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Regional variation in characteristics of patients with decompensated cirrhosis admitted to hospitals in the UK

The Trainee Collaborative for Research and Audit in Hepatology UK *

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We performed a sub-analysis of our retrospective study investigating emergency admissions for patients with decompensated cirrhosis in November 2019 across the UK (18 months after the introduction of minimum-unit pricing (MUP) in Scotland).[1] Admissions were grouped by NHS regions and comparisons were made utilising Chi-square or Kruskall-Wallis tests (see Supplementary Methods).

We included 1,224 admissions from 104 Hospitals across the UK (see Supplementary Table 1). 85.1% of admissions were for patients with a previous diagnosis of cirrhosis. Only 67.2% had a prior history of decompensation implying that nearly a third of admissions were index presentations of decompensated cirrhosis. Inpatient mortality was high with nearly 1 in 6 admissions (15.6%) resulting in patient death (Supplementary Table 2).

Alcohol-related liver disease (ARLD) was the predominant aetiology of liver disease (74.8% of admissions) followed by non-alcoholic fatty liver disease (NAFLD) (14.3%) (Supplementary Table 2). Other aetiologies were less well-represented with the third highest aetiology being hepatitis C (4.1%). Importantly, 56.0% of patients reported at least weekly alcohol intake. There were differences in the regional prevalence of both ARLD and NAFLD (Figure 1). Hospitals in National Health Service (NHS) Scotland that were included in our study had the lowest number of admissions for patients with alcohol-related liver disease (86 [67·2%] of 128 admissions (Figure 1A)) and the second highest proportion of admissions related to NAFLD (30 [23·4%] of 128 admissions (Figure 1B)). Despite bordering NHS Scotland, hospitals from NHS North East and Yorkshire that were included in our study had the highest number of admissions for patients with alcohol-related liver disease (131 [81·9%] of 160

admissions (Figure 1A)) and the fourth lowest proportion of admissions related to NAFLD (19 [11·9%] of 160 admissions (Figure 1B). However, there were no significant differences between regions in proportion of admissions for patients regularly using alcohol with NHS Scotland fifth highest in this domain (Supplementary Table 3).

With nearly 90% of admissions for decompensated cirrhosis being for patients with NAFLD or ARLD, it is essential that healthcare policy focuses on reducing the prevalence of these aetiologies. Our data supports the recent assessment of MUP in Scotland underscoring the importance of a unified approach to MUP being adopted across the UK.[2] Recent data have demonstrated the impact of the soft-drink industry levy on the prevalence of childhood obesity.[3] Further interventions targeting high sugar and salt containing produce may positively impact the UK prevalence of NAFLD. However, there needs to a targeted approach to overcome societal inequalities which are strong drivers of disease.[4] Our finding that regions historically associated with a higher prevalence of liver disease have significantly younger median admission ages likely reflects the association of liver disease with deprivation (Supplementary Table 3). Undoubtedly, tax levies impact patients in lower socioeconomic groups more than those in higher socioeconomic groups. Funding generated from such policies should be reinvested in alcohol and obesity services with areas of deprivation prioritised. There has been welcome increased funding to local authorities in England to improve drug and alcohol addiction services, with areas of deprivation prioritised, and this needs to be sustained to have maximum impact and reverse the real-term per person cuts since 2015-2016. [5] However, there remain well-described inequities in access to obesity services across the UK which need to be addressed.[6] Effectively implementing

targeted interventions to combat ARLD and NAFLD will likely reduce the burden of liver disease over time.

Limitations of this study are discussed in Supplementary Methods and include; the retrospective design, use of a single month and incomplete coverage of all UK hospitals. The COVID-19 pandemic has again further changed the landscape around liver disease, including the aetiological drivers, individual behaviours and access to healthcare services as a whole.[7]

Whilst there has been significant focus in improving outcomes for patients with established liver disease and decompensation in the UK, prevention is better than cure. It is imperative that we advocate for reconciled, coordinated healthcare polices focused on preventing morbidity and mortality due to NAFLD and ARLD.

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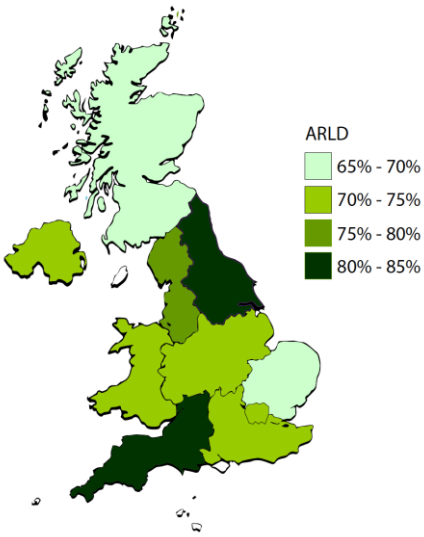
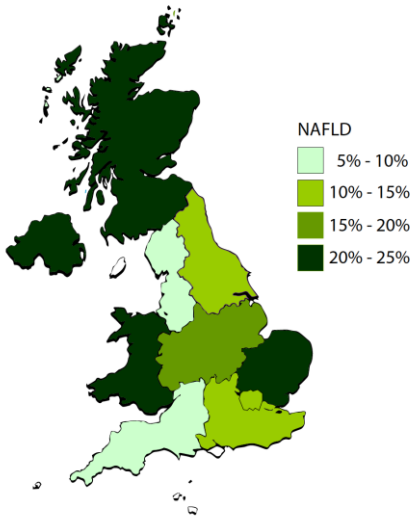


A)



B)

Figure Legend

Figure 1. Geographical representation of admissions for patients with ARLD and NAFLD. A) ARLD **B)** NAFLD. Results presented of Chi-square tests. See Supplementary Table 3 for more information. Statistical significance signified by *

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