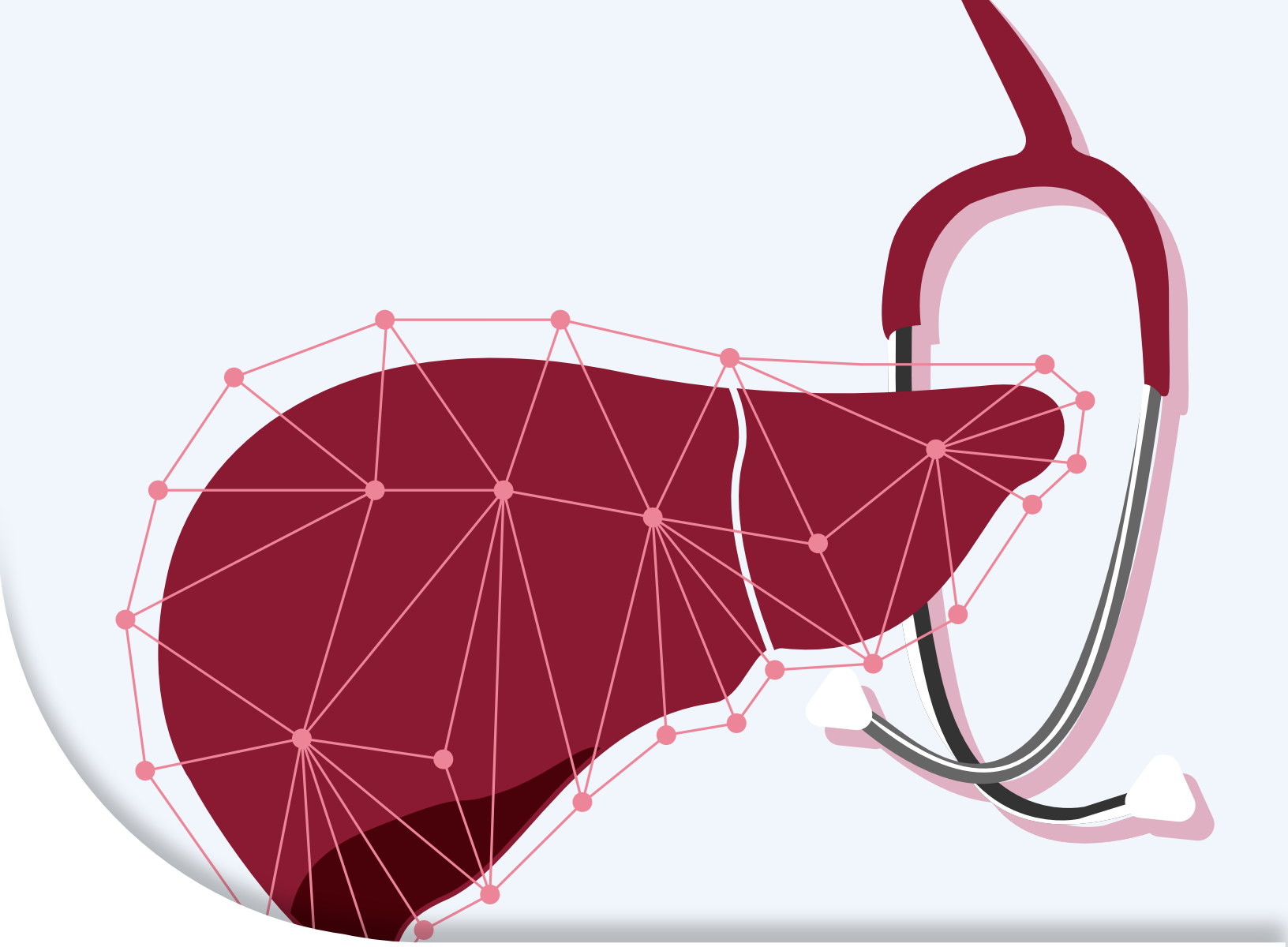

BEST PRACTICES IN LIVER HEALTH POLICY

a **Liver Health is Public Health** Report

Third Edition

GLI GLOBAL LIVER INSTITUTE

LIVER HEALTH IS PUBLIC HEALTH

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INTRODUCTION

In recent years, there have been significant advancements in the understanding and treatment of liver health conditions, including expanded diagnostic options, vaccines and treatments for viral hepatitis, and, most recently, breakthroughs in pharmaceutical interventions for steatotic liver disease (SLD) - formerly known as fatty liver disease. However, access to care and opportunities for liver health improvement remain elusive for many patients globally.

The ramifications of liver disease are substantial; this affects individuals, communities, and economies worldwide. From losses in productivity due to fatty liver disease and the healthcare burden of viral hepatitis to premature loss of life from end-stage liver disease, the toll is significant. Additionally, the links between liver disease and other prevalent health conditions like cardiovascular disease, diabetes, and obesity further complicate treatment outcomes and increase healthcare costs.

Currently, **liver disease accounts for two million deaths annually** and is responsible for 1 out of every 25 deaths worldwide.[1] Steatotic liver disease affects a quarter of the global adult population and is the second-leading cause of end-stage liver disease and liver transplantation in Europe and America.[1] A rise in alcohol consumption, along with an aging population and increased prevalence of metabolic risk factors, is expected to lead to a significant surge in mortality associated with both alcohol-associated and steatotic liver disease.[1] However, growing political involvement and investment in implementing proven healthcare advancements bring much promise.

This report continues to serve as a call to action for the policymakers and health ministers who serve their populations; it provides examples of successfully implemented policies that can be modified and followed in further communities to improve liver health outcomes worldwide.

A review of this report reveals a few common themes:

- Limited public understanding of liver health
- Widespread disparities and underdiagnosis
- And a need for public awareness of the impact of obesity on liver health

The policies presented aim to address these issues. Each edition adds more standout examples of policies from settings with different barriers, resource limitations, and diverse cultural contexts. Please take insight and inspiration from this report to develop policies that will improve the lives of liver patients and their families in your community.

Liver disease is responsible for **1 out of every 25 deaths worldwide.[1]**

CHAPTER **ONE**

Australia Leverages its Primary Care System to Reduce Obesity and Chronic Disease

Executive Summary

Australia is facing a growing public health challenge with the dramatic rise in cases of metabolic dysfunction-associated steatotic liver disease (MASLD), now the most prevalent liver disease globally. The current adult prevalence of 38% represents a ~20% increase over 15 years. This rise parallels trends in overweight and obesity, with rates as high as 66% of adults and 26% of children affected. The burden falls disproportionately on vulnerable populations:

- Aboriginal and First Nations peoples[§] experience rates of approximately 74% in adults and 38% in children
- Rural and remote area residents show rates approaching 68-70%
- Socioeconomically disadvantaged communities face a 68% prevalence

Without intervention, MASLD cases could exceed **7 million by 2030.**

[§]First Nations peoples include Torres Strait Islander people and others.

Without intervention, MASLD cases could exceed 7 million by 2030. With an economic impact already in the billions, policymakers have stepped up their efforts to halt and reverse the upward trajectory in obesity and non-communicable disease (NCDs).

Australia has prioritized reducing obesity by leveraging its strong primary care infrastructure. The **National Obesity Strategy 2022-2032** empowers general practitioners to lead multidisciplinary teams in collaboration to implement **risk-based screening** for MASLD using accessible tools such as waist circumference measurements, FIB4 index testing, and FibroScan® ultrasound. This approach aims to identify high-risk patients early, when liver disease can be reversed, and reserves specialist referrals for patients with progressive disease.

Successful implementation requires overcoming several challenges. However, Australia has shown its firm commitment to improving health outcomes in all Australians through comprehensive, equity-focused primary care.

Background

With rates of 25–30% in adults,[1,2] metabolic dysfunction-associated steatotic liver disease (MASLD) is now the most prevalent liver-associated disease globally, and the Commonwealth of Australia is no exception.

Concurrent with the rise in liver disease, the rates of obesity and type 2 diabetes (T2DM) have risen dramatically in Australia. Overweight/obesity is now the 2nd leading risk factor (after tobacco use) for many chronic conditions, including MASLD. Moreover, as Australia's population of 27.2 million[3] ages, the number of people affected by obesity and its impacts is expected to grow.

Following warnings from the WHO,[4] specialty medical societies,[5,6] liver disease advocacy groups,[7] and others,[8] reducing obesity rates throughout Australia has become a leading public health priority, requiring major efforts from government policymakers, health care professionals, civil society, and the public. Thus, there is strong support for integrating primary care-focused guidelines for SLD screening and management into a comprehensive framework for reducing obesity.[9,10,11]

With its strong primary care infrastructure already in place and an increasing sense of urgency, Australia has begun to apply a **National Obesity Strategy.**

Objectives

- Australia's **National Obesity Strategy 2022–32**[10] aims to decrease the disease burden and diminished quality of life caused by metabolic dysfunction-associated chronic diseases for the 14 million Australians[12] living with overweight or obesity. Additionally, the strategy affirms Australia's commitment to meeting the WHO global target to "halt the rise in overweight and obesity,"[4] and aligning with the WHO Sustainable Development Goal[3, 4,13] to "ensure healthy lives and promote well-being for all" through the prevention and control of chronic diseases.
- Policymakers recognize that delivering a comprehensive roadmap demands substantial government investment and strong cross-sectoral collaboration among stakeholders from government, industry, the community, and individuals.[10,11] In addition, the strategy must be rooted in Australians' values of equity, accessibility, person-centeredness, and cultural-sensitivity.
- While MASLD is not specifically addressed in the national strategy, reducing obesity and T2DM may halt and even reverse the growing prevalence of progressive liver disease (fibrosis, cirrhosis, liver and non-liver cancers). As well as reduce the demand for liver transplantation, and ease the burden on liver specialists to whom patients with abnormal liver tests[§] or concerning imaging findings are currently referred.

The Central Role of Primary Care in the Diagnosis and Management of Chronic Disease

Most patients with MASLD will not experience disease progression to fibrosis, cirrhosis, or primary liver cancer (HCC).[1] With early recognition and accurate diagnosis using widely available tools such as waist circumference measurement, Fibrosis-4(FIB4) index testing, and FibroScan® elastography ultrasound imaging, periodic screening, and evidence-based care, patients can be managed by general practitioner-led multidisciplinary teams focused on mitigating the risk factors for liver fat accumulation. Given that primary care providers are the initial touchpoint into the universal health care system for most Australians, granting them authority over early liver disease management and arming them with the skills needed to identify the patients at risk for disease progression are important objectives. Toward that end, national health departments and government policymakers have prioritized bolstering primary care infrastructure and its capacity to manage NCDs, and MASLD in particular.

[§]Traditionally, abnormal liver enzymes (SGOT, SGPT) were used to detect liver disease that required referral for specialist assessment. However, studies showed that cases of MASLD were missed using this method.[14]

Policy Components and Implementation

Australia's National Obesity Strategy 2022–2032, Enabling Australians to eat well and be active[10] is a "10-year, whole-of-government" framework created from input gathered during the 2022 Australian Health Ministers Meeting. The primary aim was to develop a national strategy for preventing, reducing, and treating overweight and obesity "across the life course" of all Australians. The strategy envisions "an Australia that encourages and enables healthy weight and healthy living for all at all ages."

Policy Highlights

Justification: The high rates of overweight and obesity in Australian adults and children are projected to rise without decisive action. The health-system and lost-productivity costs are estimated at billions of dollars annually, and the burden falls disproportionately on Aboriginal and Torres Strait Islander peoples, communities in rural and remote areas, and socioeconomically disadvantaged groups. Fragmented approaches have hampered prior efforts to find effective solutions that achieve significant, sustainable results. Therefore, the Australian government must implement policies founded on structured evidence and support initiatives that will reverse the upward trend in obesity and its downstream effects.

Objectives: Australia aims to achieve two targets by 2030:

1. A halt and reversal in the upward trend in adult obesity prevalence,
2. And a reduction by 5% or more in overweight and obesity in children and adolescents.

Meeting these objectives will lead to reductions in deaths, hospitalizations, costs, and chronic disease burden. However, it will require broad and sustained behavior change in lifestyle habits surrounding diet and physical activity.

Policy components: The strategy recognizes overweight and obesity as primary drivers for the increasing rates of cardiovascular disease, T2DM, and several cancers; as well as the rise in preventable premature deaths, especially among underserved and socioeconomically disadvantaged groups. It considers the role that built environments, food systems, socioeconomic status, stigma, and cultural differences play in promoting obesity and complicating the implementation of effective treatments with durable results. The framework is structured around advancing healthy environments, supportive systems and services, and individual empowerment and accountability. Its success hinges on 4 guiding principles:

1. Creating equity,
2. Abolishing stigma,
3. Addressing SDOH,
4. And increasing patient involvement in crafting the weight-loss journey, while removing blame. There is an emphasis on primordial, primary, and secondary prevention of obesity, starting just after birth and spanning across the entire life course.

Implementation is guided by 3 enablers: strong leadership, quality evidence and data, and investment for delivery. The process leverages "genuine partnerships" between communities, people with lived experience, and key stakeholders in government, healthcare, and industry. A National Obesity Strategy Working Group provides oversight and ongoing surveillance to enable timely adjustment of ineffective policy measures.

Challenges to Implementation

Implementing Australia's national obesity strategy requires:

- overcoming geography and access challenges
- acknowledging diverse languages and cultural norms
- addressing social determinants
- connecting fragmented and outdated data systems
- navigating complex operational structures that govern primary health care delivery

Geographic distribution of the population: The majority of Australians (~73%) and most of the specialized health care facilities are concentrated in the urban centers along the eastern and southeast coasts.[15] The remaining 25%—including Aboriginal and Torres Strait Islander people—live in rural inner and outer regions, and remote and very remote areas,[16] where access to hospitals and the multidisciplinary teams needed to care for people with chronic liver disease are limited by distance. Health care manpower shortages persist in these areas, and virtual expert consultations must often rely on spotty digital networks.

Population demographics and social determinants of health: Diverse genetic lineages of Australia's population yield unique physiologic characteristics and vulnerabilities that must be considered when developing and delivering care. For example, applying a single set of criteria for defining obesity led to delayed recognition of at-risk groups with lean obesity. Using population-specific BMI and waist circumference measures as screening tools has raised awareness of the high prevalence of metabolic disease and more clearly defined the unmet needs of underserved sectors of Australia's population.

Social and socioeconomic determinants: First Nations people experience a disease burden 2.3 times that of other Australians.[16] Past underinvestment in comprehensive primary health services and metabolic disease detection, prevention, and treatment in socioeconomically disadvantaged communities has widened disparities in resource availability, access to care, and disease outcomes.

Diverse cultures and numerous languages have limited patient-clinician communication among indigenous peoples who speak more than 160 different languages.[16] Addressing differences in health care-related practices and cultural biases around prevention and care requires intensive efforts and investment.

Health system structure and governance: The complex, multi-tiered structure of Australia's health system, combined with fragmented jurisdictional obligations, complicates efforts to deliver a well-coordinated campaign. Alternative data-collection methods may be needed to capture results from people living in the more remote areas. In the absence of a single authority to implement the framework, oversee data collection and quality, and report outcomes, pivoting to the most effective interventions could be delayed or derailed.

Impact

1. Leveraging an established framework such as the National Obesity Strategy provides a “time-tested” mechanism for disseminating a national MASLD guideline, while overcoming logistical barriers to rapid implementation, and correcting the systemic inequities of prior policies.

2. Empowering the primary care workforce with the education, training, and resources needed to integrate routine SLD screening into existing workflows and identify patients at risk for progressive disease for referral to specialty care reduces the load on overworked specialists and decreases the need for costly surgeries, liver transplantation, and cancer treatments.

3. Engaging each patient’s general practitioner to lead a multidisciplinary team, with the patient as an active member, facilitates holistic, patient-centered interactions; encourages patient accountability and compliance; and increases the likelihood of meeting treatment targets, while monitoring the patient journey for roadblocks and adverse events.

4. Addressing the underlying systemic factors that have enabled the rise in obesity and metabolic disease requires examining the built environment; food quality, cost, availability, inactivity, and excessive food and alcohol consumption align with the UN SDG 3.4: to “ensure healthy lives and promote well-being for all at all ages.”[13]

Conclusion

Despite growing awareness of the increasing prevalence of obesity and T2DM and their link to MASLD, implementing a primary care-focused framework for risk-based screening and management of uncomplicated liver steatosis by primary care practitioners, with referral to specialty care for patients with progressive disease, is still a work in progress. Modifiable and non-modifiable challenges to implementation, including the geography and population, complex health system networks, fragmented funding channels, and incompatible data systems, will need to be addressed before a national obesity framework into which an MASLD pathway can be embedded to be fully implemented. Nevertheless, the firm commitment to improving the health of its citizens, along with the bold leadership that Australian policymakers have already demonstrated, clearly indicates they are on the path to success.

CHAPTER **TWO**

From Awareness to Action: Policy Efforts to Reshape Brazilian Diets

Executive Summary

Brazil has taken significant steps to address the public health crisis posed by metabolic dysfunction-associated steatotic liver disease (MASLD) and its related conditions, such as obesity, diabetes, and cardiovascular diseases. With over 60% of adults classified as overweight or obese and millions living with diabetes, the country faces a growing burden of non-communicable diseases.[1, 2] Recognizing the harmful effects of trans fats on liver and cardiovascular health, Brazil has implemented aggressive policies to eliminate these harmful substances from the food supply.

Over 60% of adults classified as overweight or obese and millions living with diabetes

Background

MASLD is a pressing public health issue in Brazil. With over 60% of adults classified as overweight or obese and approximately 12.3 million Brazilians living with diabetes, the country faces a dual burden: hepatic fat accumulation leading to MASLD and its progression into more severe conditions such as liver cancer (hepatocellular carcinoma).

Given that consuming trans fats can lead to increased fat accumulation in the liver, exacerbating MASLD and contributing to liver cancer.[3,4] Brazil's efforts to eliminate trans fats are part of a broader strategy to mitigate these risks. Historically, Brazil has been proactive in addressing dietary health issues, with initiatives dating back to 2003, when trans fat labeling became mandatory. More recently, Brazil has capped trans fats at 2% of total fats in 2021 and banned partially hydrogenated oils by January 2023. These measures not only aim to reduce MASLD prevalence but also curb the broader metabolic disorders linked to obesity and diabetes, setting a proactive example for public health policy in addressing interconnected health challenges.

Objectives

-
- Reduce trans fat consumption: Brazil aims to limit trans fat intake to less than 1% of the total energy value of the diet by eliminating industrially–produced trans fats. This aligns with the WHO's recommendation to reduce trans fat intake to less than 1% of total daily energy intake.[5]
- Improve public awareness on the impact of nutrition: Brazil emphasizes the importance of educating the population about the risks associated with trans fat consumption and the benefits of dietary shifts towards healthier fats. These are priorities of the Brazilian Association of Nutrition (ASBRAN) and the Federal Council of Nutritionists (CFN).[6]
- Enhance food safety regulations: Brazil aims to implement and enforce strict regulations on food manufacturers to ensure compliance with trans fat limits and bans on partially hydrogenated oils. Agência Nacional de Vigilância Sanitária (ANVISA), Brazil's health regulatory agency, plays a crucial role in enforcing these regulations.
- Improve metabolic/cardiovascular health of Brazilians: Brazil's goal of trans fat elimination policies is to improve the metabolic and cardiovascular health of its population by addressing the root causes of NCDs. Trans fats have been linked to increased risks of metabolic disorders like obesity and type 2 diabetes, which are prevalent in Brazil. Additionally, eliminating trans fats improves cholesterol profiles by lowering LDL and increasing HDL, decreasing the risk of heart disease.

Policy Components and Implementation

1. **Regulatory framework:** ANVISA approved regulations in December 2019 to limit trans fats in foods, with a phased implementation plan culminating in a ban on partially hydrogenated oils by January 1, 2023.[7] This regulatory framework is consistent with WHO's REPLACE action package, which includes reviewing dietary sources, promoting healthier fats, legislating regulatory actions, assessing and monitoring trans fat content, creating awareness, and enforcing compliance.[5]

2. **Public awareness campaigns:** Advocacy groups like ASBRAN and CFN have been instrumental in raising awareness about the health risks of trans fats. Their campaigns have included public hearings, media engagement, and social media outreach to mobilize support for policy changes.[6]

3. **Industry compliance:** Food manufacturers have had to reformulate products to meet the new trans fat standards. This has been supported by international organizations like the Global Health Advocacy Incubator, which provided strategic and technical assistance to Brazilian advocates.

Challenges to Implementation

1. **Industry resistance:** Some food manufacturers may resist reformulation due to costs and product shelf-life considerations. The food industry's reliance on cost-effective substitutes has created disparities in product quality, with cheaper items often containing less healthy lipid profiles, complicating efforts to improve overall dietary health.[8]

2. **Bridging from awareness to action:** While Brazil has education initiatives, ensuring widespread understanding of the health risks associated with trans fats remains a challenge. Brazil's nutrition education initiatives, primarily through the National School Feeding Program, integrate food and nutrition education into school curricula. However, knowledge does not translate to action, and it can be difficult to bring people to change their shopping and consumption behavior.

3. **Regulatory enforcement:** Continuous monitoring and enforcement are necessary to ensure compliance with trans fat regulations across the food industry. ANVISA's role is critical in maintaining these standards. One study found that one-third of products containing i-TFA were falsely labeled as trans-fat-free due to loopholes allowing manufacturers to declare "0g trans fat" for servings containing less than 0.1g of TFA.[9]

4. **Substitutes of trans fats:** A primary challenge with product reformulation is the substitution of trans fats with alternative fats, such as palm oil, which often results in higher levels of saturated fatty acids in processed foods. While the removal of partially hydrogenated oils has significantly reduced trans fat content, the benefits of this are dampened by the substitution of palm oil, high in harmful hydrogenated fats, as indicated by the high palmitic acid content of many foods.[8]

Impact

1. **Health benefits:** Reducing trans fat intake is expected to lower the risk of cardiovascular diseases and fatty liver disease. A study using the TFA macrosimulation model estimated that banning partially hydrogenated oils could prevent or postpone approximately 10,500 deaths in Brazil in 2018.[10] Additionally, reducing premature deaths and disabilities can lead to significant economic savings.

2. **Public awareness:** Advocacy campaigns led by ASBRAN and CFN have helped raise awareness, culminating in 97% of public comments supporting ANVISA's trans fat regulations in 2019.[11]

3. **Product reformulation:** Brazil's trans fat regulations prompted significant product reformulation efforts, with 93.4% of products meeting regional targets by 2010, even before the full ban on partially hydrogenated oils (PHOs) in 2023.[12] Food manufacturers replaced trans fats with healthier alternatives (such as palm oil and interesterified fats), reducing trans fat levels by approximately 230 tons annually. These reforms improved the nutritional quality of processed foods.[8]

4. **Economic benefits:** By reducing the burden of cardiovascular diseases and liver diseases, Brazil can also expect economic benefits. The TFA macrosimulation model projected savings of about $166.7 million due to reduced productivity losses.[10] Furthermore, eliminating trans fats aligns with WHO's goals, which can facilitate trade and ensure industry reformulation across countries.

Conclusion

Brazil's efforts to eliminate trans fats demonstrate a proactive approach to addressing metabolic and cardiovascular health issues, including liver disease. By combining regulatory measures with public awareness campaigns, Brazil sets a strong precedent for global health policy initiatives aimed at reducing the burden of NCDs. Despite challenges, the long-term benefits of these policies are expected to significantly improve public health outcomes in Brazil, positioning the policy as a best practice in liver health promotion.

CHAPTER **THREE**

China's Updated Guidelines Could Quash Rising MASLD Rates

Executive Summary

Metabolic dysfunction-associated steatotic liver disease (MASLD) is now the leading cause of liver-related morbidity and mortality in China, having replaced chronic hepatitis B infection. Urbanization, Westernized diets, a burgeoning economy, and a probable ethnic/genetic susceptibility have hiked levels of obesity, insulin resistance, and metabolic disease to near-epidemic levels, powering a nearly 10% rise in steatotic liver disease prevalence to more than 29% in the decade between 1999 and 2018. In 2024, as a response, the Chinese Society of Hepatology updated national guidelines to standardize MASLD definitions, risk-based screening, diagnosis, multidisciplinary management, and follow-up. The guidelines promote early screening with non-invasive tools, intensive management of metabolic risk factors, and clear referral thresholds, while identifying priorities for research and health-system integration. Diet and physical activity recommendations, individualized to the patient, that promote a healthy lifestyle are prioritized. The revisions are intended to support non-specialist clinicians in integrating MASLD into routine care. In 2025, a subsequent guideline intended to operationalize MASLD management at the point of care was widely distributed among primary care practitioners. While it's too soon to assess the impact, broad adoption of this targeted initiative could substantially reduce chronic liver disease and cardiometabolic mortality in China.

Over 60% of adults classified as overweight or obese and millions living with diabetes

Background

Chronic liver disease is not new to China; the drivers, however, have changed. In the past, hepatitis B and excessive alcohol consumption were the leading risk factors. While alcohol consumption patterns have not radically shifted, mass hepatitis B immunization programs (starting at birth) have vastly reduced hepatitis rates. Nevertheless, chronic liver disease rates have continued to rise such that China now leads the Asian nations in liver disease prevalence, incidence, and mortality.[1] As in many developing nations, the upward trend has been powered by increases in MASLD, due to urbanization, Westernization, substantial economic growth, and a probable ethnic/genetic predisposition.[2] Together, these conditions have driven epidemic levels of obesity, insulin resistance, and metabolic diseases, the precursors to MASLD.

In their often-cited systematic review and meta-analysis of more than 200 million people in China, Zhou et al detailed eight salient epidemiological features of the surge in steatotic liver disease[2]:

- In the years from 1999–2018, steatotic liver disease (SLD) prevalence in China increased by nearly 10% to more than 29%
- Disease onset was occurring at an earlier age
- Metabolic diseases were the main predisposing factor, necessitating an updated definition of non-alcoholic fatty liver disease and revised risk-based screening criteria
- MASLD was present at lower BMIs in the Chinese population, suggesting an ethnic/genetic predisposition
- Changes in lifestyle (especially diet and activity levels), the environment, and the economy propelled the rise in metabolic disease
- Due to the limited availability of non-invasive diagnostic tools, large sectors of the population remained undiagnosed and untreated
- Safe, effective, and affordable treatments for MASLD and liver fibrosis were inaccessible to much of the affected population
- Limited awareness among the non-specialist medical community, policymakers, and the public of the rising MASLD rates and the urgent need for nationwide MASLD policies was fueling the upward spiral in MASLD

The knowledge gaps and recommendations for future research identified by Zhou et al. contributed important insights into the changing landscape of chronic liver disease.

Given the high disease burden (with 240 million people affected in 2018)[2] and advances in the understanding of MASLD risk factors, diagnosis, and treatment, and to avert an "impending public health crisis,"[3] the Chinese Medical Association's Society of Hepatology convened an expert panel in 2024 to update the guidelines for the prevention and management of MASLD.

Objectives

The expert panel articulated three major aims:

- To standardize the disease definition, screening, diagnosis, management, and follow-up of MASLD, based on the highest quality and most recent information available.
- To assist primary care physicians and other non-specialist clinicians in "making informed decisions"[3] when developing comprehensive, patient-specific MASLD care plans.
- To alert National Health Commission policymakers, the medical community, and the public to the rising prevalence of MASLD and the urgent need to integrate a MASLD framework for screening, diagnosis, and management into the national health agenda.

Policy Components and Implementation

The guidelines promote a multidisciplinary, holistic approach to risk-based screening and integration of MASLD management into existing care pathways. Importantly, the updates offer concrete and practical recommendations for non-invasive screening (e.g., FIB4 and specialized ultrasound imaging) and management that, if implemented at scale, would capture patients early in their disease course, thereby preventing progression to more severe, resource-demanding disease. Thresholds for referral to specialty care will ease unnecessary specialist consultations.

Highlights of the 2024 guideline updates

Updates were introduced in six major categories:[3]

Disease definition & Pathophysiology

The group adopted MAFLD/MASLD as the umbrella term to include steatosis, steatohepatitis, fibrosis, cirrhosis, and liver cancer, and specified criteria for each classification. They acknowledged that alcoholic liver disease and other causes may coexist. Recent insights into risk factors for disease progression are presented.

Epidemiology

The younger age of onset of MASLD suggests that screening should begin in childhood, when risk-related patterns are often established. Acknowledging differences between European/American and Asian BMI and waist circumference criteria for defining overweight and obesity will capture patients who were overlooked in prior guidelines.

Screening, diagnosis, and multidisciplinary assessment

Patients with obesity, sarcopenic obesity (substantial muscle loss and excessive body fat), T2DM, and metabolic syndrome should be screened for liver steatosis and fibrosis by their primary care providers with non-invasive, easily accessible tests (e.g., FIB-4 score, liver function blood tests, and ultrasound elastography). Conversely, those with steatosis or fibrosis should receive ongoing multidisciplinary surveillance for metabolic dysfunction-associated conditions and multiple organ system effects. Patients with progressive or more advanced disease merit referral to specialty care.

MASLD should be diagnosed based on the "primary cause of liver disease,"[3] using imaging or histology. Ongoing assessments for metabolic syndrome-related disorders (e.g., T2DM, hyperlipidemia) should be integrated into routine surveillance.

Multidisciplinary management

Lifestyle interventions for at-risk patients and those with early disease include personalized weight-loss, anti-inflammatory diets that avoid muscle wasting, physical activities that preserve muscle strength, and lifestyle-related behavior modification therapy.

Medications feature prominently with strong support for the GLP-1 receptor agonists for weight and T2DM control, and for their anti-inflammatory and multi-organ system benefits.

Bariatric surgery is recommended for patients with fibrosis or MASH who are unable to attain their goals using less invasive, pharmacological therapies.

Follow-up & monitoring of patient progress

Patients should be followed regularly for their liver and metabolic conditions by a multidisciplinary team employing a holistic approach focused on prevention. Blood sampling, imaging, nutrition assessments, psychological evaluations, and standard metabolic disease assessments should be integrated into an individualized health maintenance program.

Future research priorities

How best to integrate MASLD into the existing national chronic disease management system is a top priority. Others include using biosamples to better delineate MASLD features and disease progression; conducting large-scale, longitudinal studies to evaluate management effectiveness in real-world populations, and leveraging emerging technological capabilities (e.g., artificial intelligence) to establish systems and networks for rapid dissemination of research findings and guideline updates.

Available English-language sources describing the implementation of a national MAFLD policy by China's National Health Commission, and integration of MAFLD metrics or targets into **Healthy China 2030**,[4] China's WHO-aligned national strategy for reducing non-communicable diseases, are limited. However, in 2025, a follow-up to the 2024 updates, specifically for primary care clinicians, was published in Chinese in a top-tier journal[5] and widely distributed as national policy. The recommendations have begun to shape clinical standards and care pathways at the local level, and are being used by professional and civil societies to lobby for national screening and management policies.

Challenges to Implementation

The 2024 MASLD guideline revisions strongly align with national public health goals to reduce rates of NCDs as laid out in the Healthy China 2030 plan.[4] These updates, and the succeeding ones, have been broadly endorsed by medical expert societies, but, as of yet, the available published evidence substantiating their formal integration into government-sponsored policy is limited. Nevertheless, limited awareness on the part of policymakers, non-specialist health care providers, and the public of the magnitude of MASLD and its effects persists, as do differences in health care delivery and outcomes between the highly industrialized and more rural provinces.

Impact

China has already witnessed improvements from its efforts to reduce rates of obesity and T2DM. With strong government support and risk-based screening, implementing the updated guideline recommendations as part of China's program to reduce NCDs is likely to have a demonstrable impact on rates of chronic liver and metabolic diseases and premature mortality. Ongoing awareness-raising and lobbying for further nationwide adoption of the guideline standards will help to ensure program success. Targeting points of multidisciplinary care where timely screening and diagnosis of early disease, using accessible and practical tools, can be performed at scale will further advance China's mission to shift health care priorities away from (costly) disease treatment and towards prevention.

Conclusion

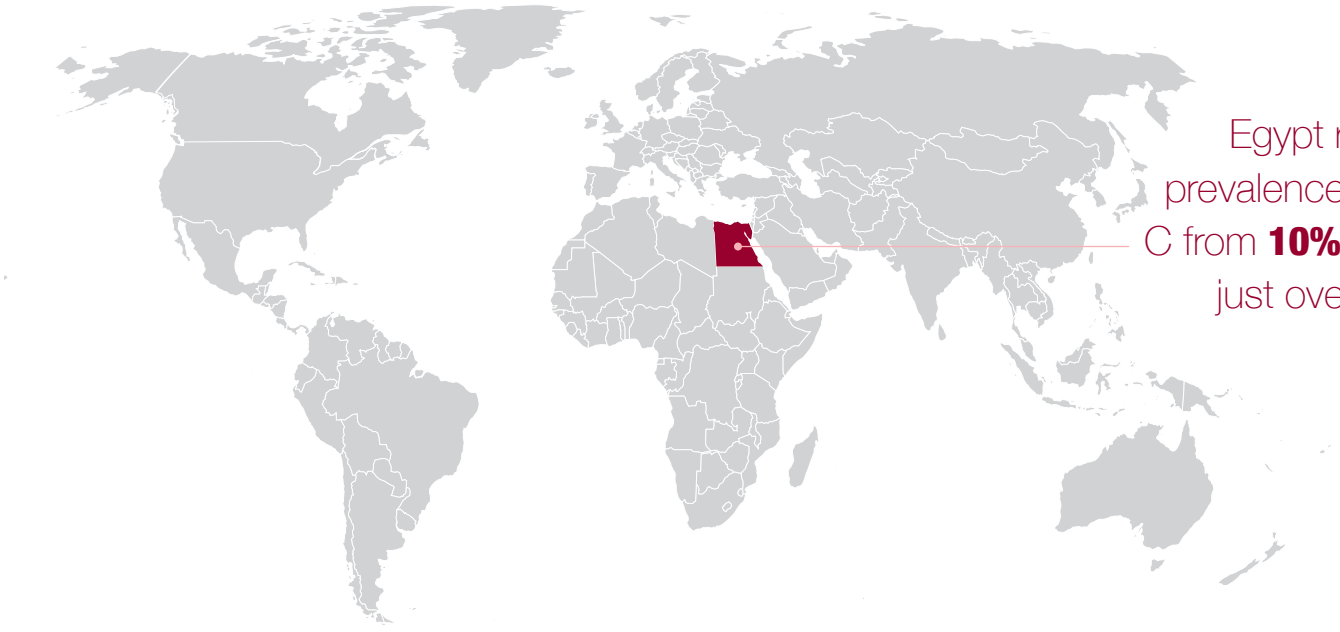
Morbidity and premature mortality rates from NCDs continue to rise in China, despite the government-sponsored policies around healthy lifestyle behaviors outlined in **Healthy China 2030**. As their population ages, the trend will continue unless additional nationwide efforts are undertaken to reverse it. MASLD is now the leading cause of chronic liver disease and an underappreciated driver for the high prevalence of the leading causes of mortality, cardiovascular disease, and stroke. The 2024/2025 updates to the guidelines for the prevention and treatment of MASLD offer an evidence-based, comprehensive, and practical roadmap for general practitioners to integrate MASLD screening and management into their patient care workflow. Current awareness-raising efforts are important, but ongoing government support is needed for equitable guideline implementation at scale. By leveraging the National Health Commission's current focus on healthy lifestyle promotion and NCD prevention, China can make great strides in preventing and managing chronic liver disease.

CHAPTER **FOUR**

100 Million Healthy Lives to Eliminate HCV in Egypt

Executive Summary

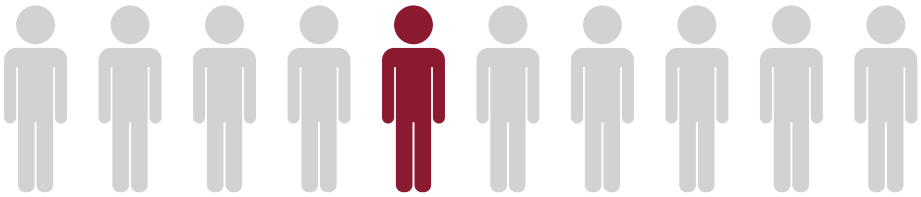
Hepatitis C virus (HCV) infection is a significant public health concern globally because it affects millions of people and poses substantial economic burdens on healthcare systems worldwide. Through unified public health efforts, Egypt has successfully transitioned from having one of the highest rates of hepatitis C in the world to one of the lowest – reducing the prevalence of hepatitis C from 10% to 0.38% in just over a decade.[1] Egypt initiated national control programs starting in 2008, with a significant shift towards elimination strategies by 2018. Egypt has made remarkable strides in combating this disease by implementing a comprehensive strategy that has led to significant reductions in HCV prevalence. Key components include national screening programs, the establishment of treatment centers, negotiation for affordable drug prices, public awareness efforts, community engagement, and international collaborations. Despite challenges such as limited healthcare infrastructure and stigma, Egypt, poised to achieve full elimination targets by 2030, offers valuable lessons globally for HCV elimination efforts.



Egypt reduced the prevalence of hepatitis C from **10% to 0.38%** in just over a decade.

Background

It is crucial to understand the burden of HCV in Egypt to understand the policy solutions deployed. Egypt, a lower-middle-income country with a population of 100 million, had one of the highest burdens of HCV infections globally. In 2008, 15% of the population had antibodies to HCV, indicating they had been exposed to the virus, and 1 in 10 Egyptians aged 15–59 years had chronic HCV infection.[2] Chronic HCV infection can progress to advanced liver disease, including cirrhosis and liver cancer. Vulnerable populations, such as those with limited access to healthcare, are disproportionately affected. Addressing this burden through effective policy interventions was imperative to reduce HCV prevalence, prevent new infections, and alleviate the economic burden on the healthcare system, ultimately improving the health outcomes of the Egyptian population.



1 in 10 Egyptians aged 15–59 years had chronic HCV infection.

Objectives

In 2008, Egypt's National Committee for Control of Viral Hepatitis (NCCVH) established the first Egyptian National Control Strategy for Viral Hepatitis, focusing on prevalence detection, treatment access expansion, and research quality enhancement. The initial objectives of the program were straightforward and ambitious, with the goal of infection control:

- Expand detection through a national screening program.
- Treat 2 million patients annually by 2030 to reduce new infections and prevent deaths.

In 2008, the National Committee for Control of Viral Hepatitis (NCCVH) established the first Egyptian National Control Strategy for Viral Hepatitis, focusing on prevalence detection, treatment access expansion, and research quality enhancement.

Building on earlier initiatives, efforts to combat HCV intensified in 2014.

- The 2014–2018 Plan of Action for the Prevention, Care & Treatment of Viral Hepatitis emphasized prevention, education, and access to care, with the goal of treating 300,000 patients annually.
- Egypt is committed to the WHO's 2030 goal of eliminating viral hepatitis and consulted with the World Bank to model elimination scenarios, ultimately opting for an ambitious approach that would eventually reduce health budgetary burdens.
- In its transition from HCV control to elimination, Egypt seeks to lead by example and become a global model for hepatitis C elimination.[2]

Policy Components and Implementation

1. **Establishment of treatment centers:** The NCCVH, which was established in 2006 by the Ministry of Health in Egypt to help develop strategies for managing HCV in the country, set up specialized treatment centers across the country to provide comprehensive care for HCV patients. These centers provided access throughout the country to deliver treatment, monitor progress, and ensure patient retention.[2]

2. **Development of treatment guidelines:** NCCVH formulated treatment guidelines to standardize care and ensure quality across all healthcare facilities.[2]

3. **Negotiation for affordable drug prices:** The Egyptian government worked with several local and international pharmaceutical and medical device companies to negotiate reduced prices and procure direct-acting antiviral drugs for all residents, which helped make treatment affordable and accessible to the full population.[2]

4. **Mass screening campaigns:** Egypt launched mass screening campaigns, such as the "100 Million Seha" (100 Million Healthy Lives) campaign, to reach a significant portion of the population and identify individuals with HCV infection. These campaigns utilized a combination of media coverage, community engagement, and widespread availability of screening sites to maximize participation.[2]

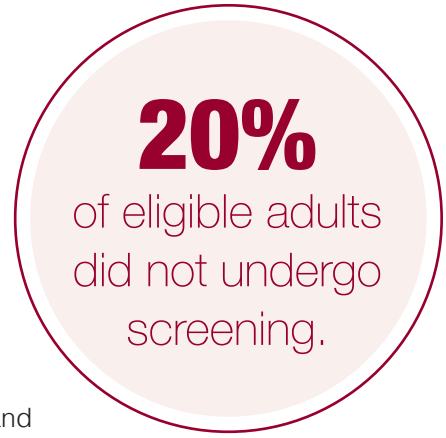
5. **Public awareness and education:** The Ministry of Health and Population conducted extensive public awareness and education campaigns to reduce stigma, increase testing rates, and promote understanding of HCV transmission, prevention, and treatment options. These efforts aimed to empower individuals to seek testing and treatment proactively. The local media also played a role in promoting screening and treatment initiatives to the public.[2]

6. **Monitoring and evaluation:** Efficient monitoring and evaluation mechanisms were established and used to track progress, identify gaps, and inform adjustments. Regular evaluation of implementation activities helped optimize resource allocation and improve program effectiveness, while analysis of the outcomes allowed evaluation of the success of the program.[2]

7. **Community engagement:** Various community engagement strategies were employed to foster trust, promote participation, and address cultural barriers to care. These strategies included engaging community leaders, forming partnerships with local organizations, and tailoring interventions to meet the needs of diverse populations.[2]

8. **International collaborations:** Egypt collaborated with international organizations, including the World Health Organization (WHO) and the Coalition for Global Hepatitis Elimination, to leverage technical expertise, learn best practices, and access resources for program implementation. The World Bank provided $530 million of monetary assistance from the International Bank of Reconstruction and Development.[3] By connecting Egypt to these resources, international partnerships played a crucial role in the country's efforts to combat HCV.[2]

Challenges to Implementation



Egypt faced significant challenges in implementing its HCV programs, including limited healthcare infrastructure, financial constraints, access barriers, stigma, treatment costs, political instability, the transition to a new president in 2014, and the overall complexity of HCV care. International collaborations were a huge contributor to combating these challenges. One of the largest challenges was the low rates of follow-up testing after treatment and the inadequate participation in screening. Approximately 12.5 million Egyptian adults, constituting 20% of eligible adults, did not undergo screening. While the cause of this is unidentified, the absence from screening could be attributed to the fact that around 10 million Egyptians live and work outside the country.[2] Certain aspects of primary prevention could have been inadequately addressed, such as limiting HCV in intravenous drug users as well as sex workers. The NCCVH plans to establish a harm reduction program for drug users, including syringe distribution, as well as the establishment of a national follow-up program to combat these insufficiencies in implementation.[2] Overcoming these barriers required a coordinated effort to ensure comprehensive care delivery and achieve the goal of eliminating HCV as a public health threat in Egypt.

Overall Impact of Policy

- Egypt has successfully transitioned from having one of the highest rates of hepatitis C in the world to one of the lowest – reducing the prevalence of hepatitis C from 10% to 0.38% in just over a decade.[1]
- The "100 Million Seha'' campaign spearheaded by the Ministry of Health and Population has facilitated the testing of over 60 million individuals and the treatment of more than 4 million people.[2]
- The incidence of new infections has drastically reduced from 300 per 100,000 in 2014 to 9 per 100,000 in 2022, bringing Egypt closer to the ultimate goal of HCV elimination.[2]
- Egypt has made significant strides in combating HCV infection. Becoming the first, and so far only, country to attain the "gold tier" status on the path to elimination as per WHO criteria.[3,4] This achievement signifies Egypt's fulfillment of WHO's programmatic coverage targets, which positions the nation to achieve reduced incidence and mortality targets for full elimination before 2030.[2]

Conclusion

Egypt's success in combating HCV stands as a global model. Through a multifaceted approach including national screening programs, affordable treatment access, public awareness campaigns, and international collaborations, Egypt transitioned from a high prevalence country to a leader in elimination efforts for HCV. Enabled by political support and strategic partnerships, Egypt's comprehensive strategies have significantly reduced both incidence and prevalence, showcasing the importance of sustained commitment and collaborative action.

Continued dedication to sustaining these efforts is essential for Egypt to achieve its ultimate goal of HCV elimination by 2030. Encouragingly, the NCCVH plans to sustain HCV-related gains through initiatives such as screening pregnant women for HCV and hepatitis B virus (HBV), screening students in schools, and rescreening and treatment for at-risk individuals who missed or did not attend the initial screening program.[2] Political commitment, adequate funding, and ongoing public engagement are imperative to maintain momentum and further decrease the HCV burden. Egypt's experience provides valuable lessons for other countries facing similar challenges in combatting HCV and advancing toward elimination.

CHAPTER **FIVE**

Nutrition Labels do an About-Face in France with the Nutri-Score

Executive Summary

The French Health Ministry's proactive approach to curbing the rise in obesity, diabetes, and related non-communicable diseases took another step forward in 2025 with the implementation of the updated Nutri-Score front-of-package label, an easy-to-understand, 5-color-coded logo that uses a sophisticated algorithm to grade the overall nutritional quality of pre-packaged foods. Informed by extensive research, the current labelling system has already proven effective in increasing public awareness of the importance of diet quality and in changing purchasing habits when applied consistently. Despite strong industry resistance, the system has been voluntarily adopted by six additional European Union (EU) nations. France is currently working to mandate the Nutri-Score labelling system nationwide; France is using their success to persuade their EU partners to join it in mandating the Nutri-Score system across all pre-packaged food lines.

Despite strong industry resistance, the system has been voluntarily adopted by **six additional European Union (EU) nations.**

Background

It's only fitting that France should focus on diet and nutrition in formulating national policies to curb NCDs, not only because France is home to some of the finest haute cuisine, but because **pre-packaged foods and fast-food franchises** have gained immense popularity there, a trend that has helped to fuel the rise in adult overweight/obesity prevalence to nearly 50%.[1] In fact, there are thousands of fast-food restaurants throughout the major cities in France.[2]

France's health ministry has long recognized excess **ultra-processed food consumption** (currently comprising nearly 1/3 of total calories per day)[3] as a major driver of obesity and metabolic syndrome, and related NCDs, including MASLD.[3] In 2016, France introduced a requirement[4] that authorities recommend a simple and accessible front-of-package nutrition label backed by strong scientific evidence of its effectiveness to complement the existing mandatory back-of-package nutrition table. Upon introducing the front-of-package label, the health minister called it a "valuable tool" for preventing obesity and diabetes, important drivers of cancer and heart disease.[4] Since the policy was voluntary, uptake by industry has been inconsistent, despite increasing evidence of the label's value. However, additional alarm bells sounded when a 2019 study of more than 40,000 adults in France[3] showed that a 10% increase in ultra-processed food consumption was associated with a **14% increase** in all-cause mortality.

As the evidence mounted, the health ministry was compelled to take more decisive action to mandate the labels on all pre-packaged foods sold in France.

Knowing that "a better-informed public will make wiser and healthier lifestyle choices,"[5] the health ministry requested Santé Publique France to update the **Nutri-Score label** and scoring algorithm to quickly and easily convey a health grade on pre-packaged foods, based on the latest dietary guidelines. To overcome growing industry resistance, the system had to be supported by scientific evidence of its effectiveness in directing consumers, regardless of education level or socioeconomic background, to purchase foods lower in sugar, salt, and saturated fats. And for maximal impact, ultra-processed food suppliers had to comply with the labelling across all their product lines.

Objectives

- The government's primary objective was to reduce ultra-processed food consumption by 20% between 2018 and 2021,[3] a milestone not yet reached.
- To reshape the food environment and reflect increasing awareness of the (low) nutritional value of many pre-packaged foods, and to transform that awareness into nationwide policy.
- To shift the nutrition paradigm away from the nutrient content of individual foods and towards whole diet quality.
- To shift public purchasing habits away from unhealthy ultra-processed foods and towards healthier choices.
- To pressure food producers and suppliers to use healthier plant-based, lower-calorie alternatives that contain less sugar and fewer unhealthy fats in **all** their products.

Policy Components and Implementation

Santé Publique France developed **Nutri-Score 5-CNL (NS-5)** as a **color-coded A–E logo** summarizing the overall nutritional quality of pre-packed foods, to complement the back-of-pack mandatory nutrition chart.

To meet the health ministry's requirement for science-driven policy, the label's developers conducted extensive 'user experience' research and validation studies, comparing different versions for ease of comprehension and effectiveness at steering consumers of all ages and socioeconomic backgrounds to healthier choices.[6]

The NS-5 system was implemented in 2017 voluntarily to comply with European Commission single-market requirements,[4] and subsequently revised in 2023 to align more closely with changing dietary guidelines. The revised version was implemented in March 2025, governed by a 7-nation steering committee comprising Belgium, Switzerland, Germany, Spain, the Netherlands, Luxembourg, and France.

The food label on the front of the package consists of five horizontally arranged colored boxes, each with a letter inside (A–E, with A inside a green box being the most favorable rating). The assigned grade stands out so that it is easily understood. The ratings are based on a nutritional score calculated from an algorithm that considers healthy nutrients (e.g., protein, fruits, vegetables, fiber) and nutrients that should be limited (e.g., salt, sugar, saturated fats, calories).

The license to use the label is free, but companies must register. Licensure is currently granted voluntarily, per European Union regulations.

By the end of 2019, an estimated 25% of pre-packed foods had the NS-5 logo,[7] and EU partners had begun to implement the policy.

In 2025, the French National Assembly voted to authorize the government to require NS-5 on most pre-packaged foods sold in France.[8] Health Ministry efforts are currently focused on transitioning to mandatory Nutri-Score labelling. They offer several reasons:

- **More than 100 studies** across Europe have confirmed that NS-5 is easily and quickly interpreted, and effective at changing behavior around purchasing and consuming healthier foods in recommended (smaller) quantities in experimental and real-life settings.[6]
- **Few interventions** aimed at tackling the growing prevalence of NCDs have as broad an evidence base confirming their effectiveness as the NS-5; French lawmakers are eager to leverage the tool in their armamentarium against cardiometabolic disease. If the legislation to mandate the label on most pre-packaged goods passes, France will be the first and only European nation to have done so.[8]
- **Prior studies have shown** that social determinants influence the proportion of ultra-processed foods in people's diets.9 Voluntary compliance with front-of-package labelling risks sustaining inequities in access since less-healthy, less costly products lacking the NS-5 label could still be stocked in economically disadvantaged neighborhoods.

Challenges to Implementation

EU Regulation Constraints: France cannot unilaterally mandate a nationwide front-of-package labelling without the policy being approved by all EU members. Early adoption by industry was understandably limited, given that voluntary commitment required the NS-5 to be applied across all products, not just "healthier-looking" items.[11]

Resistance from industry: From 2014 to 2017, major food and retail companies mounted intense lobbying campaigns against NS-5, offering their own label alternatives, and advocating for a large, real-world comparison study in supermarkets. Although the NS-5 system prevailed, the trial proved costly in both time and money. Still, since the adoption of the new label was voluntary, some large international companies resisted adopting the Nutri-Score, instead choosing alternatives in use in other EU countries.[10]

Impact

Studies have shown that diets rich in foods with a high dietary index (i.e., nutritionally unhealthy) are associated with the development of chronic disease. Proponents of the new labelling system, therefore, expect to see rates of obesity, diabetes, cancers, heart disease, and MASLD fall in areas with robust industry uptake and consumer compliance.

At present, Santé Publique, the agency responsible for advancing and monitoring the policy, reports that more than 90% of adults are aware of the NS-5 label, and 94% support the change, whereas 89% support making it mandatory. In addition, more than half of the consumers surveyed reported changing at least one of their purchases as a result of the label information.[11]

But for maximal impact, and to avoid inequities in access to healthier food options in lower-income communities, the new labelling system must be mandatory for all suppliers of pre-packaged foods. They will then be pressured to either reformulate their products with healthier alternatives or cease operations in France.

Conclusion

France's continued efforts to implement the Nutri-Score front-of-package labelling system confirm the government's commitment to halting the rise in NCDs using interventions grounded heavily in science. While compliance remains voluntary for now, the broad public approval and persistent stakeholder pressure on packaged food suppliers to add the label across all product lines provide additional momentum for universal EU adoption of the labelling policy, without which nationwide implementation in France cannot be mandated.

Ghana Sours on Sugary Drinks with a New Excise Tax

Executive Summary

Ghana has witnessed a dramatic rise in obesity and related NCDs, including MASLD, as rapid urbanization, "Westernized" dietary changes, and increased consumption of sugar-sweetened beverages have reshaped the food environment. Amidst the backdrop of a fragile economy recovering from a fiscal crisis, the rising health care costs and loss in productivity have become unsustainable. In response, the Ministry of Health and the Ghana Revenue Authority have used a "whole-of-government and society" approach to institute policies targeting prevention and control of NCDs; one of which is a 20% excise duty on sugar-sweetened beverages. While it is still too soon to assess the impact, revenue increases have already been tallied, and similar initiatives in neighboring Sub-Saharan African countries have yielded positive results.

Policies targeting prevention and control of non-communicable diseases; one of which is a **20% excise duty on sugar-sweetened beverages.**

Background

Progressive urbanization has ushered in sweeping lifestyle changes to many Sub-Saharan African nations; the Republic of Ghana is one such example. Although still a largely agriculture-driven (physically demanding) economy, Ghana is emerging as a modern, industrial (more sedentary) one. Cities have seen rural fresh food markets replaced by regional supermarkets and fast-food chains, subsequently increasing the amount and variety of unhealthy choices available to busy office and factory workers. While Ghana has made great strides in halving the number of citizens who experience hunger,[1] "Westernized" dietary habits, such as increased consumption of ultra-processed foods and sugar-sweetened beverages, have become increasingly popular, a trend foreign and domestic food manufacturers have capitalized on.

As a result, Ghana has seen a dramatic rise in NCDs, especially obesity, type 2 diabetes mellitus (T2DM), and their associated conditions.

In fact, **nearly half of women and ~40% of children** meet criteria for overweight/obesity.[2]

One model has predicted that NCDs will become the leading cause of death in Ghana by 2030.[1] Thus, progress has not come to Ghana without substantial cost; the country has witnessed a sharp increase in health care costs, reduced revenues from lost productivity, and a spike in premature mortality, amidst a simmering fiscal crisis, compounded by the COVID-19 pandemic.

But the outlook has been brightening for Ghanaians. As early as 2014, the Ghana Ministry of Health introduced the **National Policy for the Prevention and Control of Chronic Non-Communicable Diseases**. The initiative prioritized "health promotion, early detection, and integrated care," and aimed to strengthen the Ghana Health Service's capacity to handle chronic conditions while addressing key risk factors such as unhealthy diet and inactivity.[3] Following this initiative, the current National NCD Policy and Strategy (2022-2026) was implemented. The framework endorses imposing taxes on unhealthy foods and beverages.[1]

To bolster their efforts at reducing NCD burden, Ghana looked to the WHO for guidance. The evidence was mounting; increasing consumption of sugary beverages was proving to be a major contributor to the rise in obesity and T2DM,[4] both of which are strongly linked to MASLD. Moreover, aggressive marketing of these products was driving their increased popularity. Conversely, southern African nations that had implemented financial disincentives (e.g., South Africa and Uganda) were seeing reduced unhealthy beverage consumption and falling obesity rates.[5]

Thus, to "reduce Ghanaians' exposure to unhealthy diets,"[1] the Ghana Revenue Authority amended the existing Excise Duty Act to include a 20% duty on carbonated beverages, flavored juice drinks, sweetened teas, and energy drinks.[6] The bill went into effect on January 1, 2024.

Objectives

Ghana aimed to achieve three main objectives in introducing the excise duty on beverages:

- To reduce the health burden of NCDs and their skyrocketing costs by reducing the excessive amount of sugar-sweetened beverages that Ghanaians are consuming.
- To promote healthier lifestyles and raise awareness of the diet-related NCDs, especially among lower-income and underserved groups. Reducing sugary beverage intake was incorporated into dietary guidelines that recommended increasing fresh fruit and vegetables while foregoing ultra-processed, high-fat, and high-salt-containing foods.[7]
- To increase revenue for future public health projects in the short term, while reducing NCD-related costs over the long run.

Policy Components and Implementation

Parliament approved the Excise Duty Amendment Bill (Act 1108) on December 20, 2022, amending the Excise Duty of 2014 (Act 878).[6] The amendment raised the taxes levied previously on alcohol and tobacco products, and introduced a 20% duty on sweetened fruit-flavored drinks, carbonated beverages, energy drinks, and teas, to be paid by the consumer at the point of purchase.

Intense implementation efforts are underway, using a whole-of-government and society approach, to increase awareness of and maximize compliance with the new beverage regulations.

The Ghana Revenue Authority is imposing strict measures on manufacturers using a strategy of tight market controls.[8]

- Excise registration and bonding procedures for the beverages are streamlined and tightened to ensure manufacturers comply with the new regulations.
- The agency has strengthened enforcement of tax-stamp rules on the drinks and instituted "periodic crack-down operations."
- They have warned that "strict penalties, including product seizure, fines, and possible prosecution for willful non-compliance" will be enforced.[5]

To aid in the effort, the Ghana Health Service has crafted a dedicated NCD Control Program, enlisting community health nurses to assist with screening, education, and lifestyle counseling in rural and more remote communities.[9]

NCD-focused advocacy groups and civil society organizations are conducting projects to support the enforcement of the sweetened beverage tax.

- The **Institute of Leadership and Development (INSLA)** is bridging gaps between policy and practice by engaging industry stakeholders in enforcement efforts, increasing public awareness of the importance of healthy diet choices in preventing NCDs, and educating industry and the public through press releases and social media campaigns on the health and economic benefits of the tax.[5]

Lastly, the public is pressuring food manufacturers to shift production towards healthier options, such as reducing sugar content or using safe sugar substitutes, by boycotting ultra-processed and highly-sweetened foods.

Challenges to Implementation

Efforts around the excise duty implementation have been hindered somewhat by real-world conditions.

- **Limited public awareness** of the health dangers from overconsumption of sugar-sweetened beverages. Ongoing stakeholder education and training are needed amidst conditions of "data poverty and policy inertia."[1] Less costly, healthier alternatives are not always available, especially in rural and disadvantaged areas where free access to potable drinking water may be limited. Moreover, a 20% excise duty may not provide enough incentive to discourage younger, employed Ghanaians from purchasing less healthy drinks.
- **Resistance and pushback** from food manufacturers and others along the sugar-sweetened beverage supply chain. The Food and Beverage Association of Ghana strongly opposed the duty, insisting it would "collapse businesses"[10] at a time when the economy was still recovering from a fiscal crisis, and demanded it be eliminated. They were subsequently accused by some of placing profits before the health of Ghanaians.
- **Political and economic influences.** The Ghana Revenue Authority's focus on generating revenue muffled the more compelling message around the health benefits of abstaining from sweetened beverages. Furthermore, longstanding ties between government agency officials and industry leaders, along with reports of lapses in enforcement and corruption at various stages of the implementation process,[11] contributed to the policy inertia mentioned above. Additionally, pressure from sectors outside health care led to reallocation of the tax revenue reserved for public health.
- **A disconnect between policymaker expectations and public response.** When surveyed, government stakeholders anticipated the tax would be widely unpopular; however, the public supported the initiative when it was framed as a health-promoting intervention and an attempt at a fairer tax system.[12] The mixed messaging created a communication void that the industry sought to fill with anti-tax marketing messaging.

Impact

Ghana has already observed positive financial impacts of the new beverage excise duty act. According to Ghana Revenue Authority representatives, the revenue generated by the tax doubled in one year.[6] It is still too soon for the full health impact to be appreciated. However, policy supporters anticipate that the decreased demand for unhealthy drinks will create a food environment that makes it easier for Ghanaians to make healthier choices and reduce the prevalence of NCDs.[13] In addition to generating revenue to fund ongoing public health efforts in the short term, when added to existing obesity-management measures, the reduction in NCDs will drive down health care costs, which are major contributors to Ghana's overspending and subsequent debt. Importantly, decreasing the prevalence of obesity and NCDs, using WHO-supported initiatives, further aligns Ghana with the WHO Sustainable Development Goals.

Conclusion

Ghana has experienced sharp increases in the prevalence of obesity and NCDs, including MASLD. Without additional measures to reverse this trend, population health and quality of life for Ghanaians will decline further. The health care costs associated with NCDs are unsustainable for a country recovering from a fiscal crisis. The duty on sugar-sweetened beverages has proven effective in other sub-Saharan nations (e.g., Uganda and South Africa). Public response to the tax has been supportive overall, but challenges remain to be overcome for measurable benefits to be fully realized. However, with strict enforcement and increasing stakeholder support, Ghana is forging a brighter public health and economic future.

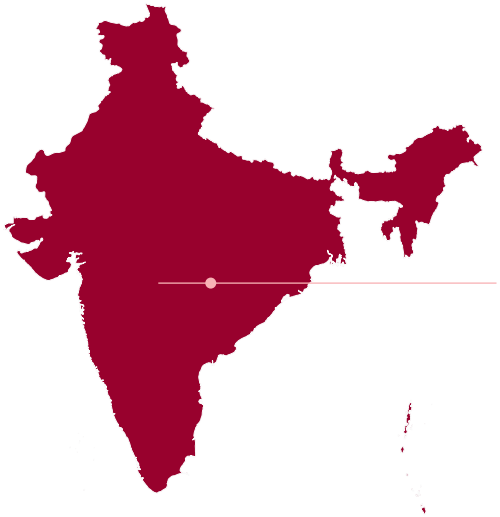
CHAPTER **SEVEN**

Integrating NASH into India's National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke

Executive Summary

In 2021, India spearheaded a national initiative to address NAFLD and nonalcoholic steatohepatitis (NASH), thus recognizing the escalating prevalence and socio-economic implications of these liver diseases. Integrated within the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS) frameworks, this guidance prioritizes early detection to mitigate healthcare costs and foster socioeconomic growth.

Operational guidance spans management principles, monitoring, screening, health promotion, media planning, and capacity building. Implementation efforts include developing national guidelines, training healthcare workers, and establishing centers of excellence. Challenges in securing funding and launching training programs exist; nevertheless, analysts foresee a reduction in NASH prevalence, which would position India as a global leader in addressing NAFLD/NASH.



Implementation efforts include **developing** national guidelines, **training** healthcare workers, and **establishing** centers of excellence.

Background

This initiative, crafted by a coalition of prominent physicians and health policymakers, emerged in response to growing concerns over the rising prevalence of NAFLD/NASH and its consequential social and economic burdens on the nation. Studies suggest the prevalence of NAFLD is around 9% to 32% of the general population in India, with a higher prevalence in those who are overweight or obese and those with diabetes or prediabetes.[1] Researchers have found NAFLD in 40% to 80% of people who have type 2 diabetes and in 30% to 90% of people who are obese.[1] Lean NAFLD, NAFLD in patients who are not obese, is especially prevalent in Indian populations. Cumulative survival has been shown to be significantly shorter for patients with lean NAFLD, while risk of severe liver disease is higher compared to overweight/obese NAFLD.[2] With this heightened risk in mind for the Indian population, efforts to reduce fatty liver disease are of vital importance to the nation.

Researchers have found NAFLD in **40% to 80%** of people who have type 2 diabetes and in **30% to 90%** of people who are obese.

Objectives

As an integral component of the broader NPCDCS initiative, operational guidelines were unveiled to streamline the detection and treatment of NAFLD/NASH, across five categories.[3]

- Establish operational principles for managing NAFLD/NASH at the community, regional, and national levels.
- Implement monitoring and screening protocols.
- Foster health promotion strategies tailored towards NAFLD/NASH.
- Form media plans to raise awareness.
- Enhance capacity building and training programs.

Lean NAFLD is disproportionately high in Indian populations, and it is linked to **higher risk** of severe liver disease and shorter survival.

Policy Components and Implementation

The Ministry of Health and Family Welfare spearheaded the launch of this guidance, which emphasizes the goal of early detection of NAFLD/NASH, with a two-pronged approach of curtailing escalating healthcare costs and mitigating the adverse effects on socio-economic development.[3] The monitoring framework for all non-communicable diseases (NCDs) has been expanded to encompass indicators for NAFLD/NASH. Population-based risk factor screening data can now be analyzed through the NCD data portal. At both the national and state levels, the following initiatives are underway[3]:

1. Development of national guidelines for the diagnosis and treatment of NAFLD/NASH.
2. Creation of a training manual for healthcare workers to disseminate information and educate communities.
3. Establishment of a Centre of Excellence for NAFLD/NASH tasked with overseeing the implementation of actions outlined in the guidelines at the state level.

A planned pathway for the detection, diagnosis, and management of NAFLD/NASH includes[2]:

1. The integration of liver function tests (LFTs) into primary care based on Clinical Biochemistry Analytical Committee recommendations.
2. The utilization of risk stratification tools and transient elastography, an ultrasound-based non-invasive diagnostic technology for advanced or inconclusive results.

Examination of Findings

Evaluation is still underway to assess the effectiveness and impacts of this policy.

Challenges to Implementation

Incorporating NAFLD/NASH into the national health priorities through NPCDCS-enabled funding would cover various activities like health promotion, population-based screening, monitoring and evaluation, and capacity-building efforts. However, since funding explicitly marked for NAFLD/NASH care pathway is not specified, there might be competition for resources with other NCDs. This could hinder implementation. Capacity-building will play a crucial role in facilitating the widespread rollout of management guidance. Training programs have not yet been put into action.

Dedicated funding for NAFLD/NASH and investment in workforce capacity building will are needed to fully deploy this initiative in India.

Impact

- According to analysts at GlobalData, the inclusion of NAFLD into the national prevention program is expected to lead to a decrease in the prevalence of NASH in India.[4]

- This adds to the strength of India's efforts to address chronic disease through lifestyle promotion. Combined with the country's 'Eat Right India' and 'Fit India Movement' initiatives, the government has taken an active role in the shift from diagnostic to preventive care.[1]

- India became the first country to approve an innovative therapy, saroglitazar (Lipaglyn), a dual peroxisome proliferator-activated receptor α/γ agonist for NAFLD in December 2020, following approval for NASH in March 2020.[5]

Conclusion

India's proactive approach to tackling NAFLD/NASH through the integration of operational guidance shows its commitment to addressing significant health challenges. By prioritizing early detection, implementing monitoring and screening protocols, fostering health promotion strategies, and building the capacity of its workforce and infrastructure, India has set a precedent for global action. Despite challenges in funding and launching training programs, the anticipated decrease in NASH prevalence shows the potential effectiveness of India's efforts.

CHAPTER **EIGHT**

Screening Diabetes Patients for NAFLD with Community Pharmacy Data, an Irish Example

Executive Summary

Nonalcoholic fatty liver disease (NAFLD) poses a significant health challenge for the Irish population. Its prevalence closely aligns with that of type 2 diabetes and, to a lesser extent, obesity, with projections indicating it could impact up to a quarter of Ireland's population within the next decade.[3] Dr. Suzanne Norris and collaborators, including Diabetes Ireland and Liver Wellness, spearheaded an initiative to boost liver health by screening for NAFLD and its more severe form, nonalcoholic steatohepatitis, in individuals living with T2DM. Using community pharmacy and transient elastography, an ultrasound-based non-invasive diagnostic technology, the program swiftly identifies high-risk individuals for tailored assessment and treatment. Though facing funding challenges, the initiative promises early detection, cost savings, and better outcomes, which emphasizes the need for ongoing investment in liver health initiatives for Ireland's population.

Nonalcoholic fatty liver disease (NAFLD) poses a significant **health challenge** for the Irish population.

Background

NAFLD is increasingly recognized as a pressing health issue in Ireland, closely tied to rising rates of obesity and T2D. It is estimated that Ireland is set to become Europe's most overweight nation by 2025, 36% of the Irish population aged over 50 is obese with a further 43% overweight.[2] Lifestyle factors like sedentary behaviors and poor dietary habits, compounded by genetic predispositions and socioeconomic factors, contribute significantly to NAFLD susceptibility and severity.

The downstream impacts of NAFLD extend beyond individual health, imposing substantial economic and public health burdens. Direct healthcare costs for diagnosis, management, and treatment, coupled with indirect costs such as productivity loss. Progression to severe stages like NASH, cirrhosis, and liver cancer significantly escalates healthcare expenditures and mortality rates.[5] Addressing NAFLD through targeted interventions, including liver screening initiatives, is crucial to mitigate these downstream impacts and alleviate the growing burden on both individuals and society as a whole in Ireland and globally.

Objectives

- Evaluate the practicality and advantages of screening high-risk individuals for NAFLD/NASH in primary care settings.
- Develop a framework and evidence to establish a national policy.
- Reduce rates of progression to NASH and cirrhosis through early detection and treatment.

Policy Components and Implementation

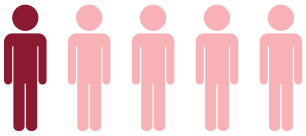
1. Individuals with T2DM are identified through pharmacy prescription records.
2. After identification, target individuals receive invitations to participate in a screening with transient elastography technology at a community-based location.[2]
3. After the screening, assessments are provided on the same day, with personalized recommendations forwarded to the respective primary care physician or consultant for further treatment considerations.[3]
4. High-risk individuals and treatment guidance follow the recommendations outlined in the 2016 practice guidelines from the European Association for the Study of the Liver (EASL).[2,4]

Challenges to Implementation

Community pharmacies represent readily accessible healthcare environments with the potential for scalability; however, without financial and technical resources allocated towards transient elastography technology and the time of general practitioners or consultants for the program review, widespread implementation of the program is nearly impossible.

Impact

1 in 5 individuals screened had advanced fibrosis/ cirrhosis of the liver.



4 in 5 individuals identified through screening had signs of diminished liver function.

Transient elastography technology, usually limited to specialized centers, demonstrated the capability to facilitate risk stratification and enable earlier detection of liver fibrosis when deployed in a community setting.[5] The assessment of fibrosis outside of the hospital environment is anticipated to yield significant cost savings for the broader healthcare system, considering the national economic burden of NAFLD in terms of direct annual medical costs has been estimated at $103 billion in the US, €27.7 billion in three European countries combined (Germany, France, Italy), and £5.24 billion in the UK.[3] Given that early diagnosis of NAFLD is crucial to a patient's liver health[4], this initiative provides patients the opportunity for an early diagnosis, limiting progression and further complications.

Conclusion

Led by Dr. Suzanne Norris (St James's Hospital and Liver Wellness®) and in collaboration with Diabetes Ireland, the initiative to enhance liver health in Ireland through proactive screening for NAFLD/NASH among individuals with T2D represents a critical step towards improving public health outcomes by promoting early screening and diagnosis for a high-risk population.

By leveraging community pharmacy data to identify high-risk patients and using transient elastography for quick screening, this initiative identifies liver fibrosis at earlier stages than usual, allowing for timely interventions and personalized treatment recommendations. Overall, the potential impact of this policy extends beyond the immediate care pathway, with anticipated benefits including improved patient outcomes, reduced healthcare costs, and enhanced health equity. Moving forward, funding and community buy-in will be essential to effectively operationalize this technique to improve liver health by addressing the pressing public health issue of NASH for individuals across Ireland.

How Does Japan Achieve the World's Highest Liver Cancer Survival Rate?

Executive Summary

Japan has achieved notable success in reducing the burden of hepatocellular carcinoma (HCC) through a comprehensive, multi-pronged approach spanning surveillance, viral hepatitis management, public awareness campaigns, and a robust clinical infrastructure. Historically, the country grappled with high rates of liver cancer linked to hepatitis B and C. By the late 20th century, HCC had become a leading cause of cancer-related deaths.

In response, Japan deployed significant public health interventions - beginning in 2008 - that prioritized early detection, accessible treatment, and proactive viral hepatitis control. These strategies have since driven down both incidence and mortality while improving survival outcomes.

In the late 20th century, **liver cancer was a leading cause of cancer-related deaths** in Japan.

Background

Historically, Japan has faced a severe burden of HCC, primarily associated with high rates of hepatitis B and C infections. In the late 20th century, liver cancer was a leading cause of cancer-related deaths in Japan. Over the past 20 years, primary liver cancer, which is largely comprised of hepatocellular carcinoma (HCC) at a rate of 95%, has consistently ranked as the third leading cause of death from malignant neoplasms in men and the fifth leading cause in women.[1] Recognizing the critical need for intervention, Japan implemented a series of public health efforts that have transformed liver health outcomes. Since 2008, the country's approach to liver health has included proactive screening, comprehensive management of viral hepatitis, and a strong emphasis on early detection and treatment of HCC. As a result, the incidence and mortality of HCC have steadily declined, and survival outcomes have improved over the past few decades.

Objectives

The objectives of Japan's organ transplant policies are to:

- Reduce HCC mortality through early detection and surveillance: Japan aims to identify HCC at its earliest stages when treatment is most effective. Surveillance of high-risk individuals with viral hepatitis increases early detection of HCC.
- Decrease HCC incidence by improving management of hepatitis B and C infections: The objective is to significantly reduce the prevalence of chronic hepatitis infections through widespread screening, vaccination for hepatitis B, and antiviral treatments. Japan targets a reduction in hepatitis C prevalence to less than 1% of the population by 2030.[2] Japan has already made significant progress in reducing hepatitis-related mortality.
- Promote public awareness of liver disease risks and prevention: Through public awareness campaigns featuring celebrities, Japan aims to educate the population about liver disease risks, prevention strategies, and the importance of regular screenings.
- Enhance patient outcomes through accessible and high-quality care: Japan aims to ensure that 95% of diagnosed HCC patients have access to appropriate treatment within four weeks of diagnosis and to improve the 5-year survival rate for HCC to over 60% by 2030.[3]

Policy Components and Implementation

1. **Surveillance system:** Regular monitoring using biomarkers, imaging, and patient and physician education ensures early HCC detection. Japan's nationwide surveillance system uses a combination of ultrasonography and three tumor markers (AFP, PIVKA-II, and AFP-L3) at 3–4-month intervals for super-high-risk patients (cirrhosis caused by hepatitis B or hepatitis C virus).[4]
2. **Viral hepatitis management:** Universal hepatitis B vaccination programs and free hepatitis screening at public health centers have reduced chronic infection rates.[5] Additionally, the rapid integration of antiviral therapies for both HBV and HCV into the national health insurance system has ensured that patients receive timely treatment, reducing the progression of liver disease.

Robust Biomarkers for Liver Cancer

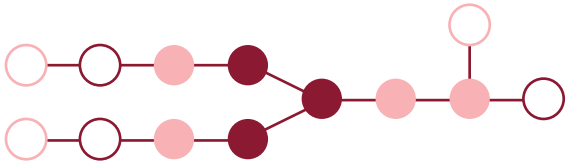
Alpha-Fetoprotein (AFP)

In healthy adults, AFP levels are usually very low. If they become elevated, it can be a warning sign of liver cancer.

MOST DIAGNOSTIC TESTS LOOK FOR AFP. JAPAN USES TWO MORE BIOMARKERS:

Protein Induced by Vitamin K Absence or Antagonist-II (PIVKA-II)

Prothrombin is a protein produced by the liver that helps the body activate certain blood-clotting factors. When liver cancer is present, the liver may produce an abnormal form of prothrombin, called PIVKA-II, which can indicate that liver cancer might be present.



L3 Fraction of Alpha-Fetoprotein (AFP-L3)

AFP can come in different "versions," and one type – called AFP-L3 – is more closely linked to cancerous tumors. When there's a high percentage of AFP-L3, it often points to a more aggressive form of liver cancer.

3. **Public health campaigns:** These efforts have been crucial in increasing early diagnosis rates and improving patient outcomes. The key components of these campaigns include healthcare professional education: The Japan Society of Hepatology has played an important role in educating other medical professionals about the importance of regular HCC screening. Additionally, the Japanese government and healthcare organizations have implemented various public awareness programs informing the public on free hepatitis B and C virus testing at local health centers and medical facilities nationwide. The education program "Shitte kan-en" (in English, "Let's learn about hepatitis") features celebrities (actors and singers) to emphasize the importance of hepatitis testing and early diagnosis.[6] The project aims to reduce the undiagnosed and untreated population by delivering concise, accurate information through multiple channels – including television, social media, and on-site promotional events.

4. **Clinical infrastructure:** Japan has developed a comprehensive network of specialized liver centers that provide high-quality care for patients with liver diseases. These centers offer a wide range of services, from early screening and diagnosis to advanced therapies, including interferon-free therapy, nucleic acid analog therapy, and procedures like laparoscopic liver resection and radiofrequency ablation.[7] The system is structured with regional core centers in every prefecture, supported by specialized institutions and primary care physicians, ensuring patients receive appropriate care at each stage of their disease. Japan's investment in advanced imaging and treatment equipment, coupled with integrated healthcare delivery systems, has allowed for cost-effective, high-quality care that continues to evolve with new evidence. Additionally, electronic medical record alert systems help non-specialist physicians refer patients with positive hepatitis screening results to hepatologists, ensuring continuity of care and reducing mortality rates for hepatitis and liver cancer.

Challenges to Implementation

1. **Financial sustainability:** Maintaining extensive surveillance programs is expensive. Although central government subsidies (e.g., nearly USD 176 million allocated for hepatitis countermeasures in fiscal year 2022) support these initiatives, long-term funding must be secured as technology advances and patient volumes shift.[8]

2. **Patient adherence and behavioral barriers:** Regular, integrated screening requires high patient compliance. Socioeconomic disparities and the burden of frequent testing (including potential wage loss) can impact participation in surveillance programs.

3. **Geographic and demographic disparities:** Rural areas often have less access to high-quality diagnostic facilities and specialized care, leading to potential delays in diagnosis. Additionally, with the oldest population in the world, Japan faces an imminent increase in comorbidities and risk factors for liver cancer within its population.

4. **Changing etiologies of liver cancer:** The growing role of MASLD amid a decline in viral hepatitis poses a significant challenge for Japan's HCC policies. Historically, public health strategies have focused on controlling HBV and HCV infections, but with more patients now developing HCC from metabolic causes (e.g., obesity, diabetes, metabolic syndrome), Japan must adapt screening protocols, prevention efforts, and treatment approaches to address this shifting disease landscape.

Impact

The impact of Japan's policies is evident in both clinical outcomes and health economics.

1. **Improved survival outcomes:** The 5-year overall survival rate for HCC has improved from approximately 5% in 1978-1980 to 58% in 2010-2013.[9] The median survival increased from 4 months to 80 months in the same period. The surveillance system that uses a combination of ultrasonography and three tumor markers at 3-4-month intervals for super-high-risk patients has ensured that over 62% of cases are diagnosed through surveillance at early stages and 6% are diagnosed at advanced stages.

2. **Enhanced diagnostic efficacy:** Japan's comprehensive surveillance program has led to success in early detection of liver cancer. Approximately 62% of liver cancer patients in Japan are diagnosed at stages A and B, which are considered early stages.10 This high rate of early detection is further evidenced by the 24th Nationwide Follow-up Survey of Primary Liver Cancer in Japan, which revealed that 68% of HCC cases are detected as solitary tumors, and 53% of HCCs are identified when lesions are 3cm or smaller in size.[10] Early detection via advanced imaging and biomarker screening is credited with a significant drop in mortality rates.

3. **Economic Benefits:** Early detection and timely intervention reduce the need for more costly treatments like liver transplantation – an approach that not only mitigates economic burdens, as evidenced by a 33% reduction in the cost of illness for liver cancer between 2002 and 2014, but also spares patients the profound life-altering impact of undergoing an organ transplant. Sustained reductions in disease progression further decrease indirect costs, including loss of productivity and long-term healthcare expenditures.

Conclusion

Japan's achievements in tackling HCC underscore the importance of comprehensive policy, early detection, and proactive public health engagement. Predictions suggest that if these strategies continue, liver cancer incidence will continue to decline. Nonetheless, there remains significant potential to enhance treatment protocols and boost the 5-year survival rate. Overall, Japan's model offers valuable lessons for countries aiming to improve liver health outcomes through proactive policy measures. Despite challenges, Japan's model sets a strong standard for countries striving to achieve advancements in liver cancer management.

CHAPTER **TEN**

Mexico's Multifaceted Approach Toward Healthier Nutrition

Executive Summary

Mexico has emerged as a leader in implementing progressive public health nutrition policies to curb obesity and improve metabolic health. Faced with one of the highest obesity rates globally, the country introduced a multifaceted policy approach targeting sugar-sweetened beverage (SSB) consumption and consumer nutrition awareness to mitigate obesity and related diseases like metabolic dysfunction-associated steatotic liver disease (MASLD).

Central to Mexico's strategy are its 2014 nationwide SSB tax and its 2020 front-of-package labeling (FOPL) law, both of which aim to inform consumers and shift industry practices. These efforts are supported by legal backing from the Mexican Supreme Court and complemented by broader initiatives such as school food regulations, a national nutrition strategy, and income-based programs like *Prospera* and *Liconsa* that improve access to healthy foods.

However, Mexico faces ongoing challenges, including high reliance on ultra-processed foods, food industry resistance, and disparities in healthy food access. Continued investment in consumer education, equitable nutrition policy, and targeted public health campaigns will be critical to sustaining momentum and achieving further health gains.

Mexico is faced with **one of the highest obesity rates globally.**

Background

Mexico has faced significant challenges with obesity and related health issues, with adult obesity prevalence reaching 36.1% as of 2018-19. This represents a 42.2% increase in obesity rates over the past 30 years. Combined, overweight and obesity affect roughly 75% of Mexican adults. Today, one of the leading causes of mortality associated with obesity is liver disease (7.6%).[1] MASLD, formerly known as non-alcoholic fatty liver disease (NAFLD), is highly prevalent, and it is estimated to affect roughly 26% of Mexico's population.[2] Obesity greatly increases the risk of MASLD – it affects an estimated 50-75% of obese individuals.[3] Recognizing the critical role of nutrition in health outcomes, Mexico implemented a sugar-sweetened beverage (SSB) tax in 2014, followed by a more comprehensive front-of-package labeling (FOPL) policy in 2020.

Objectives

- The objectives of Mexico's health policy on sugar and ultra-processed food reduction are to:
- Reduce consumption of sugar-sweetened beverages and ultra-processed foods: Efforts aim to lower the intake of SSBs to mitigate obesity and related metabolic disorders.
- Improve public awareness to make informed dietary choices: Mexico introduced new FOPL requirements as a public health tool for consumers when purchasing prepackaged foods and non-alcoholic beverages to reduce public purchase and consumption of "unhealthy" foods.
- Encourage product reformulation: The introduction of the FOPL requirements encourages food manufacturers to reformulate their products to avoid the negative association of the labels, with the end goal of improving the nutritional quality of products available in Mexico.
- Improve metabolic health: Policies aimed at decreasing the prevalence of diabetes, obesity, and related diseases like MASLD by mitigating key metabolic factors.
- Increase consumption of healthy foods in schools: Mexico established guidelines for the sale and distribution of prepared and processed food and drinks in schools to promote healthier eating habits.
- Increase access to food and nutrition education: The implementation of policies such as the National Strategy for Prevention and Control of Overweight, Obesity, and Diabetes, along with initiatives like *Liconsa* and *Oportunidades*, aims to address food insecurity and lack of nutrition education, empowering individuals to make informed dietary choices to improve their health.

Policy Components and Implementation

1. **Sugar-sweetened beverage tax:** Implemented in January 2014, Mexico's nationwide excise tax on sugar-sweetened beverages, set at 1 peso per liter (about a 10% price increase), has been a cornerstone of the country's public health strategy.[1] The tax applies specifically to soft drinks, energy drinks, bottled teas and coffees, and fruit juices/fruit-flavored drinks with added sugars. The tax is levied on manufacturers and not at the point of sale to consumers.
2. **Front-of-package warning labels:** These labels, designed as prominent black octagons, are required on food packaging. The FOPLs on processed food and drink products state whether or not the products have calories, sugars, salt, saturated fat, or trans fat beyond a designated threshold. The label is intended to alert the consumer about unhealthy levels of ingredients and discourage the purchase of foods with excess nutrients that are linked to obesity and other cardiometabolic conditions.

3. **Legal and regulatory support:** Support for these policies has been reinforced by the Mexican government. The Mexican Supreme Court has upheld the constitutionality of these measures, ensuring the government's commitment to public health remains a priority.

4. **Removing unhealthy foods in schools:** Implemented in 2025, Mexico has placed guidelines for the sale and distribution of prepared and processed food and drinks in schools as part of its comprehensive strategy to combat obesity and promote healthier eating habits among children. This initiative aims to reduce the availability of ultra-processed foods and sugar-sweetened beverages in educational institutions, replacing them with more nutritious options.

5. **National strategy for prevention and control of overweight, obesity, and diabetes:** Launched in 2013, this strategy represents a comprehensive, government-led effort to slow the growing rates of overweight, obesity, and related chronic diseases, like type 2 diabetes. Key components include promoting healthier diets, encouraging physical activity, improving access to healthcare, and raising public awareness about the risks of obesity. This strategy works in concert with other policies, such as the SSB tax and front-of-package labeling, to create a supportive environment for healthier choices and ultimately improve the health outcomes of the Mexican population.

6. ***Oportunidades* and *Liconsa*:** Government initiatives aimed at supporting low-income families with health services, food assistance, and nutrition education. *Oportunidades* (now known as *Prospera*) provides conditional cash transfers to families, contingent upon their participation in health services and ensuring their children attend school. This program aims to improve health outcomes and educational attainment, breaking the cycle of poverty. *Liconsa*, on the other hand, focuses on providing subsidized milk to low-income families, ensuring access to affordable and nutritious food.

Challenges to Implementation

1. **High dependence on ultra-processed foods:** Currently, 30% of the total energy intake in the Mexican diet comes from ultra-processed foods.[2,3] Shifting these dietary habits poses a significant hurdle.

2. **Socioeconomic disparities:** Although lower-income groups have shown notable reductions in sugar-sweetened beverage consumption, disparities in access to healthy food persist, complicating efforts to achieve health benefits across the Mexican population.

3. **Industry challenges:** Continuous pressure from food and beverage manufacturers can delay further policies and enforcement efforts. For example, a proposal to lower the sugar tax rate passed in the Mexican Chamber of Deputies but failed in the Senate.[4]

4. **Consumer education:** Sustained public education is needed to ensure that warning labels have long-term behavior change and that consumers understand the risks associated with consuming ultra-processed foods.

Impact

1. **Reduced consumption of SSBs:** Within three years of Mexico implementing a tax on SSBs, adults in Mexico consumed fewer soft drinks. The likelihood of being a non-consumer increased by 4.7%, while medium and high consumption decreased by 6.8% and 6.1%, respectively.[5] These changes were most pronounced among lower socioeconomic groups, whose SSB purchases fell by 9% in early 2014 – the first year of the new policy – and reached a 17% reduction by the end of the year. Concurrently, there was a notable shift toward healthier alternatives, with bottled water purchases rising by 16.2%.[5] Modeling studies predict that over a decade, the tax could lower the average BMI by 0.15 units, reduce obesity prevalence by 2.5%, and potentially prevent 86,000–134,000 new cases of type 2 diabetes by 2030.[5] Additionally, between 2014 and 2015, the tax generated USD 2.6 billion in revenue. A portion of the revenue was used to fund water fountains in schools and public places and to implement obesity prevention programs.[6]

2. **Product reformulation:** The implementation of FOPL has led to meaningful reformulations of products by food companies, including total calories as well as added sugars, saturated fat, sodium, non-caloric sweeteners, and caffeine. Notable changes include a decrease of up to 63.1% in products exceeding warning-label cutoffs for sodium in the bread and other cereals category and up to 26.3% decrease in products exceeding cutoffs for saturated fat in salty snacks.[7] As more balanced and nutritious products become available, this should continue to positively impact consumption and health outcomes.

3. **Changes in consumption:** Early evidence suggests that Mexico's front-of-pack labels are influencing consumer behavior. National surveys indicate that approximately 44.8% of adults and 38.7% of adolescents reported reducing purchases of at least one category of unhealthy foods in response to the labels.[8] As consumers increasingly avoid products with warning labels, industry reformulation efforts are expected to accelerate, further enhancing the impact on public health. The success of Chile's front-of-pack labeling system provides a promising model for Mexico's similar initiative. In Chile, households reduced their purchases of products with warning labels, buying 37% less sugar, 22% less sodium, 16% less saturated fat, and 23% fewer total calories.[9] These significant reductions in calorie and nutrient intake from labeled products in Chile suggest that Mexico may experience comparable trends, as both countries have implemented similar warning label systems. The parallel outcomes in sugary drink purchases and calorie intake observed in Chile offer strong external validation for the potential effectiveness of Mexico's FOPL policy.

4. **Projected health outcomes:** Because the FOPL is relatively new, it is difficult to assess its impact in Mexico. However, simulation models suggest that these interventions could lead to a potentially significant decrease in BMI and obesity prevalence over the long term and reduce obesity-related conditions.

Conclusion

Mexico's multifaceted approach-combining a sugar-sweetened beverage tax, front-of-package labeling, industry reformulation, and supportive legal measures-demonstrates a comprehensive public health strategy to combat obesity and associated liver diseases. While significant challenges remain, particularly regarding dietary reliance on ultra-processed foods and socioeconomic disparities, early impacts indicate meaningful shifts in consumer behavior and potential long-term health benefits. Continued evaluation, public education, and policy refinement will be critical to maintaining momentum and ensuring that these interventions translate into substantial reductions in obesity, MASLD, and other related chronic conditions. Mexico's current efforts demonstrate a cost-effective way of reducing the prevalence of MASLD. However, it will take more time to determine the exact impact of these policies.

Additionally, Mexico continues to tackle obesity through new policies such as reducing unhealthy foods in schools. This government-led initiative is part of the broader strategy to improve nutrition in Mexico, reduce childhood obesity, and foster healthy eating habits from a young age. Mexico's policies will have a lasting positive impact on metabolic health. The national reduction of the consumption of foods contributing to obesity and metabolic syndrome is critical for preventing MASLD.

CHAPTER **ELEVEN**

How Qatar Established Leadership in Liver Disease Research

Executive Summary

Qatar has established itself as a leader in liver disease research and treatment in the WHO Eastern Mediterranean Region (EMRO), despite facing significant public health challenges. Liver disease is the seventh leading cause of death in Qatar, with high rates of metabolic dysfunction-associated steatotic liver disease (MASLD) and viral hepatitis. To address this, Qatar has implemented a comprehensive strategy focused on increasing research output, hepatitis C elimination, universal hepatitis B vaccination, and accessible liver transplantation.

While challenges such as financial constraints, public awareness gaps, and healthcare workforce capacity exist, Qatar has made significant progress. The country has emerged as a research leader, is on track to eliminate hepatitis C by 2030, and offers an equitable liver transplantation program. These efforts highlight Qatar's success in reducing the burden of liver disease.

Qatar leads the region in hepatitis epidemiology research.

Background

Liver disease is a major public health concern in Qatar. It ranks as the seventh leading cause of death nationwide, and the country faces high rates of MASLD and viral hepatitis B and C. High rates of viral hepatitis, prevalent in the EMRO Region, are due to factors such as limited early screening, lack of widespread vaccination, and increased population mobility. Between 1990 and 2017, Qatar saw about a 7.7-fold increase in hepatitis-related cirrhosis cases, highlighting the urgency for intervention.[1]

Despite these challenges, Qatar has made strides in addressing liver health through a combination of research initiatives, regional collaboration, and innovative healthcare policies.

Objectives

- Increase research output: Qatar aims to increase research on liver disease by heavily investing in research infrastructure.
- Establish regional leadership in liver research: Qatar is actively involved in regional hepatitis research and is recognized as a WHO Collaborating Centre for Disease Epidemiology Analytics. This designation reflects its leadership role in providing epidemiological evidence and strategic action plans for combating hepatitis C in the EMRO region.
- Elimination of hepatitis C: Qatar aims to eliminate hepatitis C by 2030.[2]
- Universal vaccine coverage of hepatitis B: Following the WHO targets to reduce hepatitis B prevalence among children under five to less than 1%, Qatar aims to vaccinate its population for hepatitis B.[2]
- Increase transplantation: Qatar aims to make liver transplantation services available to all residents.

Policy Components and Implementation

1. **Investment in robust research infrastructure:** Qatar has prioritized strengthening its research capacity to better understand and combat liver diseases. Leveraging resources from institutions like Cornell Medicine-Qatar, the country has developed state-of-the-art facilities to study viral hepatitis and cirrhosis. The Qatar National Research Fund supports these efforts by funding projects focused on epidemiology, treatment, and prevention strategies.
2. **Universal vaccination coverage for hepatitis B:** Qatar's hepatitis B vaccination program is implemented through a comprehensive, universal approach. The hepatitis B vaccine has been part of the routine infant immunization schedule since 1989, with a birth dose added in 2000 and a 4-dose schedule (including pentavalent and hexavalent combination vaccines) introduced in 2003.[3] Vaccines are provided free of charge to all newborns, regardless of nationality, and are integrated into the National Expanded Programme on Immunization. Additionally, all children entering school - including those of expatriates - must provide immunization certificates, ensuring high coverage among both nationals and non-nationals.

3. **Surveillance of hepatitis:** Qatar employs a comprehensive screening strategy to reduce hepatitis, particularly hepatitis B, in the population. All expatriates entering the country are mandatorily screened for hepatitis B and C at the Medical Commission before being granted residency, reflecting the high proportion of non-Qatari residents. Additional targeted screening is conducted for pregnant women, blood donors, and healthcare workers, as well as for certain professions (such as barbers), as part of the licensing process. These measures, combined with robust surveillance and mandatory reporting of cases by all healthcare providers, have contributed to a notable decline in hepatitis B incidence in recent years.

4. **Accessible liver transplantation system:** Qatar offers free liver transplantation services to all patients – Qatari citizens and expatriates alike – through a unified waitlist system managed by Hamad Medical Corporation. This approach ensures equitable access to life-saving procedures while maintaining high standards of care. The transplantation program is supported by public education campaigns that encourage organ donation and reduce the stigma surrounding transplantation.

Challenges to Implementation

1. **Public awareness gaps:** Limited awareness among the general public and some healthcare providers about liver diseases, risk factors, and the benefits of early intervention can hinder prevention, timely treatment, and participation in prevention programs.[4] Due to the lack of public awareness, cases may remain undiagnosed until serious complications like cirrhosis or liver cancer arise.[4]

2. **Rapid growth and diversity of population:** Qatar's rapidly growing and highly diverse expatriate population complicates surveillance, vaccination, and treatment efforts, as new arrivals may have varying levels of immunity, risk, and access to care.[2]

3. **Reaching high-risk and marginalized groups:** Social discrimination and stigma make it difficult to effectively reach and treat specific populations, such as people who use drugs and prisoners, who have higher hepatitis C prevalence.[2]

4. **Rising prevalence of MASLD:** Driven by high rates of obesity, diabetes, unhealthy diets, and sedentary lifestyles, recent studies estimate that MASLD affects 44.4% of Qatar's general population.[5] Addressing these underlying lifestyle factors requires broad, sustained public health interventions and behavioral change, which can be difficult to achieve at the population level.

Impact

1. **Research output:** Qatar has established itself as a regional leader in liver disease research, with institutions like Weill Cornell Medicine-Qatar's Infectious Disease Epidemiology Group (IDEG) conducting over 100 studies on viral hepatitis and related diseases in the Eastern Mediterranean Region in about a decade. DEG's work, much of it funded by the Qatar National Research Fund, has directly supported WHO public health strategies and produced major collaborative reports, such as the comprehensive WHO report on hepatitis C in the region.[7,8] The Qatar Biomedical Research Institute (QBRI), with 71 researchers and numerous international partnerships, further drives innovation in biomarker discovery and translational research, supporting Qatar's high publication output and its reputation as a hub for scientific collaboration in liver disease.[9]

2. **Epidemiological trends:** National hepatitis C prevalence has dropped from 2% in earlier studies to 0.82% among the total population and from 0.8% to 0.2% among Qataris.[2] Additionally, all confirmed cases receive direct-acting antiviral (DAA) therapy free of charge, with a treatment response rate exceeding 95%. Efforts to reduce hepatitis also include vaccination– as of 2022, 98% of one-year-old children are fully immunized, with coverage consistently remaining between 92% and 99%.[10] Overall, Qatar is among the top ten globally on track to eliminate hepatitis C by 2030 through expanded antiviral treatment programs and public awareness campaigns.

3. **Liver transplantation outcomes:** Qatar's transplantation program stands out as one of the most equitable in the region. Liver transplants are provided free of charge to all patients - both nationals and expatriates - through a unified waitlist system managed by Hamad Medical Corporation. Given that an estimated 2.76 million non-Qatari residents make up 88.4% of the population, this unified waitlist demonstrates a commitment to improving liver health throughout the country.[11] The program has also achieved high success rates, contributing to improved quality of life for patients with end-stage liver disease.

Conclusion

Qatar's proactive approach to addressing liver diseases highlights the importance of integrating research, public health campaigns, and accessible healthcare services into national policy frameworks. By prioritizing universal vaccination coverage, regional collaboration, and equitable transplantation services, Qatar has established itself as a model for tackling chronic liver diseases in the Eastern Mediterranean Region. Continued investment in infrastructure and public awareness will be critical for sustaining these achievements and further reducing the burden of liver disease nationwide.

CHAPTER **TWELVE**

Scotland's "intelligent Liver Function Testing" (iLFT) Pathway

Executive Summary

The intelligent Liver Function Testing (iLFT) pathway emerges as a crucial response to the escalating liver disease burden in Scotland, leveraging automated algorithms to streamline diagnosis and management. The iLFT enables primary care practitioners to electronically request tests, which brings about automated investigations and tailored management plans. Despite challenges such as anticipated increases in referrals and the need for additional laboratory technology and training, iLFT demonstrates significant benefits, including improved diagnosis rates and cost-effectiveness. General practitioner feedback is overwhelmingly positive, and the intention of the National Health Service (NHS) Scotland to adopt the iLFT program throughout the country underscores its potential to enhance patient outcomes and healthcare efficiency.

The intelligent Liver Function Testing (iLFT) pathway emerges as a **crucial response** to the escalating liver disease burden in Scotland.

Background

The prevalence of NAFLD and NASH in Scotland reflects a significant public health concern. There were 17.4 chronic liver disease deaths per 100,000 population in Scotland in 2022.[1] Studies have indicated a rising prevalence of NAFLD/NASH that mirrors global trends driven by sedentary lifestyles, poor dietary habits, and rising rates of obesity. Liver disease is closely linked with inequality and deprivation. In Scotland, premature deaths from liver disease are 4 times higher in the most deprived areas compared with the most affluent.[2] Early diagnosis of a progressive disease such as liver cirrhosis holds immense value as a crucial upstream intervention to mitigate the risk of complications like liver cancer and the need for transplantation, which will ultimately enhance patient outcomes and quality of life. There is an urgent need for target interventions and policy measures, such as iLFT, to address this growing health challenge.

Objectives

- Authenticate an iLFT tool for diagnosing prevalent liver conditions, offering fibrosis staging, and recommending management strategies.[3]

- Establish clear, objective criteria necessary for confident diagnosis in a substantial real-world cohort of patients.[3]

- Diminish morbidity, mortality, and expenses linked with late diagnoses liver diseases by enhancing early detection, ensuring proper referrals, and maintaining cost effectiveness.[4]

Policy Components and Implementation

Professor John Dillon, consultant gastroenterologist and hepatologist, and Dr. Ellie Dow, consultant in biochemical medicine, worked with colleagues from NHS Tayside and the University of Dundee to develop the iLFT pathways to detect liver disease at an early stage, potentially saving thousands of lives.[5]

1. In Dundee, general practitioners can electronically request liver function tests (LFTs).[5]

2. General practitioners can input patient data such as BMI, alcohol consumption, and other risk factors.[5]

3. If abnormal LFT results are detected, additional tests are automatically conducted on the same blood sample to identify the cause and stage of fibrosis.[5]

4. The system automatically identifies the diagnosis and determines the need for specialist referral.[5]

5. The system provides a management plan, including lifestyle advice for patients with NAFLD/NASH.[5]

6. The iLFT utilizes automated algorithms to investigate abnormal LFT results from initial blood samples in primary care.[5]

Examination of Findings

- The accuracy of diagnosis and management advice from 323 iLFT cases was compared to the clinician's final opinion to confirm validity.[3]
- An automated pathway achieved diagnostic agreement in 82.4% of cases, indicating appropriate referral selections by the algorithm.[3]
- Correct referral choices were made in 91.3% of cases, irrespective of diagnostic accuracy.[3]
- Implementation of iLFTs led to a 43% increase in diagnoses.[6]
- iLFTs proved cost-effective, estimated to save the NHS £3,216 per patient over their lifetime.[6]

Implementation of iLFTs led to a **43% increase in diagnoses.**

Challenges to Implementation

Anticipated increases in referrals to liver services are expected due to heightened diagnosis and follow-up, particularly in the short term, but are crucial for timely interventions and improved outcomes.[4] The anticipated increases in referrals to liver services may place additional strain on specialists' workload and resources, necessitating careful management of patient flow and allocation of healthcare resources to ensure efficient and effective delivery of care. While the algorithm's implementation minimally impacts training and resources in primary care, additional technology and training are needed in testing laboratories. Testimonials from patients, doctors, and health system administration may be necessary to boost confidence in the algorithm among general practitioners before wider implementation.

Increased diagnosis means **increased referrals,** which may put strain on liver specialists.

Impact

- iLFTs offer a safe and reliable method of risk-stratifying and diagnosing patients based on a single blood draw, thus reducing the necessity for invasive, expensive procedures.[6]

- General practitioners expressed positivity towards iLFTs, found them user-friendly and workload-reducing, and expressed a desire to maintain access.[6]

- Since being launched as a routine service in NHS Tayside, the program has tested more than 7,500 patients. The tests have now been made standard practice across NHS Tayside, and the Scottish government's Modern Outpatient Programme is considering the opportunities this might present, with work underway to roll this out more widely across Scotland. It has already been established in sites in England.[5]

Conclusion

The iLFT pathway offers a promising solution to address under-investigated abnormalities in LFTs. By utilizing automated algorithms, iLFT streamlines the diagnostic process, leading to early diagnosis, reduced referrals, and technology/training needs. iLFT has demonstrated notable benefits: increased diagnosis rates, cost-effectiveness, and positive feedback from general practitioners. The endorsement for adoption by NHS Scotland highlights confidence in iLFT's ability to improve patient outcomes and healthcare efficiency. Continued support and integration efforts are essential for maximizing iLFTs impact across healthcare settings. Overall, iLFT represents a valuable tool in enhancing early detection, proper referrals, and cost-effective management of liver diseases, contributing to improved patient care and outcomes.

How Spain's Organ Donation Model is Saving Lives

Executive Summary

Spain has maintained its position as a global leader in organ donation and transplantation for 33 consecutive years.[1] This success is underpinned by a comprehensive policy framework centered on its opt-out organ donation system, strong hospital coordination, and strategic funding, overseen by the country's National Transplant Organization (ONT).

Key components of Spain's approach include an opt-out policy for donation after circulatory death (DCD), public engagement campaigns, guidelines that expand donors, and a comprehensive management system. Spain's organ transplantation reached an all-time high in 2024, with 1,344 liver transplants performed.[2] Public awareness efforts have further strengthened donor participation. The outcomes of Spain's model are evident: waiting lists have been reduced by nearly 50% since 2015, and survival has improved more than 10% since 1984-1994 for liver transplant patients – with first-year patient survival reaching 88.5% in 2010-2012.[3] Moving forward, Spain must continue to address emerging challenges, including workforce shortages in transplantation careers and increasing transplant demand, through smart funding and targeted policy adaptations.

Spain's organ transplantation reached an all-time high in 2024, with **1,344 liver transplants performed.[2]**

Background

Spain's success in organ transplantation is rooted in its comprehensive healthcare system and progressive policies. Starting with its first liver transplant in 1984, Spain made organ donation and transplantation a cornerstone of its healthcare system.[4] The country's shift to an opt-out donation model in 1979 was instrumental in dramatically increasing donor availability through a policy supported by widespread public trust in the healthcare system.[5]

Spain's universal healthcare system strives to ensure that all citizens have equitable access to transplant services. This strong foundation has made it easier for hospitals to coordinate transplants efficiently. Moreover, Spain's culture places a high value on solidarity and communal responsibility. However, this is not without challenges. In recent years, there has been increasing discussion around ethical considerations regarding the soft opt-out model, with some advocating for a more explicit, consent-based system.

Additionally, demographic shifts present new hurdles. With Spain's population aged 65 and over predicted to account for 26.0% of the total population in 2037, the demand for transplants is expected to rise along with donor age. Older populations often experience higher rates of liver diseases, increasing the need for transplants. Furthermore, medical advancements in transplant procedures mean an increase in the number of patients eligible for transplantation. While Spain leads globally in transplant rates, sustaining this success will require ongoing policy adjustments, investment in infrastructure, and continued public engagement efforts.

Objectives

- Increase donation and transplantation rates. This objective is directly tied to policies such as the opt-out system and targeted public awareness campaigns, which lead to consistently high donor participation. Within this soft opt-out model, everyone is an organ donor by default unless they indicate otherwise, but families of the deceased retain the final say.[6]
- Improve patient outcomes through access to transplantation. The expansion of donation criteria, particularly through DCD, has led to shorter waiting lists and improved survival rates.
- Expand recipient eligibility criteria to include broader indications. By adopting new guidelines for conditions like hepatocellular carcinoma and older recipient candidates, Spain has ensured more patients can benefit from transplantation.
- Leverage innovation and research to optimize processes. Continuous investment in transplant research has helped refine procedures and improve efficiency, further enhancing Spain's reputation as a leader in the field.

Policy Components and Implementation

1. **Donation after circulatory death:** Spain pioneered the DCD program, significantly expanding its donor pool. The ONT collaborates with hospitals to provide standardized training for medical professionals, ensuring the proper implementation of DCD protocols. Workshops, simulation-based training, and best-practice sharing sessions are conducted to optimize the procedure.

2. **Consensus guidelines:** The Spanish Society for Liver Transplantation (SETH), in collaboration with the ONT, updates guidelines to ensure best practices in patient selection and transplant procedures. SETH released comprehensive guidelines in 2019 to broaden transplantation criteria. These include new protocols for conditions like hepatocellular carcinoma and older recipient candidates. Age limits were removed in favor of case-by-case evaluation for older recipients. Additionally, the guidelines expanded recommendations to not only include patients with tumors within the Milan criteria (single tumor ≤5 cm or up to 3 tumors ≤3 cm each) but also those with larger tumors or a higher number of lesions, based on specific criteria for tumor biology and response to treatment.

3. **National Transplant Organization (ONT):** ONT plays a crucial role in ensuring policy implementation, managing logistics, and coordinating between stakeholders, including hospitals, regional healthcare agencies, and donor families. It also leads awareness and education efforts to shape social and cultural understanding of organ donation and transplantation. The ONT organizes annual conferences to align national transplant strategies and oversees data collection to enhance efficiency. Spain currently has 24 liver transplantation centers for adults and 5 for children.[7]

4. **Hospital coordination model:** Spain employs dedicated hospital coordinators who streamline donor management, liaise with families, and oversee transplantation logistics.

5. **Public engagement campaigns:** Awareness campaigns have increased organ donation consent rates, fostering a culture of solidarity and trust in the healthcare system.

Challenges to Implementation

Despite Spain's success, several challenges threaten the sustainability and growth of its organ transplant system:

1. **Shortage of transplant professionals:** Medical students are not pursuing careers in transplantation. Shown in the preference for more lucrative specialties, there is an increasing shortage of transplant surgeons and coordinators – with only one liver transplant surgeon for every 281,000 individuals in Spain.[8] If demand for liver transplants increases due to the aging population and broader criteria for liver transplants, this challenge will worsen.

2. **Concerns about the opt-out system:** While Spain's presumed consent model has been highly effective, ethical debates persist about whether presumed consent truly reflects individual autonomy. Some advocacy groups are pushing for greater transparency in decision-making.

3. **Aging donor pool:** As Spain's population ages, the availability of younger, healthier organ donors declines.

4. **Infrastructure limitations:** Spain's transplant centers raise concerns about the ability to meet future demand. Expansion and investment in transplant units are necessary to prevent reaching the capacity of the system.

Impact

Spain's organ transplant policies have had a substantial and measurable impact, making it a model for other nations. Some key indicators of success include:

1. **Reduction in waiting lists:** Since the implementation of Spain's opt-out system and coordinated hospital efforts, liver transplant waiting lists have been reduced by nearly 50% between 2015 and 2024.[3]
2. **Increased donor rates:** Spain achieved a record 52.6 organ donors per million population in 2024, more than double the EU average.[2]
3. **DCD contributions:** The DCD program resulted in 2,562 deceased donors in 2024.[9]
4. **Family refusal rates:** Family refusal rates have dropped from 25% in 2010 to 10-15% in 2024, a testament to Spain's effective public awareness and education campaigns.10 Additionally, Spain's family authorization for organ donation is 86%.[11]
5. **Transplant numbers:** In 2024, Spain performed 1,344 liver transplants, a 6% rise from the previous year, significantly improving liver health outcomes.[2]
6. **Economic savings:** Increased transplant success rates have led to a reduction in long-term healthcare costs, saving hundreds of millions annually by reducing dialysis reliance and improving post-transplant health outcomes. Every transplant in Spain represents an annual state budget saving of 21,000 euros.[12]

Conclusion

Spain's leadership in organ transplantation is rooted in its well-structured policies, public trust, and investment in healthcare infrastructure. Moving forward, Spain must focus on sustaining investment in transplantation programs, addressing workforce shortages, and reinforcing the benefits of its opt-out system to counter emerging opposition. Spain's well-directed investment, combined with policies such as the opt-out policy in place of opt-in have led to great success in Spain.

CHAPTER **FOURTEEN**

Türkiye Deploying Medical Recommendations to Control NAFLD & NASH

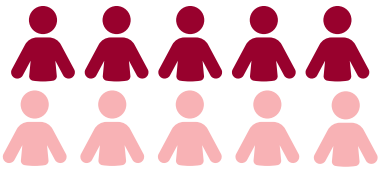
Executive Summary

The prevalence of NAFLD in Türkiye is concerning, affecting almost 1 in 2 individuals within the population.[1] Despite its significant impact on public health, the nation lacks comprehensive nationwide studies on NAFLD and its progressive form, NASH. In response, the Turkish Association for the Study of the Liver (TASL) issued guidelines tailored to the Turkish population, emphasizing evidence-based management strategies. These guidelines coincide with Türkiye's 2017 National Plan to Combat NCDs, a plan led by the Public Health Institute of the Ministry of Health in collaboration with other ministries, governmental bodies, academic institutions, and civil society organizations.

However, challenges persist, such as the need for cost-effective screening programs specifically targeting NAFLD/NASH. There has been little response to the guidelines, possibly due to competing health priorities that must be overcome to address this pressing public health issue and hopefully contribute to the implementation of health policies to support NAFLD/NASH outcomes in Türkiye.

The prevalence of non-alcoholic fatty liver disease (NAFLD) in Türkiye is concerning, **affecting almost 1 in 2 individuals within the population.**

NAFLD stands as one of the **leading causes** of chronic liver disease and cirrhosis in Türkiye.



Background

NAFLD impacts nearly half of Türkiye's population – 48.3%.[1] NAFLD stands as one of the leading causes of chronic liver disease and cirrhosis in Türkiye, like in many Western countries.[2] Existing research primarily comprises small-scale, single-centered studies targeting specific groups, which leaves a notable gap in understanding.[1] To address this deficiency, health leaders and policymakers must initiate urgent, large-scale, multi-center investigations to accurately assess the burden of NAFLD and NASH across diverse populations in Türkiye. Such endeavors are pivotal to informing and providing evidence to support policies and interventions to combat the escalating public health crisis posed by NAFLD and NASH in the country.

Objectives

2017 National Plan to Combat NCDs objectives:

- Prioritize prevention and control of NCDs in national and international agendas.[3]
- Strengthen national capacities, leadership, and partnerships for NCD prevention.[3]
- Reduce modifiable risk factors and address social determinants through health promotion.[3]
- Enhance health systems' response to NCDs and support research and development.[3]
- Monitor trends and assess progress in NCD prevention and control.[3]

TASL NAFLD and NASH guidelines objectives:

- Provide evidence-based management guidelines tailored to Türkiye's population.[4]
- Encourage the formulation of early intervention strategies for NAFLD diagnosis and prevention.[4]

Policy Components and Implementation

In 2017, Türkiye's Ministry of Health initiated a comprehensive action plan for NCDs. In 2021, the Turkish Liver Association released clinical guidelines for NAFLD, advocating lifestyle modifications and cost-effective screening programs. The Ministry of Health promotes healthy lifestyle choices to prevent cardiovascular disease, which indirectly reduces NAFLD/NASH incidence. Currently, no established policies exist for cost-effective screening programs, but these guidelines are expected to inform future health policies in this area.

2017 NCD Action Plan[3]:

- **Prevention:** Focus on tobacco control, healthy diets, physical activity, and alcohol reduction. Use community-based interventions like education programs and support groups.
- **Early Detection and Diagnosis:** Improve access to screenings for common NCDs such as diabetes, hypertension, and cancer within existing healthcare systems.
- **Treatment and Management:** Strengthen primary healthcare for comprehensive NCD care and ensure access to essential medicines and technologies.
- **Surveillance and Monitoring:** Establish a national NCD registry to collect data on prevalence, incidence, and risk factors, and enhance surveillance systems.
- **Intersectoral Collaboration:** Engage stakeholders and establish committees to coordinate efforts between government, healthcare, academia, and civil society to address social determinants of health.

TASL Guidelines on NAFLD and NASH[2]:

- **Standardize clinical approaches** that benefit specialists in various medical fields for NAFLD diagnosis and treatment.
- **Increase the use of non-invasive diagnostic methods,** given research indicating the clinical efficacy of non-invasive diagnostic methods such as transient elastography and FIB-4 (a liver fibrosis biomarker) within Turkish populations.
- **Evaluate individuals with metabolic** abnormalities for NAFLD presence.
- **Begin diagnosis** with abdominal ultrasound, with consideration of transient elastography and magnetic resonance elastography (MRE) for liver fibrosis assessment if accessible.
- **Liver biopsy** remains the gold standard for diagnosis.
- **Emphasize lifestyle modifications**, including dietary changes, exercise, and management of metabolic disorders, for effective NAFLD management.

Examination of Findings

Achieving the behavioral risk factor targets in the Multisectoral Action Plan of Türkiye for Noncommunicable Diseases 2017–2025 would have averted approximately 20,000 deaths in 2017.[5] Evaluation is still underway to assess the effectiveness and implications of Türkiye's NASH and NAFLD guidelines.

Challenges to Implementation

The national action plan prioritized interventions and capacity-building that offer broad benefits across all NCDs, resulting in greater cost-effectiveness. This may result in diminished emphasis on NAFLD/NASH specifically. There is evidence supporting the need for cost-effective screening programs and funding to launch pilot initiatives.

Impact

Studies have indicated that attaining NCD policy objectives can avert numerous fatalities within the nation.[6] However, there has been minimal uptake of the NAFLD/NASH guidelines, which suggests that fatty liver disease is considered a lower priority compared to other NCDs.

Conclusion

Addressing NAFLD/NASH in Türkiye's healthcare system is crucial, starting by integrating initiatives into existing national NCD action plans and establishing pilot screening programs. Leveraging resources and collaborating with health stakeholders can effectively combat NAFLD/NASH and improve health outcomes. Türkiye's proactive approach, exemplified by TASL guidelines and the 2017 Action Plan, demonstrates a commitment to combating NCDs and liver diseases. Continued dedication, collaboration, and resource allocation are vital for sustained progress in tackling these complex public health challenges.

CHAPTER **FIFTEEN**

The UAE's National Strategy: Prioritizing Youth Health to Combat the Rise of Non-Communicable Diseases

Executive Summary

The United Arab Emirates faces some of the world's highest rates of obesity and metabolic non-communicable diseases, driven by rapid modernization, an obesogenic food environment, and constraints on physical activity. In response, the Ministry of Health and Prevention (MoHAP) has positioned childhood obesity prevention and early cardiometabolic risk reduction as national priorities, with leadership from a dedicated Department of NCDs. The National NCD Strategy outlines a multisectoral, prevention-focused roadmap for reducing premature NCD mortality, halting the rise in obesity and diabetes, and promoting healthier lifestyles across the life course. Core measures include the Healthy Diet and Nutrition Program, national school food and beverage standards, updated physical activity guidelines, and large-scale initiatives such as Masar. Implementation follows a centralized policy-decentralized execution model, with Abu Dhabi and Dubai advancing strict guidelines on school nutrition and physical activity. Early reports suggest modest improvements in obesity, diet, and physical activity, positioning the United Arab Emirates as a regional leader in NCD prevention.

The National NCD Strategy outlines a multisectoral, **prevention-focused roadmap for reducing premature NCD mortality**

Background

As is true of the Gulf nations in general, the United Arab Emirates (UAE) ranks among the highest in prevalence of obesity and metabolic dysfunction-associated NCDs worldwide, with current rates of overweight/obesity estimated at greater than 60%[1] and MASLD rates in the region averaging ~40%.[2] The underlying drivers are common to regions undergoing rapid modernity:

- An obesity-promoting environment arising from conflicting values of Westernization and traditional gender and cultural norms
- A food environment of abundance, crammed with unhealthy, pre-packaged foods that encourage overconsumption
- The transition from physically demanding, agriculture-focused labor to sedentary, office-based work, combined with the loss of walkable green space
- And seasonal climate extremes that restrict outdoor activities

Additionally, nations emerging from conditions of food scarcity are driven to adopt a cultural aesthetic in which bigger women's bodies symbolize status, prosperity, and fertility.

The UAE has leveraged its national public health system for monitoring and improving Emirati population health and quality of life by designating a Department of NCDs within the Ministry of Health and Prevention (MoHAP) as the policy-making body for the seven emirate states. The department has been charged with instituting a nationwide, multi-stakeholder national plan for reducing NCDs, developing and updating the national NCD guidelines, and integrating NCD prevention services into public health delivery.

Thus far, the UAE response to the growing burdens of obesity, cardiometabolic diseases, and MASLD has been to focus strongly on childhood obesity, with national policies around school food standards and public-sector guidelines on healthy diet and physical activity.

Objectives

Recognizing the need to be proactive, MoHAP has set clear priorities tailored to specific life stages.[3] The Ministry's national policies focus on achieving and maintaining healthy lifestyles for all Emiratis across the entire life course, and align with the WHO strategic development goals while reducing health care costs. With more than 80% of its population between 15 and 64 years old,[4] the UAE has deliberately prioritized early intervention to prevent the harmful downstream consequences of unhealthy lifestyle habits formed at a young age.

MoHAP is dedicated to combating NCDs through trans-sectoral collaboration, active monitoring, and strict regulatory adherence by member states. Dr. Buthaina Bin Belaila, head of NCDs and Mental Health, has articulated three primary priorities:[5]

- A 33% reduction in premature NCD-related mortality by 2030
- A proactive approach to halting the rise of diabetes and obesity through early detection and intervention
- And the promotion of physical and mental well-being through risk modification programs

Policy Components and Implementation

MoHAP's National NCD Strategy[6] provides a "multisectoral, prevention-focused roadmap" for decreasing premature NCD-related deaths, stemming the rise in obesity and diabetes prevalence, and reducing diet and inactivity-related risks through fiscal, regulatory, clinical, and surveillance measures. Central to the policy, the Healthy Diet and Nutrition Program integrates cardiometabolic disease risk assessments into activities for raising healthy lifestyle awareness and educating Emiratis across the age spectrum.[5] Risk assessment guidelines are updated periodically to reflect refinements in target endpoints, and nationwide surveys are conducted to measure progress. The policy aligns with WHO guidelines promoting reduced sugar, salt, and fat intake; increased daily servings of fruits and vegetables; and 150 minutes weekly of moderate physical activity for adults, plus daily exercise parameters for children.

The core principles emphasize maintaining a healthy lifestyle across all settings. Achieving optimal outcomes demands that health-promoting habits are practiced consistently in the workplace, in school, and at home.

A public-facing website[7] features practical, easily accessible educational materials and answers frequently asked questions about non-communicable disease, diet, and exercise.

Towards Healthier School Food Standards

Recognizing that schools are important for shaping diet and physical activity behaviors in childhood that persist across the lifespan, MoHAP has allocated substantial resources to policies that promote a healthy food culture in schools. Within the framework, a national guide for school food and beverages[5] requires healthy and safe food environments in all schools. All food services (canteens, vending machines, kiosks) must comply with federal food safety and nutrition standards.[8] Abu Dhabi and Dubai, in particular, have implemented strict school policies for maintaining and enforcing these standards.

To be compliant, schools must ensure menus follow official food and nutrition guidelines, with more fruits, vegetables, whole grains, and less sugar, salt, and saturated fat.

- Abu Dhabi's red list restrictions on unhealthy foods and drinks ban high-sugar, fizzy beverages, deep-fried snacks, and energy drinks. The rules apply to foods brought from home as well as items provided in schools, and are strictly enforced under penalty of sanctions.[9,10]
- The Dubai Food and Nutrition Guidelines and Requirements in Educational Institutions[11] limit unhealthy foods, mandate menu nutrition labels, offer plant-based options, and provide nutrition education and digital tools (e.g., websites, apps, AI chatbots) to schools, food suppliers, and distributors. Recent modifications extend existing guidelines to nurseries and institutions for higher learning.
- The Masar initiative is a national project that "integrates educational programs focused on healthy eating, physical activity, and weight management to improve the health of future generations."[12] Initially introduced as a pilot, the project was so successful that it was expanded to more than 85 schools.

Physical Activity Guidelines

- National campaigns and school-based guidelines emphasize at least 60 minutes per day of moderate-to-vigorous activity.
- In-school workshops, with students participating in planning decisions, aim to increase student engagement.
- The "Dubai 30 x 30" Fitness Challenge,[13] a national school-based campaign promoting 30 minutes of physical activity daily for 30 days, uses a "whole-of-school approach" to increase physical activity during school hours and while out of school.

Policy implementation leverages trans-sectoral stakeholder collaboration so that messaging is tailored to specific audiences (e.g., students, males, females). Successful approaches have included mapping clear and practical action plans; pretesting concepts, messages, print and digital materials; frequent reassessing of the framework for effectiveness and rapid refining of ineffective elements. Implementation and evaluation methods (e.g., monitoring compliance, menu audits, educational activities) must be modifiable to meet specific local conditions.

Regular updates integrate input from periodic national health and nutrition surveys and refinements in WHO recommendations.

Challenges to Implementation

The UAE's centralized development/decentralized execution model, in which MoHAP sets policy but individual emirates are left to tailor their own implementation and enforcement programs, creates opportunities for inequalities in policy delivery that may sustain inequities in health outcomes. In addition, while MoHAP has created a centralized electronic system to integrate data from all regions, those emirates with more sophisticated health care systems and digital infrastructure may be overrepresented in survey results.

Their programs and assessments may reflect different priorities, yielding biased effectiveness and outcome comparisons with less well-resourced areas. For example, full implementation of Dubai's school nutrition and physical activity policies has yet to be achieved, despite clear written frameworks and high awareness by school representatives. Multiple overlapping initiatives, limited enforcement capacity, and social and cultural norms that conflict with healthy diet and activity recommendations—particularly for women and children—have hampered implementation efforts. These barriers are magnified in under-resourced institutions, where strong central governance is needed to fully operationalize the interventions and to overcome resource and budget constraints on surveillance and enforcement.

Impact

UAE leadership has made the prevention and control of NCDs a top public health priority. Their proactive policies around NCD prevention have positioned them as regional leaders in public health and role models for other Gulf nations facing similar challenges.

While comprehensive data on the impact of recent policy updates around healthy nutrition and physical activity are not yet available, current reporting shows a modest decline in obesity and a rise in physical activity.[14] Signs also point to an improved school food environment and increasing clinician and public support for adopting school-based nutrition and physical activity programs[5,14] as well as positive impacts on diet and physical activity behaviors. In a 2022-23 Knowledge, Attitude, and Practice survey assessing the impact of the Masar project on student behaviors, 42% of students lost weight, more than 20% increased their fruit and vegetable intake, 10% decreased their fast food and sugary beverage consumption, and more than 50% met sleep targets.[12]

If these near-term achievements are sustained, they will undoubtedly yield meaningful reductions in obesity and metabolic diseases, including MASLD, in the future.

Conclusion

The UAE's proactive policies for reducing obesity and cardiometabolic disease have positioned it as a role model and leader in NCD prevention among the Gulf nations. While comprehensive outcome data are not yet available, their focus on healthy diet and physical activity behaviors across the age spectrum—with children as a top priority—has already yielded demonstrable results. With sustained government support and the public's adherence to national guidelines, the UAE can look forward to good health and quality of life for all Emiratis.

CONCLUSION

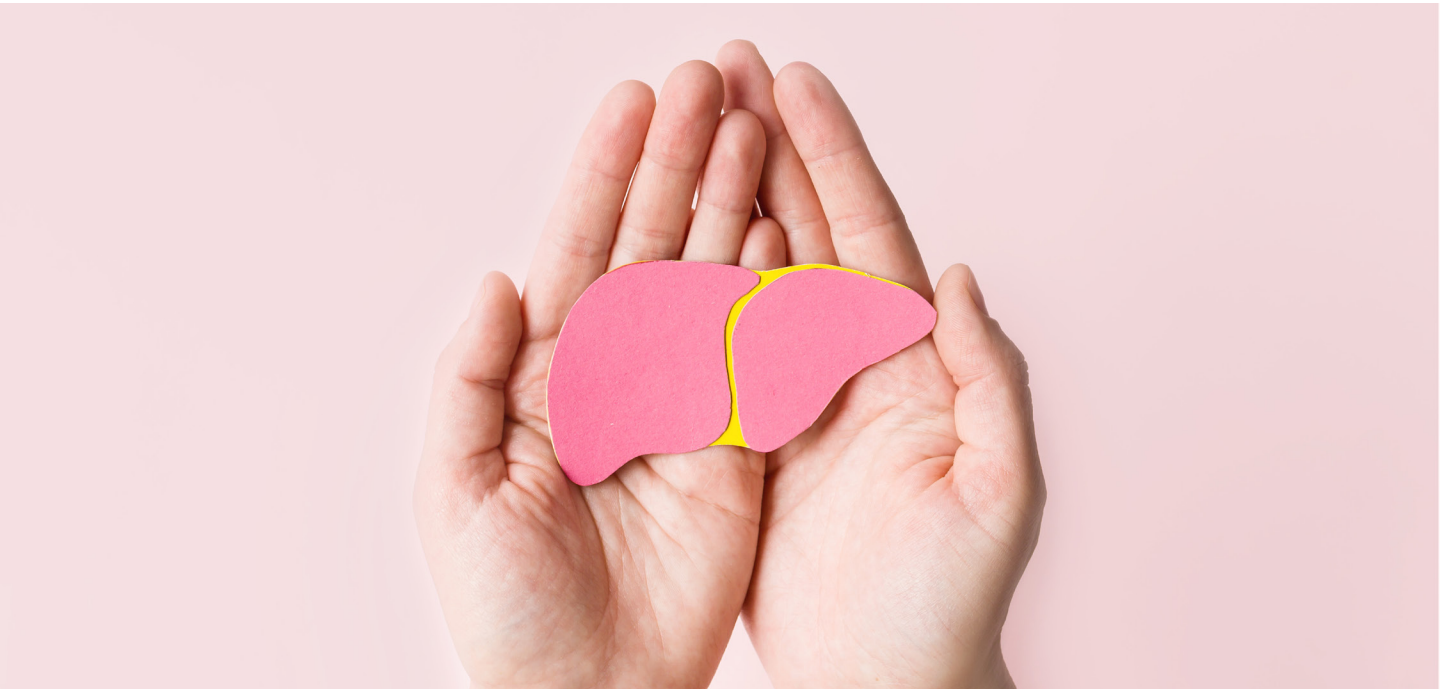
This third edition of *Best Practices in Liver Health Policy* report not only documents progress, but serves as a tool to accelerate momentum, driving awareness, accountability, and political commitment to liver health worldwide. Building on a growing network of international experts and policy leaders, this report reinforces the urgent need to place liver health firmly on the global public health agenda.

Despite affecting over 1.5 billion people worldwide, liver conditions still receive limited or delayed treatment, are subject to stigma, and lead to unnecessarily poor outcomes.1 With the prevalence of liver disease projected to rise due to sedentary lifestyles and overnutrition, urgent action is needed to address this growing burden.

Liver health requires a public health approach that prioritizes public education, accessibility to preventive measures, early detection, and seamless integration with healthcare systems. Practical interventions that consider individual preferences, cultural backgrounds, and socioeconomic circumstances are essential for effective disease management.

Moving forward, coordinated and sustained action across healthcare systems, governments, and civil society is essential to meaningfully reduce the global burden of liver disease. Years of advocacy work, under GLI's leadership, have led to the advancement of a Draft Resolution on Steatotic Liver Disease to the Executive Board of the World Health Organization in February 2026. This milestone reflects what is possible when advocacy, scientific expertise, and government leadership converge, particularly through the collaboration between GLI, the Egyptian Ministry of Health, and a broad coalition of global stakeholders in the metabolic health space.

Now is the time to move from recognition to implementation. With sustained collaboration and political will, we can shift the trajectory of liver disease and deliver measurable improvements in health outcomes for millions of people worldwide.



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CONCLUSION

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ACKNOWLEDGMENTS

Authors:
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Giacomo Donnini
Roslyn Marano
Rita Mazumder

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Kayla Johnson
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Global Liver Institute (GLI) is a 501(c)3 nonprofit organization founded in the belief that liver health must take its place on the global public health agenda commensurate with the prevalence and impact of liver illness. GLI promotes innovation, encourages collaboration, and supports the scaling of optimal approaches to help eradicate liver diseases. Operating globally, GLI is committed to solving the problems that matter to liver patients and equipping advocates to improve the lives of individuals and families impacted by liver disease. GLI holds Platinum Transparency with Candid/GuideStar, is a member of the National Health Council, and serves as a Healthy People 2030 Champion. Follow GLI on Facebook, Instagram, LinkedIn, and YouTube or visit www.globalliver.org

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This initiative is made possible thanks to the support of Boehringer Ingelheim, Madrigal Pharmaceuticals, Novo Nordisk, and Opella.

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