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HEALTH4EU kids

Your Kids' Health, Our Priority

White Book

On

Child Obesity

Prevention, Determinants and Policy Actions for Healthier Futures

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Executive Summary

Child obesity represents one of the most serious public health challenges of the 21st century. Over the past decades, the prevalence of overweight and obesity among children has increased dramatically at global, European, and national levels, affecting physical health, mental well-being, social inclusion, and future economic productivity. Once considered a problem of individual behavior, child obesity is now recognized as a complex outcome of **obesogenic environments**. It is affected by a complex, multifactorial conditions, shaped by biological, social, environmental, economic, and commercial determinants. Children are growing up in food systems that promote ultra-processed foods, digital ecosystems that encourage sedentary behavior, and urban designs that limit active play. Crucially, however, the failure to reverse this trend is no longer just about a lack of knowledge also includes but a lack of enforcement.

According to the World Health Organization (WHO) and UNICEF, childhood obesity is associated with an increased risk of non-communicable diseases, including type 2 diabetes, cardiovascular disease, musculoskeletal disorders, and certain cancers later in life. Beyond health outcomes, children living with obesity often experience stigma, discrimination, low self-esteem, and reduced educational performance, further reinforcing social inequalities. Importantly, child obesity disproportionately affects children from socioeconomically disadvantaged backgrounds, contributing to an intergenerational cycle of poor health.

Despite growing awareness, current responses remain fragmented and insufficient. Policies often focus narrowly on individual responsibility, overlooking the broader environments in which children live, learn, and play. Food systems that promote ultra-processed foods, aggressive marketing targeting children, sedentary lifestyles, digital exposure, and urban environments that discourage physical activity all play a decisive role. Schools, families, healthcare systems, municipalities, and policymakers are frequently working in silos, limiting the effectiveness and sustainability of interventions.

This White Book (charta), developed under the *Health4EUkids* JA, identifies a critical gap between legislative theory and reality. It aims to provide an evidence-based, policy-oriented framework for understanding and addressing child obesity through a comprehensive public health approach. Drawing on international evidence, European

best practices and public health principles, it argues that voluntary measures have largely failed; effective prevention now requires a shift from 'soft' guidelines to strict regulatory enforcement and accountability mechanisms and emphasizes that child obesity is largely preventable when structural determinants are addressed and supportive environments are created.

Main key call action

Child obesity is a shared responsibility. Governments, institutions, and societies must act now to protect children's health and future well-being. Healthy children are the foundation of healthy, resilient societies.

The evidence is clear. The tools are available and the economic case is undeniable. The time for voluntary measures is over; the time for decisive, enforced action is now.

The Challenge

Child obesity has increased dramatically over recent decades and now affects a substantial proportion of children across Europe and globally. High prevalence is observed even in early childhood, with strong links to socioeconomic disadvantages. Children living with obesity face, increased risk of non-communicable diseases, mental health challenges and stigma, reduced educational and social opportunities Without decisive action, child obesity will continue to increase healthcare costs, widen health inequalities, undermine population health and productivity

Why Current Approaches Are Insufficient

Despite increased awareness, many responses remain:

Fig 1: Why approaches fail

Children continue to grow up in **obesogenic environments** that make unhealthy choices the default option.

Figures

Chapter 1: Introduction and Definitions

1.1 Introduction

Child obesity has emerged as one of the most critical public health challenges of contemporary societies, affecting millions of children worldwide and posing long-term consequences for health systems, economies, and social cohesion. Over recent decades, rapid changes in dietary patterns, physical activity levels, urban environments, and digital lifestyles have profoundly altered the conditions in which children grow, eat, learn, and play. As a result, increasing numbers of children are experiencing excess body weight at ever younger ages.

Child obesity is not a transient condition limited to childhood. Evidence consistently demonstrates that overweight and obesity in early life tend to track into adolescence and adulthood, substantially increasing the risk of non-communicable diseases (NCDs) such as type 2 diabetes, cardiovascular disease, hypertension, musculoskeletal disorders, and certain forms of cancer. At the same time, children living with obesity often face psychosocial challenges, including stigma, bullying, reduced self-esteem, and poorer mental well-being, which may negatively affect academic performance and social participation.

Importantly, child obesity should not be understood solely as the result of individual choices or parental responsibility. Contemporary public health research recognizes child obesity as a **complex, multifactorial condition**, shaped by biological predispositions and strongly influenced by social, economic, environmental, and commercial determinants. Food environments that favor energy-dense, nutrient-poor foods, aggressive marketing practices targeting children, sedentary lifestyles, excessive screen time, and limited opportunities for safe physical activity all contribute to the obesogenic environments in which children live.

Child obesity also reflects and reinforces **health inequalities**. Children from socioeconomically disadvantaged families and communities are disproportionately affected, due to reduced access to healthy foods, safe recreational spaces, health literacy resources, and preventive healthcare services. As such, child obesity represents not only a health issue, but also a matter of social justice and equity.

Addressing child obesity is therefore a **public health priority** that requires a comprehensive, multisectoral response. Effective prevention and management demand coordinated action across healthcare systems, schools, families, communities, municipalities, and national policy frameworks. This White Book adopts a life-course and systems-based perspective, emphasizing prevention, early intervention, and the creation of supportive environments that enable children to achieve and maintain healthy growth and development.

1.2 Definitions

1.2.1 Overweight and Obesity in Children

Overweight and obesity in children are defined using age- and sex-specific anthropometric indicators, most commonly the **Body Mass Index (BMI)** adjusted for growth and development. BMI is calculated as weight in kilograms divided by height in meters squared (kg/m^2) and interpreted using standardized growth reference charts.

According to the **World Health Organization (WHO)**:

- **Overweight** in children is defined as a BMI-for-age greater than **+1 standard deviation (SD)** from the median of the WHO Child Growth Standards.
- **Obesity** in children is defined as a BMI-for-age greater than **+2 standard deviations (SD)** from the median.

These thresholds reflect levels of excess body fat associated with increased health risks and are widely used for population surveillance, research, and public health policy development.

1.2.2 Childhood and Adolescence

For the purposes of this White Book:

- **Childhood** refers to the period from birth up to 9 years of age.
- **Adolescence** refers to the age range between 10 and 19 years, in line with WHO definitions.

This distinction is important, as biological development, behavioral patterns, and environmental influences vary across these life stages, requiring age-appropriate prevention and intervention strategies.

1.2.3 Obesogenic Environment

An **obesogenic environment** is defined as an environment that promotes excessive energy intake and discourages physical activity, thereby increasing the risk of overweight and obesity. Such environments may include:

- Easy availability of ultra-processed, high-calorie foods
- Limited access to affordable, nutritious foods
- Inadequate opportunities for physical activity
- Urban designs that discourage walking or cycling
- Extensive exposure to food marketing, particularly through digital media

Children are especially vulnerable to obesogenic environments due to their developmental stage and limited capacity to make independent health-related choices.

1.2.4 Determinants of Child Obesity

The determinants of child obesity are commonly grouped into interconnected domains:

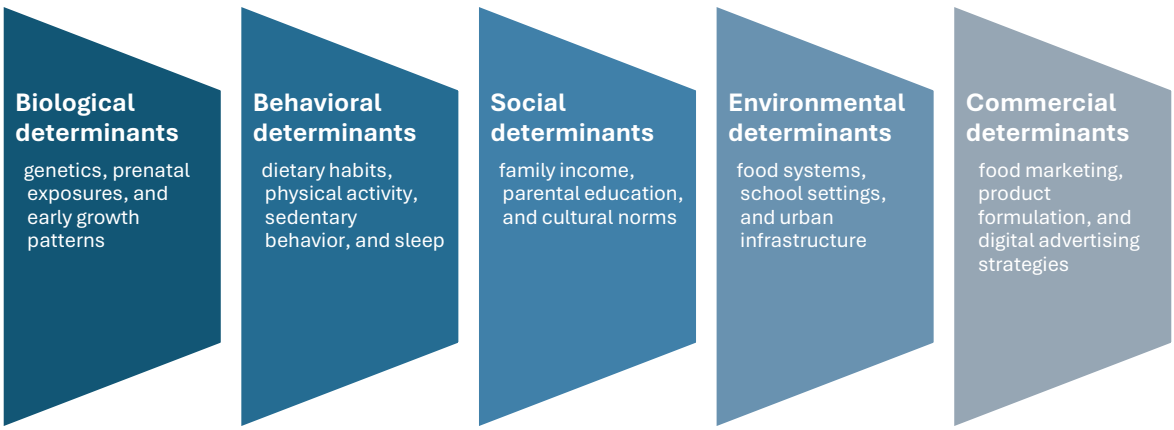

Fig2 : Determinants of child obesity

Recognizing these determinants underscores the need for comprehensive and structural approaches to prevention.

1.3 Public Health Perspective

From a public health standpoint, child obesity is a preventable condition that demands population-level strategies alongside targeted interventions for high-risk groups. Effective action requires moving beyond individual behavior change to address the broader systems that shape children's health opportunities. This White Book adopts a whole-of-government and whole-of-society approach, aligning with international frameworks and emphasizing evidence-based policymaking, intersectoral collaboration, and continuous monitoring and evaluation.

Chapter 2: Epidemiology of Child Obesity

2.1 Overview

The epidemiology of child obesity reveals a persistent and alarming upward trend over the past four decades. Once considered a problem limited to high-income countries, childhood overweight and obesity have become **global phenomena**, affecting low-, middle-, and high-income countries alike. The increasing prevalence across diverse socioeconomic and cultural contexts highlights the dominant role of environmental and systemic drivers over individual behaviors.

Child obesity now constitutes a major contributor to the global burden of disease, with implications extending far beyond childhood. Epidemiological evidence consistently shows that excess weight gained early in life strongly predicts obesity and related non-communicable diseases (NCDs) in adulthood, reinforcing the importance of early prevention and surveillance.

2.2 Global Epidemiology

At the global level, the prevalence of childhood overweight and obesity has risen dramatically since the 1980s. According to international estimates, more than 390 million children and adolescents aged 5–19 years are currently living with overweight or obesity worldwide, with a substantial proportion classified as obese.

Key epidemiological patterns:

- A rapid increase in prevalence among children aged 5–9 years
- A narrowing gap between high-income and low-/middle-income countries
- Faster growth rates in urban settings
- Increasing exposure at younger ages

Notably, the global rise in child obesity has occurred alongside persistent undernutrition in some regions, creating a double burden of malnutrition within the same populations and even households.

Table 2.1 – Global prevalence of overweight and obesity in children (indicative ranges)

Age group	Overweight (%)	Obesity (%)	Key trend
<5 years	5–7%	2–3%	Gradual increase
5–9 years	20–25%	8–10%	Rapid increase
10–19 years	18–23%	6–9%	Sustained upward trend

2.3 Epidemiology in Europe

Europe exhibits considerable heterogeneity in child obesity prevalence, with marked geographical and socioeconomic gradients. Southern and Eastern European countries generally report higher prevalence rates compared to Northern and Western Europe. Surveillance systems such as the WHO European Childhood Obesity Surveillance Initiative (COSI) provide robust evidence of:

- High levels of overweight and obesity among children aged 6–9 years
- Persistent gender differences, often with higher obesity rates among boys
- Strong associations with parental education and income

Despite stabilization or slight declines in some countries, overall prevalence remains unacceptably high, indicating that existing policies are insufficient to reverse the epidemic.

Table 2.2 – Indicative prevalence of overweight and obesity in European children (6–9 years)

Region	Overweight (%)	Obesity (%)	Observations
Northern Europe	15–20%	4–6%	Lower prevalence, slower increase
Western Europe	18–22%	5–7%	Stabilization in some countries
Southern Europe	25–35%	10–15%	Highest prevalence
Eastern Europe	22–30%	8–12%	Rapid recent increase

2.4 National and Regional Epidemiology (example focus: Greece)

In several Mediterranean countries, including Greece, child obesity represents a major public health concern. Epidemiological data consistently place Greece among the countries with the highest prevalence of childhood overweight and obesity in Europe, particularly in primary school–aged children. Key findings from national and European surveillance data indicate:

- High prevalence already evident in early primary school
- Higher rates among boys compared to girls
- Strong associations with low socioeconomic status
- Urban–rural disparities influenced by lifestyle and food environments

These patterns underscore the need for early, school-based and community-level interventions, as well as targeted support for vulnerable populations.

Recent policy dialogues conducted under the Health4EUkids Joint Action in Greece highlighted a critical 'implementation gap.' While Greece ranks 1st in Europe for childhood obesity (ages 5-19), legislation regarding school canteens and food marketing exists but lacks enforcement. Furthermore, regional disparities are acute; infrastructure available in Athens often does not exist in peripheral regions (e.g., Patras), requiring decentralized, tailored solutions.

Table 2.3 – Indicative prevalence of overweight and obesity among children in Greece

Age group	Overweight (%)	Obesity (%)
5–9 years	30–35%	12–15%
10–14 years	28–33%	10–13%
15–19 years	20–25%	7–10%

2.5 Socioeconomic and Demographic Patterns

Epidemiological evidence consistently demonstrates that child obesity is **socially patterned**. Children from disadvantaged socioeconomic backgrounds experience:

- Higher exposure to unhealthy food environments

- Lower access to organized physical activity
- Reduced health literacy
- Greater barriers to preventive healthcare services

Additional demographic patterns include:

- Gender differences, often with higher obesity prevalence among boys
- Higher risk among children with parents who have lower educational attainment
- Increased prevalence in families experiencing unemployment or economic insecurity

These findings highlight the importance of integrating **equity-focused approaches** into surveillance, prevention, and policy desSign.

2.6 Trends Over Time and Projections

Longitudinal data indicate that, without decisive policy action, child obesity prevalence is likely to **continue increasing** over the coming decades. Projections suggest earlier onset of obesity, higher lifetime exposure to metabolic risk and increasing pressure on health systems. The COVID-19 pandemic further exacerbated these trends through reduced physical activity, increased screen time, disruptions to school meal programs and psychosocial stressors affecting families

2.7 Public Health Implications

From an epidemiological perspective, child obesity represents:

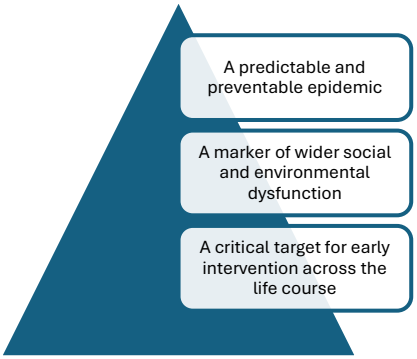

Fig 3: What child obesity represents

Robust surveillance systems, harmonized indicators, and regular reporting are essential to monitor trends, evaluate interventions, and inform evidence-based policymaking. Epidemiology should serve not only as a descriptive tool, but as a foundation for action.

Chapter 3: Determinants of Child Obesity

3.1 Introduction: A Systems Perspective

Child obesity is the outcome of a complex interaction of multiple determinants operating across the life course. While excess energy intake and insufficient physical activity are proximal causes, they are shaped by broader biological, social, environmental, and commercial forces. Understanding these determinants is essential for designing effective, equitable, and sustainable prevention strategies.

This White Book adopts a systems-based and life-course approach, recognizing that children's weight status is influenced by exposures beginning before birth and continuing through infancy, childhood, and adolescence. Importantly, many determinants lie outside the direct control of children and families, highlighting the responsibility of societies and policymakers to create supportive environments for healthy growth.

3.2 Biological and Early-Life Determinants

3.2.1 Genetic and Epigenetic Factors

Genetic predisposition plays a role in individual susceptibility to obesity; however, genetic factors alone cannot explain the rapid increase in prevalence observed globally. Instead, gene–environment interactions and epigenetic mechanisms are increasingly recognized as critical pathways through which early-life exposures influence long-term metabolic health.

3.2.2 Maternal Health and Prenatal Exposures

Maternal obesity, gestational diabetes, smoking during pregnancy, and poor maternal nutrition are strongly associated with increased obesity risk in offspring. These factors may alter fetal programming, affecting appetite regulation, fat distribution, and metabolic function later in life.

Evidence presented by a leading pediatric endocrinologist during the Health4EUkids policy dialogues emphasizes that maternal consumption of high-sugar foods alters the taste of amniotic fluid, effectively 'training' the fetus to prefer sweet tastes before birth. This underscores the need for nutritional support beginning at conception.

3.2.3 Infant Feeding and Early Growth

Early-life nutrition plays a decisive role in shaping growth trajectories. Breastfeeding is consistently associated with a reduced risk of childhood obesity. Early introduction of energy-dense complementary foods may increase risk. Rapid weight gain in infancy is a strong predictor of later obesity. These findings underscore the importance of interventions targeting the first 1,000 days of life.

In Greece, exclusive breastfeeding rates at six months are critically low (estimated at <1%). Stakeholders identify the lack of community-based support (e.g., home-visiting midwives) and the scarcity of 'Baby-Friendly Hospitals' as primary structural barriers, rather than a lack of maternal willingness.

3.3 Behavioral Determinants

3.3.1 Dietary Patterns

Unhealthy dietary patterns are a central determinant of child obesity. Children's dietary behaviors are strongly influenced by availability, affordability, marketing, and social norms rather than informed choice alone. Key features include:

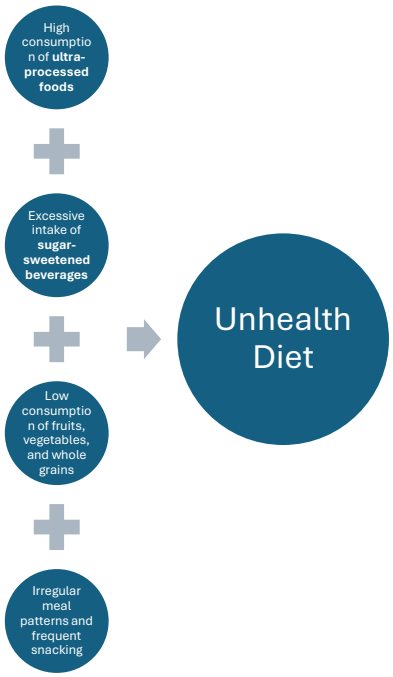

Fig 4: Key features of dietary patterns

3.3.2 Physical Activity, sedentary Behavior and Sleep patterns

Insufficient physical activity and high levels of sedentary behavior contribute significantly to energy imbalance. Contributing factors include reduced opportunities for active play, limited physical education in schools, unsafe or inaccessible outdoor spaces and increased screen-based entertainment. Many children fail to meet WHO recommendations for daily physical activity, particularly in urban and socioeconomically disadvantaged settings. Short sleep duration and poor sleep quality are increasingly recognized as determinants of obesity. Disrupted sleep may affect hormonal regulation of appetite and energy metabolism and is often linked to excessive screen time.

3.4 Social and Family Determinants

3.4.1 Socioeconomic Status

Socioeconomic disadvantages are one of the strongest predictors of child obesity. Lower-income families often face:

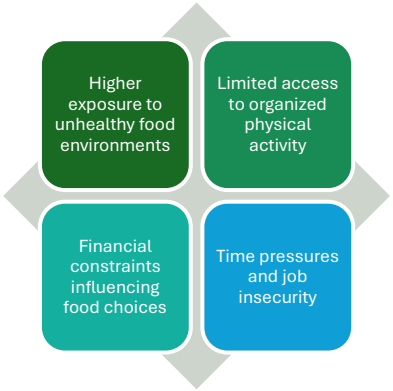

Fig 5: Socieconomic factors

These conditions contribute to persistent social gradients in obesity prevalence.

3.4.2 Family Environment and Parental Influence

Parents and caregivers shape children's dietary habits, physical activity patterns, and health behaviors. Parental obesity, health literacy, stress, and mental health all influence children's risk. Importantly, families themselves operate within broader structural

constraints. In addition, cultural beliefs regarding body size, food, and physical activity may influence behaviors and attitudes toward weight. In many Southern European contexts, Greece included, food is culturally synonymous with “care and celebration”. The “grandparent effect,” where overfeeding is an expression of love, remains a significant barrier to portion control and dietary quality. In some contexts, excess weight in children may not be perceived as a health concern, delaying prevention or intervention efforts.

3.5 Environmental Determinants

3.5.1 Food Environment

The modern food environment strongly favors energy-dense, nutrient-poor foods, high availability of ultra-processed products, price incentives favoring unhealthy options, aggressive marketing, including digital platforms and placement strategies targeting children. School food environments play a particularly important role, as children consume a significant proportion of daily energy intake during school hours.

3.5.2 Built Environment and Urban Design

Urban environments that discourage walking, cycling, and outdoor play contribute to sedentary lifestyles. Factors include, lack of safe sidewalks and bicycle paths, limited green spaces, traffic safety concerns and urban sprawl. Municipal planning decisions thus have direct implications for child health.

3.6 Commercial and Digital Determinants

The *commercial determinants of health* are increasingly recognized as key drivers of child obesity. Food and beverage industries influence consumption patterns through, product formulation (high sugar, fat, and salt content), targeted marketing to children, sponsorship of events and digital content. Digital marketing, including social media, influencers, and gaming platforms, exposes children to pervasive and often unregulated

promotion of unhealthy foods, undermining parental efforts and public health messaging.

3.7 School and Educational Determinants

Schools represent a critical setting for both risk and protection. Determinants include quality and nutritional value of school meals, availability of vending machines, time allocated to physical education, health education curricula and school policies on food marketing. Well-designed school-based interventions can reduce inequalities and reach children across socioeconomic backgrounds.

3.8. Psychological Determinants and Mental Health

Stress, anxiety, depression, and adverse childhood experiences are associated with unhealthy eating behaviors and reduced physical activity. Emotional eating may serve as a coping mechanism, particularly in contexts of social or economic stress. Conversely, obesity-related stigma can exacerbate mental health challenges, creating a vicious cycle.

3.9. Interactions and Cumulative Effects

The determinants of child obesity operate in connection with each other. Rather, they interact dynamically across time and contexts. For example, socioeconomic disadvantage may shape food and built environments or digital exposure may influence sleep, diet, and mental health and early-life biological vulnerabilities may be amplified by obesogenic environments. Understanding these interactions reinforces the need for integrated, multisectoral policy responses.

3.10. Implications for Prevention and Policy

The complexity of determinants highlighted in this chapter demonstrates that child obesity cannot be effectively addressed through **isolated interventions or individual behavior change alone**. Sustainable progress requires:

- Structural and regulatory measures
- Equity-focused policies

- Early-life and school-based interventions
- Community and environmental transformation
- Protection of children from harmful commercial influences

These implications form the foundation for the prevention strategies and policy recommendations presented in subsequent chapters of this White Book.

Chapter 4: Health, Social and Economic Consequences of Child Obesity

4.1 Introduction

Child obesity has far-reaching consequences that extend well beyond excess body weight. Its impacts are multidimensional, affecting physical health, mental well-being, social participation, educational attainment, and economic sustainability. These consequences manifest both in the short term during childhood and adolescence and in the long term across the life course, placing a growing burden on individuals, families, health systems, and societies.

Importantly, the consequences of child obesity are not evenly distributed. Children from disadvantaged socioeconomic backgrounds often experience compounded risks, including poorer health outcomes and reduced access to supportive services. Understanding these consequences is essential to justify sustained investment in prevention and to inform evidence-based policy action.

4.2 Health Consequences

4.2.1 Physical Health Outcomes in Childhood

Children living with obesity face an increased risk of multiple health conditions, including insulin resistance and type 2 diabetes, hypertension and dyslipidemia, respiratory problems, including asthma and sleep apnea, Orthopedic complications affecting posture and mobility, early signs of cardiovascular disease. These conditions, once considered diseases of adulthood, are now increasingly diagnosed in pediatric populations, signaling a shift in the epidemiology of chronic disease.

4.2.2 Long-Term Health Risks and Mental Health and Psychosocial Consequences

Longitudinal studies demonstrate that child obesity strongly predicts adult obesity. Children with obesity are significantly more likely to develop cardiovascular disease, Type 2 diabetes, certain cancers, Chronic musculoskeletal disorders, reduced life expectancy. Early onset of obesity results in longer cumulative exposure to metabolic risk factors, increasing disease severity and complexity in adulthood. Child obesity is also associated with higher rates of low self-esteem and poor body image, anxiety and depressive symptoms, and emotional distress and social withdrawal. The relationship

between obesity and mental health is bidirectional: psychological distress may contribute to unhealthy behaviors, while obesity-related stigma exacerbates mental health problems.

4.2.3 Stigma, Bullying, and Discrimination

Children living with obesity frequently experience also, weight-based bullying in schools, social exclusion and peer rejection and negative attitudes from adults, including educators and healthcare providers. Weight stigma can have lasting effects on self-confidence, academic engagement, and trust in health services, undermining prevention and treatment efforts.

4.4 Social and Educational Consequences

4.4.1 Educational Outcomes

Evidence suggests that child obesity may negatively affect:

Fig 6: Educational outcomes

These effects may be mediated by health problems, psychosocial distress, and stigma, contributing to reduced educational attainment over time.

4.4.2 Social Inequalities and Intergenerational Effects

Child obesity both reflects and reinforces social inequalities. Children growing up in disadvantaged environments face higher exposure to obesogenic conditions, lower access to supportive resources and greater long-term socioeconomic disadvantages. The intergenerational transmission of obesity risk perpetuates cycles of poor health and social exclusion.

4.5 Economic Consequences

4.5.1 Costs to Health Systems

Child obesity contributes to increased healthcare utilization and costs through:

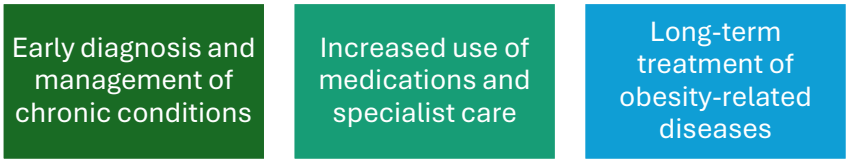

Fig 7: impact to Health system

As obesity-related diseases emerge earlier in life, health systems face escalating financial pressures.

4.5.2 Societal and Productivity Costs

Beyond healthcare expenditures, child obesity imposes substantial indirect costs, including reduced productivity in adulthood, increased absenteeism and disability and premature mortality. These costs represent a significant economic burden for societies and undermine sustainable development.

4.5.3 The Economic Case for Prevention (ROI)

The economic rationale for immediate action is compelling. According to the OECD, the "hidden" costs of obesity stem from reduced productivity, absenteeism, and premature retirement. Current estimates indicate that overweight and obesity reduce Gross Domestic Product (GDP) by 3.3% on average across OECD countries, effectively erasing a significant portion of annual economic growth. In terms of public spending, OECD nations currently allocate approximately 8.4% of their total health budgets solely to treat obesity-related complications. However, prevention offers a high-value opportunity for fiscal recovery. Analysis confirms that for every 1€ invested in cost-effective prevention policies (such as regulatory restrictions on unhealthy food marketing and front-of-pack labeling), governments can expect a return of up to 6€ in economic benefits. This 6-to-1 return is driven by avoided healthcare expenditures and a more productive workforce. Furthermore, achieving a 20% reduction in the calorie content of energy-dense foods

alone could prevent over 1 million cases of chronic disease annually, saving an estimated 13.2 billion USD per year. Investing in child obesity prevention is, therefore, not merely a health expenditure but a high-yield economic strategy that strengthens national fiscal sustainability.

4.6. Impact on Families and Communities

Families of children with obesity may experience, emotional stress and stigma, financial strain related to healthcare and support services, challenges navigating fragmented systems of care. At the community level, high prevalence of child obesity signals broader environmental and social dysfunction, affecting overall population health and well-being.

4.7 Consequences in the Context of Public Health

Recent public health emergencies, including the COVID-19 pandemic, have highlighted the vulnerability of children living with obesity. Disruptions to, school routines, physical activity opportunities and access to healthy foods have exacerbated existing health risks and widened inequalities, reinforcing the urgency of resilient and preventive health systems. The health, social, and economic consequences of child obesity underscore the necessity of early, comprehensive, and sustained prevention strategies. Failure to act will result in increasing burden of chronic disease, escalating healthcare costs, widening social inequalities and reduced quality of life across generations. Investing in child obesity prevention is therefore not only a health imperative, but also a social and economic necessity. These consequences provide a compelling rationale for the prevention strategies and policy actions outlined in the subsequent chapters of this White Book.

Chapter 5: Prevention and Intervention Strategies for Child Obesity

5.1 Introduction

Child obesity is a largely preventable condition, provided that prevention and intervention strategies address the full range of biological, behavioral, social, environmental, and commercial determinants. Evidence clearly demonstrates that isolated or short-term interventions have limited impact. Instead, comprehensive, sustained, and multisectoral approaches are required to create environments that support healthy growth and development throughout childhood and adolescence.

This chapter outlines effective prevention and intervention strategies across the life course and key settings, emphasizing equity, early action, and policy coherence.

5.2 Life-Course Approach to Prevention

5.2.1 Preconception, Pregnancy and Early Life

Interventions during the earliest stages of life offer the greatest potential for long-term impact. Key strategies include promotion of healthy maternal nutrition and weight before and during pregnancy, prevention and management of gestational diabetes, smoking cessation during pregnancy, support for exclusive breastfeeding and guidance on appropriate complementary feeding. Policies that support parental leave, maternal health services, and early-childhood care are critical components of obesity prevention.

International partners are moving toward strict accountability measures to support early-life nutrition. During the Health4EUkids Policy Dialogue, the World Health Organization (WHO) Athens Office on Quality of Care announced a forthcoming initiative with the Ministry of Health to reform hospital evaluations. This initiative aims to introduce specific quality indicators that will penalize hospitals failing to actively promote and support breastfeeding, thereby enforcing “Baby-Friendly” standards through direct administrative consequences rather than voluntary compliance.

5.3 Family- and Individual-Level Interventions

5.3.1 Nutrition Education and Health Literacy

Improving health literacy among parents and caregivers is essential. Effective interventions are to focus on practical skills rather than information alone, to encourage healthy family meals, to address portion sizes and food labeling to be culturally appropriate and accessible.

5.3.2 Behavior Change Support

Family-based, non-stigmatizing interventions that promote balanced diets, regular physical activity, healthy sleep routines and reduced screen time are more effective than child-only approaches.

5.4 School-Based Prevention Strategies

Schools are key settings for equitable prevention, reaching children across socioeconomic backgrounds. Effective actions include nutritional standards for school meals, removal of sugar-sweetened beverages, regulation of vending machines and water availability in schools. Regulation alone is insufficient. Policy dialogues confirm that without strict enforcement mechanisms (audits and penalties), school canteen lists are frequently ignored. Effective policy requires the "policing" of school food environments to ensure compliance. Policies should ensure daily opportunities for physical activity, quality physical education, active breaks during the school day and safe routes to and from school. Health education curricula should promote nutrition and physical activity literacy, address media and digital marketing awareness and encourage critical thinking and empowerment. Health Promotion should transition from ad hoc seminars to a mandatory, standalone subject within the primary school curriculum, ensuring consistent "health literacy" education akin to history or mathematics.

5.5 Community and Municipal Interventions

Communities and local authorities play a pivotal role in shaping children's daily environments. Local actions are particularly effective when developed through community engagement and co-creation. Key interventions include:

Fig 8: Community interventions

5.6. Healthcare System Interventions

Primary healthcare services should routinely monitor child growth, identify early signs of excessive weight gain, provide timely counseling. For children already living with obesity, care should be family-centered, multidisciplinary (pediatricians, dietitians, psychologists), focused on health rather than weight alone and mainly free from stigma and discrimination

5.7. Policy and Regulatory Measures

Structural and regulatory interventions are among the most effective population-level strategies. In Food Policy and Regulation, key measures include restrictions on marketing of unhealthy foods to children, front-of-pack nutrition labeling, fiscal policies (e.g. taxes on sugar-sweetened beverages) and reformulation of food products Also, digital and Media regulation policies should protect children from digital marketing of unhealthy foods, influencer-based promotion, in-app advertising and gaming incentives

5.8 Addressing Health Inequalities

All prevention strategies must explicitly address **equity**

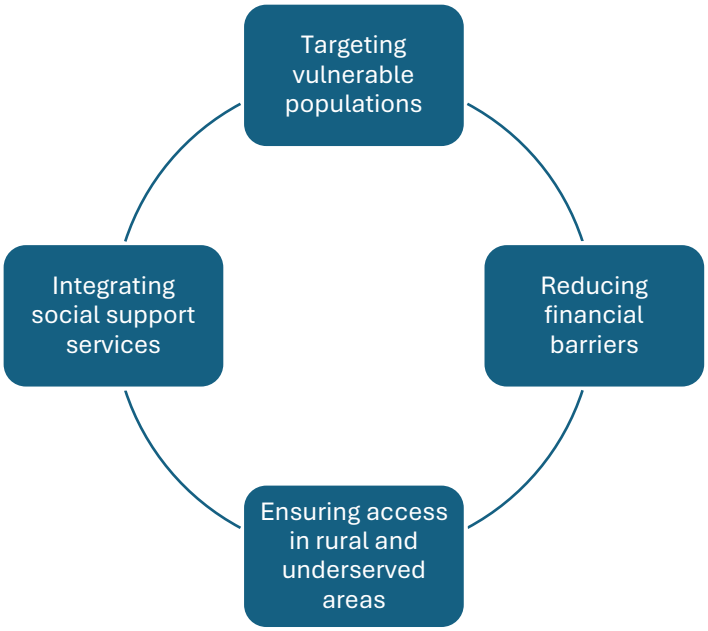

Fig 9: prevention strategies

Failure to incorporate equity risks widening existing health disparities.

5.9 Evidence of Effectiveness and Best Practices

International experience demonstrates that multicomponent interventions are more effective than single actions, long-term commitment is essential, strong governance and accountability improve outcomes, and community involvement enhances sustainability. Successful examples often combine regulation, education, environmental change, and healthcare action.

5.10 Monitoring and Evaluation of Interventions

Effective prevention strategies require clear objectives and indicators, regular monitoring, outcome and process evaluation and adaptation based on evidence. Robust evaluation ensures accountability and continuous improvement.

Chapter 6: Policy Recommendations and Action Plan

6.1 Introduction

The prevention of child obesity requires decisive political leadership, sustained investment, and coordinated action across sectors. Evidence presented in this White Book clearly demonstrates that child obesity is not an inevitable consequence of modern life, but a preventable public health challenge when policies address its structural and systemic determinants.

This chapter proposes a **comprehensive policy framework and action plan** grounded in international best practice, public health evidence, and equity principles. The recommendations adopt a whole-of-government and whole-of-society approach, recognizing that no single sector can effectively address child obesity in isolation.

All policy actions should be guided by the following principles:

Fig 10: Principles of policy actions

6.2 Strategic Policy Recommendations

To combat child obesity these are some recommendations in different levels:

Recommendation 1: Establish National Child Obesity Prevention Strategies

To do that we need to develop or strengthen a **national, integrated child obesity strategy,** to refine clear objectives, targets, timelines, and responsibilities, to ensure alignment with WHO and EU frameworks and to secure sustainable financing.

Recommendation 2: Strengthen Regulatory Measures to Create Health-Promoting Environments

Governments should implement robust regulatory actions, including, restrictions on marketing of unhealthy foods and beverages to children, mandatory front-of-pack nutrition labeling, fiscal policies to discourage sugar-sweetened beverages and ultra-processed foods, and nutritional standards for foods provided in public institutions

Recommendation 3: Transform School and Early-Childhood Settings

Schools and early-childhood facilities should be prioritized as health-promoting environments having universal access to healthy school meals, including daily opportunities for physical activity, applying prohibition of unhealthy food marketing within schools and integrating health literacy into curricula

Recommendation 4: Empower Local Authorities and Communities

Municipalities should be supported to create safe, active, and inclusive public space, to promote active transport, to implement community-based nutrition and physical activity programs and to engage families and civil society organizations

Recommendation 5: Strengthen the Role of the Healthcare System

Healthcare services should integrate routine growth monitoring and early detection, provide family-centred, non-stigmatizing counseling, ensure access to multidisciplinary care for children with obesity, train healthcare professionals in obesity prevention and communication

Recommendation 6: Address Commercial and Digital Determinants

Governments must regulate digital marketing targeting children, monitor industry practices, prevent conflicts of interest in policy development and promote transparency in public-private partnerships

Recommendation 7: Prioritize Equity and Vulnerable Groups

Policies should target low-income and high-risk populations, remove financial and geographic barriers to healthy living, integrate obesity prevention into social protection policies, address cultural and contextual factors

BOX: Policy Dialogue Insights

Academic and regional stakeholders (Health4EUkids scientific coordinators) argued that Greece suffers from excellent legislation but poor enforcement.

- Despite strict legal lists of permitted foods, unhealthy options remain widely available due to a lack of auditing. The consensus was that "theory is over; we need the whip" implying strict enforcement and penalties are now necessary.
- Interventions must be adapted for non-metropolitan areas (e.g., islands, remote regions), where infrastructure and specialized personnel (e.g., midwives, dietitians) are scarce compared to Athens.

The following key insights emerged from the high-level Policy Dialogue held in Athens to mark the conclusion of the Health4EUkids Joint Action in Greece. Stakeholders from the Ministry of Health, academia, WHO, UNICEF, and civil society identified the following critical barriers and opportunities for future policy action:

1. From Legislation to Enforcement

While Greece possesses a robust legislative framework for school nutrition and food safety, a significant gap remains between legal theory and on-the-ground reality. Participants emphasized that "laws are theory, but enforcement is the problem".

- Voluntary measures have largely failed. Strict enforcement ("the whip") is required for school canteens, where banned unhealthy products remain widely available due to a lack of effective auditing.
- Despite years of discussion regarding front-of-pack labeling and marketing restrictions, actual implementation remains slow, often stalled by complex EU-level negotiations or lack of national political will.

2. The First 1,000 Days: A Missed Window of Opportunity

The dialogue highlighted that obesity prevention often starts too late.

- Interventions must target the period of pregnancy, as maternal consumption of high-sugar foods can alter fetal taste preferences via amniotic fluid, predisposing infants to sweet tastes before birth.
- Exclusive breastfeeding rates at six months are alarmingly low (estimated at <1%). This is driven by structural failures, including a lack of "Baby-Friendly" hospitals and insufficient community-based support (e.g., midwives) for mothers after discharge.

A major shift was announced regarding healthcare accountability. The **World Health Organization (WHO)** Athens Office on Quality of Care, in collaboration with the Ministry of Health, committed to introducing strict performance indicators for hospitals.

- Moving beyond voluntary guidelines, the WHO representative stated that hospitals will face penalties in their official quality evaluations if they fail to actively promote and support breastfeeding, effectively enforcing "Baby-Friendly" standards through administrative consequences.

3. Transforming the School Environment

Schools were identified as the primary battleground for prevention, yet current approaches are fragmented.

- Health promotion is currently treated as optional or ad-hoc. It must become a mandatory, standalone subject within the primary curriculum, with dedicated hours comparable to history or mathematics.
- Primary health care professionals (pediatricians, dietitians, midwives) need institutionalized access to schools to provide education and screening, rather than relying solely on overburdened teachers.

4. Cultural and Regional Determinants

Policies must be adapted to the specific cultural and geographic context of Southern Europe.

- In Greece, food is culturally equated with love. Overfeeding by extended family members (e.g., grandparents providing treats) undermines nutritional interventions, requiring family-wide education.
- A "one-size-fits-all" policy is ineffective. Infrastructures available in the capital (Athens) often do not exist in peripheral regions or islands, where access to specialized health professionals and safe recreational spaces is severely limited.

The **Ministry of Health** representative emphasized a fundamental shift in the state's philosophy, moving away from "individual responsibility" toward "social responsibility."

- The current landscape was described as a "golden opportunity" due to unprecedented political will and available funding.
- The Ministry is finalizing a "roadmap" of legislative regulations to institutionalize obesity prevention policies, ensuring they survive changes in political leadership.
- Policies must explicitly address the intersection of obesity with mental health and eating disorders, particularly in the post-COVID era.

5. Governance and Leadership

- The complexity of obesity, involving agriculture, education, and finance, demands leadership beyond the Ministry of Health. Stakeholders called for a high-level inter-ministerial committee, ideally led by the Prime Minister, to ensure binding cooperation across sectors.

UNICEF representatives highlighted that childhood obesity is a violation of the **Convention on the Rights of the Child** (specifically the right to adequate nutrition).

- A critical barrier identified is the "siloed approach" of government ministries. UNICEF noted that prevention programs run solely by the Ministry of Health are "problematic"; effective action requires binding cooperation with the **Ministry of Education** to penetrate schools effectively.
- Drawing parallels to the anti-tobacco movement, UNICEF stressed that state action is insufficient without strong pressure and advocacy from civil society to counter commercial interests.

6.3 Action Plan: From Policy to Practice

Table 6.1 – Indicative Action Plan for Child Obesity Prevention

Policy Area	Key Actions	Responsible Sectors	Timeframe
Governance	National strategy & coordination mechanism	Health, Education, Finance	Short term (6m)
Regulation	Marketing restrictions & labeling	Health, Consumer Protection	Short–Medium (6m-12m)
Schools	Healthy meals & daily physical activity	Education, Local Authorities	Short (6m)

Communities	Active urban design & local programs	Municipalities, Transport	Medium (12-24m)
Healthcare	Screening & multidisciplinary care	Health Services	Short (6m)
Monitoring	Surveillance & evaluation systems	Public Health Institutes	Continuous

To implement effectively requires, an interministerial coordination body, clear mandates and accountability, engagement of scientific advisory committees, and regular reporting and public communication. Stakeholder engagement should include educators, health professionals, parents, youth representatives, and civil society.

6.4 Monitoring, Evaluation and Accountability

An effective child obesity programme should necessarily include monitoring and evaluation part. Governments should define measurable indicators, use harmonized surveillance systems, evaluate policies regularly and publish transparent progress reports. Monitoring should assess not only outcomes, but also **policy implementation fidelity** and equity impacts. Preventing child obesity is a cost-effective investment. Long-term benefits include, reduced healthcare costs, improved educational outcomes, increased productivity, and healthier future generations. Sustainable financing mechanisms must be identified and protected.

6.5 Call to Action

Child obesity threatens the health, well-being, and future prosperity of societies. The evidence is clear, the tools are available, and the cost of inaction is high. Governments, institutions, and communities must act decisively to create environments that enable all children to grow up healthy, active, and empowered.

Preventing child obesity is not only a health priority—it is a moral, social, and economic imperative.

Chapter 7: Monitoring, Surveillance and Indicators

7.1 Introduction

Effective prevention and control of child obesity require robust monitoring and surveillance systems. Without reliable data, it is not possible to assess the magnitude of the problem, identify vulnerable populations, evaluate the effectiveness of interventions, or ensure accountability for policy actions. Monitoring and surveillance are therefore essential components of a comprehensive child obesity strategy and should be integrated into national public health information systems. This chapter outlines the principles, structures, and indicators necessary to support evidence-based decision-making, continuous improvement, and transparency.

7.2 Objectives of Monitoring and Surveillance

The primary objectives of child obesity monitoring systems are to track trends in overweight and obesity prevalence over time, identify disparities across socioeconomic, geographic, and demographic groups, monitor exposure to key risk factors and protective factors, evaluate the impact of policies and interventions, inform policy adjustments and resource allocation and support international reporting and comparability

7.3 Surveillance Systems and Data Sources

7.3.1 Population-Based Surveillance

Population-based surveillance provides standardized and comparable data. Key sources include:

- National child health surveillance systems
- School-based measurement programs
- WHO Childhood Obesity Surveillance Initiative (COSI)
- National health and nutrition surveys

These systems should ensure regular data collection (at least every 2 years), standardized methodologies, and high data quality.

7.3.2 Healthcare-Based Data

Healthcare systems can contribute valuable data through, routine growth monitoring in primary care, electronic health records and preventive health visits. Integration of healthcare data with public health surveillance enhances early detection and targeted intervention.

7.3.3 School and Community Data

Schools and local authorities can support monitoring by collecting information on, physical activity opportunities, school food environments and participation in health promotion programs. Community-level data are essential for assessing environmental determinants and local interventions.

7.4 Key Indicators for Child Obesity Monitoring

Monitoring frameworks should include a balanced set of outcome, process, and impact indicators.

Outcome Indicators	Behavioral and Environmental Indicators	Equity and Social Determinants Indicators	Policy and System Indicators
Prevalence of overweight and obesity by age and sex	Dietary patterns (e.g. sugar-sweetened beverage consumption)	Socioeconomic status	Existence of national child obesity strategies
Mean BMI-for-age z-scores	Physical activity levels	Parental education	Implementation of marketing restrictions

Waist circumference (where available)	Sedentary behavior and screen time	Household income	Coverage of school nutrition standards
Trends over time	Sleep duration	Migration background	Availability of physical education in schools
	School meal quality	Urban–rural differences	Municipal investment in active environments
	Access to recreational spaces		

7.5 Data Quality, Ethics and Governance

Monitoring systems must adhere to high standards of data accuracy and reliability, ethical data collection and informed consent, protection of children's privacy and transparency and public reporting. Clear governance structures should define roles, responsibilities, and data-sharing protocols.

7.6 Use of Data for Policy and Practice

Surveillance data should be actively used to guide national and local policy development, target high-risk populations, adjust and scale effective interventions, support public communication and awareness and fulfil national and international reporting obligations. Data should be presented in **accessible formats**, including dashboards, policy briefs, and infographics.

7.7 International Comparability and Collaboration

Alignment with international standards enables benchmarking across countries, sharing of best practices, contribution to global monitoring efforts. Participation in European and global initiatives strengthens national capacity and policy coherence.

7.8 Challenges and Limitations

Common challenges include inconsistent data collection, limited coverage of vulnerable populations, insufficient integration across sectors, resource constraints and addressing these challenges requires political commitment and sustained investment.

Conclusions and Final Call to Action

Child obesity represents one of the most pressing public health challenges of our time. The evidence presented throughout this White Book demonstrates unequivocally that childhood overweight and obesity are not isolated medical conditions, but the outcome of complex and interrelated biological, social, environmental, and commercial determinants. Their consequences extend across the life course, affecting physical and mental health, educational attainment, social equity, and economic sustainability.

Despite decades of awareness, progress in reversing the child obesity epidemic has been **slow and uneven**. Fragmented policies, insufficient regulation, short-term interventions, and an overemphasis on individual responsibility have limited impact. At the same time, children continue to grow up in environments that systematically promote unhealthy diets, physical inactivity, and sedentary lifestyles. This imbalance between individual capacity and environmental pressure places an unfair burden on children and families.

The findings of this White Book make clear that **child obesity is preventable**. Effective solutions exist and have been successfully implemented in different contexts when political commitment, multisectoral collaboration, and sustained investment are present. Prevention efforts must begin early in life, continue throughout childhood and adolescence, and be embedded within health systems, schools, communities, and policy frameworks that prioritize children's well-being.

A central message of this White Book is that addressing child obesity is a matter of equity and social justice. Children from socioeconomically disadvantaged backgrounds bear a disproportionate burden of risk and harm, reinforcing intergenerational cycles of poor health. Policies that fail to address these inequalities risk widening health gaps and undermining social cohesion. Equity must therefore be a guiding principle in all prevention, intervention, and monitoring efforts.

This White Book calls for a **whole-of-government and whole-of-society response**. Ministries of health, education, finance, transport, urban planning, agriculture, and digital regulation must work in alignment, supported by strong governance mechanisms and accountability structures. Local authorities, schools, healthcare professionals, civil

society organizations, and families all have essential roles to play in shaping healthier environments for children.

Protecting children from harmful commercial influences, particularly in digital and food environments, is a critical policy responsibility. Regulatory measures must be strengthened to ensure that economic interests do not undermine public health objectives. Children's rights to health, adequate nutrition, and safe environments should be explicitly recognized and safeguarded in all relevant policies.

Investment in child obesity prevention is not only a health imperative but also an **economic and societal necessity**. The long-term costs of inaction—rising healthcare expenditures, reduced productivity, and avoidable suffering—far outweigh the resources required for effective prevention. Investing in healthier childhoods yields substantial returns for societies and future generations.

Final Call to Action

This White Book calls upon governments, institutions, and communities to:

Recognize child obesity as a **top public health and policy priority**

Commit to **comprehensive, long-term national strategies** grounded in evidence and equity

Implement **strong regulatory and environmental measures** that support healthy choices

Invest in **early-life, school-based, and community-level prevention**

Strengthen **monitoring, surveillance, and accountability mechanisms**

Protect children from **harmful commercial and digital practices**

Foster **cross-sectoral collaboration and community engagement**

The health and well-being of children reflect the values and priorities of our societies. The choices made today will shape the health trajectories of future generations. **Now is the time to act decisively**, to create environments that enable all children to grow, thrive, and reach their full potential. Preventing child obesity is not only possible, it is a shared responsibility and a moral obligation.

Key messages for policy and practice

- Child obesity is not solely a medical issue but a societal challenge, requiring coordinated action across health, education, urban planning, agriculture, social protection, and digital regulation.
- Early-life interventions, including maternal health, breastfeeding, and early nutrition, are critical in shaping long-term health trajectories.
- Schools play a pivotal role as settings for health promotion, offering opportunities for healthy nutrition, physical activity, and health literacy.
- Community and municipal environments must enable active living, safe play, and equitable access to healthy foods.
- Healthcare systems should prioritize early detection, counseling, and family-centered support, while avoiding stigmatization.
- Strong regulatory policies—such as restrictions on marketing to children, fiscal measures, and front-of-pack labeling—are essential to counteract commercial determinants of obesity.
- Continuous monitoring, surveillance, and evaluation are necessary to assess progress and guide policy adjustments.

The White Book concludes with a clear call to action: tackling child obesity requires political commitment, sustained investment in prevention, and a whole-of-government and whole-of-society approach. Protecting children's health today is an investment in healthier, more resilient societies tomorrow.

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Annex I

Fig 11: Infographic about child obesity

Annex II

Book: Addressing child obesity

The conversation surrounding childhood obesity is at a critical juncture, demanding a fundamental shift in our communication strategy. The current public discourse is often fraught with blame and misinformation, leading to significant stigma that can be deeply confusing and harmful for children. This is powerfully captured in the simple, heartbreaking question from a child who, after a doctor's visit, asks his mother, “Does it mean I'm bad?” This question reveals a profound misunderstanding at the heart of our societal approach. The primary challenge for public health professionals, educators, and families is to reframe this narrative. We must move the conversation away from one of personal failing and insufficient willpower to a compassionate, science-based understanding. This requires equipping stakeholders with the knowledge and language to discuss weight and health in a way that supports, rather than shames, a child. To do this effectively, we must first ground our communication in the complex science that underlies this condition, which the produced illustrated book aims to achieve. Language and perspective have the power to create either a supportive or a damaging environment for a child. How we talk about weight, health, and the body is as important as the health strategies we employ. By adopting a mindful and precise communication toolkit, we can protect a child's self-esteem and foster a positive relationship with their body and their health. The following principles are foundational to this new approach.

The following principles are foundational to this new approach, and are incorporated in the work produced:

Principle	Strategy
Adopt Person-First Language	This is a simple but profound shift. Always say “a child with obesity” or “a child living with obesity” instead of "an obese child." This language intentionally separates the child from the condition, reinforcing that their identity is whole and complete. It sends the clear message that "Weight is just one small part of who you are."
Focus on Health, Not Numbers	Shift the goalposts from a number on a scale to measures of function and well-being. Frame health goals around what the body can do, explaining that the goal is to ensure their "heart, sugar levels, and liver remain strong, so you can run and play for a very long time."
Promote Body Neutrality	Introduce and practice the concept of body neutrality, which involves respecting the body for what it does, not for how it looks. This approach helps children appreciate their bodies for their amazing capabilities. A core tenet of this principle is the message: "The body is an instrument for living life, not an ornament to be looked at."

Addressing Obesity book presentation: