White Paper: The Impact of Metabolic-Associated Steatotic Liver Disease (MASLD) on Public Health in Romania

Summary

Metabolic-Associated Steatotic Liver Disease (MASLD), previously known as Non-Alcoholic Fatty Liver Disease (NAFLD), has emerged as a significant public health challenge globally, and Romania is no exception. The prevalence of MASLD is closely linked to metabolic conditions such as obesity, type 2 diabetes, and cardiovascular disease, all of which have shown a steady rise in Romania over the past two decades. As the country continues to experience these trends, the burden of MASLD on the Romanian healthcare system is becoming increasingly apparent.

Purpose of this White Paper

This white paper explores the current and projected impact of MASLD in Romania, identifies the key drivers of its increasing prevalence, and discusses the implications for the healthcare system and public health policies. It also provides recommendations for policy interventions and preventive strategies to mitigate the growing burden of MASLD.

About SRGH & RoALD

The Romanian Society of Gastroenterology and Hepatology (SRGH) is a professional organization dedicated to advancing the fields of gastroenterology and hepatology in Romania. Its mission focuses on promoting research, education, and the highest standards of clinical practice in the diagnosis, treatment, and management of gastrointestinal and liver diseases.

The Romanian Association for the Study of the Liver (ROALD) is a specialized medical association in Romania focused on advancing the study, understanding, and treatment of liver diseases. ROALD brings together hepatologists, gastroenterologists, researchers, and healthcare professionals committed to improving liver health through research, education, and public health initiatives.

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This two societies have joind efforts with the purpose of raising awareness, on the importance of screening and health education as well as for supporting health policy development for the increasing epidemics of MASLD.

Introduction

Background

Metabolic-Associated Steatotic Liver Disease (MASLD) encompasses a spectrum of liver disorders ranging from simple steatosis (fat accumulation in liver cells) to steatohepatitis (MASH), which can lead to liver fibrosis, cirrhosis, and even hepatocellular carcinoma. MASLD is considered the hepatic manifestation of metabolic syndrome, strongly associated with obesity, insulin resistance, hypertension, and dyslipidemia.

Romania, like many other countries in Eastern Europe, is witnessing a rapid increase in metabolic disorders, with MASLD becoming one of the most common liver conditions in the country. This is a consequence of changing dietary habits, a sedentary lifestyle, and an increase in obesity rates, especially among younger populations.

Objective

This white paper aims to:

1. Examine the prevalence of MASLD in Romania.
2. Analyze the associated risk factors and the impact on public health.
3. Evaluate the economic burden of MASLD on the Romanian healthcare system.
4. Propose public health interventions to address the growing challenge of MASLD.

Prevalence of MASLD in Romania

Current Trends

MASLD is underdiagnosed in Romania, as in many countries, due to its often asymptomatic nature in the early stages. However, recent studies estimate that 23-33% of the European population with higher rates in Western Europe and relatively lower in Eastern countries (Younossi, 2016). In Romania 20% of the population is estimated to be affected by MASLD without having recent and solid investigational date on large population based studies (Radu C, 2008). This translates to aproximately 4 million individuals at various stages of the disease.

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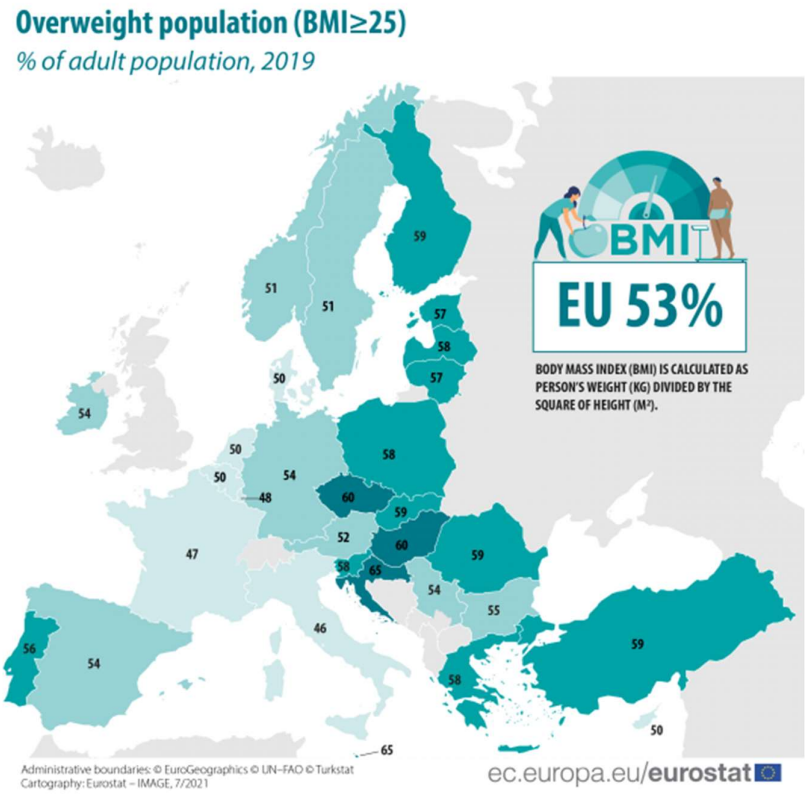
Currently, NAFLD represents the second-leading cause of liver transplantation in the US (21% of liver transplants in 2018) and Europe (8.4% liver transplants in 2016), but the leading aetiology in females (Adam, 2018)

Several factors contribute to the rising prevalence of MASLD in Romania, including:

- Obesity:

The obesity rate in Romania has increased significantly over the past two decades. According to the World Health Organization (WHO), approximately 55% of Romanian adults are overweight, and 23% are obese. Childhood obesity has also surged, leading to earlier onset of metabolic diseases, including MASLD (Quek J, 2023).



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Share of overweight population by sex and age, 2019

(%)

	Males 18 years or over	Females 18 years or over	Total 18 years or over	18 to 24	25 to 34	35 to 44	45 to 64	65 to 74	75 years or over
EU	60.2	45.7	52.7	25.0	39.3	49.7	59.8	65.7	59.3
Belgium	56.2	44.6	50.2	26.2	36.2	49.0	57.3	62.6	52.7
Bulgaria	64.3	46.3	54.9	23.2	37.2	48.8	63.4	70.2	62.6
Czechia	69.8	50.6	60.0	20.9	43.3	57.8	68.7	76.4	67.8
Denmark	57.8	43.3	50.4	26.0	40.0	50.1	59.6	57.6	50.5
Germany	60.7	46.5	53.5	28.2	40.8	52.3	60.0	66.1	57.4
Estonia	61.7	52.3	56.7	26.5	35.9	51.5	67.0	75.7	67.8
Ireland	62.3	46.4	54.4	39.7	52.1	52.9	61.5	59.7	57.5
Greece	66.8	49.1	57.6	23.4	39.7	50.4	66.0	74.7	68.8
Spain	61.7	45.9	53.7	25.1	37.4	49.6	60.4	68.3	66.0
France	52.9	42.0	47.2	22.3	37.8	43.7	53.9	57.2	53.6
Croatia	73.2	58.5	64.8	27.3	45.1	59.8	69.3	78.7	70.0
Italy	55.3	37.1	45.7	18.0	31.2	39.7	49.9	58.8	55.0
Cyprus	59.4	40.8	49.8	23.5	32.7	49.2	61.6	65.7	64.7
Latvia	60.1	56.9	58.3	22.3	38.9	52.4	67.8	73.5	71.7
Lithuania	60.2	53.9	56.8	20.1	40.0	48.2	69.1	74.0	65.5
Luxembourg	58.5	38.4	48.4	24.1	36.5	46.7	56.9	62.5	57.1
Hungary	67.3	53.3	59.9	31.3	43.9	55.4	68.4	76.4	67.3
Malta	71.0	58.0	64.8	38.6	56.6	66.1	73.3	73.7	72.5
Netherlands	55.1	45.1	50.0	25.0	39.4	49.8	57.4	60.2	54.3
Austria	60.6	44.1	52.2	27.2	39.0	48.3	59.9	66.4	58.7
Poland	66.9	50.2	58.1	26.6	43.4	55.3	67.8	73.7	65.4
Portugal	60.9	51.5	55.9	27.6	38.9	52.3	62.9	70.4	63.6
Romania	66.9	50.9	58.7	25.4	42.8	55.4	70.2	72.3	62.3
Slovenia	66.3	49.8	58.1	26.1	42.7	53.3	66.1	72.9	68.8
Slovakia	67.3	50.5	58.7	23.8	42.0	58.0	68.3	77.3	73.0
Finland	62.5	55.8	59.0	30.4	45.9	58.9	65.9	69.1	65.7
Sweden	57.1	45.7	51.3	27.5	39.7	50.3	60.9	60.1	52.4
Norway	57.7	43.3	50.6	28.2	40.8	50.9	61.0	57.6	49.2
Serbia	62.7	45.0	53.6	24.1	42.1	51.8	62.4	65.1	53.8
Turkey	59.8	57.8	58.8	26.9	44.8	65.1	74.3	73.3	59.8

Source: Eurostat (online data code: hlth_ehis_bm1e)

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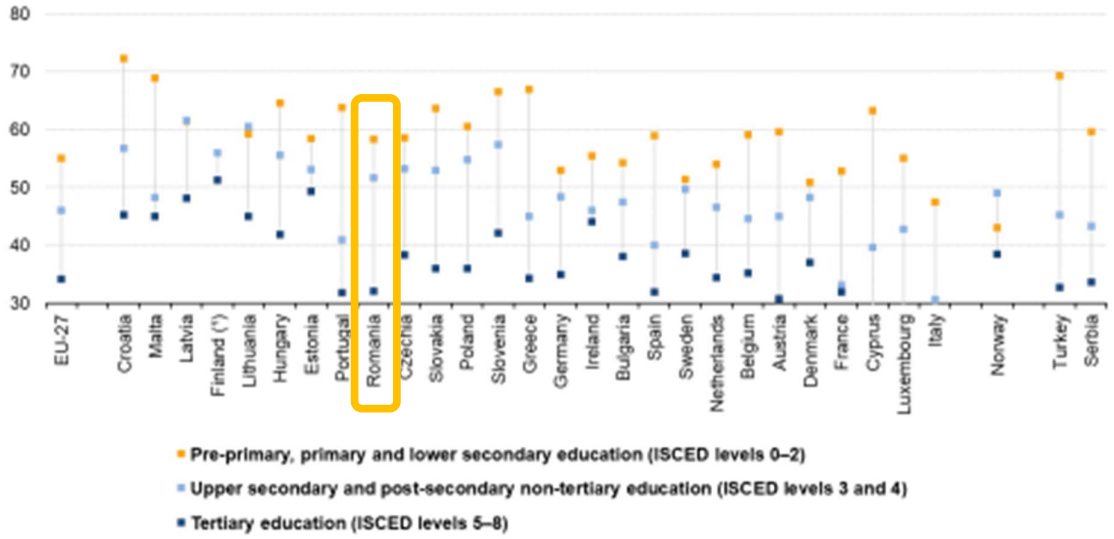
Proportion of women who were overweight, by educational level, 2019
(%)

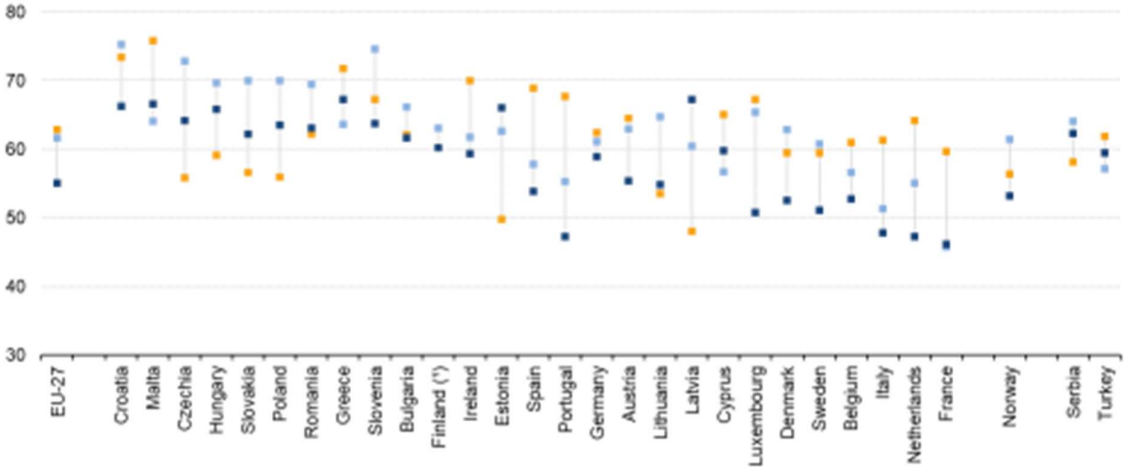


- Pre-primary, primary and lower secondary education (ISCED levels 0–2)
- Upper secondary and post-secondary non-tertiary education (ISCED levels 3 and 4)
- Tertiary education (ISCED levels 5–8)

(:)2019 data not available for ISCED levels 0-2.
Note: population aged 18 and over. Ranked on the overall proportion of women who were overweight
Source: Eurostat (online data code: hlth_ehis_bm1e)

eurostat

Proportion of men who were overweight, by educational level, 2019
(%)



- Pre-primary, primary and lower secondary education (ISCED levels 0–2)
- Upper secondary and post-secondary non-tertiary education (ISCED levels 3 and 4)
- Tertiary education (ISCED levels 5 and 8)

(:) 2019 data not available for ISCED levels 0-2
Note: population aged 18 and over. Ranked on the overall proportion of men who were overweight
Source: Eurostat (online data code: hlth_ehis_bm1e)

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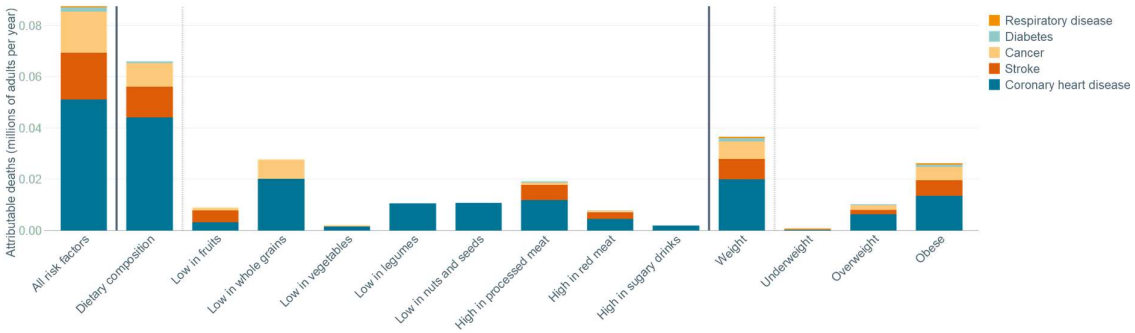
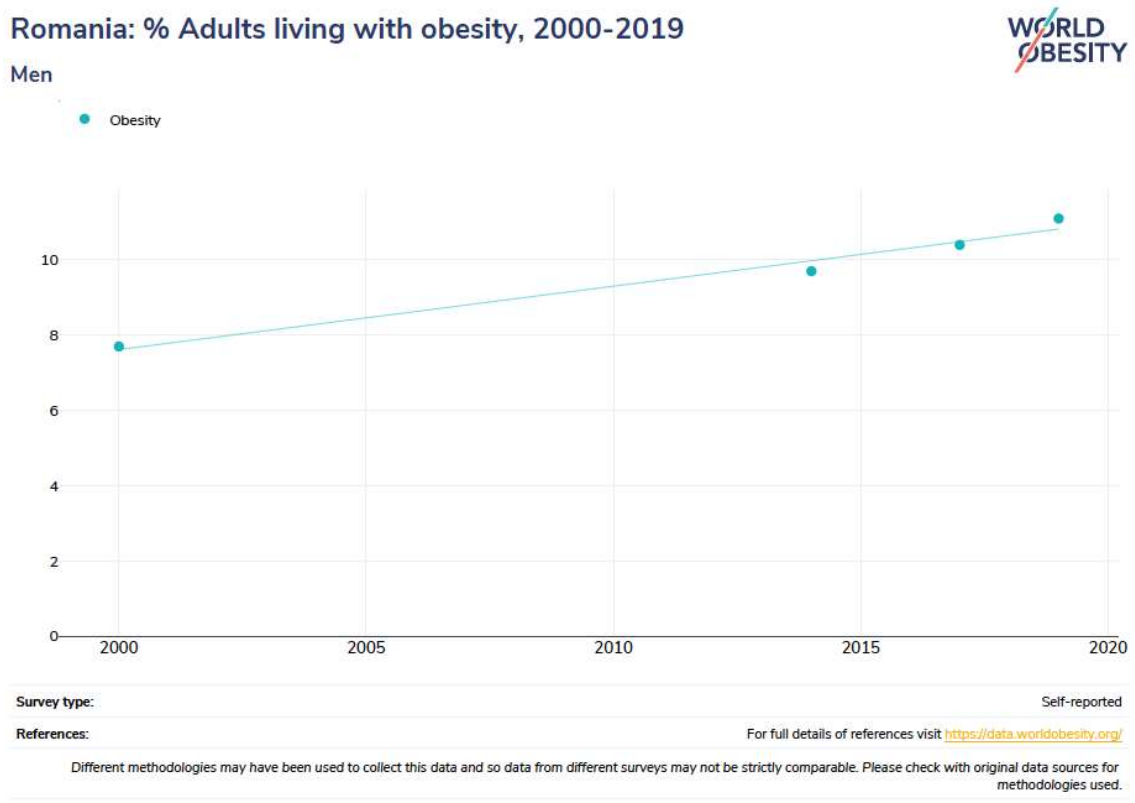


Courtesy of *World Obesity Federation, London, 2024*.



Courtesy of *World Obesity Federation, London, 2024*.

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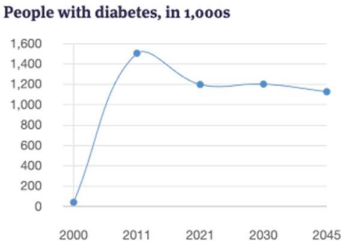
- Diabetes:

The prevalence of type 2 diabetes in Romania is around 12%, and this metabolic disorder is a major risk factor for MASLD development. Insulin resistance, which is common in diabetic patients, exacerbates fat accumulation in the liver (Saeedi, 2019).

Romania

Diabetes report 2000 — 2045

At a glance	2000	2011	2021	2030	2045
Diabetes estimates (20-79 y)					
People with diabetes, in 1,000s	42.5	1,506.3	1,199.0	1,203.3	1,128.5
Age-adjusted comparative prevalence of diabetes, %	-	7.7	6.5	7.1	7.5
People with undiagnosed diabetes, in 1,000s	-	-	255.4	-	-
Proportion of people with undiagnosed diabetes, %	-	-	21.3	-	-



IDF Diabetes Atlas 2021

Sedentary Lifestyle:

Urbanization and modern lifestyle changes have led to a decrease in physical activity levels, with over **60% of Romanians** reporting insufficient physical activity.

Demographic Breakdown

MASLD affects both rural and urban populations in Romania, although urban areas show a slightly higher prevalence due to lifestyle factors like sedentary behavior and dietary patterns. Middle-aged adults (40-60 years) are the most affected, but recent data shows that younger populations are increasingly diagnosed with MASLD due to rising rates of childhood obesity and early metabolic syndrome.
Half a century ago, the European public opinion survey was created to help collect, understand, and track over time what Europeans think about their present and expect for the future.
The Eurobarometer data collected in 2017 showed that more than one in three adults in 28 European countries were physically inactive and this trend was more pronounced in Southern and Eastern Europe compared to Northern and Western Europe

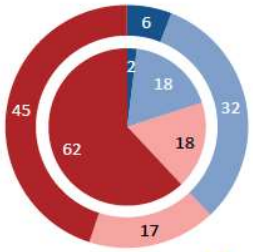
Table 1 Level of physical activity of individuals aged 18–64 across the 28 European countries expressed in percentages, 2017 (n = 19 645)

Countries	N	Low % (95% CI)	Moderate % (95% CI)	High % (95% CI)
EU 28[a]	19 645	36.2 (35.1–37.3)	40.8 (39.7–42)	23 (21.9–24)
Southern Europe				
Croatia	844	42.2 (38.7–45.6)	38.6 (35.2–41.9)	19.3 (16.5–22)
Cyprus	328	55.2 (49.2–61.1)	27.8 (22.5–33.2)	17 (12.4–21.7)
Greece	729	44 (40.1–47.9)	40.2 (36.3–44.1)	15.8 (12.9–18.7)
Italy	830	55.6 (52.1–59.2)	36.4 (32.9–39.9)	8 (6–9.9)
Malta	300	62.8 (56.5–69.1)	27.2 (21.4–33)	10 (5.8–14.3)
Portugal	790	63.7 (60.2–67.2)	25.7 (22.5–28.8)	10.7 (8.3–13)
Slovenia	715	34.5 (30.9–38.2)	42.6 (38.8–46.4)	22.8 (19.5–26.2)
Spain	724	30.2 (26.8–33.7)	49.3 (45.5–53.1)	20.4 (17.4–23.5)
Western Europe				
Austria	819	38.8 (35.3–42.3)	37.5 (34–41)	23.7 (20.6–26.8)
Belgium	746	40.2 (36.4–44.1)	37.2 (33.4–41)	22.6 (19.2–25.9)
France	700	37.8 (34–41.5)	40.6 (36.7–44.4)	21.7 (18.4–25)
Germany	1056	21.1 (18.2–24.1)	41.1 (37.5–44.8)	37.7 (34.1–41.4)
Luxembourg	367	27 (21.8–32.2)	38.1 (32.5–43.8)	34.9 (29.1–40.6)
The Netherlands	647	22.5 (19–26)	46.8 (42.5–51.1)	30.7 (26.8–34.7)
Northern Europe				
Estonia	579	23.7 (19.9–27.5)	41.5 (37.1–45.8)	34.8 (30.6–39.1)
Denmark	581	25.2 (21.4–29)	47.9 (43.4–52.5)	26.8 (22.7–30.9)
Finland	574	26.8 (23–30.6)	45.7 (41.4–50.1)	27.5 (23.6–31.4)
Ireland	776	39.2 (35.6–42.9)	41.3 (37.6–45)	19.5 (16.6–22.4)
Latvia	727	24.6 (21.1–28.1)	41.1 (37.1–45.2)	34.2 (30.4–38.1)
Lithuania	615	35.6 (31.5–39.7)	40.3 (36–44.7)	24 (20.3–27.8)
Sweden	545	19.2 (15.3–23.1)	51.3 (46.2–56.3)	29.6 (24.9–34.2)
UK[a]	896	30.9 (27.4–34.3)	43 (39.2–46.7)	26.2 (22.8–29.5)
Eastern Europe				
Bulgaria	820	42.8 (39.2–46.3)	39.6 (36.1–43.1)	17.6 (14.8–20.4)
Czechia	806	35.9 (32.4–39.5)	43.8 (40.1–47.6)	20.2 (17.1–23.3)
Hungary	746	35.5 (31.8–39.2)	38.2 (34.3–42)	26.3 (22.8–29.9)
Poland	744	46.1 (42.1–50.1)	36.4 (32.4–40.3)	17.5 (14.2–20.8)
Romania	801	46.4 (42.8–50.1)	37.2 (33.7–40.7)	16.3 (13.6–19.1)
Slovakia	840	38.9 (35.3–42.5)	36.4 (32.9–40)	24.7 (21.4–28)

a: This represents the 28 European countries before Brexit.

Nikitara K,. Eur J Public Health. 2021

QB1. Cât de des faceți exerciții fizice sau sport?
(%)



UE27 Cerc exterior RO Cerc interior

	UE27 2022	UE27 Δ 2017	RO 2022	RO Δ 2017
În mod regulat	6	-1	2	-4
Cu oarecare regularitate	32	-1	18	+5
Rareori	17	+3	18	=
Niciodată	45	-1	62	-1
Nu ştiu	0	=	0	=

Evoluție: apr./mai 2022 (EB97.3) - dec. 2017(EB88.4)

Data from the latest Eurobarometer from 2022 looks even more concerning regarding Romania in particular compared to other European countries with a decreasing trend from 2017 results of the same survey (Sjöström, 2006).

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Risk Factors and Public Health Impact

Key Risk Factors

1. Obesity and Overweight: Excess body fat, particularly visceral fat, is one of the strongest predictors of MASLD. Romania's rising obesity rates, especially among children, are a major driver of MASLD prevalence.

2. Metabolic Syndrome: Metabolic syndrome, characterized by a cluster of conditions like hypertension, hyperlipidemia, and insulin resistance, is closely tied to MASLD. Romania’s aging population and the rise in lifestyle-related diseases exacerbate the risk of MASLD.

3. Type 2 Diabetes: With a growing population of diabetics in Romania, the risk of MASLD development increases, as insulin resistance is central to both conditions.

4. Sedentary Lifestyle and Poor Diet: The consumption of high-calorie, low-nutrient foods, along with physical inactivity, has become more prevalent in Romania, especially in urban centers, contributing to the rise in metabolic diseases, including MASLD.

Impact on Public Health

The growing burden of MASLD in Romania poses several public health challenges:

- Increased Morbidity and Mortality: MASLD is a progressive disease that can lead to more severe liver conditions such as cirrhosis, liver failure, and hepatocellular carcinoma. As MASLD progresses to NASH and liver fibrosis, the risk of liver-related mortality increases.

- Cardiovascular Disease: Patients with MASLD are at a higher risk of cardiovascular disease, which remains the leading cause of death in Romania. The coexistence of MASLD with other components of metabolic syndrome accelerates cardiovascular complications, further straining public health resources.

- Economic Burden: MASLD places a significant financial strain on the healthcare system due to increased demand for diagnostics (e.g., liver biopsies, imaging studies), long-term management of metabolic conditions, and the treatment of advanced liver disease. Additionally, indirect costs, such as lost productivity due to illness, contribute to the overall economic impact.

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Economic Burden of MASLD in Romania

Healthcare Costs

The direct costs associated with MASLD stem from diagnosis, monitoring, and treatment of the disease at various stages. As the disease progresses, the need for more advanced interventions, such as liver transplants, becomes critical, further increasing healthcare expenditures.

It is estimated that **up to 15% of healthcare spending in Romania** may be related to metabolic conditions, including MASLD. The cost of managing complications such as cirrhosis and hepatocellular carcinoma is particularly high, with liver transplantation being one of the most expensive interventions.

Productivity Loss

MASLD not only affects individuals' quality of life but also leads to productivity loss due to chronic illness and disability. With a significant proportion of the working-age population affected by MASLD, Romania faces potential economic repercussions from decreased workforce participation and increased absenteeism.

Public Health Response and Policy Recommendations

Current Strategies

The Romanian healthcare system is already strained by non-communicable diseases (NCDs), and the management of MASLD has not yet been fully integrated into national health strategies. While some initiatives targeting obesity and diabetes are in place, MASLD-specific policies remain limited.

CALL TO ACTION

WE propose a range of recommendations across five key areas aiming to optimise:

1. Increase knowlegde
2. Lifestyle style change for prevention
3. Treatment and care
4. Patient envolvment and empowerment

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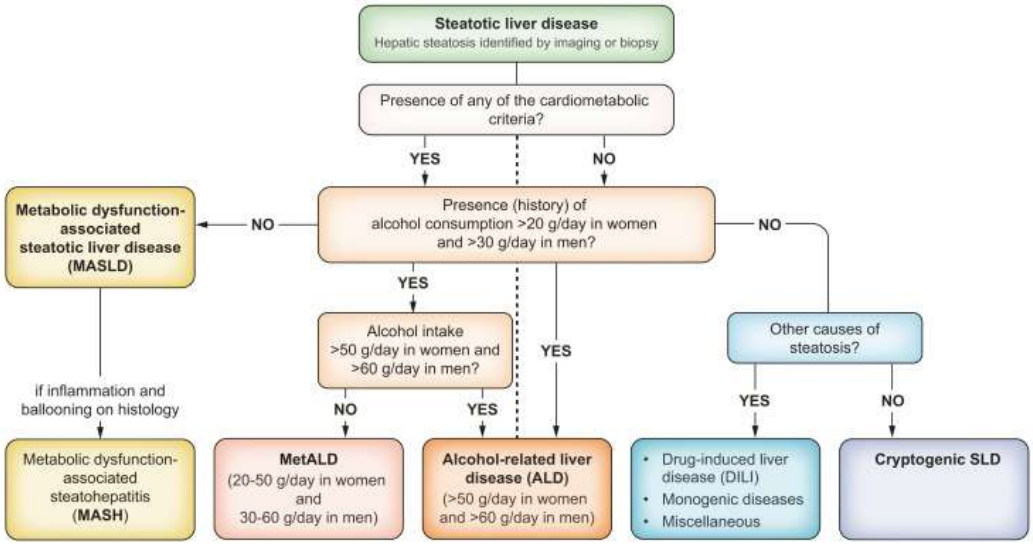
SYNERGIES WITH OTHER EU PLANS AND GUIDELINES

The key reports we reference in this white paper are:

EASL–EASD–EASO Clinical Practice Guidelines on the management of metabolic dysfunction-associated steatotic liver disease (MASLD) (2024)



WHO acceleration plan to stop obesity (2023)

Argentina, Bahrain, Barbados, Botswana, Brazil, Chile, Egypt, Eswatini, Iran (Islamic Republic of), Jordan, Kuwait, Malaysia, Mauritius, Mexico, Panama, Peru, Philippines, Portugal, Qatar, Seychelles, Slovenia, South Africa, Thailand, Tonga, Trinidad and Tobago, Türkiye, United Kingdom of Great Britain and Northern Ireland, and Uruguay.

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Global action plan on physical activity 2018–2030: more active people for a healthier world (WHO 2018)

Ideal Primary Care for Patients at Risk for MASLD

Primary care for individuals at risk of MASLD should focus on early identification, risk stratification, and management to prevent progression to Metabolic Dysfunction-Associated Steatohepatitis (MASH) with a focus on

1. **Referral and Coordination:** Timely referrals to hepatology specialists for patients with evidence of advanced liver fibrosis (e.g., FIB-4 > 2.67) and seamless communication between primary care providers and specialists.
2. **Patient Education:** Engaging patients with relevant counseling about MASLD, focusing on dietary and lifestyle changes that align with their backgrounds and preferences.

Barriers to Ideal MASLD Care

Despite its prevalence, several barriers hinder optimal MASLD care delivery in primary care settings:

1. **Limited Awareness:** Many primary care practitioners (PCPs) are unfamiliar with MASLD diagnostic criteria and the progressive nature of MASH.
2. **Challenges in Risk Stratification:** Insufficient use of tools like FIB-4 or elastography for identifying patients at risk of advanced fibrosis.
3. **Inadequate Coverage for Lifestyle Interventions:** Limited insurance coverage for medical nutrition therapy, behavioral health support, and exercise programs critical for MASLD management.
4. **Health Disparities:** Vulnerable populations often face challenges accessing MASLD care, exacerbating disease progression in underserved groups.
5. **Lack of integrated care centers to match the population needs**

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Strategies to Improve MASLD Care

Roundtable experts outlined strategies to address gaps in MASLD care and optimize primary care delivery:

1. **Education for Clinicians:** Expanding MASLD-specific training for PCPs, emphasizing its links to metabolic dysfunction and advanced liver disease.
2. **Enhanced Decision Support Tools:** Integrating MASLD risk assessment algorithms, such as FIB-4 calculations, into electronic medical records (EMRs) with automated prompts and recommendations.
3. **Broader Insurance Coverage:** Advocating for coverage of nutritional interventions, lifestyle and behavioral counseling to support sustained health changes.
4. **Patient Empowerment:** Providing clear, culturally sensitive education on MASLD risk factors and management to enable patients to advocate for appropriate care.

Emerging Considerations for MASLD

Pharmacologic Developments

With nearly 100 investigational drugs for MASH under development, the anticipated approval of new therapies will likely revolutionize MASLD management. These treatments will necessitate updated guidelines for PCPs, expanded insurance coverage for MASLD-related medications, and greater utilization of noninvasive diagnostic tools.

Role of Advanced Practice Clinicians

As MASLD diagnoses increase, advanced practice clinicians (APCs) such as nurse practitioners and physician assistants will play an essential role in delivering care in integrated, multidisciplinary settings. Their involvement will be critical in addressing workforce shortages and scaling care to meet the rising demand.

Technological Integration

Enhanced use of telehealth and EMR-integrated MASLD screening protocols will improve accessibility and care coordination, particularly for underserved populations.

Integrated Care Approach: A multidisciplinary approach involving hepatologists, endocrinologists, nutritionists, and primary care physicians is essential for the effective management of MASLD. Training healthcare professionals to recognize and manage MASLD is necessary to improve patient outcomes.

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Promotion of Healthy Lifestyles: Public health initiatives aimed at reducing obesity rates and improving dietary habits, particularly among children and adolescents, should be prioritized. Community-based interventions promoting physical activity can help reduce the burden of metabolic diseases.

Research and Data Collection: Developing a national registry for MASLD patients can help track the disease's progression and evaluate the effectiveness of public health interventions. Further research is needed to assess the true prevalence of MASLD and its associated costs in Romania.

Taxation and Regulation of Unhealthy Foods: Starting from January 2024 Romania introduced a sugary beverage tax that has lowered consumption of such beverages with 5% compared with 2023 (less than the expected 10%) but could explore similar policies to reduce the consumption of high-calorie, low-nutrient foods that contributes to metabolic disorders. For now, the EU doesn't have strict rules that would regulate the marketing of unhealthy products to children — it relies on voluntary self-regulation and codes of conduct of the industry. Current proposals include ending the marketing of junk food between 6 a.m. and 11 p.m. on broadcast media; and ending such marketing entirely on digital media, including social media and video-sharing platforms, forbidding the use of influencers to promote junk food.

Conclusion

Metabolic-Associated Steatotic Liver Disease (MASLD) represents a growing public health concern in Romania, driven by rising rates of obesity, diabetes, and other metabolic conditions. The impact of MASLD on morbidity, mortality, and healthcare costs is substantial and will continue to rise unless effective public health strategies are implemented. By prioritizing early detection, promoting lifestyle changes, and integrating MASLD management into national health policies, Romania can mitigate the long-term burden of this disease and improve population health outcomes.

This white paper calls for an urgent, coordinated public health response to address the growing challenge of MASLD in Romania. Implementing preventive measures, raising public awareness, and optimizing healthcare delivery will be key to reducing the impact of this disease on the country's public health system and economy.

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