTER 1 : HEALTH BEHAVIORS

1	Impact of Nutri-Score on Food Purchases: A four-country analysis of household grocery data spanning 6 years of purchases	9
2	Objective measurement of physical activity and sedentary time in children and adolescents in Belgium	11
3	An Umbrella Review of Cancer Screening Among Migrant Populations: Barriers, Facilitators, and Differences	12

ABSTRACT 1 : IMPACT OF NUTRI-SCORE ON FOOD PURCHASES: A FOUR-COUNTRY ANALYSIS OF HOUSEHOLD GROCERY DATA SPANNING 6 YEARS OF PURCHASES

Author: Godden Elke, Dens Nathalie, Granic Georg D, Thornton Lukar

Affiliations: University of Antwerp, Department of Marketing Research

Background: Background: Nutritional front-of-pack labelling is high on the European Commission's health promotion agenda. The Nutri-Score — a colour-coded label adopted by several EU countries — has been shown to help consumer understanding of food healthfulness. However, most studies focus on lab or online settings, leaving real-world behavioural impact underexplored. This study leverages real-world shopping data to assess whether healthier Nutri-Scores are purchased more frequently, and whether this differs across countries with and without the Nutri-Score system.

Methods: Using purchase data covering over 962,000 households and more than 3.4 million products across four countries (2016–2022), we analyse the sales of products with different Nutri-Scores in different product categories. Nutri-Scores were derived via web scraping based on EAN barcodes. Data ranged from before the implementation of the Nutri-Score (2016) through to well after its rollout (2022). Two countries in the dataset implemented Nutri-Score during this period; two did not.

The project includes three core analyses:

- Descriptive comparisons of total sales by Nutri-Score grade (A–E) in the two countries that implemented the Nutri-Score; The period before the official introduction of the label serves as a control.
- Exploration of whether healthier products are more purchased in countries with the Nutri-Score versus those without.
- Comparison of sales of matched products across countries with and without the Nutri-Score;

The initial focus is on three product categories (yoghurts, breakfast cereals, and chips), analysing both sales value (€) and volume (units/ml).

Observations: Initial results for Belgium (yoghurts) show clear shifts post-2018:

- In value terms (€), Nutri-Score A and B products gained market share, while C products declined from >40% in 2018 to <30% by 2022.
- In unit terms, B products rose from ~30% to >40% between 2018–2019, A remained stable (~30%), and C declined steadily.
- These trends appear to pre-date the official 2019 Nutri-Score implementation, suggesting early retailer/producer action or rising consumer interest. No consistent seasonality patterns were observed.

Conclusion: Preliminary evidence suggests shifts in purchasing patterns aligned with the Nutri-Score system. Nutri-Score C products have lost market share, while A and B have gained ground—though the timing suggests that factors beyond the official implementation (e.g. pre-emptive reformulation, early consumer awareness) may be at play.

Main messages:

- Market share of healthier yoghurt products (Nutri-Score A and B) increased in Belgium from 2018 to 2022, while less healthy products (C) declined. These trends began before official implementation, suggesting potential early adoption or consumer anticipation.
- This study leverages high-resolution consumer panel data covering millions of purchases across countries, product categories, and time. The richness of this dataset enables future analyses on label effectiveness, price effects, and product reformulation at scale, offering valuable insights for public health policy and food industry strategy.

Keywords: Health promotion , Global health , Household purchase data , Nutritional label , Nutri-Score

Acknowledgments : Gratitude goes to AiMark for the provision of the data

ABSTRACT 2 : OBJECTIVE MEASUREMENT OF PHYSICAL ACTIVITY AND SEDENTARY TIME IN CHILDREN AND ADOLESCENTS IN BELGIUM.

Authors:

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- Author 3: Berger, Nicolas, Sciensano, Department of Epidemiolgy and Public Healtherveeuw Sarah (1), Vanthomme Katrien (1), Toma Sorana (1)

Affiliations: Sciensano, Department of Epidemiolgy and Public Health

Background: To effectively promote physical activity (PA) and limit sedentary behaviour (SB) among young people, governments need accurate insights into their activity patterns. Therefore, PA and SB of children and adolescents were objectively measured using accelerometers as part of the Belgian Food Consumption Survey conducted in 2014-2015 and 2022-2023.

Methods: Children (3-9 years) and adolescents (10-17 years) wore a triaxial accelerometer during waking hours for seven consecutive days. Participants with at least two valid weekdays (?10 hours of wear time) and one valid weekend day (?eight hours of wear time) were included in the analyses, resulting in a final sample of 1212 participants in 2014-2015 and 878 participants in 2022-2023. Weighted mean times of sedentary time (ST), light PA (LPA), and moderate-to-vigorous PA (MVPA) were calculated. Difference between subgroups and survey years were assessed using multiple linear regression. Weighted proportions of children and adolescents meeting the current PA guidelines were compared between subgroups and survey years using logistic regression. All analyses were adjusted for age and sex.

Results: In 2022-2023, children and adolescents had a mean ST of 6.4 hours/day. ST was higher in adolescents than in children (+2.5 hours/day; P<0.001), and higher in girls than in boys (+11 minutes/day; P<0.05). In addition, ST decreased by 1.4 hours/day between 2014-2015 and 2022-2023 (P<0.001). In 2022-2023, an average of 5.6 hours/day was spent in LPA and 46 minutes/day in MVPA. Both LPA and MVPA were lower in adolescents than in children (-1.7 hours/day LPA, -10 minutes/day MVPA; P<0.001). MVPA was lower in girls than in boys (-13 minutes/day; P <0.001), and in those from low-educated families compared with those from medium- (-7 minutes/day; P<0.05) and high-educated (-7 minutes/day; P<0.01) families. LPA increased by 1.6 hours/day between 2014-2015 and 2022-2023 (P<0.001), while MVPA decreased by 8 minutes/day (P<0.001). Finally, 26 % of young people reached the PA

guidelines, which was lower than in 2014-2015 (38%). This proportion was higher in boys (32%) than in girls (19%), and in children (33%) than in adolescents (19%).

Conclusion: Only a quarter of children and adolescents in Belgium meet the PA guidelines, which is lower than 10 years ago. Girls and adolescents are at higher risk of spending less time in MVPA and not meeting the guidelines, compared to boys and children. Our results highlight the need for targeted interventions to substantially increase PA and reduce SB in young people, especially during the transition to adolescence.Cervical cancer screening programs have been pivotal in early detection and prevention efforts globally. However, despite their implementation, disparities in screening uptake persist, particularly among women from migrant backgrounds. This paper explores the role of cultural health capital (CHC) in shaping these disparities. CHC, an extension of Pierre Bourdieu's cultural capital concept, encompasses individuals' cultural resources and practices influencing health and well-being. While previous studies have indicated links between aspects of CHC and cancer screening participation, there remains a need to examine its interaction with migrant background characteristics. This paper considers the role of CHC in cervical cancer screening uptake among migrant populations .

Main messages:

- One in four children and adolescents in Belgium meets the physical activity guidelines, which is less than 10 years ago.
- Girls and adolescents spend more time in sedentary behaviour, less time per day in moderate-to-vigorous physical activity and are less likely to meet the physical activity guidelines, than boys and children.

Keywords: Physical activity, Sedentary time, Accelerometer, Guidelines

Acknowledgments : We would like to thank all the interviewers who contributed to the data collection, and all the participants who accepted to take part in the survey. This study was funded by Sciensano, the Flemish Region, the Walloon Region, the German-speaking Community, the French Community Commission and the Common Community Commission.

ABSTRACT 3 : AN UMBRELLA REVIEW OF CANCER SCREENING AMONG MIGRANT POPULATIONS: BARRIERS, FACILITATORS, AND DIFFERENCES

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Affiliations: Ghent University

Background: Cancer prevention through regular and timely screening intervention significantly reduces morbidity and mortality. However, its benefits are unevenly distributed, particularly among migrant populations who often face multifaceted barriers to uptake. Studies suggest that language differences, legal status, cultural norms, and limited awareness of healthcare systems can impede screening participation. To consolidate existing knowledge and identify actionable strategies, we conducted an umbrella review of systematic reviews examining cancer screening among migrant populations in different settings worldwide.

Methods: We systematically searched PubMed and related databases, combining Medical Subject Headings (MeSH) terms and free-text keywords for "cancer screening" and "migrants." Filters for "review," "systematic review," and "meta-analysis" were applied to narrow the scope, yielding 131 relevant citations. Following inclusion and exclusion criteria focused on adult migrant populations, we retained 21 systematic reviews (published 2005–2023). Data were extracted at a primary study level on screening type, study setting, migrant origin, screening test applied, quantitative or qualitative measures of inequalities and the relevant comparison group asseed to determine ienqualites. Reported barriers and facilitators were also extracted by study setting and migrant origin . We further recorded primary study overlap and removed all duplicates.

Results: Overall, these 21 reviews covered 158 primary studies on breast cancer screening, 142 on cervical screening, 17 on colorectal screening, and 9 on prostate screening. Most studies reported lower screening rates among migrant populations compared to majority populations, although notable exceptions emerged for Western European migrants residing in other Western states. For generational differences, second-generation groups of non-European heritage often continued to experience inequalities, mirroring broader ethnic disparities documented in the United States, Canada, and the United Kingdom. Barriers ranged from individual-level factors (limited language proficiency, low screening awareness) to structural issues (distance to medical facilities, cost, and complex health system navigation). A recurring theme was that longer residency in a host country generally correlated with higher screening uptake, yet persistent disparities among specific second-generation groups suggest deeper structural or sociocultural barriers.

Conclusion: Migrant populations generally face distinct challenges to accessing cancer screening, indicating a need for tailored interventions that address both immediate individual-level needs and longer-term structural inequities. While greater familiarity with the host country can mitigate some barriers, persistent inequalities

among certain groups underscore the influence of systemic factors such as institutional bias and socioeconomic disadvantage. Targeted outreach and culturally tailored interventions that address both individual and structural factors may more effectively promote screening.

Main messages:

- Disparities in cancer screening among migrant populations signify broader inequities in global health. Our umbrella review shows that individuals who migrate often encounter multifaceted barriers, including language gaps and socioeconomic disadvantage. Findigns suggest policymakers and health systems worldwide should adopt culturally responsive strategies, promoting universal, equitable access to cancer prevention.
- Effective cancer screening uptake demands a comprehensive health promotion approach that addresses both individual behaviors and systemic barriers. Findings from our umbrella review underscore the importance of culturally tailored education, community outreach, and supportive public policies. Together, these measures can empower migrant communities and drive substantial improvements in overall population well-being as a whole.

Keywords: Migrant inequalities, Cancer screening, Ethnic Inequalities, Barriers to cancer screening, Prevention

Acknowledgments : /

CHAPTER 2: HEALTH AND ENVIRONMENT

1	No Walk in the Park: Understanding the Diverse Pathways Through Which Green Spaces May Contribute to Cancer Survival	14
2	Environment-epigenome interaction in the male germ line and risk for offspring health.	16
3	Residents' health near international airports: key lessons for the Brussels case study	19

ABSTRACT 1 : NO WALK IN THE PARK: UNDERSTANDING THE DIVERSE PATHWAYS THROUGH WHICH GREEN SPACES MAY CONTRIBUTE TO CANCER SURVIVAL COMMUNITY HEALTH WORKERS: IMPROVING ACCESS TO HEALTHCARE FOR SOCIO-ECONOMIC VULNERABLE GROUPS

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Background: Cancer is one of the leading causes of death in high-income countries. The high failure rate of oncology drugs underscores the importance of non-pharmaceutical interventions throughout the cancer care continuum. While the (re)introduction of vegetation has recently gained traction in the fight against climate change, these efforts are not typically viewed through the lens of public health, let alone cancer care.

Methods: In an extensive literature review, we identified a number of mediators that are implicated to be affected by green space on the one hand and affecting cancer

outcomes on the other hand. We attempt to compile this body of research in a narrative review on the potential role of green space exposure in the amelioration of survival in cancer patients. Our review focuses on the following pathways: (1) stimulation of physical activity, (2) prevention of type 2 diabetes, (3) reduction of exposure to air pollution, (4) improvement of mental health and (5) promotion of social cohesion. We discuss the mechanisms through which these mediators act on cancer outcomes in detail. We briefly explore some less evident routes such as heat waves and diet.

Early Findings: The focal pathways from green space to survival are superficially distinct but frequently interconnect, and can be funneled into two large categories: direct effects on tumor growth and metastasis, and effects on treatment efficacy and completion rates. The discussed mechanisms suggest that the exact location and accessibility of a green space determine the extent through which it may improve a cancer patient's prognosis. Proposed differential effects of urban vs rural green space and greater benefits for vulnerable populations in particular merit further study.

Conclusion: Maximizing the potential of green spaces requires a multidisciplinary approach. Public health is one of many services greenery provides and deserves consideration when urban planners and policymakers determine the scale and geospatial specifics of revegetation efforts.

Main messages:

- There is a compelling case to be made for the beneficial effects of green spaces for cancer survival, though the evidence is mostly fragmented among studies that investigated specific steps in the causal pathway.
- Successfully implementing green space as a public health intervention requires thorough knowledge of the pathways to improved health, its greatest beneficiaries, and the trade-offs and synergies with other ecosystem services.

Keywords: Green space, Cancer, Survival, Non-pharmaceutical intervention, Narrative review

Acknowledgments : Funding by the NATIONAL INSTITUTE FOR HEALTH AND DISABILITY INSURANCE (NIHDI)

ABSTRACT 2 : ENVIRONMENT-EPIGENOME INTERACTION IN THE MALE GERM LINE AND RISK FOR OFFSPRING HEALTH.

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Affiliations: Department of Human Genetics, Faculty of Medicine, KU Leuven

Background: Unhealthy lifestyle, alcohol use, smoking, obesity, and environmental pollution can influence fertility and alter genes within sperm. Although it is known that the male germline epigenome is highly sensitive to various factors, the effects of pre-conception exposures in men on his fertility and health of a future child are given less consideration compared to influences from the maternal side. This is an important gap in preventive health care. Alterations in DNA methylation in regions that regulate establishment and expression of imprinted genes might be a mechanism of inheritance and have not been studied thoroughly before.

Methods: Here we use an epidemiological study to assess epigenetic effects in about 90 sperm samples of healthy volunteers. Our dataset includes socio-economic information and anthropometric measurements. Next to semen samples, we also collected blood and urine. Metabolites of environmental chemicals such as organophosphate esters (OPEs) have been tested in urine. Genome-wide epigenetic

outcome measurements in sperm cells were mainly obtained through an Illumina HumanMethylation450 BeadChip, which covers over 450,000 CpG sites. Differentially methylated CpG sites (DMCs) associated with the exposures of interest were assessed. Multiple regression models -correcting for confounding factors and multiple testing- were implemented to evaluate the association between the exposures and DNA methylation both at the global and CpG sites level.

Results/Observation: We studied the following exposures in men: age, physical condition, and organophosphate esters. We identified a set of DMCs in older men, and could map these to genes related to spermatogenesis, embryo development and neurodevelopmental diseases. Among those, few genes have been identified as (putative) imprinted genes and several DMCs were found at Imprint Control Regions (ICRs), suggesting a role in epigenetic inheritance. Preliminary data on lifestyle related exposures, such as exercising and exposures to endocrine disruptors or OPEs - and their potential multiplicative effects - show a limited number of DMCs. Annotated genes are currently further explored, especially in the context of potential inheritance of sperm-born signatures to future offspring.

Conclusion: Sperm DNA methylation alterations are associated to ageing, environmental exposure and harmful lifestyles. A defined set of genes -or biomarkers- associated to those changes in DNA methylation due to paternal exposures prior conception, could be integrated in future screening tests. If replicated in larger studies and with deeper sequencing, the field involving environmental toxicity modeling could benefit from well-designed epigenetic biomarkers. These biomarkers could be included in integrated approaches to testing and assessment (IATA), along with adverse outcome pathways (AOP) that encompass molecular cascades from environmental exposures and complex interactions with lifestyle factors. In the context of clinical practice and wellbeing of the next generation(s), our data supports earlier findings that a man's environment at conception plays a significant role in sperm epigenetic integrity; and consequently, his reproductive and offspring health. Greater attention needs to be given to promote health in young men before conception.

Main messages:

- According to the Paternal Origins of Health and Disease paradigm (POHaD), pre-conception exposures to environmental pollutants and harmful lifestyle of future father may alter the sperm epigenome, potentially leading to long-term health effects in offspring. Our study design and pilot findings can help identify epigenomic regions targeted by environmental factors in the male germ line. Next, it highlights the importance of increasing the awareness of the role of

men in offspring health. Our project provides an opportunity for tailoring health promotion initiatives at a national level.

- Intergenerational epigenetic effects of environmental exposures in humans are generally not considered in chemical risk assessment. Pre-conception exposure to organophosphate esters (OPEs) might influence sperm DNA methylation signatures, thereby potentially altering male reproductive and offspring health. Our pilot results could serve as a first step towards the identification of epigenetic biomarkers. The integration of human epigenome-wide datasets could help to further determine new epigenetic biomarkers to be included in the next-generation chemical risk assessment.

Keywords: Organophosphate esters, Sperm, 450K, Imprinting, Offspring health

Acknowledgments : This work was supported by a Health and the Environment award from the Duke Cancer Institute and the Duke Nicholas School of the Environment, a research grant from FWO (G0C8523N), co-funded by the FPS Health, Food Chain Safety and Environment, Belgium. This work was conducted in the framework of the European Partnership for the Assessment of Risks from Chemicals (PARC) and has received funding from the European Union's Horizon Europe research and innovation program under Grant Agreement No 101057014. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

ABSTRACT 3 : RESIDENTS' HEALTH NEAR INTERNATIONAL AIRPORTS: KEY LESSONS FOR THE BRUSSELS CASE STUDY

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Background: The expansion of Brussels Airport and (sub)urbanisation have caused significant environmental health burdens for residents, primarily through noise and air pollution. Due to its location near the border of different regions and linguistic communities, adequate management and burden-sharing have been a complex political issue for decades. This study reviews evidence on the health impact on residents living around airports and proposes policy measures from a "One Health" perspective.

Methods: A multidisciplinary working group (SHC 9741) was established by the Belgian Superior Health Council with representation of different regions, ensuring country-wide credibility. Potential conflicts of interest were assessed. A narrative review was conducted, using peer-reviewed publications and national health reports up to early 2024, retrieved from PubMed, Web of Science, and Google Scholar, supplemented by external (inter)national expert hearings (ACNUSA, NORAH, RIVM, VITO). Policy recommendations were developed through consensus.

Results: In 2019 (pre-COVID-19), over 163,000 residents near Brussels Airport were exposed to aircraft noise exceeding >45 dB(A) Lnight and >10 nightly overflights with LAmax >60 dB(A). According to the WHO, >15% of residents exposed to >45 dB(A) Lnight will experience high sleep disturbance, while ENVISA estimated that 220,000 residents might experience high annoyance. Cognitive impairment in children, some cardiovascular diseases, and mental health problems may indirectly arise, though not all associations are conclusive. Some effects may be amplified by air pollution. High ultrafine particle levels (UFP) are measured, especially downwind of the airport near Steenokkerzeel. Positive associations with cardiovascular effects have been observed by RIVM at Schiphol Airport, while short-term exposure to UFPs can exacerbate respiratory complaints. Other studies suggest associations with adverse birth outcomes and certain cancers (e.g. brain), but (molecular) epidemiological research is needed to quantify these risks for Brussels Airport residents.

Conclusion: Given substantial evidence of adverse health effects, mitigating measures should not be delayed. A night flight ban (11 PM – 7 AM) is recommended, alongside alignment of flight paths to prevent exceedances of the 60 dB(A) LAmax threshold. The LAeq and overflights >60 dB(A) near schools should be limited. Minimum noise levels for reporting must be lowered to meet WHO health thresholds (45 dB(A) Lden, 40 dB(A) Lnight), while unified indicators should be developed across all legislative regions, emphasising noise event frequency and peak intensity over noise averages. To reduce UFP exposure near runways, emissions should not increase during stable air conditions (early morning/evening). Further (sub)urbanisation near the airport and flight increases must be halted.

Main messages:

- The abstract highlights the interconnectedness of environmental and human health, showing how chronic exposure to aircraft noise and ultrafine particles (UFPs) contributes to several preventable adverse health effects. Evidence-based measures are proposed.
- Preventive measures like a ban on night flights, stricter noise thresholds, and a lower concentration of emissions are recommended to reduce sleep disruption and multiple health risks. These policies emphasize cross-sectoral collaboration to translate evidence into action, reducing preventable diseases near Brussels Airport.

Keywords: Public health, noise, UFP, sleep disturbance, airports

Acknowledgments : All members of ad hoc working group SHC 9741 (https://www.hgr-css.be/en/report/9741/health-impact-of-air-traffic-around-brussels-airport) are thanked for their collaboration: Dirk Adang (UHasselt), Catherine Bouland (ULB), Pierre Cole (Tivoli La Louvière), Frédéric Dobruszkes (ULB), Claudia Falzone (ULiège), Luc Hens (VITO), Luc Int Panis (UHasselt), Anne-Claude Romain (ULiège), Nicolas Van Larebeke (UGent), Johan Verbraecken (UZA), Philippe Kohl (ULiège), Etienne Masquelier (UCL). Also Luc Dekoninck (UGent) is thanked for his valuable input.

CHAPTER 3 : HEATLH AT WORK AND SCHOOL

1	Implementing health promotion interventions at the workplace: what are the opportunities and challenges in the context of the Belgian public health system?	21
2	Exploring the mediating factors in the telework burnout relationship: optimizing teleworkers' mental health	23
3	Strengthening Mental health And Resilience Through Schools (SMARTS)	25

ABSTRACT 1 : IMPLEMENTING HEALTH PROMOTION INTERVENTIONS AT THE WORKPLACE: WHAT ARE THE OPPORTUNITIES AND CHALLENGES IN THE CONTEXT OF THE BELGIAN PUBLIC HEALTH SYSTEM?

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Background: Optimal strategies for implementing health promotion and prevention at the workplace are currently the subject of a research project supported by the Walloon Region, as part of the regional Health promotion plan (WAPPS). The strategies are intended to be in continuity with, or complementary to, the activities put in place as part of the federal government's policy in this area, as described and regulated by the Workplace Wellbeing Code.

Methods: Since January 2025, the concern set out above has been the subject of an exploratory, participatory and interdisciplinary research, designed to take place in an iterative process of collecting and analysing materials from 6 types of sources: (i) regulatory texts that define the respective competences of the federal level and the Region; (ii) conceptual frameworks that define the WHO settings-based approach to health promotion, with a focus on workplace health promotion; (iii) grey literature from recognised institutions and observatories; (iv) relevant international scientific literature, in particular systematic reviews published over the last 10 years; (v) semi-directive interviews with stakeholders representing the workplace, the health promotion sector and other relevant institutions; (vi) deliberation workshops with the same stakeholders, in order to co-construct contextualized and relevant recommendations.

Preliminary results: The current literature reviews confirm the interest in occupational health promotion measures, as well as their feasibility and effectiveness. Although the activities assigned by the federal government to occupational health professionals are clearly described in the Workplace Wellbeing Code, there is currently no clearly established legislative framework entrusting the occupational health professionals identified by the federal government with health promotion missions within the regional Health promotion Plan, even though the regional administration (AVIQ) approves occupational medicine services.

Conclusion: This exploratory research highlights the challenge of integrating the tasks of occupational health professionals as defined by the federal level of jurisdiction and those which the regional level of jurisdiction may assign to them as operators in relation to the implementation of the Regional Health Promotion Plan into a package of coordinated, multidisciplinary activities. It also points to the challenge of integrating the occupational health professionals into the network of regional operators acting in the context of the regional health promotion plan.

Main messages:

- This exploratory research highlights the challenge of integrating the tasks of occupational health professionals as defined by the federal level of jurisdiction and those which the regional level of jurisdiction may assign to them as

operators in relation to the implementation of the Regional Health Promotion Plan into a package of coordinated, multidisciplinary activities

- This exploratory research points the challenge of integrating the occupational health professionals into the network of regional operators acting in the context of the regional health promotion plan.

Keywords: Workplace health promotion, interdisciplinarity, participatory and translational research, operational framework, evidence integration

Acknowledgments : Funding and operational support is received from AVIQ. Scientific support for legal aspects is received from Aurelie Frankart & Jean-Marc Hausmann. We also acknowledge the contribution of our colleagues at RESO and CESI: Dominique Doumont, Laura Gimenez, Camille Guiheneuf, Clément Montagne, Fany Panichelli

ABSTRACT 2 : EXPLORING THE MEDIATING FACTORS IN THE TELEWORK BURNOUT RELATIONSHIP: OPTIMIZING TELEWORKERS' MENTAL HEALTH

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Background: The traditional physical workplace has been replaced by alternative work arrangements, including teleworking. Over the past 50 years, teleworking has grown substantially, particularly within the European Union. Nevertheless, its impact on burnout is not well understood. While factors such as workload and social support are known to contribute to burnout, the role of teleworking remains unclear.

Aim: This study aimed to 1) investigate the mediators linking telework and burnout, and 2) examine whether the frequency of telework has a different effect on burnout.

Methods: Data from the 2023 June BelHealth survey were analyzed, a mental-health monitoring survey of a Belgian sample. The survey was conducted using snowball sampling (n = 7,186). Employed participants aged 18 to 65 years were included, resulting in a final sample of 2,327 participants. Telework was measured by asking

participants how frequently they worked from home. Telework was categorized into four levels: non-teleworkers (reference group), monthly teleworkers, weekly teleworkers, and daily teleworkers. Mediators were identified based on the Job Demands-resources (JDR) framework: emotional load, role conflict, workload, social support, autonomy, and skills (SIMPH questionnaire). Burnout was measured using the BAT-12. To investigate the (in)direct effect of telework on burnout, interventional mediation analyses were used. One model regressed the outcome on the exposure, mediators, and confounders. The other regressed the mediators on the exposure, and confounders. Both models were adjusted for confounders: age, sex, education, work skill, chronic illness, functional limitation, type of contract, and quality of social support. The total, indirect, direct, and joint effects estimates were derived using structural equation models using lavaan.

Results: Total effects showed a 0.01 average increase in burnout for monthly telework (-0.07; 0.09), a 0.01 reduction for weekly telework (-0.04; 0.06), and an 0.07 decrease for daily telework (-0.23; 0.09) compared with non-teleworkers. Weekly telework was linked to a direct effect of 0.134 increase in burnout (0.08; 0.18). Indirect effects in weekly telework reduction in burnout through emotional load (-0.05, 95% CI: -0.08; -0.03), role conflict (-0.04, 95% CI: -0.08; 0.01). The contribution of all indirect effects (joint indirect effect) was -0.13 (95% CI: -0.23; -0.03).

Conclusion: This study highlights two key findings: 1) the frequency of telework has a different impact on burnout for the total effect, 2) while the direct effects of telework on burnout increased burnout, its indirect effect of telework appeared to be protective. Future studies should explore the subjective experiences to better understand the role of each mediator that contributes to burnout.

Main messages:

- Telework can reduce burnout indirectly by improving key job conditions—especially emotional load and role conflict.
- Choosing the optimal telework frequency requires considering both the nature of one's job characteristics and individual energy resources.

Keywords: Occupational health, Telework, Work prevention, Mental health

Acknowledgments : We would like to express our gratitude to the BELHEALTH team. This study was approved by the ethics committee of the Universitaire Ziekenhuis Gent (reference number: ONZ-2022-0323). The analysis was supported by the FWO and FNRS grant number G099523N.

ABSTRACT 3 : STRENGTHENING MENTAL HEALTH AND RESILIENCE THROUGH SCHOOLS (SMARTS)

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Background: Mental health problems continue to be one of the main contributors to the global burden of disease in young people. Numerous mental health programs already tackle this issue, but there exists a "science-to-practice gap" as many mental health programmes have proven difficult to sustain within 'real-world' settings and high levels of attrition exist. These issues highlight the need for programmes to be carefully designed in function of the needs and challenges of the end-users and at the same be engaging and motivating for end-users. Therefore, using a participatory design approach, the SMARTS project developed an evidence-informed multicomponent school and sport-based mental health program for adolescents.

Methods: SMARTS focused on adolescents between 13 and 15 years old in the Brussels Capital Region. We adopted the participatory design framework proposed by Hagen et al. (2012), which entails that the end-users take on an active role and the program is continuously evaluated from their perspective throughout the entire research process. In a first step, focus group interviews were conducted with pupils, teachers, and parents, respectively, to gain a more detailed understanding of the mental health problems that youngsters experience, whereas several experts (e.g., CLB consultants, prevention advisors, sport psychology researchers) were interviewed to include an academic and practice-oriented perspective of the problem. In a second step, co-design workshops were organized with pupils, teachers and parents, respectively, to create exercises that use sports as a vehicle to promote mental health.

Results: Together with the end-users, we developed a universal prevention program that can be included in a broader whole-school approach. SMARTS contains a series of exercises covering four components of mental well-being (cfr. Geluksdriehoek, Vlaams Instituut Gezond Leven), namely feeling well, being able to be yourself, being well surrounded, and being resilient. The broad selection of exercises allow the end-user to mix and match the exercises to compile a session that optimally fit the needs of the target group.

Conclusion: The SMARTS project included pupils, parents, teachers and experts in a participatory design approach to create a sports-based universal intervention program for adolescents in Brussels. By combining the input from end-users and using sports as a vehicle, both uptake and impact of this mental health program is maximized.

Main messages:

- In order to tackle the worsening issue of mental health problems in youngsters, it is crucial to develop prevention programs that bridge the "science-to-practice gap". To this end, SMARTS consistently included input from end-users as well as experts to ensure the scientific soundness.
- SMARTS used sports as an appealing and motivating context for mental health promotion, which is a clear extra advantage in addition to the well-establish positive impact on mental, physical and social aspects.

Keywords: Prevention, Mental health promotion, Adolescents, Participatory design, sports

Acknowledgments : This project is funded by the European Union (Horizon Europe Research and Innovation Programme, Grant agreement no. 101136358).

RAPID-FIRE PRESENTATIONS

CHAPTER 1 : EXPOSOME

1	Genetic and epigenetic informative biomarkers for a next-generation risk assessment of the exposome and an improved health	27
2	Bridging the gap between the environment and human health: the microbiome as a biomarker of health and exposure in population-based health studies	29
3	Integrating Environmental and Individual Approaches to Sustainable Prevention of Burnout	30
4	The Key Role of Exposome in Building a Healthier Population	32

5	The use of probabilistic methods in exposome research	33
6	Exploring the link between microplastic exposure and sensitization in children using data dimensionality reduction: an observational study in Croatia	34
7	BEL-PASS study: Objective measurement of physical activity, sedentary behaviours and sleep in the adult population in Belgium	36

ABSTRACT 1 : GENETIC AND EPIGENETIC INFORMATIVE BIOMARKERS FOR A NEXT-GENERATION RISK ASSESSMENT OF THE EXPOSOME AND AN IMPROVED HEALTH

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Background: Some chemicals from the exposome have a high toxicological profile (e.g. bisphenols, phthalates, perfluoroalkyl substances, heavy metals and air pollution) and may have an impact on human health, with adverse effects at the biochemical, physiological, and/or behavioral level, potentially leading to diseases (e.g. cancer, neurodegeneration or reproduction/growth disorder). It is important to clearly evaluate the risks linked to these chemicals, so that prevention and mitigation actions can be taken.

Chemical risk assessment can be improved if informative biomarkers are used combined with human biomonitoring (HBM) to assess exposure. In addition to exposure biomarkers, effect biomarkers inform on biological reactions in the body, potentially leading to adverse effects, and susceptibility biomarkers account for inter-individual variability in internal exposure and biological effects. The level of DNA-methylation (DNAm) of specific genes has already been associated with chemicals exposure and/or cancer-related mechanisms. Therefore, DNAm is an ideal candidate

as effect biomarker, but this epigenetic marker is understudied in the context of chemicals. Single nucleotide polymorphisms (SNPs) have been associated with increased susceptibility to chemicals. However, these genetic biomarkers are not often included in HBM, where they could help to eliminate study biases and confounding factors.

The measurement of as many informative biomarkers (exposure, effect and susceptibility) as possible, for critical risk assessment, has a cost and can be limiting during study design. Therefore, cost-efficient methods and easy to collect samples are required to facilitate the implementation of large-population studies. In this context, the Oxford Nanopore Technology (ONT) holds promise, as this technique allows the direct sequencing of native DNA, and is able to measure simultaneously both genetic (SNPs) and epigenetic (DNAm) biomarkers. Both genetic and epigenetic biomarkers can be detected in non-invasive samples, such as saliva, which is more easily collected and stored, in addition to be better accepted by participants, in comparison with the traditional blood sampling.

We will present the results of a mini-review advocating for a better inclusion of ONT and non-invasive samples in HBM, for combined measurement of effect and susceptibility biomarkers. This innovative approach will facilitate the evaluation of the impact of the exposome on the global health, and will lead to a next-generation of risk assessment.

Main messages:

- The use of DNA-methylation and genetic polymorphisms, as effect and susceptibility informative biomarkers, should be better included (with exposure biomarkers) in human biomonitoring, assessing the impact of the exposome on human health.
- Key technologies, such as Oxford Nanopore Technology allowing simultaneous detection of both epigenetic and genetic biomarkers, and the use of non-invasive samples, such as saliva, are crucial criteria facilitating the cost-efficient design of large-population study. This innovative approach will lead to a next-generation risk assessment and contribute to a better protection of human health and the environment.

Keywords: Biomarkers, SNP, DNA-methylation, human biomonitoring, Oxford Nanopore Technology

Acknowledgments : This work was carried out in the framework of the European Partnership for the Assessment of Risks from Chemicals (PARC) and has received

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ABSTRACT 2 : BRIDGING THE GAP BETWEEN THE ENVIRONMENT AND HUMAN HEALTH: THE MICROBIOME AS A BIOMARKER OF HEALTH AND EXPOSURE IN POPULATION-BASED HEALTH STUDIES

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Background: Recent research has established that the human microbiome is influenced by our health, behavior, but also the surrounding environment, including exposure environmental contaminants and the biodiversity in the surrounding landscape. We propose a novel application of microbiome data within population-based health studies, leveraging its potential as a biomarker for health and environmental exposure or cohorts.

Microbiome composition can be analyzed through non-invasive sampling methods (including self-sampling), e.g. feces, saliva, or nasal swabs, however these techniques have not yet been widely integrated into large-scale public health studies. The microbiome data could then be associated with epidemiological participant data such as demographic, clinical or exposure profiles (e.g. from national health examination surveys, food consumption surveys, national cohorts, human biomonitoring studies related to environmental chemical exposure, mental health assessments or projects related to climate change and environmental biodiversity alterations). However, although previous studies have explored microbiome associations in smaller population groups, microbiome sampling has not yet been included as biological evidence of health or exposure to health risks in large population-based studies representative of the general population. This approach would enable a more comprehensive assessment of the impact of environmental changes on population

health. Additionally, such studies could identify population groups at risk, track the emergence of diseases or help to evaluate the effects of mitigation actions taken in response to climate change.

We will present results of a mini-review on the potential of including the microbiome as biomarker in population-based health studies. This includes various practical considerations and benefits of including the microbiome in such studies, covering the potential samples that can be collected to analyze the human microbiomes, how this sampling can be standardized, the different technologies now available to analyze the microbiome of these samples and how this analysis will affect the information that can be obtained from the study. We will present some examples of topics where the microbiome could be included as biological evidence in population-based health studies involving several exposures, for the benefit of public health. We also stress the challenges that remain to be overcome to allow the use of this microbiome data in order to provide relevant authorities with important insights to drive a proactive public health policy.

Main messages:

- The microbiome has a key role as it influences and is influenced by our health status, lifestyle and environment, including exposure to environmental contaminants and the biodiversity in the surrounding landscape.
- The human microbiome has the potential to act as a biomarker of health or exposure to health risks in the general population, if information on the microbiome can be collected in population-based health surveys or cohorts. The microbiome data could provide relevant authorities with important insights into the public health and help drive a proactive public health policy.

Keywords: Microbiome, Public health survey, Population, cohort, Metagenomics

Acknowledgments : We acknowledge the members of the METAMORPHOSE project team.

ABSTRACT 3 : INTEGRATING ENVIRONMENTAL AND INDIVIDUAL APPROACHES TO SUSTAINABLE PREVENTION OF BURNOUT

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Background: Burnout, a critical public health issue, is increasingly recognized as influenced by both individual vulnerabilities and environmental stressors. SOS Burn-out Belgique, a young non-profit organisation recognised by the AVIQ for health

promotion and burnout prevention, uses an innovative approach considering both environmental and individual determinants of burnout to tackle this problem.

Description of Fieldwork: SOS Burn-out Belgique employs a holistic approach, (1) working on the environmental dimension (i) by raising awareness among all types of public: general population through conferences, round tables, booth at fairs or other events, visibility on social media; employers, managers and human resources professionals through employer counselling, policy recommendations and workplace well-being programmes promotion; (health) professionals through interventions among primary care professionals like family doctors and professionals in the socio-educational sector, (ii) by developing partnerships with relevant organisations and institutions, (iii) by advocating its cause to politicians, and (2) working on the individual dimension (prevention or support for the victims of burnout) through an information and guidance line, peer support groups, green residential stays, walks in the countryside and online workshops.

Observations: Monitoring of different types of figures indicates great interest for SOS Burn-out Belgique's activities. More than 4,000 people visited the website in 2024 and thousands of people follow SOS Burn-out Belgique on social media. More than thousand calls have been recorded in 2024. So far, thousands of people have been made aware of the issue of burnout, and hundreds of people have been helped. Preliminary findings from satisfaction and needs and requests surveys indicate a high level of satisfaction from all types of audience. While raising awareness of the general population can encourage people to seek medical advice, raising awareness of health professionals can help detecting people at risk of burnout, and setting up workplace policies can enhance overall well-being, it is currently too early to assess the impact of SOS Burn-out Belgique's actions on burnout.

Conclusion: An integrated approach addressing both environmental and personal factors is adopted by SOS Burn-out Belgique for effective burnout prevention. SOS Burn-out Belgique has become a recognised actor in the prevention of burnout.

Main messages:

- Systemic changes in work environments and societal structures are essential to address the root causes of burnout.
- Support for individuals is the other dimension of the fight against burnout.

Keywords: Burnout, Integrated Approach, Prevention, Health promotion

Acknowledgments : Funding : AVIQ (Agence pour une Vie de Qualité)

ABSTRACT 4 : THE KEY ROLE OF EXPOSOME IN BUILDING A HEALTHIER POPULATION

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Background: The exposome concept, integrated into a One Health framework, encompasses the comprehensive range of exposures that an individual is subject to from conception through the lifespan, shaping human health. The exposome research at Sciensano focuses on various dimensions, including respiratory health influenced by air pollution, nutrition, risks of exposure to biological and chemical contaminants, risk factors of the burden of disease, collection of health data through population cohorts and many other aspects. These efforts are complemented by genomics, which helps identify individual susceptibilities and gene–environment interactions. Together, they enable a thorough understanding of how chemical exposure, socio-environmental factors, personal behaviours and other factors affect the development and progression of diseases.

Drawing on interdisciplinary expertise in epidemiology, risk assessment, analytical chemistry, molecular biology, applied genomics and other disciplines, our research integrates survey data, biomonitoring, chemical and microbiological analysis, (epi)genetic and microbiome biomarkers, risk modelling, statistics, cohort-based studies and other tools to examine the exposures and health outcomes across population groups.

This work provides an overview of our recent advancements and achievements in the different areas of exposome research. One example is a project focusing on monitoring the extent of socioeconomic differences in the environmental burden of disease and assessing the impact of policy measures on environmental health inequalities. One of the goals was to develop a tool for monitoring environmental (health) inequalities. Other examples include using the microbiome as a biomarker in population-based health studies to reflect health and exposure, and integrating genetic and epigenetic biomarkers in human biomonitoring, which benefits chemical risk assessment. Advances in analytical techniques enable efficient measurement of these biomarkers, even in non-invasive samples, supporting large-scale population study design. Within the European Partnership for the Assessment of Risks from Chemicals (PARC),

Sciensano is involved, among others, in addressing the knowledge gaps for mycotoxins by applying both traditional and more innovative methods to collect genotoxicity data for these food contaminants. In another project, Sciensano develops a centralized database with information on food product labelling and packaging, which can facilitate evidence-based policy decisions for food safety and nutrition. These and other studies related to the exposome will be briefly presented.

Overall, the exposome provides a framework for understanding and enhancing population health. Our research promotes the One Health vision by untangling how various environmental exposures contribute to adverse health outcomes, and with that, our ongoing work can support more informed interventions and policies.

Main messages:

- The power of the exposome approach can ultimately be used to identify emerging health risks through comprehensive data analysis and to develop preventive strategies targeted to specific life stages or vulnerable populations.
- To benefit the population and contribute to disease prevention, exposome research requires combined efforts and collaboration among scientists across diverse disciplines, clinicians, policymakers, funders and the general public.

Keywords: /

Acknowledgments : This contribution results from the cooperation of the members of the Working Group on Exposome at Sciensano.

ABSTRACT 5 : THE USE OF PROBABILISTIC METHODS IN EXPOSOME RESEARCH

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Background: Doing exposome research inherently implies working toward mapping the exposome of every individual in the population. This involves measuring all the environmental factors they are exposed to during their lifetime and determining the related health impact. While significant progress has been made in the last few decades toward reaching this goal, limitations due to time, funding, and methodology mean that this type of data is not currently available. One of the challenges in contemporary exposome research is therefore finding ways to counter these limitations in innovative ways. We explore how Monte Carlo methods can be used to

fill some of the gaps that are often found in observational data when doing this type of research. This overarching term includes a versatile range of computational algorithms relying on stochasticity to describe the probabilistic behaviour of random variables. Some of these methods are more specifically referred to as Markov Chain Monte Carlo algorithms and are widely applied in Bayesian inference. In the context of exposure assessment, they are used to generate a pseudo-population encompassing all possible individual exposure scenarios of one source through a simulation of the underlying physical process, propagating both variability and uncertainty. However, additional considerations are required when combining multiple exposure sources, including their linkage at the individual level in a representative manner. These probabilistic methods offer the flexibility to explicitly account for their intertwined pathways while dealing with some typical data challenges that the exposome researcher is faced with, such as missing values, limited sample sizes and inconsistencies.

Main messages:

- Introducing probabilistic methods to anyone unfamiliar with them so that they can incorporate it in their work to potentially advance the field of exposome research.
- Explaining the advantages and disadvantages of probabilistic methods in the context of exposome research in an effort to help users improve their data-driven decision-making skills.

Keywords: Exposome, probability, MCMC, Bayesian

Acknowledgments : /

ABSTRACT 6 : EXPLORING THE LINK BETWEEN MICROPLASTIC EXPOSURE AND SENSITIZATION IN CHILDREN USING DATA DIMENSIONALITY REDUCTION: AN OBSERVATIONAL STUDY IN CROATIA

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Background: In recent years, growing attention has been given to the potential health impact of micro- and nano-plastics (MNPs), originating from various sources, including plastic packaging, personal care products and synthetic clothing. MNPs have been detected in bottled water, fishes, seafood, various processed foods, as well as in the air, where they contribute to ambient particulate matter. Emerging evidence suggests that elevated concentrations of MNPs in the environment and diet may contribute to an increased risk of allergy. The objective of this study is to assess the impact of MNP-related exposome including diet, lifestyle, and air pollution on the risk of allergic sensitization in the Croatian children population.

Methods: A total of 1,155 children, aged 6 to 18 years, were recruited from three Croatian regions : Zagreb, Dalmatia, and Slavonia.

Sensitization to allergens was assessed using skin prick tests (SPT), and a binary variable was created using a sensitization index cut-off of 0.6. Dietary exposure to MNPs was assessed using the validated Food Frequency Questionnaire, along with two study-specific questionnaires focusing on MNPs exposure through consumption habits, lifestyle and environmental characteristics. Family allergy history was obtained from the validated ISAAC questionnaire. Air pollution exposure was assessed using the average PM10 levels from the two weeks preceding the SPT.

A total of 489 variables were collected. Missing data were handled using multiple imputation by chained equations. Dimensionality reduction was performed in two steps. First, a variable selection was informed by expert input and Multiple Correspondence Analysis. Second, clustering analysis was conducted separately on two subsets of MNPs indicators related to: (1) lifestyle and consumption habits, (2) nutritional habits. A multivariate logistic regression model was used to assess the association between MNPs exposure clusters, PM10, and allergic sensitization, adjusting for socio-economic factors, allergic family history, pet ownership, BMI, breast feeding, region and urbanicity.

Results: Sensitization to at least one allergen was seen in 44.6% of participants. Three clusters were identified for variables related to (1) behavioral exposure to MNPs, (2) nutritional habits. No significant associations were found between MNP-related

behavioral clusters and sensitization. However, one nutritional cluster—characterized by high intake of diverse food types—was associated with an increased risk of sensitization. PM10 exposure showed a negative association with sensitization.

Conclusion: Preliminary findings do not demonstrate a significant association between MNPs exposure and allergic sensitization. Alternative modelling approaches, such as penalized regression, are being explored for further analysis

Main messages:

- This study illustrates the utility of dimensionality reduction techniques in disentangling complex behavioral and environmental exposures related to micro- and nano-plastics.
- The preliminary finding of no apparent direct significant link between MNPs exposure and allergic sensitization highlights the importance of refined exposure assessment methods and warrants further investigation using alternative modeling approaches to better understand the interplay between environmental exposures and allergic outcomes in children

Keywords: exposome, micro and nano-plastics, allergy, sensitization, children

Acknowledgments : This work is part of the IMPTOX project which was funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 965173

ABSTRACT 7 : BEL-PASS STUDY: OBJECTIVE MEASUREMENT OF PHYSICAL ACTIVITY, SEDENTARY BEHAVIOURS AND SLEEP IN THE ADULT POPULATION IN BELGIUM

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Background: Physical activity (PA) and sedentary behaviours (SB) are established risk factors for non-communicable diseases (NCDs). Additionally sleep quality and duration have been associated with all-cause mortality and coronary heart diseases. To effectively encourage PA and sleep and limit SB, governments need up-to-date and accurate data. However, current national and regional monitoring systems predominantly rely on self-reported data, including questionnaires, that come with a range of bias and limitations. This study, which is part of a broader harmonisation initiative across 8 European countries, aims to overcome existing limitations by using objective measurements to monitor PA, SB, and sleep in adults (20-69 years) in Belgium.

Methods: 1200 participants will be recruited from the BELCOHORT and EHIS studies. Objective measures will be captured using accelerometers and anthropometric measurements, and enriched with a sleep and no-wear diary, alongside a health questionnaire. Nurses will conduct two home visits, to collect data and deliver instructions on how to wear the accelerometers and complete the diaries. Participants will be asked to wear two Axivity AX3 devices, one on the hip and one at the wrist, for 7 consecutive days. In this interval, they will complete the diaries and the health questionnaire.

Results: We expect this data collection to provide us with rich and robust information about the objective state of PA, SB and sleep at both national and regional levels. For the first time in Belgium, these data will allow us to estimate sleep and sedentary time, as well as time spent in different intensities of activity. The proportion of the population meeting WHO recommendations will be estimated, overall and by population subgroups. Results will be compared with those of 7 other European countries which will have followed a similar protocol. Raw accelerometer data will subsequently be available for detailed analysis of activity patterns, allowing to provide targeted guidance for policy makers at both national and regional levels.

Conclusion: This study will allow to identify at-risk groups for NCDs associated PA, SB and sleep in the adult population. Such information will support national and regional health promotion policies, or any policy with an impact on those risk factors (e.g. transportation, sport).

From a methodological point of view, this study will provide valuable information on the ease of conducting follow-up studies based on existing survey infrastructures (BELCOHORT and EHIS) in order to obtain additional representative data.

Main messages:

- The study will identify populations at higher risk of NCDs due to physical inactivity, sedentary behaviour, and poor sleep, helping tailor health and non-health policies for vulnerable groups.
- TFrom a policy perspective, objective data from diverse subgroups can ensure that interventions to reduce health inequities are evidence-informed and reach those most in need.

Keywords: physical activity, sedentary behaviours, sleep, accelerometer, monitoring

Acknowledgments : This study is funded by the European joint action "Prevent-NCD", the Walloon Region, and Sciensano.

CHAPTER 2 : EQUITY AND HEALTH

1	Demedicalized and Decentralized HIV testing project in Brussels and Wallonia for people with a migrant background, especially Subsaharian African Migrant: a community based approach	38
2	Health in all policies: how does the justice system take prison health into account in its policies?	40
3	Providing group classes in Adapted Physical Activity for vulnerable groups as close as possible to where they live	41
4	Situational Analysis in Flanders: Self-Management and Digitalization for People with Type 2 Diabetes	42
5	Eliminating hepatitis C through both an individual and a structural approach: the example of the Translation project	45
6	Demographic Determinants in Assisted Dying Trends: A 21-Year Analysis of Euthanasia Cases in Belgium (2002–2023)	46

ABSTRACT 1 : DEMEDICALIZED AND DECENTRALIZED HIV TESTING PROJECT IN BRUSSELS AND WALLONIA FOR PEOPLE WITH A MIGRANT BACKGROUND, ESPECIALLY SUBSAHARIAN AFRICAN MIGRANT: A COMMUNITY BASED APPROACH

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Background: Migrant communities are a priority group for HIV prevention (as outlined in the national HIV plan) and face multiple barriers to accessing testing. To effectively reach this group, it is recommended to implement integrated testing projects, considering the stigma and taboos surrounding HIV.

In Belgium, migrants from sub-Saharan Africa represent the highest-risk group for heterosexual HIV transmission, with an increasing number of infections occurring post-migration.

Since 2017, PPS has been running an HIV testing project. In 2023, we had included testing for other STIs as syphilis, hepatitis B and C, chlamydia and gonorrhea, following on the update to the royal decree on screening. The project aims to facilitate public access to testing and strengthen linkage to care through networking and a community-based approach. Its goal is to reduce health inequalities in screening by ensuring universal access to these services.

Testing is offered through three strategies: walk-in testing at our facilities and partner locations, and outreach testing in community spaces using a mobile unit. The outreach approach is particularly valued by the public, as it brings services closer to their daily environments, helping to overcome various accessibility barriers. Peer support is also highly appreciated.

This testing initiative is complemented by community mobilization efforts, including awareness-raising activities, free distribution of prevention materials, and training of volunteer community liaisons in key locations and at events (bars, cafés, restaurants, festivals, football tournaments, etc.). The informational tools, available in multiple languages, are co-created with the target audience. This to respect health litteracy principles to ensure relevant messages, clear, and adapted to the audience's needs.

Additionally, community support is provided for individuals who receive a positive test result to facilitate linkage to care.

In 2023 we perfomed 682 HIV tests VIH (8 reactive, 4 linckage to care), 207 STI tests chlamydia/gonorrhée (17 Cham + and 7 Gono +)

HIV and STI testing through a community-based approach helps break down barriers and improve access. This enables more targeted testing and ensures that individuals who might otherwise be excluded from the conventional healthcare system receive the necessary support.

Main messages:

- Offering a free outreach approach helps eliminate inequalities in access to testing services.
- Integrating this approach into a community-based strategy also facilitates engagement in HIV testing.

Keywords: Demedicalized, STI, HIV, Testing, Migrant

Acknowledgments : Thanks to COCOF and AVIQ for supporting our testing activities.

ABSTRACT 2 : HEALTH IN ALL POLICIES: HOW DOES THE JUSTICE SYSTEM TAKE PRISON HEALTH INTO ACCOUNT IN ITS POLICIES?

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Background: As in the outside world, health care in prisons is a fragmented responsibility between the federal government and the federated entities. However, the prison environment differs from the outside world in that prison healthcare falls within the remit of the Ministry of Justice and not Public Health. This division of responsibilities means that the budget is limited, health professionals are dependent on the Ministry of Justice, priority is given to security and there is a lack of training for professionals, all of which has consequences for the health of detainees.

As a result, we are seeing delays in the provision of care, a failure to respect continuity of care and the equivalence of care with that provided in the outside world, very little prevention and a number of breaches of confidentiality. In addition, the implementing decrees concerning health in the 2005 law governing daily life in detention have still not been adopted. In this context, health is finding it hard to carve out a place for itself within our prisons. While these factors have very tangible effects on the health of detainees, they also pose serious public health problems for the outside world, as most of the detainees are destined to be released.

Furthermore the health needs of detainees are significant. There is a high prevalence of mental health problems, as well as drug and medication use, a higher suicide rate and an increased prevalence of infectious diseases. Many people in prison had little recourse to the healthcare system prior to their incarceration. As a result, the majority of the prison population is in poorer health than the general population.

It was these findings that prompted civil society, more than 10 years ago, to create a collective call for a transfer of responsibility for prison healthcare to the Federal Public Service for Public Health. After many years of waiting, this transfer was recently initiated via various pilot projects.

What is the current prison health policy and how does it impact on the health of detainees? In this context, how can a 'Health in all policies' approach be created? How can we reconcile these two antinomic approaches: 'supervise and punish' and 'care and cure'? Drawing on its expertise as an officer in health promotion in prisons for nearly 10 years, I.Care will try to shed some light on these issues.

Main messages:

- Since healthcare in prison is the responsibility of the Ministry of Justice, it is not the subject of a genuine public health policy which has significant negative impact on the health of detainees
- A transfer to the Ministry of Public Health is underway. To what extent will this enable a genuine public health policy to be put in place in prisons?

Keywords: Health in all policies, prison environment, health policy, Justice

Acknowledgments : /

ABSTRACT 3 : PROVIDING GROUP CLASSES IN ADAPTED PHYSICAL ACTIVITY FOR VULNERABLE GROUPS AS CLOSE AS POSSIBLE TO WHERE THEY LIVE

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Background: 35% of people over the age of 65 suffer from one or two chronic illnesses. Every year, a third of seniors aged 65 and over fall, with significant physical and psychological consequences. Evidence shows that physical activity (PA) reduces 19.5% of the burden of disease attributable to chronic illnesses and helps prevent falls. In terms of mental health, 46% of people over 65 suffer from loneliness.

On the other side of the age spectrum, there has been an increase in childhood obesity. It is therefore essential to offer both senior and younger populations adapted physical activity (APA) programmes as a preventive and therapeutic support tool.

Description fieldwok : Created in 2009, GymSANA has around twenty employees with degrees in motricity sciences, psychomotricity or physiotherapy. It aims to offer physical activity programmes, particularly for senior citizens. The professionals are fully equipped and travel to community halls, reception centres and accommodation facilities to deliver APA group classes. All programmes combine balance exercises, strength training and body shape awareness, and are adapted to the profile of the beneficiaries.

Recently, GymSANA introduced an APA programme aimed at young people who are overweight or obese.

GymSANA now counts 3,800 beneficiaries (86% women, 14% men), through 250 class locations in 107 communes across Wallonia and the Brussels region.

Observations: A number of observations were made during the implementation phase: accessibility is an important factor in combating social and health inequalities, regular participation is a key factor, and rigorous programme content is not enough. We need to understand and find ways to overcome the barriers to regular participation. We need to offer group classes, close to where people live.

Beneficiaries' reluctancy to use the term 'sport' must be taken into account in the programmes.

Despite limited resources, GymSANA builds and nurtures lasting connections with associations of people affected by pathologies, local services and neighbourhood associations. It is important for physical educators to be trained not only in the motricity sciences, but also in group psychology and pedagogy.

Conclusion: The real challenge is to make physical activity accessible to the most vulnerable and disadvantaged. GymSANA, through its experience, has been able to provide some answers and observations.

Main messages:

- The real challenge is to make physical activity accessible to the most vulnerable and disadvantaged.
- We need to understand and find ways to overcome the barriers to regular participation. We need to offer group classes, close to where people live. Beneficiaries' reluctancy to use the term 'sport' must be taken into account in the programmes.

Keywords: m"Group classes in Adapted Physical Activity for vulnerable groups", "3,800 beneficiaries (86% women, 14% men), through 250 class locations in 107 communes ", "challenge ; accessible to the most vulnerable and disadvantaged"

Acknowledgments : Thanks to Fanny, Marie and Sherihane from the Department of Epidemiology and Public Health at Sciensano, to Emilie, Léna and Marc from the AVIQ's Health Promotion and Prevention Department, to the whole GymSANA team and to the thousands of beneficiaries who motivate us with their smiles at the end of the sessions.

ABSTRACT 4 : SITUATIONAL ANALYSIS IN FLANDERS: SELF-MANAGEMENT AND DIGITALIZATION FOR PEOPLE WITH TYPE 2 DIABETES

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Background: According to the World Health Organization, diabetes directly caused 1.6 million deaths in 2021. Over a decade, the prevalence of Type 2 diabetes mellitus (T2DM) in Belgium increased from 5.4% in 2011 to 6.8% in 2021, with an estimated 400,000 Belgians undiagnosed. The International Diabetes Federation projects that 1 in 8 adults will be diagnosed with diabetes by 2045. This highlights the need for effective management strategies; however, implementation remains uneven across the healthcare systems. Health technology and digital tools could offer promising support for diabetes care.

Approach: Approximately 20 healthcare providers from various regions in Flanders, Belgium, in primary, secondary, and tertiary care settings, participated in focus group discussions. The primary objective of this study is to describe and explain the present status of self-management (SM) practices among patients T2DM on a regional level in Flanders and the fragmented state of care. Secondly the use of health information and communication technologies (ICT) such as electronic health records to facilitate and improve SM for these individuals will be explored as well. Lastly, we aim to explore the challenges and enablers within this context. Recordings were transcribed and analyzed by two independent researchers following the Braun and Clarke analytical approach.

Key Findings: Thematic analysis identified six major themes. Multidisciplinary and intersectoral collaboration emerged as essential, emphasizing the shared responsibility between healthcare providers (HCPs) and patients for effective and consistent self-management. Fragmented care highlighted the challenges of siloed healthcare sectors, disrupting continuity of care. Participants expressed a strong desire for technology integration, advocating for digital tools to support self-management and improve data transparency. The need for a unified, interoperable, and accessible platform was widely recognized to enhance healthcare coordination. Additionally, the study underscored the importance of patient empowerment and health literacy, emphasizing the role of education and support in fostering self-management. Finally, systemic pressure and GP workload were identified as key challenges, with general practitioners facing significant burdens that impact diabetes care delivery.

Implications: This study provides valuable insights into the self-management practices of people with Type 2 diabetes in Flanders and the role of health ICT in supporting their care. It identifies current practices, unmet needs, and barriers to implementing digital tools. These findings can help policymakers and healthcare providers optimize digital health solutions and guide the development of tailored interventions that enhance self-management and improve patient outcomes.

Main messages:

- Bridging Fragmented Diabetes Care Through Digital Health Innovation
  Effective Type 2 diabetes management requires integrated, multidisciplinary care, yet fragmented healthcare pathways and limited data interoperability hinder coordination. Digital health solutions, including a centralized, interoperable ICT system, can enhance communication, improve patient self-management, and reduce administrative burdens on healthcare providers. Strengthening digital infrastructure will promote equitable access to diabetes care and support proactive health interventions. Policymakers must address structural barriers to digital tool implementation to ensure sustainable, patient-centered care. A unified approach to digital health can bridge gaps in care and improve health outcomes for individuals with diabetes in Belgium.
- Empowering Patients and Healthcare Providers for Sustainable Diabetes Prevention and Management
  Effective diabetes prevention and management require systemic, team-based approaches rather than reliance on individual responsibility. Our study highlights the need for patient empowerment, digital literacy, and workload redistribution to optimize self-management. Digital tools can support diabetes care, but adoption barriers—including policy constraints, digital literacy gaps, and resistance to innovation—must be addressed. Health policies should prioritize tailored interventions that integrate digital solutions into routine care. By strengthening health promotion and prevention strategies, policymakers can create a more sustainable, equitable healthcare system that improves long-term outcomes for people with diabetes in Belgium.

Keywords: Type 2 Diabetes, Self-management, Health Digitalization, Health Policies, Multidisciplinary collaboration

Acknowledgments : This research is conducted under the DIPAR pilot project, part of the Joint Action for Cardiovascular Diseases and Diabetes, co-funded by the European Union. More information is available at: https://jacardi.eu/

ABSTRACT 5 : ELIMINATING HEPATITIS C THROUGH BOTH AN INDIVIDUAL AND A STRUCTURAL APPROACH: THE EXAMPLE OF THE TRANSLATION PROJECT

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- Marion Guémas, directrice

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Background: In 2016, the WHO suggested the goal of eliminating hepatitis C (HCV) worldwide by 2030.

Although the prevalence of this disease has fallen in the free society, the prison population remains a crucial and particularly vulnerable target group in the fight against hepatitis C. What's more, the people incarcerated in our prisons still do not have access to healthcare equivalent to that provided in the free world, which represents a problem in the fight against infectious diseases such as HCV. In addition to the difficulties in organising screening and treatment at local level in each prison, the problems surrounding the management of hepatitis C in our prisons are also structural in nature.

In 2022, following a disturbing observation made by a prison nurse, our association I.Care decided to look into the matter, by developing a project called Translation. The nurse explained that she had asked all the convicted men in her prison (around 430 in 2022) to be tested for hepatitis C and that 50% of them had declined the offer. We therefore looked into the reasons for refusing to undergo this screening and carried out a review of the way this disease is managed within the prison, tracing each stage from prevention to recovery. The aim was to understand what was being offered, what was actually being done or not done, what barriers were encountered by professionals and prisoners, and so on.

Following this assessment, we drew up a list of possible courses of action to try and improve this care. We carried out a large number of actions, all of which were part of a global health promotion approach. On the one hand, we looked at activities to be carried out directly with detainees and professionals by improving their knowledge of the disease from a health literacy perspective, or by holding awareness and prevention sessions. On the other hand, actions aimed more at structural changes have been carried out, such as analysing the prison service's official internal procedures in relation to the problem, participating in working groups, drafting analyses and

recommendations on the subject, mentioning the problem at advocacy meetings with our political representatives, etc.

With its multi-level approach, our Translation project has attempted to address the issue holistically, with promising results in our Belgian prisons. In this presentation, we would like to outline the ins and outs of this two-year project.

Main messages:

- The project Translation has been planned to participate to the elimination of HCV in the prison context through a holisitic health promotion approach.
- Combining individual and structural initiatives is necessary to reach the sustainable goal of eliminating HCV in Belgium.

Keywords: hepatitis C, access to healthcare, information tools, holistic approach, health promotion

Acknowledgments : /

ABSTRACT 6 : DEMOGRAPHIC DETERMINANTS IN ASSISTED DYING TRENDS: A 21-YEAR ANALYSIS OF EUTHANASIA CASES IN BELGIUM (2002–2023)

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Background: Since the legalization of euthanasia in Belgium in 2002, the number of reported cases has risen significantly, from 235 in 2003 to 3,423 in 2023. This increase has sparked ongoing debates about a potential "slippery slope" in assisted dying practices, with concerns that eligibility criteria might be expanding. However, limited research has systematically examined the long-term patterns and the role of demographic determinants in this increase. This study aims to assess the contribution of demographic changes, particularly population ageing, to the observed rise in euthanasia cases over two decades.

Methods: We analysed administrative data on all reported euthanasia cases in Belgium from 2002 to 2023, obtained from the Belgian Federal Commission for the

Control and Evaluation of Euthanasia (FCCEE). A Poisson regression model was used to examine patterns while adjusting for age, gender, and regional differences, incorporating population data from the Belgian Statistical Office (Statbel). We estimated Rate Ratios (RRs) and Prevalence Rates (PRs) to determine the extent to which demographic factors contributed to the observed increase in euthanasia cases. Interaction effects across subcategories such as gender, age groups, region, and medical conditions were also explored.

Results: Over the study period, 33,647 euthanasia cases were reported, with 33,580 valid cases included in the analysis. Our findings indicate that between one-fourth and one-third of the increase in cases can be attributed to demographic changes, particularly population ageing. Euthanasia remains most common among individuals aged 70-89, with minimal gender differences. Cases citing multimorbidity have increased (PR: 1.03), while euthanasia cases involving psychiatric disorders (PR: 1.002; 1.3% of total cases) have remained stable. Meanwhile, cases involving dementia have shown a slight increase, corresponding with broader demographic ageing patterns. Regional disparities in euthanasia rates, initially pronounced, have diminished over time.

Conclusion: The rise in euthanasia cases in Belgium is largely driven by demographic shifts rather than an expansion of criteria. Early increases were largely due to the regulatory onset, while recent patterns reflect evolving demographic factors and regional adjustments. These findings provide crucial insights for policymakers in countries debating assisted dying legislation, emphasizing the need for robust regulation, comprehensive data collection, and the integration of demographic and socio-economic factors into long-term monitoring.

Main messages:

- Demographic ageing is a key driver of euthanasia patterns: The increase in euthanasia cases in Belgium between 2002 and 2023 is largely attributable to population ageing rather than an expansion of eligibility criteria.
- Effective safeguards and the need for ongoing monitoring: These findings suggest that the euthanasia safeguards implemented in Belgium appear effective, as patterns in euthanasia reflect the initial effects of legislation. Continuous monitoring of long-term trends and strengthening data collection are essential to ensure the consistent application of assisted dying laws.

Keywords: Assisted dying, Euthanasia trends, Population ageing, Demographic factors, Health policy

Acknowledgments : This cross-sectional study analyzed complete data from the Belgian Federal Commission for the Control and Evaluation of Euthanasia (FCCEE). No specific funding was received for this study, except for publication support from the

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CHAPTER 3 : COMMUNITY-BASED HEALTH PROMOTION

1	Exploring the use of meal delivery services and dietary implications through agent-based modelling	48
2	Patient and public involvement for quality at the hospital level: from ambiguous objectives to organizational robustness	50
3	The impact of school-based greenspace on Flemish adolescents' mental well-being – an observational study	51
4	Why am I hungry ? "On the road to the planet of happy eaters! » Learning to regulate yourself to bettre understand your Baby, Approach as a Lever for Early Childhood Obesity Prevention, A psycho-nutritional approach	52
5	Cooking in the urban kitchen: A photo-elicitation study exploring the impacts of apartment living on food practices in Belgian cities	54
6	'Did you hear it?' A citizen-science project on environmental noise and the use of hearing protection in Flanders	56
7	From isolated initiatives to a national network strengthening physical activity promotion: a story of collaboration	57

ABSTRACT 1 : EXPLORING THE USE OF MEAL DELIVERY SERVICES AND DIETARY IMPLICATIONS THROUGH AGENT-BASED MODELLING

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Background: Ready-to-eat meal delivery services have become increasingly popular in recent years, with implications for food behaviours and dietary patterns. The decision to use meal delivery services emerges from complex interactions between individuals, their social networks, and the food environment. Agent-based modelling (ABM) offers an advanced approach to capture these interactions. This study aims to develop an ABM to simulate patterns of meal delivery use and its impact on diet quality over time in a stylised urban environment.

Methods: The model represents a mid-sized, stylised city and includes two types of agents: individuals and out-of-home food stores (e.g., restaurants, fast food outlets). The use of meal delivery services (yes/no) is influenced by personal context, social influences, and the out-of-home food environment. Personal context includes household income (low/medium/high), household size (living alone/with others), access to fresh food (low/medium/high), kitchen conditions (limited/enough space for cooking), preference for home cooking (yes/no), perceived time scarcity (rarely/sometimes/often), and digital literacy (low/medium/high). Social influences come from the behaviours of both proximal networks (i.e., closest friends and relatives) and the broader community (i.e., others in their neighbourhood). The out-of-home food environment also affects behaviour, with stores varying in the healthfulness of their options (proportion of healthy vs unhealthy options) and whether they offer delivery services (yes/no). Together, individuals' behaviour and the healthfulness of food options influence diet quality, measured on a continuous scale from 0 (unhealthy) to 1 (healthy). The first step in developing the ABM is to explicitly describe these processes in a conceptual model, based on theories, empirical evidence, and expert opinions. This conceptual model will then be translated into algorithms to build the ABM, which will be implemented in NetLogo. The main outputs of the model will be the prevalence of meal delivery usage and diet quality over time. Each iteration will represent one week, with simulations running over a 10-year period to examine long-term patterns.

Results: By June 2025, we will be able to present the finalised conceptual model as well as the visual Overview, Design concepts, and Details protocol (vODD) of the model.

Conclusions: This ABM will explore the emergence and evolution of meal delivery services usage and its effects on diet quality. By simulating interactions between individuals, social norms, and food stores, the model contributes to the growing body of research on ABM in public health. The model will be made open-source and available for use or extension by other researchers.

Main messages:

- Our study demonstrates how agent-based modelling can reveal emergent patterns in meal delivery services usage and diet quality that traditional models fail to capture. We will be able to assess whether and how different patterns of usage and diet quality develop based on personal, social, and environmental characteristics.
- Our study answers the repeated calls to increase the critical mass using agent-based modelling for public health. Such modelling approaches are useful tools to understand food behaviours and how dietary inequalities may emerge overtime.

Keywords: Meal delivery services, diet, systems science, agent-based modelling

Acknowledgments : This work is supported by a Fonds Wetenschappelijk Onderzoek (FWO) grant (G080823N).

ABSTRACT 2 : PATIENT AND PUBLIC INVOLVEMENT FOR QUALITY AT THE HOSPITAL LEVEL: FROM AMBIGUOUS OBJECTIVES TO ORGANIZATIONAL ROBUSTNESS

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Context: Patient and public involvement has become a major method for improving healthcare, healthcare services and healthcare policies. At hospital level, patient and public participation remains poorly implemented. When participation initiatives are taken, doubts remain as to their realization due to the ambiguity of their objectives. Building on Luhmanian systems theory, the aim of this research is to identify the real contribution of patient and public involvement to the hospital system.

Methods: The research examines the case of patient and family advisory councils at hospital level. As part of a multi-site qualitative case study, three councils were the subject of observations, interviews with patients and hospital professionals, and document collection. An in-depth qualitative analysis was conducted with multiple iterations between fieldwork and data analysis.

Results: The results show that patient and public advisory councils actively contribute to the organizational robustness of hospital systems. A major differentiation work through the communication process enabled patient and family advisory councils to concretely define the four dimensions of organizational robustness: system, efficiency, environment, disruption. The entire robustness mechanism is described as an immunization of the hospital system.

Conclusion: The in-depth analysis proposed in the study enables public health practitioners to move beyond the classic ambiguity of patient and public involvement initiatives. This analysis not only offers empirical clarification of what can be expected from patient and public involvement. It also provides ways of implementing involvement initiatives more comprehensively.

Main messages:

- Patient and public involvement is frequently presented as a key method to move to a sustainable health system
- The study suggests that patient and public involvement is a way to enhance the robustness of hospital systems, which is a central propriety of sustainability for many authors.

Keywords: Patient and public involvement, Organizational robustness, Systems theory, Hospital, Patient and family advisory council, Qualitative research

Acknowledgments : Qualitative research is not possible without the engagement of numerous patients and professionals: thank you to each of those who accepted my observations and interviews.

ABSTRACT 3 : THE IMPACT OF SCHOOL-BASED GREENSPACE ON FLEMISH ADOLESCENTS' MENTAL WELL-BEING – AN OBSERVATIONAL STUDY

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Background: Mental health complaints among adolescents are on the rise. Various theoretical models suggest that exposure to greenspace can protect mental well-being. Given that adolescents spend a substantial portion of their time at school,

integrating greenspace into school environments presents a valuable opportunity to support their mental well-being. Moreover, school-based greening initiatives can help promote equity as all students, regardless of background, benefit from these shared spaces. This study aims to quantify the impact of greenspace on secondary school premises on Flemish adolescents' mental well-being.

Methods: We will utilize data from a representative sample of over 10,000 secondary education students in Flanders. Survey data on health, including mental well-being, will be combined with geographic information system (GIS) data measuring the proportion of greenspace available on school premises. To assess the causal impact of school-based greenspace on adolescents' mental well-being, we will apply the generalized propensity score method. To account for potential residual confounding, we will also include a negative control outcome (i.e., the frequency of toothbrushing).

Results: The findings will provide empirical evidence on the causal impact of school-based greenspace on the mental well-being of Flemish adolescents.

Conclusions: The findings will not only contribute to the academic understanding of environmental impacts on youth, but also provide relevant insights for policymakers, urban planners, and school boards.

Main messages:

- School greening initiatives may support adolescents' mental well-being while providing benefits for environmental sustainability
- As school greening initiatives are costly and long-lasting, robust evidence on the causal impact of school-based greenspace on mental well-being is needed.

Keywords: greenspace; adolescents; mental well-being; schoolyards

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ABSTRACT 4 : WHY AM I HUNGRY ? "ON THE ROAD TO THE PLANET OF HAPPY EATERS! » LEARNING TO REGULATE YOURSELF TO BETTRE UNDERSTAND YOUR BABY, APPROACH AS A LEVER FOR EARLY CHILDHOOD OBESITY PREVENTION, A PSYCHO-NUTRITIONAL APPROACH

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Context: Childhood obesity is a major public health challenge in Belgium and across Europe. Emerging data indicate that appetite-related behaviors and disordered eating patterns in expectant mothers can be early risk factors for childhood overweight, even in the absence of genetic transmission. The MangeursHeureux.be project is an action-research initiative that focuses on maternal well-being as a pathway to early prevention of obesity in children.

Methods: Over 600 pregnant women were screened using validated tools including the DEBQ, EAT-7, and Westenhoefer questionnaires. Participants attended 1 to 4 psychoeducational modules promoting self-regulation skills, mindful eating, and positive food communication. Interventions included the BATRA app, intuitive eating games, and a behavioral pyramid to prevent weight stigma and promote healthy feeding environments. Postnatal follow-up surveys assessed baby BMI, breastfeeding, and maternal behaviors.

Results: Among participants, 36% showed sensitivity to external food cues, 31.5% reported emotional eating, and 31.5% exhibited cognitive restriction. The average BMI before pregnancy was 27. A significant portion showed signs of rigid dietary control, with 13.5% presenting symptoms associated with bulimic tendencies and 18% with restrictive, anorexia-like traits. 12.5% scored above 4 on the EAT, warranting further diagnostic assessment. The evolution of DEBQ scores was correlated with the number of modules attended, showing measurable improvement in appetite regulation. Babies of participating mothers showed standardized growth patterns without overweight by age 2.

Conclusion: This study demonstrates the high prevalence of disordered eating behaviors in pregnant women and the feasibility of an early intervention strategy based on self-regulation and positive communication. Screening should be implemented systematically in prenatal and fertility care settings. The MangeursHeureux.be method provides health professionals with practical tools for behavior-focused prevention of obesity and disordered eating in the mother-child dyad.

Main messages:

- Preventing childhood obesity starts with supporting maternal well-being. Our data show that 12.5% of pregnant women exhibit signs of eating disorders, and one in three has appetite traits that can be transmitted to the child.
- Our public health strategy promotes both maternal mental health and a healthy food environment for the child. We developed tools for early detection, stigma-free communication, and behavioral remediation—mindful eating placemats, a label-decoding app, a marketing awareness game, and the "Mindful Bite" kit. These tools empower mothers and equip professionals with scalable methods to foster nurturing, regulation-based environments from pregnancy onward.

Keywords: "Appetite regulation","Disordered eating","Maternal well-being","Early prevention","Childhood obesity"

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ABSTRACT 5 : COOKING IN THE URBAN KITCHEN: A PHOTO-ELICITATION STUDY EXPLORING THE IMPACTS OF APARTMENT LIVING ON FOOD PRACTICES IN BELGIAN CITIES

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Background: In response to exponentially growing urban populations, apartment living is becoming ubiquitous in cities worldwide. Apartments, however, are often built

with smaller and more restrictive kitchens and food-related spaces which limit opportunities for home food preparation whilst promoting preferences towards less healthy yet convenient food alternatives. The transition to apartment living poses detrimental impacts on food practices and, hence, may perniciously contribute to the obesity pandemic. Despite these crucial implications, this topic is currently understudied in housing and public health literature, especially in the Belgian context. To address this gap, this study explored how apartment living influences food practices in the two major Belgian cities, Antwerp and Brussels.

Methods: As the two most populated cities in Belgium and where substantial growth in apartments has been observed, Antwerp (~530,000 inhabitants, 2666/ km^2) and Brussels (~1,200,000 inhabitants, 7694/km^2) were the chosen study sites. Using a qualitative descriptive approach, 23 participants with diverse backgrounds were interviewed face-to-face using photo-elicitation. Participants took a total of 253 photographs of apartment kitchens and food-related spaces, whilst a total of 909 minutes of audio recordings were collected. Using predeveloped themes based on international apartment design guidelines, the qualitative data were coded deductively and analysed using framework analysis.

Findings: Six apartment kitchen design and characteristics themes were identified: 'Ventilation', 'Suitability of construction materials', 'Storage for food and kitchen appliances', 'Lighting', 'Kitchen size and layout', and 'Kitchen fixtures and equipment'. Participants discussed in detail how these kitchen-related aspects facilitated or hindered various food practices, and described coping strategies they employed to navigate challenges. Compared to owner-occupiers, renters had more limited capabilities to address housing-related constraints, which rendered them more likely to compromise on their desired food practices.

Conclusion: By capturing how housing conditions impact apartment dwellers' food practices, findings from this study underscore the understudied link between urban housing and diet-related health whilst identifying pathways to inform housing-specific built environment policies to better support health-promoting food practices.

Main messages:

- Tapping into apartment dwellers' lived experiences, this study explored how the home environment had important influences on food practices: the size, design, and functionality of kitchens were important considerations for individuals when planning, managing, and preparing food. This may inform housing-specific built environment policies in Belgium to better support diet-related health.
- Compared to owner-occupiers, renters had limited capabilities to address material and physical kitchen constraints, urging them to compromise certain aspects of their food practices. This finding has important implications towards nutrition inequalities in Belgium, given that less affluent populations, namely renters, face additional environmental constraints in adopting healthier diets.

Keywords: Apartment living, food practices, photo-elicitation, urban kitchen, Belgium

Acknowledgments : /

ABSTRACT 6 : 'DID YOU HEAR IT?' A CITIZEN-SCIENCE PROJECT ON ENVIRONMENTAL NOISE AND THE USE OF HEARING PROTECTION IN FLANDERS

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Background: De Oorzaak, an initiative of the University of Antwerp, Antwerp University Hospital and De Morgen, is the largest citizen science project into environmental noise in Flanders. What sounds do we hear every day, where do they sound the loudest and what does that do to our health? To find out, we called on the help of thousands of citizen scientists.

Methods: This study investigated the exposure locations where people were annoyed by noise and the use of hearing protection in Flanders, as part of the bigger initiative De Oorzaak. Respondents were asked to fill-out an anonymous survey distributed by De Morgen, a Flemish newspaper. Participants had to be 18 years or older and give informed consent. The survey included demographic information, exposure locations, motives, barriers, perceptions and preferences regarding the use of hearing protection. Data exploration revealed a near-normal distribution of ages and optimized the grouping of regions for a more accurate geographical representation. Noise types were divided into environmental, occupational and recreational noise. Reasons for wearing and not wearing hearing protection were categorized into seven and eleven categories respectively. IBM® SPSS® Statistics was used for in-depth data analysis.

Results: In total, 4 782 respondents started the survey, of which 4 448 finished the survey completely. Only completed surveys were used for the analyses. More females (56.5%) than males responded. The median age of males was 56 years, for females it was 50 years. A high percentage of respondents are constantly exposed to noisy

environments (31.2% daily and 32.1% several times a week). The most present of the annoying noise sources is environmental noise (53.5%), followed by recreative noise (23.7%) and occupational noise (22.8%). It is uncommon to use hearing protection, as 62.3% stated using it in noisy environments never or less than a fourth of the time. A big part of the respondents stated never using hearing protection (27%). From those who use hearing protection, the most common options were reusable earplugs (13%), disposable earplugs (9%) and custom-made earplugs (8%). Many respondents feel that wearing hearing protection is annoying and limits their capabilities of talking to others.

Conclusion: Although a big part of our respondents is often exposed to annoying noise, the use of hearing protection is still limited. This necessitates the implementation of a campaign to raise awareness and improve knowledge about the use of hearing protection. On the symposium, more detailed analyses will be presented.

Main messages:

- Although a big part of our respondents is often exposed to annoying noise, the use of hearing protection is still limited.
- The Flemish Government should invest more in awareness-raising campaigns regarding the (correct) use of hearing protection.

Keywords: Noise, Hearing protection, Citizen science, Survey, Flanders

Acknowledgments : We would like to thank the respondents who filled-out the questionnaires and the newspaper De Morgen, for their support.

ABSTRACT 7 : FROM ISOLATED INITIATIVES TO A NATIONAL NETWORK STRENGTHENING PHYSICAL ACTIVITY PROMOTION: A STORY OF COLLABORATION

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Background: In Belgium, only 41% of female and 31% of male adults meet the WHO recommendations for physical activity (WHO, 2020). Notably, physical activity (PA) reduces 19.5% of the attributable burden of chronic diseases, hence the emergence of various frameworks aimed at promoting PA such as Physical Activity on Prescription (PAP). PAP refers to exercise referral schemes, in which citizen/patients receive prescriptions for supervised group or individual exercise sessions and/or PA counselling for a set duration. In Belgium, PAP is implemented in various forms, but remains fragmented. For instance, the Flemish government set up a program based on PA counselling, while practices in Wallonia focused mainly on adapted physical activity sessions.

Description fieldwork: In 2022, a national study day was hosted at Sciensano to allow different stakeholders to meet and discover PAP initiatives. In 2023, a national network focusing on PA(P) has been set up. Various actors were invited to participate, including but not limited to regional representatives, researchers, program coordinators and practitioners. This group facilitates the exchange of knowledge and expertise between the actors at different governance and practice levels, through bi-annual meetings and by fostering engagement beyond these meetings. The aim is to promote synergies between different programs and enable stakeholders to gain a more comprehensive understanding of the PAP landscape, including types of actors, practices, models and challenges.

Observations: Initially, exchanges within the group focused on presenting programs and initiatives to reinforce the network. Over time, discussions evolved to include scientific updates and workshops on topics like adapted physical activity. Another example is the co-creation of a research project with Sciensano: Sciensano, as an expertise center in health promotion accredited by the Walloon Agency for a Qualitative Life (AVIQ), works on the provision of PA and launched a qualitative analysis of PAP programs in Belgium.

On average, 20 stakeholders attend each meeting. The expert group meetings led to knowledge exchange, capitalisation and collaborations between participants. This shift reflects the group's growing maturity and capacity for in-depth collaborations.

Conclusion: This national network embodies an opportunity to consolidate and expand a national expert group transcending differences in approach, territorial context and language in the Belgian context. The expert group, allowed the reinforcement of the PAP expertise and capitalisation on existing initiatives. This is an example of how the expert group's knowledge can be leveraged to inform Belgian policy improvements and enhance national health promotion through PA.

Main messages:

- Creating national network for (local) initiatives can reinforce practices and knowledge in health promotion. We need to create opportunities to build a resilient system anchored in pre-existing initiatives and bridge potential gaps.
- Transdisciplinary collaboration can provide unique insights into unmet needs in the healthcare system and ignite creative solutions in health promotion in particular in regards to physical activity.

Keywords: network, physical activity, health promotion, exercise medicine

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