



# Nomenclature and definition of metabolic-associated fatty liver disease: a consensus from the Middle East and north Africa

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With the increasing prevalence of obesity and type 2 diabetes, fatty liver disease associated with metabolic dysfunction is a global health problem, especially because it is one of the earliest consequences of obesity and it precedes diabetes development. Fatty liver disease associated with metabolic dysfunction is of particular concern in the Middle East and north Africa, where its prevalence is greater than that in the rest of the world. Despite the magnitude of the problem, no regional guidelines have been developed to address this disease. This Review describes suggestions of redefining fatty liver disease associated with metabolic dysfunction, including its terminology and criteria for diagnosis. Experts have raised serious concerns on the current nomenclature, which labels the disease as non-alcoholic fatty liver disease (NAFLD), and its diagnostic criteria. The panel reached a consensus that the disease should be renamed as metabolic-associated fatty liver disease (MAFLD) and that the disease should be diagnosed by positive criteria. The aim is now to work with authorities across the region to implement these proposed changes and reflect them in health-care policy and to improve health care for patients in this region.

## Introduction

Geographically, the Middle East and north Africa represent a region in western Asia that extends into north Africa and comprises 21 countries. This super-region has been proposed by the US Institute for Health Metrics and Evaluation and has a population of nearly 500 million people. The population of the Middle East and north Africa has diverse cultures, economic systems, social factors, historical backgrounds, and political contexts.

Parallel with economic evolution, virtually all countries of the Middle Eastern and north African region are currently in a nutritional transition to a diet typically associated with North America and Europe, with increases in the intake of fast food, processed foods, and soft drinks. It has been reported that over the past five decades there has been an overall increase in energy intake, including meat and vegetable oils, and decreases in fruit intake as a source of energy.<sup>1</sup> In parallel, the burden of disease in this region is witnessing a pronounced shift from communicable to non-communicable diseases.<sup>2-4</sup>

Although the prevalence of overweight and obesity has risen globally between 1980 and 2013 in men (from 28.8% to 36.9%) and women (from 29.8% to 38.0%), and is continuing to increase at pandemic rates,<sup>5,6</sup> the rise is more profound in the Middle East and north Africa than in the rest of the world. Among the top 15 countries with the highest prevalence of obesity in adults (aged >18 years) in the world, ten of these countries are in the Middle East and north Africa region, and at least 50% of women in Kuwait, Qatar, and Libya are overweight (body-mass index [BMI] 25–30 kg/m<sup>2</sup>) or obese (BMI ≥30 kg/m<sup>2</sup>).<sup>5,6</sup> Worryingly,

the prevalence of obesity among school children and adolescents (aged <20 years) ranges between 25% and 30%. Similarly, the average age-standardised prevalence of insufficient physical activity in this region is 32.8% (95% uncertainty interval 31.0–35.2), which is higher than the global prevalence of 27.5% (25.0–32.2).<sup>7</sup> Notably, three of the four countries worldwide with a prevalence of insufficient physical activity that is over 50% were located in this region—namely, Kuwait, Saudi Arabia, and Iraq.<sup>7</sup>

Among different Global Burden of Disease super-regions in 2017, women living in the Middle East and north Africa ranked first and men living in the Middle East and north Africa ranked second for disability-adjusted life-years (DALYs) due to metabolic risk factors.<sup>3</sup> Furthermore, approximately 23% of all-cause DALYs in the region were attributed to metabolic risk factors in both sexes.<sup>3</sup> Notably, among various categories of risk factors (including environmental, metabolic, and behavioural), metabolic factors ranked first in the Middle East and north Africa with a cumulative mortality of more than 300 deaths per 100 000 individuals; whereas, globally, the figure was less than 250 deaths per 100 000 people.<sup>3</sup>

## The burden of fatty liver disease in the Middle East and north Africa

The prevalence of what was previously termed non-alcoholic fatty liver disease (NAFLD) has risen in parallel with lifestyle changes and has had direct clinical and economic impacts. According to the Global Burden of Disease Study, mortality related to chronic liver disease ranked 11th in all-cause DALYs, resulting in 524 years of life lost per 100 000 population.<sup>8</sup> Men in Kuwait and Qatar had the highest prevalence of cirrhosis, more than twice

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the global estimates.<sup>8</sup> Although there is scant data on the epidemiology of NAFLD in the Middle East and north Africa, available data suggest that this region has the highest prevalence of the disease at around 32%; whereas, global prevalence is around 25% in adults aged 18 years or older.<sup>4</sup> Country-specific data suggest that the prevalence of NAFLD in Egypt is around 15·8% in children (aged 6–18 years).<sup>9</sup> The disease's prevalence in adults was reported to be up to 35·3% in Iran (aged 20–70 years), 31·5% in Kuwait (aged 18–64 years), and between 48·3% and 60·1% in Turkey.<sup>10–13</sup> It has also been mathematically projected that by 2030, the prevalence of NAFLD will increase from 25·0% to 30·2% in United Arab Emirates and from 25·7% to 31·7% in Saudi Arabia.<sup>14</sup>

Consequently, NAFLD was reported to be the most rapidly growing indication for liver transplantation in multiple countries in the Middle East and north Africa.<sup>15</sup> Up to 63% of referred patients for liver transplantation in Kuwait in 2018–19 had cirrhosis related to NAFLD.<sup>16</sup> Similarly, the age-standardised incidence of hepatocellular carcinoma related to NAFLD has increased by 39·2% between 1990 and 2017 in most countries of this region, with the highest increase of 89·8% observed in Egypt.<sup>17</sup>

### Unique challenges in the Middle East and north Africa

In February, 2020, consensus by an international panel recommended the adoption of the name metabolic-associated fatty liver disease (MAFLD) as a more appropriate term than NAFLD to describe fatty liver disease associated with metabolic dysfunction. This group subsequently suggested a set of positive criteria to diagnose the disease, independent of alcohol intake.<sup>18–20</sup> In this consensus, authors focused on disease heterogeneity and the effects of such heterogeneity on the performance of clinical trials. These suggestions represent a milestone step in our understanding of fatty liver disease.<sup>21–27</sup> However, perspectives as to whether or not these changes are needed can vary substantially between different regions and health-care systems.

From our regional perspective, despite the self-evident statistics, it is likely that existing data for fatty liver disease associated with metabolic dysfunction underestimate rather than overestimate the actual magnitude of the problem because of underdiagnosis and the fact that current diagnostic criteria are based on the exclusion of other liver diseases. These issues in diagnosis might result in misclassification and under-reporting of fatty liver disease associated with metabolic dysfunction because of the high prevalence of viral hepatitis in the region, and they indicate an urgent need for positive criteria for disease diagnosis in the Middle East and north Africa.

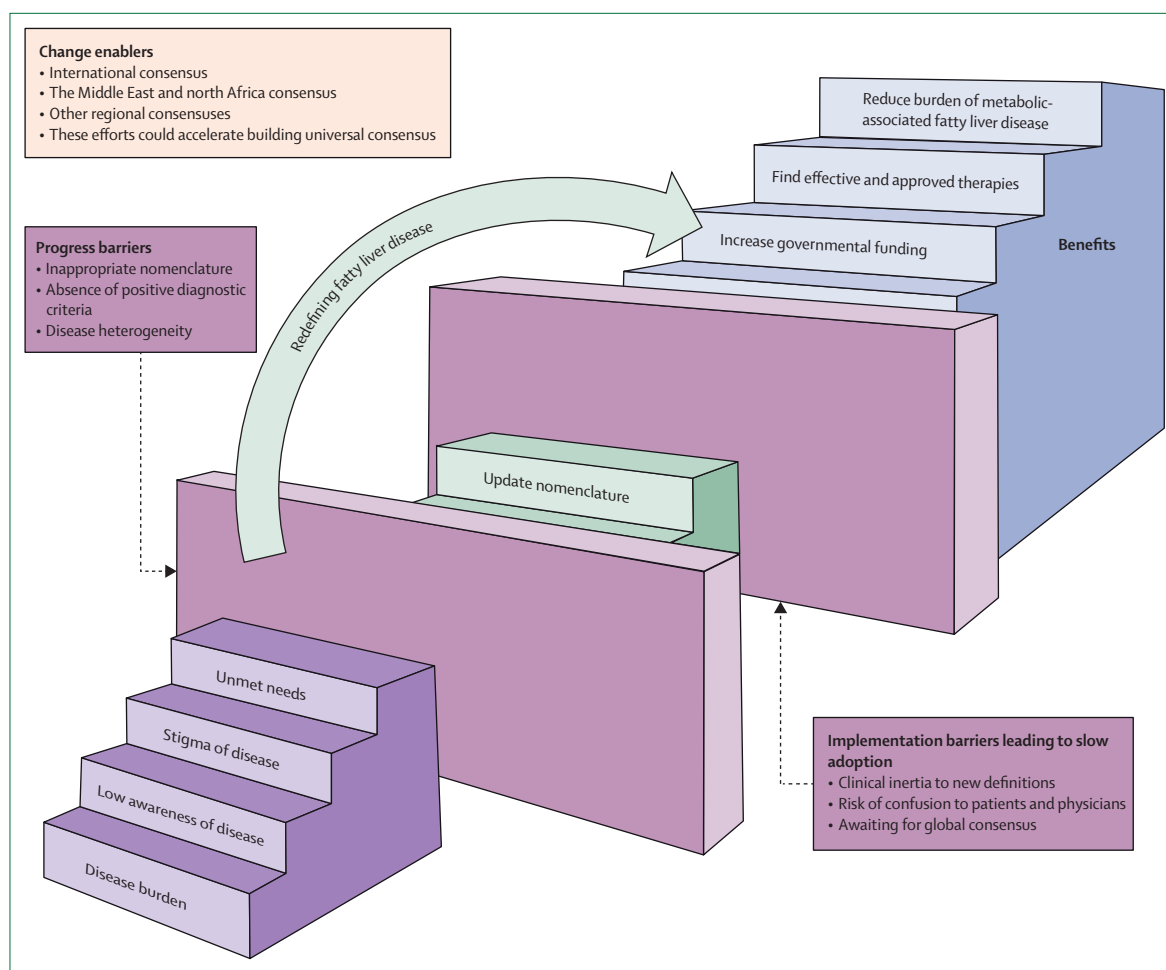
More worryingly, there has been little progress in awareness among the public and health-care community that might otherwise lead to early diagnosis and intervention, or access to funding to implement

the required strategies for prevention. For example, although Egypt is one of the countries on track to meet WHO recommendations for the elimination of hepatitis C<sup>28</sup> and has allocated tremendous resources towards this objective, programmes to prevent or control fatty liver disease are virtually non-existent. This current status can be partly attributed to the confusion in nomenclature of the disease and criteria for diagnosis. Thus, there is a pressing requirement that these two major challenges are addressed to facilitate improved communication of the risk of fatty liver disease associated with metabolic dysfunction to patients, general practitioners, health-care payers, and authorities. Because almost all of the Middle Eastern and north African region have a religious prohibition on alcohol consumption and social discouragement of drinking, unfortunately there is still a strong stigma associated with the current nomenclature that reduces the likelihood of people engaging with health services to seek treatment and support.

Because of the unique challenges and reasons for change in this region, leading members of regional countries in the Middle East and north Africa sought to respond to the increasing burden of fatty liver disease associated with metabolic dysfunction, to reach consensus on disease nomenclature and diagnostic criteria, and to evaluate the international consensus from the perspective of regional experts. Substantial momentum involving various stakeholders, including medical societies across disciplines, will be needed to fully adopt the proposed redefining of fatty liver disease;<sup>27</sup> this work represents a pivotal step in this path. Additionally, such work represents an urgent call for action to tackle this disease and we believe that it will ultimately help to improve health policy related to fatty liver disease associated with metabolic dysfunction in this region (figure). Of note, the purpose of this Review was not to try to suggest different diagnostic criteria for fatty liver disease associated with metabolic dysfunction. Instead, this Review intended to collate the views of experts in the region on this proposal, given that they are the individuals on the front line of clinical practice, patients' awareness, and medical education.

### Building consensus

In March, 2020, an invitation letter was sent electronically to a panel of potential contributors (ie, experts of liver disease in the region), explaining the need for reaching a consensus on recommendations to update the nomenclature and definition of fatty liver disease associated with metabolic dysfunction, describing the Delphi method<sup>29</sup> and tasks expected of members. After receiving confirmation of the participation of all individuals approached, an iterative approach was used via email to gain consensus. Panel members scored and gave their views on the suitability and clarity of each item on the draft questions' checklist (appendix 2, p 1). Panel members



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 See Online for appendix 2

Figure: The implications of and barriers to the redefining of fatty liver disease

were asked to provide their views on whether or not there is a need for the change in nomenclature from NAFLD to MAFLD (indicated by “yes” or “no”), and the Delphi method was adopted for voting and opinion collection. For each of the diagnostic criteria items, members were asked to give their opinion on whether or not the individual item was clear (indicated by “yes” or “no”) and if it should be included, by use of a nine-point rating Likert scale (from 1 [definitely do not include] to 9 [definitely include]). Members were given the opportunity to express their opinion in the form of free text on the wording and to offer their inputs on each item. They could also suggest additional statements. For inclusion in the final list, items had to achieve a score between 7 and 9 by 70% or more of the members and between 1 and 3 by 30% or fewer of the members. Similarly, items were excluded if 70% or more of the members scored an item between 1 and 3, and if 30% or fewer of the members scored it between 7 and 9. The responses were anonymised to ensure that the comments from individuals were provided without pressure or influence. Subsequently, a manuscript was

drafted and circulated to the panel, and feedback was incorporated over several rounds of revision.

### Recommendations

The Middle East and north Africa consensus panel, consisting of 26 participants, recommend renaming and redefining fatty liver disease associated with metabolic dysfunction and replacing the term “non-alcoholic fatty liver disease (NAFLD)” with “metabolic-associated fatty liver disease (MAFLD)” (supported by 24 participants [92%]; table 1). Participants also recommend adopting positive criteria for defining the disease. Although the panel support the proposed diagnostic criteria for MAFLD,<sup>20</sup> they do not recommend including high-sensitivity C-reactive protein because of its low specificity and because it is not done routinely in clinical practice across the region (tables 1, 2).

We also recommend abandoning the term “non-alcoholic steatohepatitis” and the term “cryptogenic cirrhosis” to describe cirrhosis related to fatty liver disease (tables 1, 2). However, the panel recommends

	Level of agreement
Rename "non-alcoholic fatty liver disease" to "metabolic-associated fatty liver disease"	24/26 (92%)
Update the definition of fatty liver disease associated with metabolic dysfunction with a set of positive criteria	22/24 (91%)
Abandon the term "non-alcoholic steatohepatitis"	19/23 (82%)
Abandon the term "cryptogenic cirrhosis" to describe fatty cirrhosis related to liver disease	22/24 (91%)
Keep the term "secondary" to describe other causes of hepatic steatosis	13/22 (59%)

**Table 1: Consensus statements and level of agreement on the nomenclature and redefining of fatty liver disease**

	Panellist score			Recommendation
	1-3	4-6	7-9	
Overweight or obesity (defined as body-mass index $\geq 25$ kg/m <sup>2</sup> )	2/26 (7.7%)	0/26 (0.0%)	24/26 (92.3%)	Yes
Diabetes	2/26 (7.7%)	5/26 (19.2%)	19/26 (73.1%)	Yes
Presence of at least two metabolic risk abnormalities from the following:				
Waist circumference $\geq 94/80$ cm in men and women	2/26 (7.7%)	0/26 (0.0%)	24/26 (92.3%)	Yes
Blood pressure $\geq 130/85$ mm Hg or specific drug treatment	3/24 (12.5%)	3/24 (12.5%)	18/24 (75.0%)	Yes
Plasma triglycerides $\geq 150$ mg/dL ( $\geq 1.70$ mmol/L) or specific drug treatment	3/24 (12.5%)	0/24 (0.0%)	21/24 (87.5%)	Yes
Plasma HDL cholesterol $< 40$ mg/dL ( $< 1.0$ mmol/L) for men and $< 50$ mg/dL ( $< 1.3$ mmol/L) for women, or specific drug treatment	2/26 (7.7%)	0/26 (0.0%)	24/26 (92.3%)	Yes
Prediabetes	1/24 (4.2%)	5/24 (20.8%)	18/24 (75.0%)	Yes
Homoeostasis model assessment of insulin resistance score $\geq 2.5$	3/23 (13.0%)	1/23 (4.4%)	19/23 (82.6%)	Yes
Plasma high-sensitivity C-reactive protein $> 2$ mg/L	9/21 (43.0%)	4/21 (19.0%)	8/21 (38.0%)	No

**Table 2: Consensus statements and level of agreement on the updated diagnostic criteria for metabolic-associated fatty liver disease**

keeping the term "secondary" to describe other causes of hepatic steatosis (tables 1, 2). Because of the high prevalence of liver disease (particularly viral hepatitis) in the Middle Eastern and north African region, the panel recommends careful consideration of the presence of dual causes. This group of patients with liver disease are likely to have differential natural history, prognosis, and response to treatment. For example, MAFLD might accelerate the progression of liver disease in patients with alcoholic liver disease and viral hepatitis, and synergistically induce liver cirrhosis or even the development of hepatocellular carcinoma.<sup>30,31</sup> Similarly, patients with MAFLD are more susceptible to developing drug-induced liver injury that superimposes on other probable causes of acute-on-chronic liver failure,<sup>32</sup> compared with patients who do not have MAFLD. The

proposed algorithm for the diagnosis of MAFLD is depicted in appendix 2 (p 2).

### Discussion

This consensus has shown that there is a substantial degree of dissatisfaction with the current nomenclature among the participating experts. The reasons behind this dissatisfaction can be viewed from four perspectives: that of the patient, the physician, the payer, and the science. The impact of these negative consequences extends beyond academic interest to adversely affect the quality of health care delivered and the chance that patients will embrace the necessary behavioural changes.

### The patient's perspective

From a patient perspective, the use of the name NAFLD has at least three major concerns: confusion, stigmatisation, and trivialisation. Questions that health-care providers in our region are frequently faced with when dealing with patients include, "I want to know what my disease is, not what it is not" and "If it is not alcohol-related, what is it due to?". Accordingly, a 2019 study indicates that patients do not have a great understanding of this disease and are not familiar with its consequences in the long term.<sup>33</sup> The current nomenclature causes serious confusion among patients and restricts effective communication between physicians and patients about the disease.

Most of the Middle Eastern and north African region have a religious prohibition on alcohol consumption and social discouragement of drinking. Because of the association of the name NAFLD with alcohol use, the disease results in substantial stigma in society. The negative effect that stigma has in exacerbating illness is well established, resulting in a barrier to awareness of liver disease and inequity in access to appropriate care. It is also increasingly recognised by health-care providers in the region that patients and their families are seeking to reduce the stigma of fatty liver disease and that it affects their engagement with clinical services. Therefore, a change in nomenclature is a key tool for reducing stigmatisation, which was emphasised by the European Liver Patient's Association in 2018.<sup>34</sup>

The term NAFLD also trivialises the problem by including terms such as "non", which might be interpreted as a suggestion that the disease is not serious or even as a licence to consume alcohol. These aspects are reflected in the current nihilism in the standard of health care for fatty liver disease associated with metabolic dysfunction in the Middle East and north Africa. For instance, according to NAFLD guidelines from the American Association for the Study of Liver Diseases,<sup>35</sup> European Association for the Study of the Liver,<sup>36</sup> and Asian Pacific Association for the Study of the Liver,<sup>37</sup> liver biopsy is required to diagnose, stage, and grade the disease. Unfortunately, even patients who understand

that they are at risk of serious liver disease might avoid biopsy because the disease is trivialised by the use of the term “non”. This response contrasts with the situation for viral hepatitis when, before the advent of new therapies, patients were willing to have a liver biopsy to stage their hepatitis B or hepatitis C. The resulting delays in diagnosing fatty liver disease associated with metabolic dysfunction compound detrimental patient outcomes and associated financial burden, and prevent early intervention when it is most effective. Of direct relevance, it has been shown that most patients with fatty liver disease associated with metabolic dysfunction are diagnosed incidentally and at the time of cirrhosis diagnosis.<sup>38</sup> Hence, there is an implicit assumption by the panel that as a consequence of the nomenclature change, patients are likely to perceive the disease more seriously and better understand the emerging long-term consequences. In turn, a positive change in attitude might improve disease management and patient outcomes, and effectively link patients to treatments for the probable extrahepatic consequences of the disease. Overall, understanding patient preferences and appreciating patient needs across the broad population of patients with fatty liver disease associated with metabolic dysfunction should translate into improved acceptance of health-care messages.<sup>33</sup>

### The physician’s perspective

The current diagnosis of NAFLD is based on the presence of steatosis in more than 5% of hepatocytes in the absence of arbitrarily defined, clinically significant ongoing or recent alcohol consumption and other known causes of liver disease.<sup>35–37,39</sup> As alcohol use is a stigmatised behaviour in the Middle East and north Africa, patients in this region might deny its consumption when asked during consultation.<sup>40</sup> Additionally, any discussion of alcohol use can be off-putting for patients who might feel stigmatised or judged. This situation is even more challenging when asking specific subpopulations (eg, women and children) because of cultural taboos, making the certainty of diagnosis impossible for the physician. Thus, the update of nomenclature benefits both patients and doctors by removing the stigma of alcoholism with all its implications. Removing confusion regarding terminology and having a positive and non-stigmatising set of diagnostic criteria can improve awareness of the disease and decrease the disconnection between messages conveyed by physicians and information retained by patients.

### The regulatory and payer’s perspective

The next steps for research and policy on MAFLD in the Middle East and north Africa are challenging. Linking the name of a metabolic disease to alcohol consumption, as has been the case with NAFLD and will be overcome with the adoption with MAFLD, is likely to be problematic, turning the disease into one of a lower priority for

allocating resources for research or health policy across most, if not all, of this region. There is also minimal consideration of the influence of obesity and metabolic abnormalities on liver health as a national health policy. Therefore, although most countries in the Middle East and north Africa have strategies or action plans for related conditions (eg, obesity and diabetes), fatty liver disease associated with metabolic dysfunction is infrequently or not at all discussed. Additionally, none of the countries in this region have a written national strategy or action plan for fatty liver disease. To the best of our knowledge, in all of the nations in the Middle East and north Africa, there is no implementation of comprehensive preventive programmes backed by suitable policies, surveillance, monitoring, and evaluation systems in primary health-care settings. Similarly, scientific research and publication on fatty liver disease (indicated by quantity and coverage) is strikingly low but required, especially research with a regional focus.

### The scientific and academic perspective

Although originally intended to clearly differentiate the cause of this disease from alcohol-induced fatty liver disease, the term “non-alcoholic” is unhelpful and perpetuates the false assumption among health-care professionals that fatty liver disease associated with metabolic dysfunction represents a diagnosis of exclusion. This term also leads to perceptions among less informed physicians that the disease is not important in the Middle East and north Africa. Furthermore, what constitutes a threshold for clinically significant alcohol consumption, particularly in paediatric cases, is moot.

Additionally, our understanding of the pathogenesis of fatty liver disease associated with metabolic dysfunction is advancing and it is well recognised to occur as a result of an underlying alteration of systemic metabolic status. Hence, updating the nomenclature would help to clearly describe the disease.

One of the previous suggestions for nomenclature was to adopt obesity-induced liver disease as a replacement term. However, the panel felt that MAFLD was more appropriate given that, although obesity is the single major risk factor for MAFLD, the condition can also develop in people who are not obese.<sup>41</sup> The use of the term obesity is also likely to be a focus of considerable social stigma.

### Why does the consensus endorse redefining fatty liver disease?

The expert panel recommends the implementation of positive criteria to diagnose MAFLD, given its high prevalence and that of its related risk factors in the Middle Eastern and north African super-region, combined with the prevalence of viral hepatitis B and C. The new criteria will allow for a diagnosis based on positive criteria and will enable disease diagnosis, even if hepatitis C is cured or hepatitis B virus replication is

**Panel: Research priorities and unmet needs in the field**

We suggest the following aspects as research priorities in the Middle East and north Africa:

- We recognise that there are no specific cutoff values for lipid and waist circumference for the region, and we recommend use of international criteria for the current time. Identification and standardisation of these cutoffs is necessary in the Middle East and north Africa.
- Further studies are required to validate the proposed diagnostic criteria and disease definition in population-based cohorts.
- Despite the rising prevalence of metabolic-associated fatty liver disease in the Middle East and north Africa, more data are required on the prevalence of this disease (including in people who are not obese).
- Whether the prevalence of metabolic-associated fatty liver disease is underestimated or not needs to be determined. With the high prevalence of hepatitis B and C virus in the Middle East, a large proportion of patients are predicted to have more than one cause of liver disease. Further studies are required to clarify this prevalence.
- Data on patients' awareness, economic health burden, and impact on the quality of life are required to inform and raise awareness among policy makers.
- Population-based data are required to assess the performance and the optimal cutoffs of non-invasive diagnostic tests for the progressive form of metabolic-associated fatty liver disease.
- Patients from the Middle East and north Africa are currently under-represented in ongoing clinical trials for metabolic-associated fatty liver disease; this needs to change.
- Prioritising research activity and research resource allocation and encouraging collaborative research studies and funding are crucial in filling these research gaps.
- Characterisation of the genetic architecture of metabolic-associated fatty liver disease in the Middle East and north Africa is required.

suppressed. Furthermore, the coexistence of MAFLD with other chronic liver diseases is expected to be common, further suggesting the need for a set of positive criteria for diagnosis, regardless of concomitant diseases. Patients with more than one liver disease are likely to have differential prognosis and response to therapy. These criteria will ensure that efforts are ongoing to eliminate all forms of liver disease in a particular patient. According to current criteria, linking a diagnosis of fatty liver disease to exclusion criteria (eg, alcohol use or viral hepatitis) means that it seriously and negatively affects the accuracy of population screening for fatty liver disease associated with metabolic dysfunction and reported incidence rates. It should also be noted that, according to current criteria, there is no clear threshold for alcohol intake, with data

suggesting that alcohol use is associated with hepatic steatosis even among individuals presumed to have NAFLD.<sup>42</sup> Notably, a 2020 study suggested that the definition of MAFLD is more practical and efficient for identifying patients with fatty liver disease at high risk of disease progression than is the definition of NAFLD in a real-world cohort.<sup>43</sup> In this study, patients with MAFLD were older (48·39 years [15·20] vs 46·81 years [15·77]) and had a higher BMI, higher risk of metabolic comorbidities (eg, diabetes and hypertension), higher homeostatic model assessment of insulin resistance, and higher concentrations of lipids and liver enzymes than did patients with NAFLD. Further studies are required to assess the validity of these criteria in real-world cohorts from the patient population in the Middle East and north Africa.

**MAFLD: an umbrella term**

There is growing evidence of the substantial heterogeneity of fatty liver disease associated with metabolic dysfunction; therefore, the term MAFLD represents an umbrella for describing a spanning spectrum of disease that is likely to be composed of several phenotypes that vary in pathophysiology, prognosis, and patterns of response to therapy. These phenotypes might present to a varying extent among patients in real-life practice. Thus, we recommend abandoning the term non-alcoholic steatohepatitis, because it is an outdated, oversimplistic term that does not match current understanding of the disease. Similarly, we recommend abandoning the term cryptogenic cirrhosis to describe cirrhosis related to fatty liver disease because, again, this diagnosis should be considered as a part of the spectrum of the disease. As with other liver diseases, patients with MAFLD should be scored according to the degree of inflammation and fibrosis. With the general move towards personalised medicine to improve clinical care, a future research direction would be to address how best to show this heterogeneity, incorporating various aspects, such as genetics, epigenetics, metabolomics, and microbiome (appendix 2, p 3). In particular, the dynamic interaction between genetics and environmental factors has an important role in shaping the intraethnic and intrageographical variation in the prevalence and natural course of MAFLD.<sup>44,45</sup>

There was no clear consensus between the panel members on what the other causes of hepatic steatosis should be called, aside from MAFLD. We recommend continued use of the term secondary to describe these conditions for the time being.

**Conclusion**

The statistics for fatty liver disease associated with metabolic dysfunction and its related conditions are alarming and indicate the need for an urgent call for action to tackle this disease. In this Review, leading members from countries in the Middle East and north

### Search strategy and selection criteria

We searched Ovid MEDLINE and Embase between Feb 15, 2020, and June 11, 2020, for articles published at any time until June 11, 2020, that described studies and review articles related to the nomenclature and definition of metabolic-associated fatty liver disease. We used the search terms “fatty liver”, “NAFLD”, “MAFLD”, AND “metabolic fatty liver” and examined the reference lists of articles to identify additional studies and searched the grey literature. Considering the dynamic of the topic and the need to increase the sensitivity of the search, we did a grey literature search using the same keywords on Google Scholar to find the most recently published articles. We restricted the literature search to articles published in English.

Africa recommend use of the term MAFLD over NAFLD to describe fatty liver disease associated with metabolic dysfunction and to apply the suggested positive criteria for diagnosis. Panel members will recommend these findings to health-care authorities in their respective countries and will work with them to implement these changes in health-care policies. If appropriately implemented, these recommendations could substantially improve the prevention, awareness, identification, and treatment of fatty liver disease associated with metabolic dysfunction. The proposed redefining of the disease should increase the prioritisation of research activity on MAFLD to fill current gaps of knowledge (panel). This action, supported by appropriate resource allocations, collaborative funding grants, a coordinated interdisciplinary approach, and effective policy decisions, will help to combat the growing burden of this disease.

#### Contributors

All authors contributed to the conceptualisation and the writing of the Review. GS reviewed the drafts and approved for final publication.

#### Declaration of interests

IW reports grants from Novartis, Abbvie, and Onxeo; and personal fees from Merck Sharp and Dohme, and Eva Pharma, outside of this Review. All other authors declare no competing interests.

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