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New metrics for the Lancet Standing Commission on Liver Disease in the UK

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New metrics for the Lancet Standing Commission on Liver Disease in the UK



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Executive summary

The format for this third report of the *Lancet* Commission follows the same pattern as in 2015 in concentrating on the main recommendations, all of which are evidence based and have been most carefully considered in terms of their ability to reduce the current burden of liver disease in the UK and its financial cost. The working groups set up around the recommendations have concentrated this year on producing a set of the main metrics, which will enable further charting of disease prevalence and consequences on an annual basis. They have also identified those areas where important data are not being obtained, which needs to be rectified. The metrics shown were decided on after extensive discussion and in many cases numerical data are incomplete, having not been available within the time frame for this report. Where targets have not been set, the aim is to consider these further in the next year's programme of work.

The initial ten recommendations have been reduced from ten to eight because of some overlap between the original points. **[A: we are not able to include panels, figures, or tables in the summary, so the panel has been converted to text here. I have copied the previous sentence into the introduction of the main text so that the panel can be included there.]** The eight recommendations are: (1) improving expertise and facilities in primary care to strengthen detection of early disease and its treatment, and screening of high-risk patients in the community; (2) establishment of acute liver services in district general hospitals linked with 30 regional specialist centres for complex investigations and treatment, and increased provision of medical and nursing training in hepatology; (3) a national review of liver transplantation to ensure better access for patients to increase capacity; (4) specialist paediatric services and continuity of care in transition arrangements for children with liver disease reaching adult life; (5) measures to reduce overall alcohol consumption in the country; (6) promotion of healthy lifestyles to reduce obesity and the burden of non-alcoholic fatty liver disease; (7) eradication of chronic hepatitis C virus infection from the UK **[A: correct?]** by 2030 and a major reduction in the burden of disease for hepatitis B; and (8) increasing awareness of liver disease in the general population and within the National Health Service (NHS), including the work of liver patient support groups.

The recommendations are in agreement with the ongoing thinking and action of the All Party

Parliamentary Group on Liver Health, with which we are increasingly liaising. The target audience of this report, as for the previous reports, encompasses all those involved in health care, including hospital consultants, general practitioners, public health physicians, and most importantly, those involved in industry and marketing. The recently published, comprehensive **Global Burden of Disease Study 2015** also includes important data on disease burden for alcohol, obesity, and viral hepatitis in relation to other major non-communicable diseases related to lifestyle issues, including smoking.

For many of the recommendations the metrics show little progress in terms of reduced disease burden, although together with the efforts of other bodies and agencies, there has been some movement in that direction. Thus, for recommendation 1, the recently published guidelines by NICE on fatty liver disease and the diagnosis of cirrhosis are likely to help considerably in improving clinical management at general practitioner and community level, giving guidance as they do on the best pathways to follow for the early identification and treatment of liver disease. Similarly, for recommendation 2, on the need to improve hospital services, we can point to the completion of a major review of hospital staffing and facilities for the care of the sick liver patient in hospital. These will inform further efforts to improve hepatological expertise and facilities within district general hospitals and the desired networks with specialist centres.

The updated version of the maps published in last year's report illustrate the considerable variation in levels of current provision and will be of value in discussions on rationalisation and avoidance of duplication in provision of acute services being proposed. **[A: it's not possible to include figures in the summary, but the maps are cited and included later in the main text]** The maps also illustrate the need for greater provision of liver services in the deprived areas that have the highest rates of liver disease morbidity and mortality. The number of district general hospitals that do not meet the criteria for an acute liver service is unacceptable.

Recommendation 3, relating to the national strategic review of liver transplantation in the UK, is proceeding, albeit rather slowly. This is because of the need, with the financial constraints facing the NHS at present, for the costs of this procedure to be properly considered along with agreement on work packages. The recommendation remains that additional centres are set up to correct the

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PII

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For Global Burden of Disease Study 2015 see <http://www.thelancet.com/gbd>

present geographical inequalities and increase the number of liver transplants carried out. Of note here during the past year is the likely increase in the number of donor organs available as a result of new developments in organ perfusion which can return function to donor livers, particularly those obtained from donors after cardiac death that were previously considered too damaged for use. Furthermore, initial results of the introduction of presumed consent in Wales have shown a striking increase in the number of organs being donated over the first four months of its operation.

Recommendation 4 highlights again the ever increasing population of adolescents with liver disease requiring supervision and care arising from the better results of treatment of infants and children including the use of liver transplantation. The measures needed are outlined with some encouraging pilot statistics.

Sadly the sections about recommendations, 5, 6, and 7, on the consequences of the lifestyle issues of excess alcohol consumption and obesity, as well as viral hepatitis, make depressing reading. The section on liver disease due to alcohol shows the increase in alcohol consumption and hospital admissions that was predicted to follow removal of the escalator tax in 2014. The necessary measures to reverse this are again set out in this section including further information on the value of the minimum unit pricing policy [A: have I spelled out "MUP" correctly?]. A recently published, nationally commissioned representative survey of over 3000 respondents in Northern Ireland [A: as we cannot include references in the summary, the citation has been removed here and subsequent references renumbered.] again showed that the minimum unit pricing [A: ok?] policy targeted those suffering the greatest harm from drinking and would significantly reduce alcohol attributable mortality. Recent studies have also shown that the percentage of total alcohol consumed by the heavy drinkers has increased from 13% to 17%.

Similarly there is little encouragement to report for recommendation 6, on the introduction of effective measures to reduce obesity rates for the 60% of the population who are now in the overweight category. The outcry from the medical profession and public alike on the watering down of the sugar tax proposal is some indication of the realisation of the harmful effects of obesity in causing diabetes, heart attacks, and liver disease. Surveillance programmes for primary hepatocellular carcinoma in patients with cirrhosis as well as those with fatty liver disease are still not being implemented in district general hospitals despite the continued increase in the number of such cases. The enormous cost of obesity to patient health, to the NHS, and to society in general, are highlighted. In the context of hepatocellular carcinoma development, smoking, it should be emphasised, remains an important contributing but preventable risk factor.

Recommendation 7 does portray a more hopeful note on the treatment of patients with hepatitis C. The new

drugs that have been introduced are proving in practice to be both efficacious and safe, with resulting high levels of viral clearance. On present evidence, the risk of selecting resistant mutations would appear to be low. Operational Delivery Networks are in place throughout England and the main issues relate to how many and which cases should be treated, with the limitation on total cost imposed by NHS England. The very high price of the medication imposed by manufacturers on high income countries remains difficult to justify.

For recommendation 8, which relates to increasing public awareness of health problems from liver disease, there is undoubtedly very much more activity in the media on lifestyle health-care issues. Most importantly, the Commission is able to report considerable ongoing success in meeting with Members of Parliament (MPs). Engaging their support is essential if the necessary legislation and regulation are to be finally approved by Parliament. National liver disease profiles detailing disease prevalence and mortality have been produced for each of the 533 parliamentary constituencies and show a 17-fold difference in the rates for the most deprived areas. [A: please clarify; do you mean a 17-fold difference in rates between the most and least deprived areas?]

Introduction

Are we being too optimistic in seeing a little light at the end of the tunnel for the efforts of the *Lancet* Commission to reduce levels of morbidity and mortality from liver disease in the UK, which predominantly affects those still in working life and is increasingly being seen in the young? Lifestyle issues of excess alcohol consumption, obesity, and viral hepatitis, responsible for the majority of liver illness in this country, are increasingly being featured in the media. As yet, however, the long entrenched government policies on alcohol and obesity remain in place, and the lobbies of the food and drinks industry continue to have a major influence. The increasing demands on the National Health Service (NHS) and the resulting financial pressures must be a strong argument for the introduction of measures that can substantially reduce the prevalence of disease. The health and cost benefits to the country from tackling smoking through regulation and taxation should be an encouragement to Parliament to follow similar initiatives for the other major lifestyle issues. £2.1 billion is spent each year on the treatment of liver disease. Hospital admissions and mortality rates are increasing again, as described in this third report of the *Lancet* Commission. Being largely preventable, this cannot be justified; nor can the figure of nearly 60% of UK [A: correct?] police officers' time being spent on alcohol-related offenses. Furthermore, according to HM Treasury's figures, without the cuts and freezes in alcohol duty over the past few years, including those in the 2015 government budget, alcohol duty would have raised £770 million more for the government exchequer in 2016–17. As a

result of scrapping the duty escalator, government finances will be £2.9 billion worse off by 2017–18.¹ [A: references have been renumbered to accommodate citations added during peer review and deletion of first reference from summary] The costs of obesity alone amount to £5.1 bn a year for the NHS, with 40 000 deaths linked to people being overweight or obese. There were 440 288 admissions to hospitals in England in 2014–15 in which obesity was the main or secondary reason for a person being admitted.

This *Lancet* follow-up report, with its emphasis on metrics, gives many other examples of the cost to the country of not taking the necessary measures over lifestyle issues. Sadly, plans for introduction of a sugar tax, proposed in the Queen’s Speech to Parliament, have been watered down, particularly with respect to important limits on advertising junk food, although proposals on sugary drinks remain. How effective will be the targets set on the food industry for reducing sugar content of foods? Sally Davies, Chief Medical Officer for England, has bravely reduced safe limits for alcohol consumption for both women and men, on the basis of national and international evidence of the progressive increased risk of developing various cancers, including the common ones of breast and colon.

On a more optimistic note, two guidelines for the investigation and management of liver disease published by the National Institute for Health and Care Excellence (NICE) and guidelines by the British Society of Gastroenterology should help in the earlier detection and management of liver disease. This year has also seen the appointment of Jez Thompson as the jointly funded British Liver Trust and Royal College of General Practitioners Clinical Champion of Liver Disease. Already he is making an impact, as will be evident in his contribution to this report [A: correct?]. Improving health care for patients with liver disease in district general hospitals is also of vital importance, as highlighted by the adverse reports by the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) and the new data from a comprehensive national survey of staffing and hospital facilities. This [A: by ‘this’ do you mean the data/reports?] should provide the basis for better and more equitable planning of services, particularly in deprived areas with high incidence of liver disease. Public Health England (PHE) launched in August, 2016, a new tool to help local authorities prevent or reduce the impact of alcohol harm. Known as CLear, and based on the success of the tobacco control CLear tool, it provides a framework for local partnerships to review local structures and alcohol services. Additionally Scotland is moving forward again on introducing the minimum unit price for alcohol, and Wales and Northern Ireland are pursuing major programmes based on strong government support tackling the harms of liver disease. More information on the work going on in the devolved countries is considered

in the relevant sections of this report and in the general reviews [A: which general reviews?].

Encouraging also this year, and following a start made in 2015, has been the successful and increasing dialogue with MPs on raising awareness of liver disease in Parliament. The work has been greatly helped by the involvement of a lobbying agency, Incisive Health, to whom we are indebted for their ability in making contacts and in following them through. [A: reference to Norgine has been deleted, as this information is usually restricted to the competing interests/acknowledgments section] Representatives of the *Lancet* Commission held 16 one-to-one meetings with MPs from the government and opposition parties. The House of Lords had a debate on the implementation of the *Lancet* Commission’s

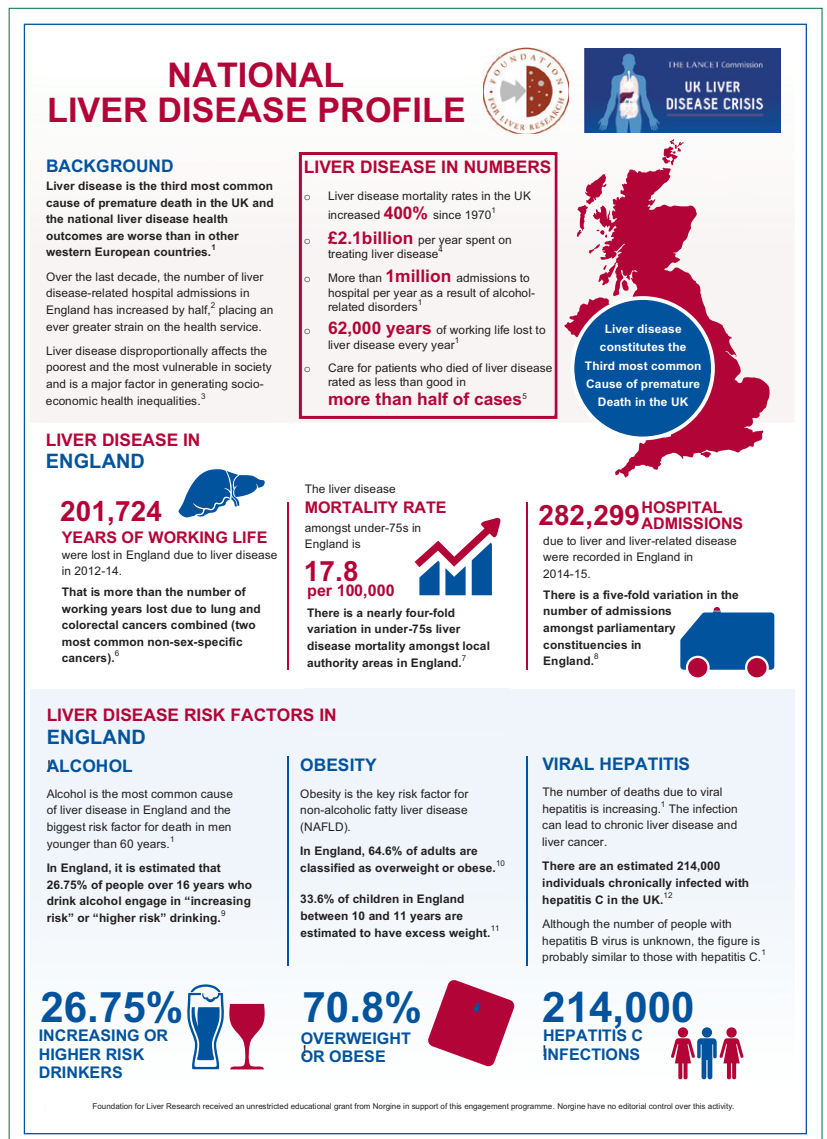


Figure 1: National liver disease profile for England [A: figure title ok? Please add publisher and year of publication] [A: please state copyright holder and confirm that you have obtained formal permission to use]

recommendations and multiple parliamentary questions have been tabled in both the House of Commons and the House of Lords on topics related to liver disease. In addition to private meetings, the *Lancet* Commission partnered with the All Party Parliamentary Group (APPG) on Liver Health in holding two parliamentary briefing events; one in the House of Lords (October, 2015), and another in the House of Commons (July, 2016). Both events sought to raise parliamentary awareness of the *Lancet* Commission's blueprint for improvement and of the need to act to address the continuing liver disease crisis. Together these events were attended by 38 MPs. In addition, we have been liaising closely with the Children of Alcoholics APPG.

July, 2016, saw the launch of the *Lancet* Commission's most recent campaigning resource, *Constituency Liver Disease Profiles*, designed to bring to life the health and financial impact of liver disease on local communities and generate greater interest in liver disease among MPs. As well as the national liver disease profiles (**figure 1**) [A: in several cases, figure citations appeared to give the wrong figure numbers. I have renumbered figures and citations accordingly - please check that the figures are in the correct order and that citations in the

text are correct throughout. For all images derived from other publications, please ensure that the source and copyright holder are acknowledged in the figure legend and confirm that you have obtained permission to use the figure - I have flagged this up in individual figure legends where it's clear that a figure has been published elsewhere, but I may have missed some] part of this initiative's work has been to produce a customised infographic for each of the 533 parliamentary constituencies in England, bringing together exclusive data provided by Public Health England and existing data intelligence to provide a concise summary of the impact of liver disease on local populations. The data collected as part of this exercise have been used in targeting MPs from the 50 areas with the highest burden of liver disease. The remarkable 17-fold difference between the burden of liver disease in the North West of England and rates in the Home Counties [A: you cited 'table 1' here, but the text does not match any of the supplied tables, so I have deleted the citation] is a telling statistic and, with its association with social deprivation, shows also the need for wider social and public health measures in addition to reducing alcohol consumption and obesity.

The constituency liver disease profiles are publically accessible on the Foundation for Liver Research website² and available to the wider liver disease community to be used in the briefing of relevant political stakeholders on the burden of liver disease in their areas.

The Commission will continue its engagement with Parliament and will explore other ways to communicate the burden of liver disease to key stakeholders, such as healthcare commissioners, local authorities, and those charged with developing and implementing sustainability and transformation plans.

Panel 1 summarises the Commission's recommendations, which have been reduced from ten to eight in order to reduce overlap between the original points. [A: ok to include panel 1 here? (All figures, tables, and panels need to be cited in the text)]

Recommendation 1: improving expertise and facilities in primary care to strengthen detection of early disease and its treatment, and screening of high-risk patients in the community

[A: we cannot use bullet points within the main text, so the text has been edited accordingly] The most common forms of liver disease have risk factors shared with other co-morbidities that are typically already under primary care surveillance, and which can be identified and addressed within primary care to prevent liver pathology developing. Once developed, liver disease is typically slow to progress, and the patient with early disease might remain asymptomatic for years, while the disease itself is slowly advancing in severity. Early intervention, risk modification and treatment within primary care might prevent or retard progression to cirrhosis and end

Panel 1: Updated recommendations of the *Lancet* Standing Commission for Liver Disease in the UK [A: title ok?]

Recommendation 1: improving expertise and facilities in primary care to strengthen detection of early disease and its treatment, and screening of high-risk patients in the community

Recommendation 2: establishment of acute liver services in district general hospitals linked with 30 regional specialist centres for complex investigations and treatment, and increased provision of medical and nursing training in hepatology

Recommendation 3: a national review of liver transplantation to ensure better access for patients to increase capacity

Recommendation 4: specialist paediatric services and continuity of care in transition arrangements for children with liver disease reaching adult life

Recommendation 5: measures to reduce overall alcohol consumption in the country

Recommendation 6: promotion of healthy lifestyles to reduce obesity and the burden of non-alcoholic fatty liver disease

Recommendation 7: eradication of chronic hepatitis C virus infection from the country by 2030 and a major reduction in the burden of disease for hepatitis B

Recommendation 8: increasing awareness of liver disease in the general population and within the NHS; work of liver patient support groups.

stage liver disease. Patients with advanced liver disease spend the majority of their lives within their own families and communities where they are registered with a general practitioner. Although many people with advanced liver disease attend secondary care outpatient clinics and some have repeated hospital admissions during acute crises, much of their health care is provided within community settings. For these reasons, clinicians working in primary care and other community services, including community drug services, have unique and important roles in the prevention, early detection and management of liver disease. Engagement will reflect local factors, including local prevalence, population demographics, and level of prioritisation by local commissioners, as well as mechanisms to incentivise staff and investment in support services.

Primary prevention of liver disease includes screening for hazardous and harmful alcohol use and obesity³ and having access to early in-house interventions or referral pathways to services to address these issues.^{4,5} Hepatitis B immunisation for those at risk, including injecting drug users, is another form of primary prevention. Critical to primary care, and to pressing workload considerations, is the recognition that many risk factors for liver disease are also risk factors for other long-term conditions. Effective screening for liver disease risk factors does not necessarily mean new work, but rather the linking of liver disease to current best practice and the monitoring and management of other conditions.

Secondary prevention of liver disease includes screening for hepatitis C^{6,7} and hepatitis B infections in those who have been, or are current, drug injectors or who have other risk factors,⁸ and onward referral if necessary.⁴ It also includes case-finding for early liver disease in those with high-risk obesity or alcohol use and providing appropriate interventions and ongoing monitoring.^{5,9}

Tertiary prevention of the consequences of established and more severe liver disease includes ongoing involvement in the support, monitoring, and management of patients with more advanced liver disease, together with appropriate referral of patients to secondary care services.¹⁰ Further developments might include appropriately resourced and supported initiatives to move areas of care traditionally delivered within secondary care to primary care, such as hepatitis C treatment, building on innovative models and frameworks already in place.^{11–13}

Substantial work has already been done to raise the profiles of these roles for primary care practitioners. The *Lancet* Commission publications have provided several recommendations with relevance to primary care.^{10,14} In 2016, the Royal College of General Practitioners (RCGP) selected liver disease as a one of their clinical priority programmes,¹⁵ and, in partnership with the British Liver Trust, it has recently appointed a primary care Clinical Champion for Liver Disease.¹⁶ This builds in part on the RCGP Nutrition for Health clinical priority programme (2011–15), whose RCGP nutrition position statement

clarified the need for greater primary care action on obesity and the role of obesity as a risk factor for liver disease.¹⁷ An RCGP liver disease position statement will be developed as part of this new clinical priority programme, in order to benchmark good practice in primary care, and to support the translation of new NICE guidance on non-alcoholic fatty liver disease (NAFLD) and cirrhosis into service delivery, especially where investment in commissioning new diagnostic testing facilities is required.

Raising the profile of liver disease within primary care requires the development of robust guidance together with effective drivers to alter clinical practice.¹⁴ These include professional training, development of toolkits and pathways, and investment in services to facilitate increased management of liver conditions within primary care.¹⁴ Bold investment plus innovative local commissioning initiatives will be needed if traditional areas of secondary care management, such as hepatitis C treatment, are to feature more in primary care as the price of new antiviral drugs falls and arrangements through the operational delivery networks become less necessary. Innovations require a full and realistic awareness of the large number of patients at risk of and with early liver disease, and the multiple competing workload pressures that already exist within primary care.¹⁰

As part of moving forwards with the *Lancet* Commission recommendations, a number of metrics have been proposed, to assess where we are now, and to guide future developments. The metrics agreed to support the *Lancet* Commission's recommendation 1 are shown in [panel 2](#).

Metric 1: percentage of adult patients in primary care who have had body-mass index recorded in the preceding year

NAFLD is an increasingly important cause of liver disease, including cirrhosis, as obesity rates rise at all

Panel 2: Metrics for recommendation 1

- 1-1 Percentage of adult patients in primary care who have had body-mass index recorded in the preceding year
- 1-2 Percentage of adult patients in primary care who have had a measure of alcohol consumption or risk in the preceding year
- 1-3 Percentage of adult injecting drug users who have had a recent hepatitis C virus test
- 1-4 Percentage of adult injecting drug users who have had hepatitis B virus immunisation
- 1-5 Introduction of a suite of Read codes to cover liver disease risk factors, diagnoses, and interventions to facilitate excellence of clinical care and practice audit and performance monitoring
- 1-6 Referral of all children born at term in the UK with conjugated jaundice to a national paediatric liver unit before they are 8 weeks old

ages within the UK, and for this reason assessing the percentage of adult patients in primary care who have had their body-mass index (BMI) recorded in the preceding year is important.¹⁸ Primary care is uniquely placed to identify obesity, and measuring and recording the BMI of a patient in the obese range is the first stage to providing in-house interventions or accessing a local tiered weight management pathway.

Despite developments in information technology within primary care, full data on BMI recording in general practice are not easily accessible. The data are held neither at the level of the clinical commissioning group (CCG) or devolved nation equivalent, nor by the relevant national public health body for the four nations of the UK. Complete datasets are available at practice level, but to access them would require large-scale surveys of practices across the UK.

The literature suggests that general practitioners (GPs) are not comfortable addressing obesity as a health issue. Ogden and Flanagan found that GPs are ambivalent about the effectiveness of obesity interventions, finding that “obesity does not belong within the medical domain”.^{19,20} In 2004, Hankey and colleagues found that less than 10% of GPs had carried out any form of audit to determine the prevalence of overweight or obesity in their practice population, and that health professionals were generally unclear on how to deliver effective weight management advice.²¹ Other published evidence points to GPs’ concern about the potential for damaging their relationship with their patients by bringing up the issue of obesity.²² More recent work has reiterated concerns about barriers to case finding and obesity management in primary care that centre on uncertainty about the evidence base, while signposting useful resources to address sensitivities about raising the topic of obesity in consultations and other training resources.²³

The best data for this metric come from the financial incentive quality and outcomes framework (QOF) target and payment scheme for GPs. One QOF target has been the establishment and maintenance of a register of patients aged 16 years and older with a recorded BMI of 30 or greater in the preceding 12 months. QOF recorded prevalence for obesity in England in 2014–15 was 9%, representing 4.2 million patients, and obesity had the second highest recorded disease prevalence after hypertension.²⁴ In Scotland the figure was 8% in 2014–15,²⁵ and in Wales 9.5% in 2014–15.²⁶ Data for Northern Ireland do not include easily available information on obesity as a record of disease prevalence. QOF data have limitations, and only relate to those people who have had a recent measurement and are therefore on each GP practice’s obesity register; they do not provide any BMI recordings in those who are overweight, or on obese people who are not on the practice’s obesity register. The best estimate of the overall prevalence of obesity comes from survey evidence. The Health Survey for England report²⁷ cited an overall

prevalence rate for obesity of 25% in England. Similar evidence gives an obesity prevalence of 24% in Wales²⁸ and 28% in Scotland.²⁹

Taken together these figures suggest that around a third of those who are obese have had measurement and recording of their BMI in primary care in the past 12 months and two-thirds have not. In the UK the average person consults his or her GP six times a year³⁰ and there is some evidence to suggest that those who are obese see their GPs at a higher rate than average.³²

More work is clearly needed to explore the drivers and barriers to measuring and managing obesity in primary care, and the effectiveness of interventions provided.

Metric 2: percentage of adult patients in primary care who have had a measure of alcohol consumption or risk in the preceding year

The full range of practice-based data on alcohol use and morbidity recording in consultations is not easily available, although GPs regularly use standardised and coded tools to record alcohol use and related morbidities.

Hazardous and harmful alcohol use is prevalent in the UK population. Survey statistics for Scotland show that nearly one in four men (23%) and around one in six women (17%) women drink at harmful or hazardous levels.³² In England, 18% of men and 13% of women drink at an increased risk of harm, and 5% of men and 3% of women drink at higher risk levels.³² Figures for Wales⁹ and Northern Ireland³³ are broadly comparable. **[A: original reference 1 now appears here as reference 33]**

Alcohol use is related to many areas of social, physical, and mental health problems, triggering high rates of consultation in primary care. Based on a survey conducted by the British Medical Association, the Institute for Alcohol Studies estimates that in Scotland around 6% of GP consultations are related to ill health contributed to by alcohol use.³⁴ An indirect estimate of the number of GP consultations contributed to by alcohol use in Leeds produced a figure of 10% of all consultations.³⁵ Given average consultation rates of five per person per year, this totals up to 30 million appointments each year across the UK.

However, a consultation for an alcohol-related condition does not mean that alcohol use was discussed. In their 1998 study, Kaner and colleagues found that GPs did not routinely enquire about alcohol use in their patients and only one in five GPs felt effective in helping a patient to reduce drinking levels.³⁶ Rapley and colleagues’ later survey found GPs were in fact routinely enquiring about alcohol use, but lack of time and the need to manage competing multiple problems within a single consultation were the main inhibitors to managing a greater number of risky drinkers.³⁷ A policy of brief interventions at the time of screening, at presentation with hypertension, and when symptomatic could have longer lasting effects **[A: than GP consultation?]**.

Data on direct engagement with alcohol issues in a GP consultation can only be sourced indirectly. Until 2015, the Practice Team Information (PTI) system collected consultation data from general medical practices in Scotland. The most recent PTI figures on GP consultations give an estimate of 94630 alcohol morbidity-coded primary care consultations by 48420 patients in 2012–13, and for the purposes of this metric a coded consultation is taken as a proxy measure of a primarily alcohol-related consultation.³⁸ Given that Scotland has a population of over 4 million adults and a harmful and hazardous alcohol use prevalence of around 20%, it can be estimated that there are 800 000 harmful and hazardous drinkers in Scotland. Given that just less than 50 000 patients had a primarily alcohol-related consultation in one year, this represents just 5% of the

harmful and hazardous drinking population of Scotland. Other evidence points to higher rates of engagement with alcohol consumption by GPs, and in a poll of English patients in 2004, Aalto found that 11% of those visiting their GP had been questioned by their GP about their alcohol use, even if briefly.³⁹ Further indirect evidence comes from a review of primary health-care records for patients who died from alcohol-related conditions in Glasgow in 2003. 21% had no record at any time of having been advised to abstain from alcohol; 23% had received a brief intervention; and 58% had been referred to a specialist alcohol service, though a third of these never attended.⁴⁰

However, local initiatives have shown that it is possible to achieve substantially better performance in primary care in this metric area ([panel 3, table 1](#)).

Panel 3: The Bolton CCG implementation example (see table 1 for data)

National and local reports surrounding alcohol behaviours suggest that Bolton, along with several other parts of North West England, is well above the national average for the prevalence of problem drinking. Alcohol harm is among the top five causes of the life expectancy gap [A: between wealthier and poorer people?] for both men and women in the town.⁴¹ A local project was developed to better understand the drinking habits and patterns of use and misuse among Bolton's adult population.

The initiative, which has been running now for 5 years, offers an AUDIT-C test every 2 years, to all patients aged 16 years and older. The primary care development and health improvement team, led by Stephen Liversedge, has been working closely with GPs and their staff to increase patient awareness of the dangers posed to good health and wellbeing from alcohol misuse. A pathway for primary care has also been developed.

The latest data show that since April, 2014, 129 867 patients have been supported to undertake an AUDIT-C test in primary care in Bolton. This accounts for 53.7% of the eligible population. Even though all 50 practices in Bolton participate in the initiative, some perform better than others [A: do you mean some GPs are better than others? If you mean the patient population differs between practices, is this sentence redundant?]. Table 1 shows local data analysis. [A: as tables and figures are required to stand-alone, we have moved the group definitions to the table. Please note that we are unable to use colours within tables, so the groups are shown in table subheadings]

The variability of AUDIT C-data in table 1 shows that practices with higher levels of deprivation within their population cohort can achieve high activity when appropriate support and modest incentives are in place.

As well as meeting the original aim of raising awareness of the dangers of alcohol misuse at a population level, this local project carries many other benefits:

Provides patient education about the benefits of abstinence and information about the risks of excessive drinking Presents opportunities for patients who are AUDIT-C positive (score ≥ 5) to have a comprehensive health trainer intervention at the surgery to modify unhealthy alcohol-related behaviours

Patients who are high-risk or dependent drinkers are directed to local alcohol services

Provides practices with an understanding of an individual's alcohol-related behaviours, which might assist with future healthcare

Alerts clinicians to the need to advise individual patients whose alcohol consumption might adversely affect their medications

Produces data that can inform commissioning for alcohol services

Supplies information to inform future projects

The initial scheme offered practices £2-00 per AUDIT-C completed. This was funded from Public Health [A: please clarify meaning of 'from Public Health'], included a training day for all clinical staff, and focused on activity. The current scheme now sits within the Bolton Quality Contract, which commissions for outcomes across 20 standards and 40 key performance indicators. All Bolton practices are signed up and alcohol screening is one of the key performance indicators. The local target for 2016–17 is to have 145 000 current AUDIT-Cs completed (60% of the eligible population). Investment has been £68 000 over 2 years, which currently equates to £0.53 per AUDIT-C completed.

Peer pressure among practices, arising from freely available local publication of the data for all Bolton practices, has helped to drive engagement, as has the investment in availability of in-house health trainers to modify unhealthy alcohol-related behaviours.

	Number of registered patients aged ≥16 years	Number of AUDIT-Cs done	Proportion of patients aged ≥16 years receiving AUDIT-C	Peer average for proportion of patients aged ≥16 years receiving AUDIT-C
High deprivation, BME, young (IMD 50-75-41-23)				
1	1523	1180	77.5%	72.5%
2	2297	2071	90.2%	
3	2274	2144	94.3%	
4	1021	891	87.3%	
5	2965	2403	81.0%	
6	2626	1340	51.0%	
7	4557	2487	54.6%	
High to mid deprivation, BME/mixed ethnicity, young/normal (IMD 51-88-38-15)				
8	3545	3043	85.8%	64.5%
9	3056	1374	45.0%	
10	2717	1631	60.0%	
11	3228	1115	34.5%	
12	3161	1733	54.8%	
13	1487	1109	74.6%	
14	1610	1272	79.0%	
15	1984	1623	81.8%	
16	1634	1082	66.2%	
17	3236	2048	63.3%	
18	6009	4393	73.1%	
Mid deprivation, mixed ethnicity, normal (IMD 40-40-26-84)				
19	6476	4171	64.4%	55.0%
20	1710	766	44.8%	
21	2752	1469	53.4%	
22	2374	1196	50.4%	
23	3152	2025	64.2%	
24	3941	2106	53.4%	
25	9378	5229	55.8%	
26	4089	1659	40.6%	
Mid deprivation, white, normal (IMD 44-95-34-71)				
27	10750	6251	58.1%	56.9%
28	5440	2591	47.6%	
29	5176	1718	33.2%	
30	4043	2352	58.2%	
31	2647	1474	55.7%	
32	5050	3805	75.3%	
33	8325	5510	66.2%	
34	5090	2760	54.2%	

(Continues in next column)

Metric 3: percentage of adult injecting drug users who have had recent HCV testing

Chronic HCV infection is thought to affect 214 000 people in the UK, representing 0.3% of the UK population. 90% of these infections have been acquired through injecting drug use. An estimated half of those with chronic hepatitis C infection are undiagnosed.⁴²

	Number of registered patients aged ≥16 years	Number of AUDIT-Cs done	Proportion of patients aged ≥16 years receiving AUDIT-C	Peer average for proportion of patients aged ≥16 years receiving AUDIT-C
(Table continued from previous column)				
Mid to low deprivation, white, normal/old (IMD 32-77-23-37)				
35	4905	2465	50.3%	42.0%
36	4024	2412	59.9%	
37	3281	2203	67.1%	
38	10 558	3764	35.7%	
39	4877	2255	46.2%	
40	2479	1242	50.1%	
41	6149	2402	39.1%	
42	10971	3114	28.4%	
Low deprivation, white, normal/old (IMD 21-18-9-76)				
43	8424	4826	57.3%	49.2%
44	6254	3555	56.8%	
45	12 201	4861	39.8%	
46	6212	3834	61.7%	
47	16 653	7676	46.1%	
48	8075	3004	37.2%	
49	2311	1131	48.9%	
50	4953	3102	62.6%	
All practices				
Total	241 650	129 867	53.7%	..

[A: column headings have been edited for clarity, please check that they are correct] Data are for April, 2014, to June, 2016 [A: correct?]. BME=black and minority ethnicity. IMD=index of multiple deprivation. [A: please add brief definitions for young, normal, and old]

Table 1: Patients undertaking AUDIT-C test in NHS primary care practices within Bolton CCG, clustered by deprivation, age [A: mean/median age? If not, please specify how age is defined], and ethnicity [A: ie, majority ethnic group? If not, please clarify how ethnicity is defined]

A high proportion of current psychoactive drug users attend services for treatment, and data on testing are routinely submitted to local commissioners by all drug services and collated by public health bodies in a number of [A: please clarify] reports. Further information is available via the Unlinked Anonymous Monitoring (UAM) survey of people who inject drugs in contact with drug services.

Drug misuse treatment is characterised by multiple treatment episodes and drug service patients have a comprehensive assessment at the start of each treatment episode which routinely covers HCV risk. In the UK in 2013–14, 87% of patients had been offered a hepatitis C test at the beginning of their most recent treatment episode, and of those more than two-thirds (67%) accepted the offer.⁴² Around half of those who inject psychoactive drugs are typically found to be hepatitis C antibody positive.⁸

In England and Wales, among those who inject only performance and image enhancing drugs, 3·6% have antibodies to hepatitis C. Only 32% report ever having been tested for hepatitis C. In Scotland, among those who had only injected image-enhancing [A: addition of 'enhancing' correct?] and performance drugs during the last 6 months, 5·1% had antibodies to hepatitis C in 2013–14 and just under a third (29%) reported ever being tested for hepatitis C. This had increased from 18% in 2010.⁴² As this group does not use traditional drug services, opportunities for HCV testing are needed outside drug treatment facilities.

Testing also takes place in general practice, and testing rates have increased year-on-year between 2010 and 2014, rising by 5% between 2013 and 2014, representing 60 000 tests across 23 sentinel laboratories each year.⁴² This suggests that awareness of HCV infection in the primary care setting is increasing, and this is particularly important for people who acquired the infection from historical injecting drug use and who might not have attended drug treatment services for many years, and for those who acquired the infection via an alternative route such as historical blood product transfusion, tattooing, or body piercing. It has been estimated that around 50% of individuals with chronic hepatitis C infection are not in contact with drug treatment services, and accessing more comprehensive data on testing in primary care will be of increasing importance.

Testing for HCV infection in the prison setting is particularly important as this population represents a particularly high-risk group. Data from several different sources suggest significant and continuing under-testing of this population group,⁸ but rates of testing for HCV rose from 5·3% of new admissions to prison in 2010–11 to 8·6% in 2013–14.

Metric 4: percentage of adult injecting drug users who have had HBV immunisation

Hepatitis B virus (HBV) is transmitted by parenteral exposure to infected blood or body fluids, and transmission in the UK is predominantly through sexual contact, blood-to-blood contact (eg, sharing of needles and other equipment by injecting drug users or needlestick injuries), or through perinatal transmission from mother to child. Data on HBV immunisation in sexual health clinics and primary care practices are not available, and the following metrics are focused on those who are at risk from injecting drug use and who are in contact with drug services. The data are taken from collated information provided routinely by drug services and from the Unlinked Anonymous Monitoring survey

In England, Wales, and Northern Ireland, reported uptake of the vaccine (ie, receiving at least one dose of vaccine) for those who inject psychoactive drugs increased from around half in 2004 to almost three-quarters in 2014. However, the level of uptake declined from 76% in 2011 to 72% in 2014. Among injecting drug

users surveyed in 2014 who had never been infected with hepatitis B and who had taken up vaccination, 61% had received three or more doses of the vaccine and had completed the course of immunisation. Of those who had not taken up vaccination 55% (219 of 396) were currently receiving a prescribed substitute drug as part of drug service provision. The non-immunised group used other health services where vaccination could have been offered; 62% (247 of 397) had seen a general practitioner; 26% (103 of 397) had attended an emergency department; 14% (56 of 397) had used a walk-in or minor injury clinic; and 7·8% (31 of 397) had attended a genitourinary medicine clinic.⁴² These contacts represent lost opportunities for vaccination as part of primary prevention. Among people injecting image-enhancing and performance-enhancing drugs in England and Wales only 40% reported uptake of the vaccine against hepatitis B.⁴²

Metric 5: draft and adopt a suite of Read codes to cover liver disease risk factors, diagnoses, and interventions to facilitate excellence of clinical care and practice audit and performance monitoring

Review by the commission team has identified an opportunity to develop a comprehensive set of Read codes (the standard clinical terminology system used in general practice in the UK) [A: definition of Read codes added for the benefit of readers who may not be aware of the term—ok?] relevant to both prevention and management of liver disease and associated risk factors. This project will be taken forwards by the Commission team over the next year.

Metric 6: to ensure that all children born at term in the UK with conjugated jaundice are referred to a national paediatric liver unit before they are 8 weeks old

Currently all children with significant neonatal liver disease [A: please clarify this. What types of neonatal liver disease are deemed significant/non-significant?] are referred to one of the three national liver units. National data is collected on the age at which Kasai portoenterostomy

Panel 4: Metrics for recommendation 2

- 2·1 Number of DGHs with liver units (>2 consultant hepatologists)
- 2·2 Number of regional specialist units
- 2·3 Number of consultant hepatologists in post
- 2·4 Number of DGHs with 24-hour emergency endoscopy cover
- 2·5 Number of DGHs enrolled into QuEST programme
- 2·6 Number of DGHs with multidisciplinary alcohol care teams

DGH=district general hospital.

	Consultant hepatologists (WTE)	Number of acute DGH (≥2 WTE hepatologists and ≥2 gastroenterologists with interest in hepatology)	Number of level 2 regional specialist liver units (services)	Number of large regional specialist liver units (≥3 WTE hepatologists)	Units (excluding large centres) with 24 h OOH; n (% able to manage varices)	TIPSS provision
UK	221; 0.34 per 10 ⁵ population (64.9 million)	16	23 (excluding 7 transplant centres)	21 (excluding 7 transplant centres)	143/183 (78%); [120/143 (84%)]	44/207 (21%)
England	193.8; 0.35 per 10 ⁵ population (54.7 million)	16	18 (excluding 6 transplant centres)	18 (excluding 6 transplant centres)	117/135 (87%); [104/117 (89%)]	34/159 (21%)
Scotland	20.6; 0.39 per 10 ⁵ population (5.3 million)	0	3 (excluding 1 transplant centre)	2 (excluding 1 transplant centre)	13/22 (59%); [8/13 (62%)]	8/22 (36%)
Wales	2.6; 0.08 per 10 ⁵ population (3.1 million)	0	1	0	5/16 (31%); [5/5 (100%)]	1/16 (6%)
Northern Ireland	4; 0.22 per 10 ⁵ population (1.8 million)	0	1	1	8/10 (80%); [3/8 (38%)]	1/10 (10%)

WTE=whole time equivalent. DGH=district general hospital. OOH=out-of-hours service. [A: definition correct?] TIPSS=transjugular intrahepatic porto-systemic shunt.

Table 2: Summary for UK and devolved nations of hepatologists per 100 000 population, hepatology provision in terms of staffing levels, level 2 services, endoscopy and TIPSS service, and enrolment in LIVER QuEST

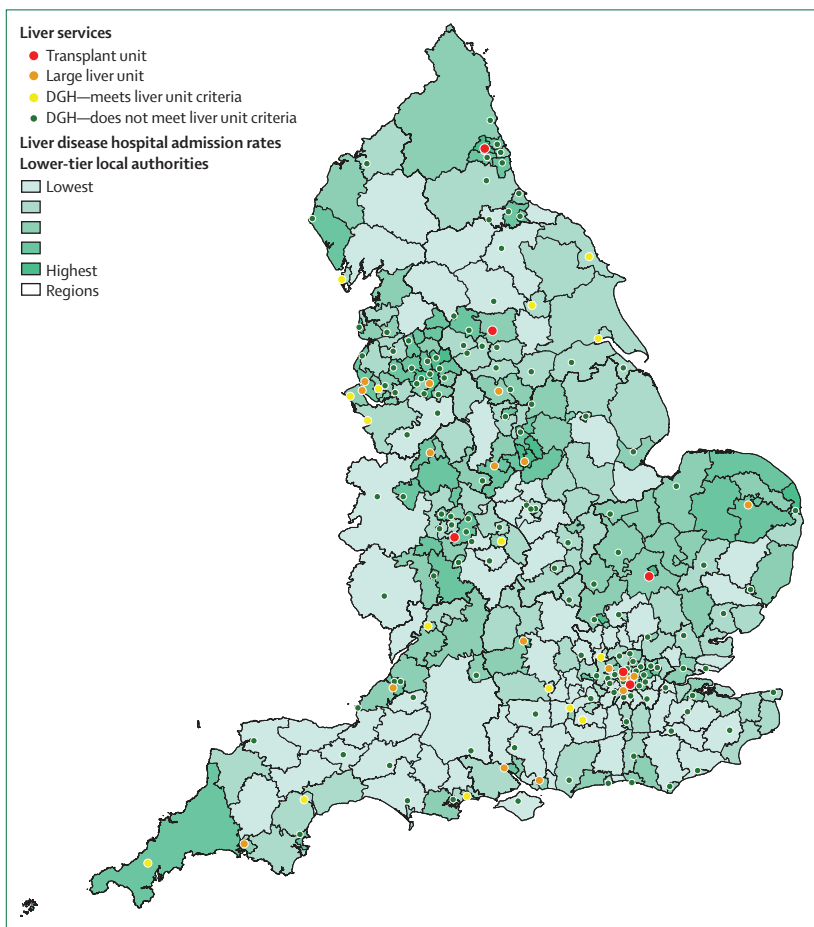


Figure 2: Distribution of liver services in England in relation to hospital admissions for liver disease in people of all ages, directly standardised rates per 100 000 population, 2014–15
 Map prepared under licence by Public Health England. © Crown copyright and database right 2016.
 [A: please confirm that you have obtained formal permission to use]

is done [A: correct as edited?] for biliary atresia and the outcome. Between January, 2009, and December, 2013, 230 children were diagnosed with biliary atresia in England and Wales; 75 (32.6%) were older than the recommended age for operation (ie, >56 days old) at time of Kasai portoenterostomy or laparotomy, and seven of 75 had a primary transplant.³³ Further education and awareness of the importance of early diagnosis of neonatal liver disease will be addressed through initiatives from PHE and the Children’s Liver Disease Foundation (CLDF).

Recommendation 2: establishment of acute liver services in district general hospitals linked with 30 regional specialist centres for more complex investigations and treatment, and increased provision of medical and nursing training in hepatology

[A: please add a subheading for this section (the template requires use of an introductory subheading if subheadings are to be used later in the section)]

In presenting the metrics for this recommendation (panel 4), Mark Hudson and Jessica Dyson have obtained up to date figures on hospital staffing levels and facilities for liver disease in the UK through a new survey of hospital trusts. Of the 207 hospitals approached, 100% provided information. Overall, a total of 221 whole time equivalent (WTE) consultant hepatologists and 305.7 [A: 305.7 WTEs?] gastroenterologists with an interest in hepatology were identified. The data for the devolved countries are provided in table 2 and expressed as WTE per 100 000 population. The provision of liver services as defined by WTE staffing levels in the UK is summarised in figure 2. Outside of transplant centres, only 21 (10%) centres have three or more hepatologists, meeting the criteria for large units coming within the category of specialist regional centres. Only 16 of the remaining hospitals in the UK would meet the criteria

for an adequately staffed acute service (two hepatologists and two or more gastroenterologists with an interest in hepatology).

Considering England alone, 193·8 WTE consultant hepatologists were identified, compared to 122 in 2010;⁴³ a 59% increase. However, 54·7 (28%) of these were in the six English transplant centres and 69·6 (36%) were in the 18 large units within the category of specialist regional centres. Of the remaining 135 hospitals, only 16 (12%) meet the criteria for an adequately staffed district general hospital acute service (two hepatologists and at least two gastroenterologists with an interest in hepatology).

As well as stratifying centres in terms of the numbers of WTE consultant hepatologists, the survey also looked at the services provided. A level 2 specialist centre is defined as one that provides: out-of-hours endoscopy including the management of varices; transjugular intrahepatic porto-systemic shunts (TIPSS); a regular hepatocellular cancer or hepato-pancreato-biliary multidisciplinary team meeting; medical locoregional treatment for hepatocellular cancer; antiviral treatment for hepatitis C (in England as part of an HCV operational delivery network); liver histopathology; dedicated liver clinics; and has a specialist nurse team.

Using this definition, only 18 centres in England, three in Scotland (outside of the liver transplant centres), one in Wales, and one in Northern Ireland meet the level 2 criteria for a specialist liver unit. It is also noteworthy that five of the 21 large centres (with ≥ 3 hepatologists) in the UK do not meet these criteria, although seven of the 179 centres that have more than three WTE hepatologists can provide these services. Mapping of the district general hospitals and regional specialist centres against liver disease hospital admissions and standard mortality rates for liver disease in England are shown in **figures 2 and 3**. The maps suggest that there is now reasonable availability of specialist liver services in the majority of regions in England, particularly if the hepatitis C operational delivery networks are included. However, there remain many district general hospitals that have inadequate hepatology support. In England, 55% (88) of all hospitals do not have a specialist hepatologist and 47 (30%) do not have a dedicated liver clinic (excluding viral hepatitis). **Figure 4** summarises the provision of liver services as defined by staffing levels in the UK. **[A: ok to cite figure 4 here?]**

The NCEPOD report in July, 2015,^{43,44} highlighted major deficiencies in the care received by patients suffering severe gastrointestinal haemorrhage as a consequence of cirrhosis and variceal bleeding. The mortality rate was high at 32%, with 37% not receiving prophylactic antibiotics despite recommendations in all guidelines and strong evidence that this reduces mortality.^{45,46} Despite the failure to control bleeding in almost a third of patients, only 13 hospitals reported having a 24-h TIPSS service. The findings in the liver

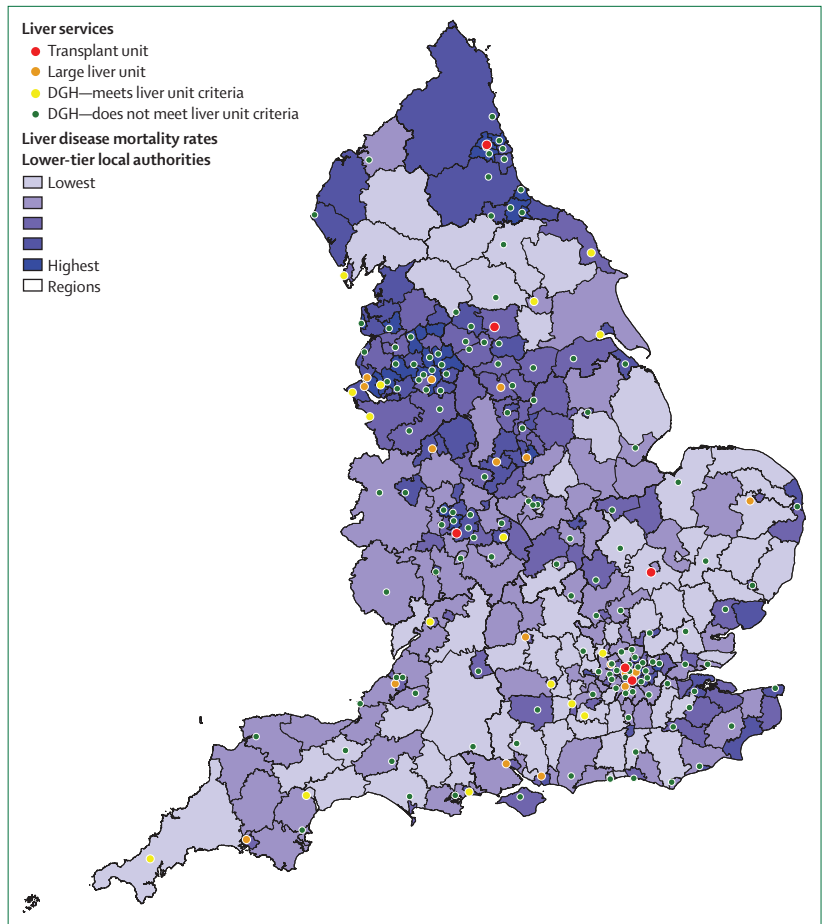


Figure 3: Distribution of liver services in England in relation to liver disease mortality in people of all ages, directly standardised rates per 100 000 population, 2013–15

Map prepared under licence by Public Health England. © Crown copyright and database right 2016.

[A: please confirm that you have obtained formal permission to reproduce] [A: Figure legend same as Figure 2?]

survey with respect to out-of-hours provision for endoscopy are summarised in table 2. The data for England excludes the transplant and large units. The provision of out-of-hours endoscopy services varied widely between the devolved nations. In England, 117 (87%) of hospitals provide emergency 24-h endoscopy cover although only 104 of these can manage varices. In Scotland, Wales, and Northern Ireland, 59% (62%), 31% (100%), and 80% (38%) of centres provide 24-h endoscopy cover, respectively (with the figures in brackets representing the proportion of endoscopists who are able to manage varices). Of the 34 centres in England recording a TIPSS service, 14 perform fewer than ten procedures per year, and in Scotland, three of the eight centres providing TIPSS performed fewer than five in the past year (table 2) which must raise concerns as to the safety and sustainability of such services. In Wales and Northern Ireland, there are single centres for the whole country, making access for emergency procedures difficult.

The survey also collated information regarding numbers of liver nurse specialists and viral hepatitis nurse specialists. These are presented in [table 3](#), which again highlights the wide variation between the devolved nations per 100 000 of the population.

Number of district general hospitals with multidisciplinary alcohol care teams

The proportion of hospitals providing some level of alcohol liaison service is similar across each of the nations in the UK. However, the number of hospitals with formal, multidisciplinary alcohol care teams is uncertain. The

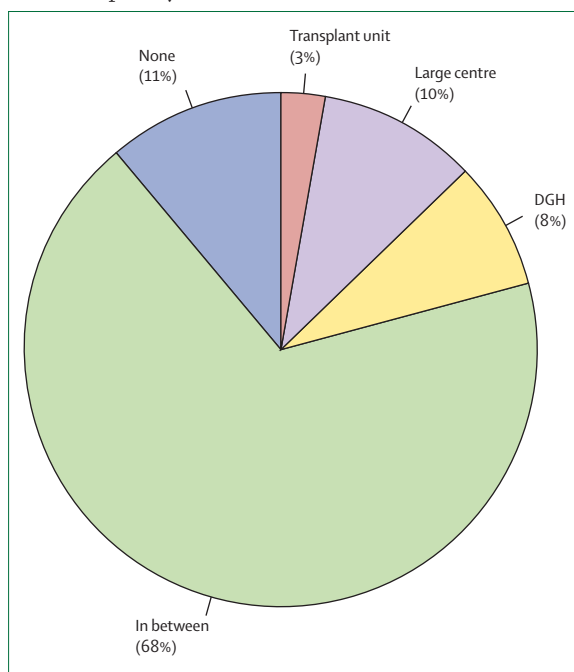


Figure 4: Provision of liver services as defined by WTE staffing levels in the UK [A: are these figures for 2016?]

Large centre=three or more WTE hepatologists, DGH=two hepatologists and two or more gastroenterologists with an interest in hepatology, none=no WTE hepatologists or gastroenterologists with an interest in hepatology, in-between=anything between DGH criteria and none.

	Liver nurse specialists	Viral hepatitis nurse specialists	Alcohol liaison service
UK	163.5; 0.25 per 100 000 population (64.9 million)	223.5; 0.34 per 100 000 population	171/207 (83%)
England	134; 0.24 per 100 000 population (54.7 million)	175; 0.32 per 100 000 population	133/159 (84%)
Scotland	18; 0.34 per 100 000 population (5.3 million)	31; 0.58 per 100 000 population	18/22 (82%)
Wales	9.5; 0.31 per 100 000 population (3.1 million)	15.5; 0.5 per 100 000 population	12/16 (75%)
Northern Ireland	2; 0.11 per 100 000 population (1.8 million)	2; 0.11 per 100 000 population	8/10 (80%)

Table 3: Summary for UK and individual nations of specialist nurse provision, alcohol liaison services, and liver fellows

evidence base for the role of alcohol care teams, together with the six key elements of a model team, are well described.⁴⁷ The establishment of a consultant-led, multidisciplinary alcohol care team and a 7-day alcohol specialist nurse service were also two of the principal recommendations of the NCEPOD report,⁴⁸ which highlighted the delays in referral of patients for specialist care and missed opportunities for brief interventions during previous admissions. The present survey shows uncertainty in the number with formal multidisciplinary alcohol care teams, although some level of alcohol team was present in the majority of hospitals in England and the devolved nations. In a small, local, London-based survey in 2009, only 10% of hospitals surveyed had a multidisciplinary alcohol care team consultant lead and 42% had an alcohol specialist nurse service.⁴⁹

In 2014, PHE published data on hospital alcohol care teams and alcohol specialist nurses.⁵⁰ Encouragingly, in a 2015–16 follow-up survey, at least 76 out of a total of 116 hospitals surveyed (66%) had a consultant lead. Around 45% were led by gastroenterology or hepatology, 18% by psychiatry, and 11% by emergency medicine. Almost a quarter of services were clinically led by nurses. However, only 68% of hospital that responded to PHE’s 2015 survey have teams staffed adequately to provide seven day cover and deliver the potential impact demonstrated by Royal Bolton or Salford.⁴⁷

PHE analysis of secondary care alcohol specialist services has identified that, regardless of geographical location or size of hospital, the most effective alcohol care teams are those providing a seven day service, led by a senior clinician with dedicated time for the team and evidence-based interventions. Alcohol care teams facilitate identification of alcohol misusers in hospitals and deliver appropriate packages of care provided by multidisciplinary teams. This requires dedicated sessional input from senior clinicians and at least three other clinical staff in order to facilitate seven day working throughout the year.

Care bundles and Liver QuEST accreditation

Some progress has been made during this year with development of the cirrhosis care bundle to standardise early treatment (within 24 hours of admission to hospital) for patients with decompensated cirrhosis. Results of implementation of the bundle, which has been piloted in the Newcastle upon Tyne NHS Hospitals Foundation Trust as a successful Commissioning for Quality and Innovation (CQUIN) target, show that patients with a completed care bundle are more likely to have appropriate management. A comparison of pre-bundle and post-bundle audit data from three English hospitals showed that patients with a completed care bundle are significantly more likely to undergo a diagnostic ascitic tap to exclude spontaneous bacterial peritonitis ($p=0.020$), have an accurate alcohol history documented ($p<0.0001$), and be given prophylactic antibiotics following variceal haemorrhage ($p=0.0096$).⁵¹

Some progress has also been made in implementation of the Liver Quality Enhancement Service Tool (Liver QuEST) project for accreditation of hospital services. Liver QuEST is an evolving quality assurance framework that aims to improve the care of patients with liver disease across England.³² The project is sponsored by the Royal College of Physicians and has the backing of the patient groups, the British Society of Gastroenterology, the British Association for the Study of the Liver, and the Lancet Commission. This process has been piloted in six units across England and the learning from these visits was recently reviewed. Early themes arising from the review process include an underutilisation of information technology and a failure in simple key performance indicators in emergency care (such as antibiotic prescription in variceal bleeding). To date 24 hospitals have engaged with Liver QuEST, including eight DGHs. The project currently uses the operational delivery networks associated with hepatitis C. It is also working with NHS Wales to involve their liver services within the scheme, with a plan to involve the other devolved nations over the coming year.

Recommendation 3: a national review of liver transplantation to ensure better access for patients and to increase capacity

Panel 5 shows metrics for recommendation 3. The rate of liver transplant activity is the primary metric of performance. The number of transplantations done in 2015–16 was 917 and in line with activity over the last three years. There was a 4% decrease in the number of patients on the waiting list on March 31, 2016. The transplantation rates fall short of the targets set by the NHS Blood and Transplant T2020 strategic review.

The *Lancet* Commission continues to hold the view that liver transplant services should be subjected to a fundamental review, but there is no evidence to date that this will be forthcoming. However, the first formal peer review process of individual programmes is scheduled for late 2016. An extensive range of quantitative measures will be evaluated that measure performance against agreed national service specifications as well as outcomes, and there might be an opportunity to scope capacity for expansion if the increase in donor organs materialises.

Equity of access to liver transplant services and the rate of organ utilisation across all the programmes are cardinal metrics of performance. The most recent report on liver transplantation published by NHS Blood and Transplant confirms the continuing crude differences by geographical region and access to liver transplantation. The highest transplant rates per million population were in Scotland (19·1) and Northern Ireland (17·9) and the lowest in the south of England (9·3). The remaining Strategic Health Authority areas had rates in the 13·0–14·4 range.

Waiting times and the risk of death on the waiting list are also dimensions of equity of access and historically there have been substantial differences between centres in these parameters. The metrics designed to monitor this aspect

Panel 5: Metrics for recommendation 3

- 3-1 Number of patients treated
- 3-2 Transplant activity normalised to waiting list
- 3-3 Waiting time to transplant normalised by blood group
- 3-4 Primary offer acceptance rate of used whole organs
- 3-5 Use of marginal donors

Panel 6: Metrics for recommendation 4

- 4-1 Reduction in outpatient did not attend (DNA) rates in patients transitioned to adult services in the three main liver centres to less than 15%
- 4-2 Reduction in graft loss or death in 16–24 year olds post-transition
- 4-3 Educate adult physicians in paediatric liver disease and transition to adult services by supplementing adult curriculum

are transplant activity rates normalised to the size of the waiting list, and the waiting times to transplantation for each of the blood groups. However, substantial progress has been made to direct organs preferentially to the patients most likely to benefit from the transplant, aiming to maximise use of donated organs. A new national offering sequence is scheduled to operate from summer 2017. The first offer of an organ will no longer be directed to centres but to the highest ranked patient in the country. The new system should improve equity of access and is expected to reduce mortality on the waiting list by 50%. Another dimension of equity of access is consistency in the comorbidity profiles considered acceptable in patients being listed for liver transplantation.

The percentage of livers retrieved but not transplanted has increased from 8·2% to 16·6% over the past decade, with a 4% point increase in the last two years. While the cause of this trend is likely to be multifactorial, the possibility that it includes an element of impaired ability to cope within the service needs **[A: who is failing to cope? Please clarify]** to be given due consideration. However, organ utilisation should be consistent across the service, and two metrics to track this have been designed: the acceptance rate on first offer of a whole organ; and the use of organs falling within an agreed definition of marginal organs. At present, practice varies considerably between centres, with higher decline rates in those centres with shorter waiting lists. The extent to which these differences are logistical or cultural needs to be clarified.

Recommendation 4: specialist paediatric services and continuity of care in transition arrangements for children with liver disease reaching adult life

Panel 6 shows the metrics for recommendation 4. Between 2008 and 2015, 667 young people transitioned into adult services from national paediatric liver units at

Birmingham Children’s Hospital and King’s College Hospital, of whom 17 died (2·5%) [A: please add numbers for death after transplant and from liver disease (as in originally supplied table 4), if you wish. In the submitted manuscript, the table showed only 10 deaths, for 2008-2013. The table has been deleted because it is easy to give the data in the text and this requires less space. I have assumed that you only want to present the data for 2008-2015, but if you also want to include the numbers for 2008-13 to show the difference over time, please add a sentence to the text.] Historic data from all three national centres (Birmingham Children’s Hospital, King’s College Hospital, and Leeds) showed that approximately 22% did not attend outpatient clinics in adult services despite a specialist transition service⁵³ (M Samyn, unpublished) highlighting the need for more focused management and support. [A: ref 54 changed to an in-text citation, as unpublished work cannot be not included in the reference list. Subsequent references have been renumbered. Please check that references are correctly cited.]

The three national paediatric liver centres are now using a validated self-management tool to empower

young people to manage their condition and identify specific areas where more multidisciplinary support is required to facilitate the transition process.

Recognition that additional education and training for adult hepatologists on childhood liver disease is needed has led to the development of a draft curriculum, which has been submitted to the relevant specialist committees for inclusion in core training for gastroenterology and hepatology.

Recommendation 5: measures to reduce overall alcohol consumption in the country

Metric 5-1: policy metrics

Panel 7 shows the metrics for recommendation 5, and table 4 summarises policies across the UK. [A: Sentence inserted to provide citations for panel and tables in the main text; please confirm that wording is ok. The two reports cited in the table have been added to the reference list and subsequent references renumbered.] In March, 2012, David Cameron, then Prime Minister, stated: “When beer is cheaper than water, it’s just too easy for people to get drunk on cheap alcohol at home before they even set foot in the pub. So we are going to introduce a new minimum unit price (MUP). For the first time it will be illegal for shops to sell alcohol for less than this set price per unit. We are consulting on the actual price, but if it is 40p that could mean 50 000 fewer crimes each year and 900 fewer alcohol-related deaths a year by the end of the decade.” He went on to say: “Of course, I know the proposals in this strategy won’t be universally popular. But the responsibility of being in government isn’t always about doing the popular thing. It’s about doing the right thing.” However, minimum unit pricing was postponed indefinitely following lobbying from the drinks industry^{56,57} and the government has made no moves to

Panel 7: Metrics for recommendation 5

- 5-1 Policy metrics
- 5-2 Overall alcohol consumption in country
- 5-3 Number of hospital admissions from alcoholic liver disease
- 5-4 Number of deaths directly due to alcohol consumption
- 5-5 In-hospital mortality from alcoholic liver disease
- 5-6 Hospital and community alcohol services
- 5-7 Survivals for liver admissions

	England	Wales	Scotland	Northern Ireland
Minimum unit pricing	Opposed to minimum unit pricing	Legislation in progress	Minimum unit pricing bill passed, legal verdict awaited	Legislation in progress
Taxation	Not devolved; tax cuts to drinks industry worth £3·55 billion according to 5-year Treasury projections since 2013	Not devolved; tax cuts to drinks industry worth £3·55 billion according to 5-year Treasury projections since 2013	Not devolved; tax cuts to drinks industry worth £3·55 billion according to 5-year Treasury projections since 2013	Not devolved; tax cuts to drinks industry worth £3·55 billion according to 5-year Treasury projections since 2013
Health information	PHE report awaited	Outlined in <i>Working Together to Reduce Harm</i> ⁵⁴	Information by disease aetiology, good quality data on HCV and advanced alcohol-related liver disease, using routine data sources	Improved health information outlined in <i>New Strategic Direction for Alcohol and Drugs</i> ⁵⁵
Protection of children from alcohol marketing	PHE report awaited	Welsh Assembly pressing UK government for change	Remains aspirational	Not devolved
Countering drink industry	Industry influence has probably never been higher	No clear policy	Trying to develop a consensual approach	No clear policy

[A: the Powerpoint files supplied included some rows that were not present in the Word version of the manuscript. I have added these rows to the table, but please let me know if they should not be included]

Table 4: Policy metrics

bring forward any effective measures since, such as protection of children from alcohol marketing.

There have been two subsequent developments. PHE was commissioned by the UK and devolved governments to produce two reports, one of UK alcohol policy and a further report of alcohol related harm to third parties—ie, people harmed as a result of drinking by other people. PHE has formally reviewed the evidence for alcohol policy, and is due to publish this report in late 2016.

The UK Chief Medical Officers published reviewed drinking guidelines in January, 2016, stating that any amount of alcohol intake can increase the risk of developing a range of illnesses, recommending a weekly intake of no more than 14 units with several drink-free days each week.⁵⁸ [A: the reference originally cited here was the 1995 guideline, please add the correct reference to the list] The report did not address higher risk and harmful drinking, but did conclude that since the previous guideline in 1995,⁵⁹ new evidence has outlined that the risk of cancer starts from zero alcohol intake and rises in a linear fashion. The report also addresses the putative health benefits of alcohol, concluding that this evidence was considered less strong than had been considered previously [A: correct?], and that a reduced risk in the UK is significant only for women aged 55 years or older. The 14-unit guideline on regular drinking would be consistent with a little under a 1% lifetime risk of death from alcohol for people who follow this consistently.⁵⁸

Metric 5.2: alcohol consumption

Sources of data for alcohol consumption include HM Revenue and Customs (HMRC) receipts and population surveys, with surveys recording 55–60% of the consumption recorded by HMRC. Data from HMRC clearance [A: please briefly define 'clearance'] show increasing gradually consumption of alcohol in the UK until 2008, when the 2% above inflation duty escalator was introduced (figure 5). Consumption then transiently decreased, but it is now rising strongly once more. There has also been marked shift towards the consumption of stronger alcohol, with a decrease in consumption of beer, and increased consumption of wine, spirits, and cider.⁶⁰

The UK Opinions and Lifestyle Survey found that 58% of the UK population had drunk alcohol in the previous week, with around 18% of the highest earners drinking on five or more days, compared with 8% of lowest earners. Wales (13%) had the highest proportion of people drinking more than 14 units a week, compared with Scotland (12%) and England (8%).

Analysis of Health Survey England (HSE) data from 2014 for the total amount of alcohol consumed by drinkers categorised by level of weekly consumption (table 5) shows that 24% of alcohol was consumed by low-risk drinkers and 76% by higher-risk drinkers, of which 52% was consumed by people drinking more than twice the amount recommended in guidelines.⁶¹

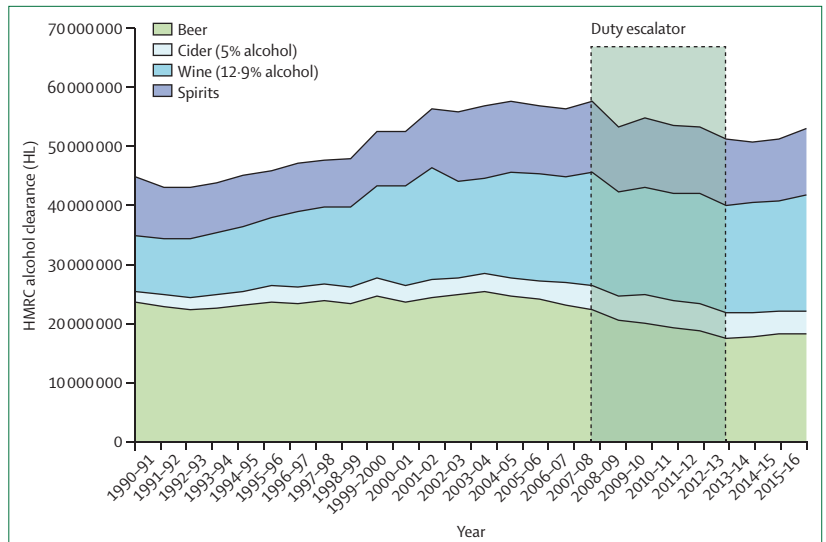


Figure 5: HMRC alcohol clearance in the UK, 1990–91 to 2015–16

[A: please define 'HL' (used in y axis label)]

	1991–92 cohort				2014 cohort			
	Count	Column N %	Sum	Column sum %	Count	Column N %	Sum	Column sum %
None	678	9.6%	0	0%	1434	18.6%	0	0%
>0–14	4686	66.4%	19 040	25.2%	4633	60.0%	19 176	24.6%
15–28	960	13.6%	19 363	25.6%	922	11.9%	18 841	24.2%
29–75	641	9.1%	27 463	36.3%	629	8.2%	27 051	34.7%
≥75	88	1.2%	9751	12.9%	98	1.3%	12 830	16.5%

The proportion of teetotallers doubled; that of extreme drinkers increased slightly from 1.2% to 1.3%, whereas the proportion of total alcohol consumed by extreme drinkers increased from 13% to 17% (Yates χ^2 p<0.0001). [A: please clarify meaning of 'count' and 'sum' in the column headings]

Table 5: Analysis of HSE data from 1991–92 and 2014 with total amount of weekly units consumed, categorised by weekly alcohol rating

Comparing the distribution with HSE data from 1991–92, the proportion of alcohol consumed by extreme drinkers drinking more than 75 units a week has increased from 13% to 17%.

Metrics 5.3 and 5.4: alcohol-related hospital episodes and deaths

Trends in alcohol-related hospital episodes for England show a steady increase peaking in 2012, and relative stability in the 2 years since (figure 6). [A: citation of figure 6 here ok?] Directly attributable alcohol-related deaths increased steadily in England and Wales throughout the 1980s, 1990s, and 2000s. The majority of these deaths were a result of alcohol-related liver disease, and there is a relationship between alcohol-related deaths and increasing affordability of alcohol, as alcohol duties were not increased in line with incomes (figure 7). [A: correct to cite figure 7 here (not figure 3, as originally stated)? Reference cited in figure legend renumbered in

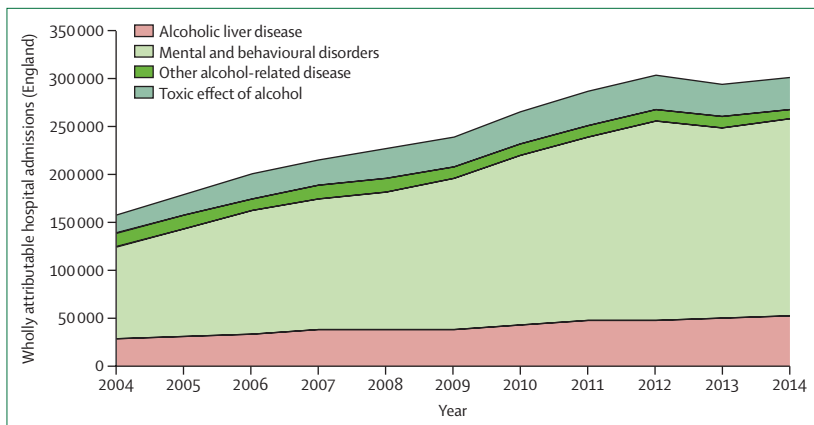


Figure 6: Trends in wholly attributable hospital admission episodes

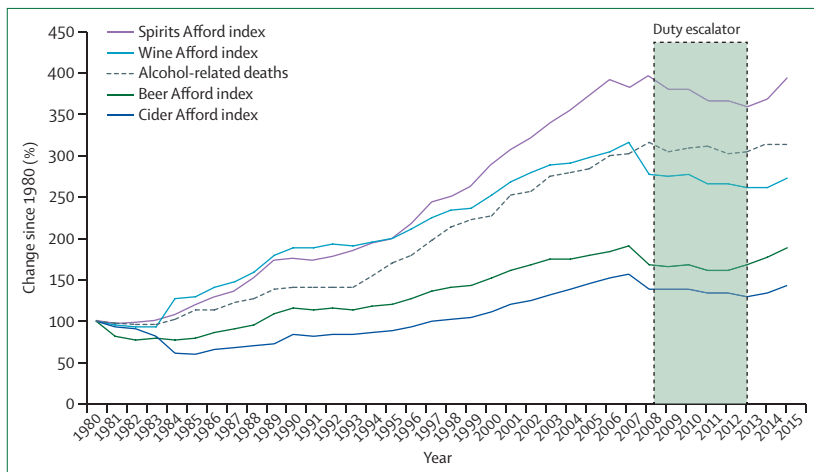


Figure 7: Trends in deaths directly attributable to alcohol and the affordability of various alcohol drinks as influenced by changes in alcohol duty (England and Wales)

All data normalised to 100% in 1980. Data from Health and Social Care Information Centre, June, 2015.⁶²

[A: reference renumbered in line with order in text]

line with this placement in the text.] The patients dying of directly alcohol-related causes are extreme drinkers; the average weekly consumption of patients with alcohol-related cirrhosis is around 150 units, and that of patients with alcohol dependency is even higher, at around 180 units, so on the whole these patients are drinking the cheapest alcohol they can find.^{63,64} Alcohol-related deaths are strongly linked to health inequalities; many of these patients are already spending much of their disposable income on alcohol and are sensitive to price changes.^{65,66}

In the 2008 government budget, alcohol duty was increased and a 2% above inflation escalator introduced. The subsequent decrease in affordability coincided with a change in the trend in alcohol related mortality. We hypothesised that this change was a direct result of changes in the price of alcohol combined with the impact of an economic downturn on incomes⁶⁷ and predicted that alcohol mortality would rise following the 2013 repeal of the 2% duty escalator and the subsequent tax

cuts. [A: should ref 68 be cited here instead of in the following sentence?] Alcohol-related deaths increased in 2014 (reported November, 2015) and the figures for 2015 will be reported in November, 2016.^{68, 69} [A: ref 69 was a duplicate of ref 68, please add the citation for the 2015 report to the reference list instead]

Data for Scotland for this metric, compiled from data collected by the Office for National Statistics,⁷⁰ are presented in graphic form within the report from Scotland later in this paper. The graph shows the number of deaths registered each year against the 5-year moving average and demonstrates a year-on-year increase from 1992, peaking in 2002. Since that date there has been a series of staggered decreases to the 2015 level of around 1100 deaths per annum.

Metric 5-5: alcohol-related deaths [A: should this be "in-hospital mortality from alcoholic liver disease", as in the panel? If not, should the paragraphs below be part of the previous section, and should there be an additional section on in-hospital deaths?]

Figure 8 shows in-hospital mortality of liver disease for acute trusts in England. [A: correct to add citation of figure 8 here? If not, please advise as to where it should be cited] In 2015, there were 1150 alcohol-related deaths, a decrease of 2 [A: ie, 0.2%] (0.2%) compared with 2014 on the basis of the current definition, and the third lowest annual total since 1997. The number of alcohol-related deaths was relatively stable, at roughly 600 per year, during the 1980s. It then increased rapidly during the 1990s and early 2000s, to around 1500 per year in the mid-2000s. The figure of 1546 in 2006 was the largest so far recorded; since then, the trend has been generally downward, as the rises in some years have been small (compared to the falls in the other years) and could well be due to year-to-year variability. Deaths in 2015 consisted of 764 male deaths and 386 female deaths, continuing a long-term pattern.⁷¹

There were approximately 16 chronic liver disease deaths per 100 000 population in Scotland in 2014, similar to the rate in 2013. In 2014, male mortality rates for chronic liver disease were twice as high as those reported for women (21 per 100 000 compared with 10 per 100 000 population). Between 1993 and 2003, there was a sharp increase in chronic liver disease mortality rates overall and in both men and women; for men, the mortality rate increased from 14 per 100 000 to 35 per 100 000 population and for women, from 8 per 100 000 to 16 per 100 000 population. Since 2003 the rates have decreased for both men and women. In 2014, chronic liver disease mortality rates were highest in people aged 55–64 years (36 per 100 000 population).

Metric 5-6: hospital and community alcohol services

The most effective and cost-effective means to reduce alcohol-related deaths and hospital admissions is to reduce alcohol consumption in extreme and harmful

drinkers by increasing the price. We also need to detect and intervene earlier in liver disease. Once patients present with liver disease it is too late [A: for successful treatment?] in most cases, and there is little evidence that any therapeutic strategy improves survival, but we do know that the main determinant of long-term survival is whether the patient abstains from alcohol.⁷² As a result, efforts have been made to integrate alcohol treatment services with liver units in acute trusts. Data obtained from Public Health England indicate that of 192 district general hospitals in England, currently (2015–16 financial year) ten to 13 hospitals are known to have no service. [A: if these data are unpublished, please obtain Iain Armstrong's written permission to cite] 116 were known to have an alcohol service in March, 2016; a further 42 were known to have services in 2014. So the total number of hospitals with services is probably between 116 and 158. Since 2014, six hospitals are known to have lost funding for their alcohol specialist services, while two have services that previously did not. Funding is generally a mixed economy from local authority public health and clinical commissioning groups or provider trusts, often in partnership. In December, 2015, a third of services were secure in their funding beyond 2018–19, nearly half were secure until at least 2018–19. However, a good deal of funding is short term; over a third were not assured of funding beyond the next financial year (2016–17) and 20 had no funding identified for the coming financial year (2016–17).

There is concern that further local authority cuts will result in a substantial loss of alcohol services in England. This contrasts with Northern Ireland and Wales, where alcohol services are attracting substantial health board investment and are being developed. The Wales Liver Plan has made a firm commitment to develop ACTs [A: please spell out] embedded in secondary care with assertive outreach teams, a clinical lead has been appointed in three of the six health boards so far, and the number of alcohol specialist nurses has increased from 13 to 17. In Northern Ireland, alcohol specialist nurses will increase from ten in 2013 to 18 in 2016, aiming for a total of 28 to ensure a 7-day alcohol specialist nurse service. In Scotland the current alcohol strategy is being refreshed and proposals for such teams are being considered.

The report *Public Health post-2013*,⁷³ [A: reference added to list, subsequent references renumbered] published by the Commons Health Select Committee, shows how local authorities have undergone cuts to public health budgets year-on-year, after assuming responsibility from central government. The paper includes a survey commissioned by the Association for Directors of Public Health, which shows that local alcohol treatment services face the biggest public health cuts of all, with 46% of local authorities planning cuts to alcohol treatment services in 2015–16, rising to 72% in 2016–17. The Commons

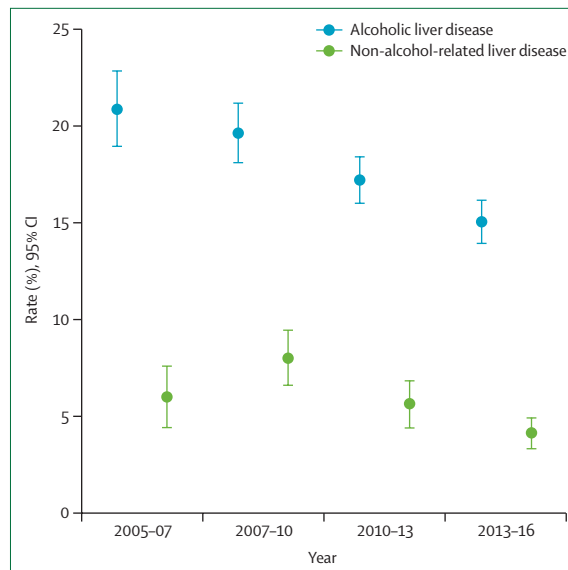


Figure 8: In-hospital mortality of liver disease for acute trusts in England

Committee highlighted the government's pledge to reduce health inequalities in the UK and that these cuts would undoubtedly increase inequalities. NHS England recommends that local authorities, clinical commissioning groups, and provider trusts should jointly fund alcohol services. Lack of agreement over funding responsibilities presents a major threat to the on-going provision of specialist hospital alcohol services and, as local authorities are forced to make further budget cuts, there is a danger that they will see these hospital-based services as an easier economy than services which have a more obvious effect on council outcomes.

Metric 5-7: survival of alcohol related liver disease admissions

The NCEPOD report of 2013 identified a number of shortcomings in the hospital treatment of patients with alcohol related liver disease, and previous *Lancet* [A: correct?] Commission reports have outlined the variation in hospital mortality rates between trusts, with recommendations for more specialist liver units across the UK.⁴⁸ However, there have been steady advances in the management of patients with alcohol-related liver disease, endoscopic banding of varices, terlipressin treatment of hepatorenal syndrome, and in intensive care.⁷⁴⁻⁷⁶ There have been steady year-on-year improvements in in-hospital mortality across acute trusts in the UK (figure 8). [A: "figure 8" correct here (not figure 4, as originally cited)?]

Baseline data for longer-term survival has been calculated using NHS data (2005–14) supplied by liver units in Southampton, Plymouth, Newcastle, and Sunderland (figure 9). 5-year survivals remain poor, varying from around 85% for viral hepatitis to 65% for alcohol-related liver disease and 35% for primary liver cancer.

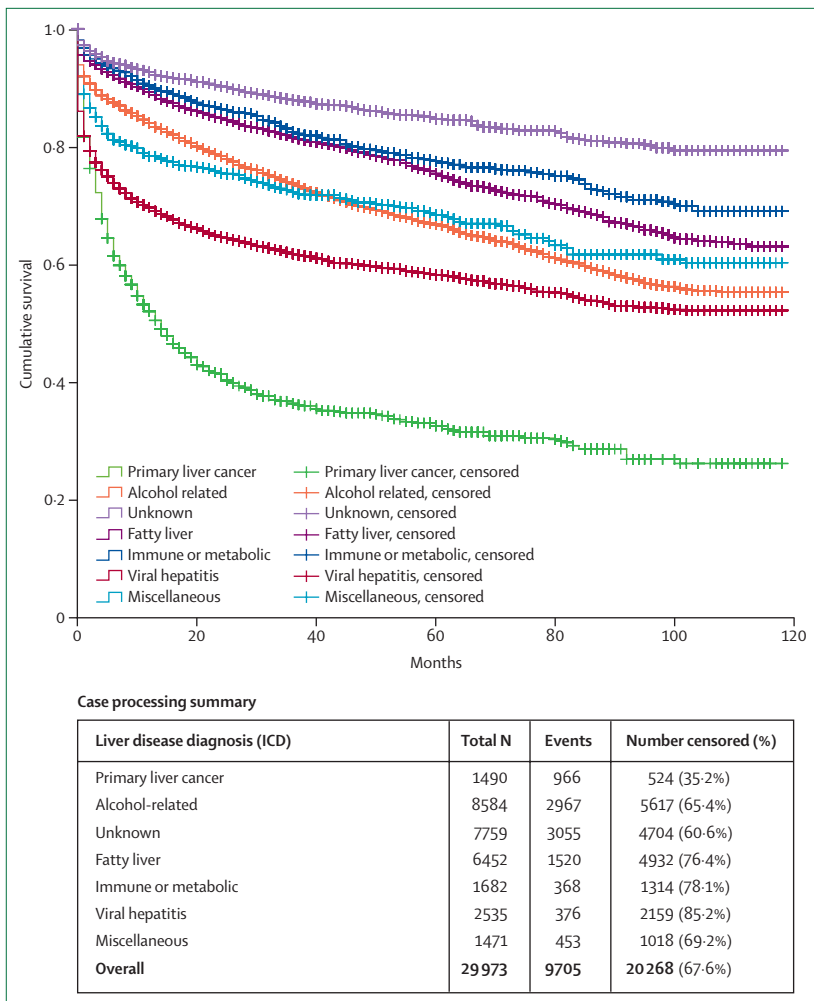


Figure 9: Kaplan-Meier survival plots (months) from the time of first liver admission of patients from Southampton, Plymouth, Newcastle, and Sunderland, admitted 2005–14
ICD=International Classification of Disease. [A: correct? Should this give a specific edition?]

One year survival metrics will be used to measure improvements in survival against the 2005–14 baseline (figure 6) [A: should this be figure 9?]. The very high 1-year mortality of patients with alcohol-related, cryptogenic liver disease and primary liver cancer reflects the late diagnosis of the majority of liver cirrhosis.

Data from Scotland relating to metric 3: number of admissions from alcoholic liver disease

Figure 10 shows the trends in rates of hospital stays for four conditions; alcoholic liver disease, alcoholic liver failure, alcoholic acute hepatitis, and alcoholic cirrhosis. In 2014–15, there were 35 059 alcohol-related general acute hospital stays in Scotland; a standardised rate of 672 stays per 100 000 population. This is a continuation of the fall in rates since 2007–08. However, in 2014–15, rates for hospital stay were still more than four times higher than at the beginning of the time trend. The decrease since 2007–08 has been predominantly driven

by the reduction in more acute conditions, such as harmful use and toxic effect, whereas the more chronic conditions, such as alcohol-related liver disease, have increased. The increase in hospital stays seen up to 2007–08 has been driven to a large extent by repeat visits rather than new patients being admitted to hospital. In 2014–15, alcohol-related stays in general hospitals were nearly eight times more frequent for individuals living in the most deprived areas compared with the least deprived areas. The rate for alcoholic liver disease, 6963 stays in 2014–15, has increased over the last two years and showed a much flatter curve in the previous years than for alcohol-related conditions overall. The breakdown of alcohol-related liver disease shows that most of the rise is due to cirrhosis and to repeat admissions, with the number of new patients being relatively static, suggesting that rather than a reduction in the number of patients developing alcohol-related cirrhosis, they are more likely to survive their first admission.

Recommendation 6: promotion of healthy lifestyles to reduce obesity and the burden of NAFLD

Metrics for recommendation 6 are shown in panel 8. Obesity and its effects on health, such as non-alcoholic fatty liver disease, continues to be a major burden to the UK that will require concerted efforts by government, health-care professions, and the public if it is to be addressed. This section will provide objective assessments of the prevalence of obesity in children and adults in the UK as well as data on the subsequent effects of obesity on liver disease.

Metric 6-1: prevalence of child and adult obesity

Data from HSE, along with that from equivalent surveys in Wales, Scotland, and Northern Ireland, show the scale of the problem affecting both adults and children (figure 11) [A: “figure 11” correct?]. Ongoing monitoring of these data will be an important guide to the current burden of obesity and provide a benchmark to assess the impact of strategies to reduce obesity over the long term.

Data on childhood obesity are not available from all of the UK at this stage. Collation of these data, along with cross-referencing with data from the National Child Measurement Programme (NCMP), will be important to build an accurate picture of childhood obesity.

Metric 6-2: adoption of Health Select Committee priorities for childhood obesity

The recent Health Select Committee report⁷ identified key overarching objectives to protect families from the pressures of unhealthy food marketing by changing the obesogenic environment; to enable individual choice by making healthy food choices and access to opportunities for physical activity easier; to inform families of the risks associated with poor diet and physical inactivity; and to support children and families to lose weight and

maintain a healthy weight. The government published its childhood obesity plan⁷⁸ in 2016. **Table 6** assesses the extent to which the plan meets recommendations from the Health Select Committee. Very few of the recommendations are addressed in the plan, and most of those that are rely on voluntary commitments from industry.

Metric 6-3: Prevalence of NAFLD/non-alcoholic steatohepatitis in secondary care

HES data provide information on patients admitted to hospital with NAFLD or non-alcoholic steatohepatitis (NASH) as a diagnosis. While these data will be influenced by greater coding of NAFLD or NASH, they do capture the increased morbidity and mortality of patients with NAFLD or NASH, providing information on the burden of NAFLD or NASH on hospital bed usage (**figure 12**). [A: ok to cite figure 12 here?]

At present there is substantial variation in the identification and referral of patients with NAFLD, reflecting the lack of clear guidance. A BSG-led [A: please spell out BSG] group with representation from the relevant stakeholders, including patient groups, will report in late 2016 with new guidance on the management of abnormal liver function tests. This should help standardise care, reduce unnecessary referrals, and ensure that patients needing further investigation are identified at the appropriate stage.

Metric 6-4: number and proportion of patients with NAFLD as a diagnosis assessed for liver transplantation

This metric provides information on the impact of obesity on inducing end-stage liver disease due to NAFLD, as well as providing a measure of the provision of adequate services for such patients with NAFLD or NASH.

Patients with NAFLD as a primary or contributory factor still account for a relatively small proportion of elective cases on the liver transplant waiting list (**figure 13**). [A: ok to cite figure 13 here?] This might reflect a low number of patients with end-stage liver disease due to NAFLD or challenges with identifying, referring, and listing such patients for transplantation. Further exploration of these data are required to ensure equity of access to transplantation for such patients, although the likelihood of them having more co-morbidities is a consideration.

Metric 6-5: number of bariatric surgery operations per 100 000 population

This metric is a measure of the extent of service provision for those in clear need of further support and intervention. Referral to weight management services and consideration of bariatric intervention is strongly supported by an evidence base.

The current rate of service provision is much less than 1% of those with a BMI of 40 kg/m² or greater and more

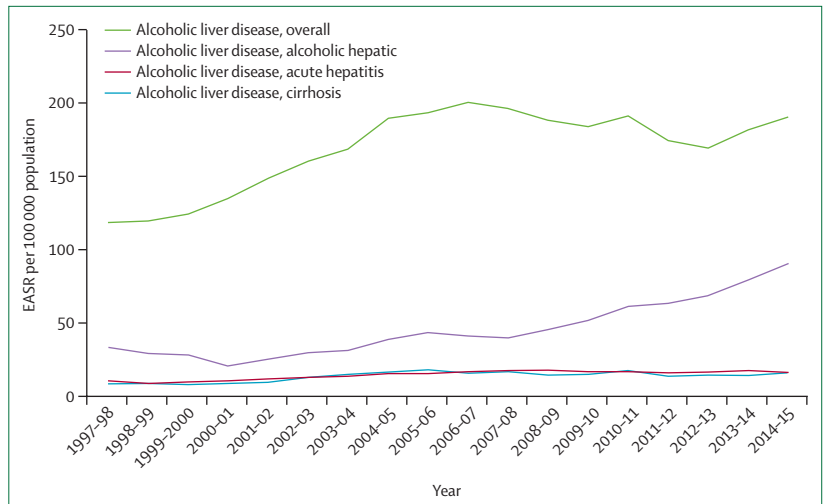


Figure 10: Trends in stay rates for alcoholic liver disease, alcoholic liver failure, alcoholic acute hepatitis, and alcoholic cirrhosis⁷⁹ [A: add 'in Scotland?'] EASR=European age-standardised rate.

Panel 8: Metrics for recommendation 6

- 6-1 Prevalence of child and adult obesity
- 6-2 Adoption of Health Select Committee priorities for childhood obesity
- 6-3 Prevalence of NAFLD/non-alcoholic steatohepatitis in secondary care
- 6-4 Number and proportion of patients with NAFLD as a diagnosis assessed for liver transplantation
- 6-5 Number of bariatric surgery operations per 100 000 population



Figure 11: Prevalence of adult obesity in the UK

recent data from the Health and Social Services Information Centre indicate an almost 10% fall in the number of NHS bariatric surgery procedures (**figure 14**).

	Government's child obesity plan	Traffic light assessment
Strong controls on price promotions of unhealthy food and drink	Not included	Red
Tougher controls on marketing and advertising of unhealthy food and drink	Not included	Red
A centrally led reformulation programme to reduce sugar in food and drink	Launch of a voluntary sugar reduction programme with aim of reducing overall sugar by at least 20% by 2020, including a 5% reduction in year 1. Not clear what fines or levies will be implemented if targets are not achieved.	Amber
A sugary drinks tax on full-sugar soft drinks, in order to help change behaviour, with all proceeds targeted to help children at greatest risk of obesity	A soft drinks industry levy will be introduced in England from 2018, with the revenue from it invested in programmes to reduce obesity and encourage physical activity and balanced diets for school age children.	Green
Labelling of single portions of products with added sugar to show sugar content in teaspoons	Establish a review of additional opportunities to go beyond current labelling scheme. Examples given include clearer visual labelling, such as teaspoons of sugar in packaged food and drink.	Amber
Improved education and information about diet	Discussion of use of information technology such as the Change4Life Sugar Smart app. No further investment or new programme.	Red
Universal school food standards	Funding generated from the sugar levy will be diverted towards the primary physical education and sport premium, which includes school healthy breakfast clubs. From September, 2017, a voluntary health rating scheme for primary schools will be taken into account during Ofsted inspections. The new school food standards will be updated in the light of refreshed government dietary recommendations. The majority of schools are subject to the school food standards. However, some academies and free schools are not. There will be a campaign by the Secretary of State for Education encouraging all schools to commit to the standards.	Amber
Greater powers for local authorities to tackle the environment leading to obesity	No change in local authority power. There will be further encouragement for local authorities to adopt the Government Buying Standards for Food and Catering Services (GBSF) standards, particularly in leisure centre vending machines. This will be accompanied by the full uptake of GBSF in central government Departments.	Red
Early intervention to offer help to families of children affected by obesity and further research into the most effective interventions.	Re-committing to the Healthy Start scheme, which provided an estimated £60 million worth of vouchers to families on low income across England in 2015–16. These can be exchanged for fresh or frozen fruit or vegetables and milk. No other plans.	Red

Table 6: Measures in the government's child obesity plan measured against recommendations of the Health Select Committee.

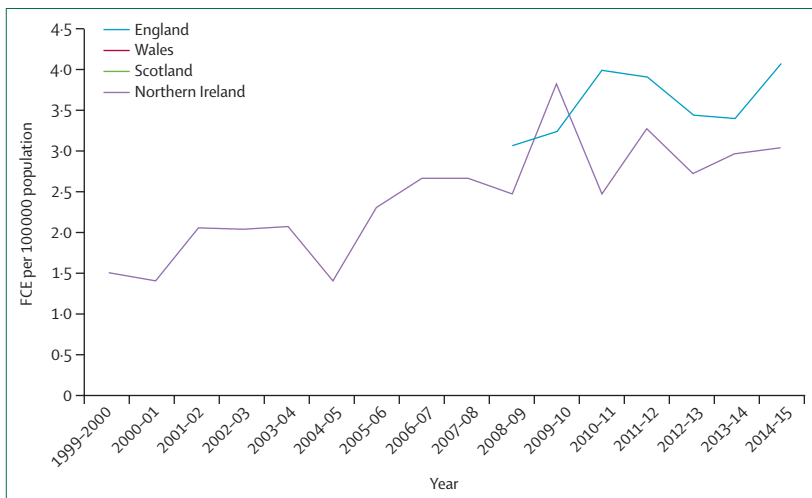


Figure 12: Finished consultant episodes (FCE) in which NAFLD was a coded diagnosis in the UK, 1999–2014

Notably, the rate of surgery in Sweden was 78 procedures per 100 000 population in 2013 (data from Scandinavian Obesity Surgery Register⁷⁹). This would equate to a figure

of 49 000 procedures per annum for the UK, which is more than six times the current rate of service provision. There is no justification for such a difference, especially when the higher rate of obesity in the UK is taken into account, testifying to the marked underprovision of bariatric surgery in the UK.

Recommendation 7: eradication of chronic HCV infection from the country by 2030 and a major reduction in the burden of disease for hepatitis B

The 2014 report of the *Lancet* Commission¹¹ made a number of key recommendation for viral hepatitis, including eradication of infections from chronic hepatitis C virus in the UK by 2030 using antiviral drugs; reducing the burden of hepatitis B virus; targeting high-risk groups for these viruses, including immigrant communities; and use of a universal six-in-one vaccination for infants against hepatitis B. This report looks at metrics to measure progress towards these goals.

In May, 2016, 194 governments, including the UK, adopted WHO's first ever Global Health Sector Strategy for Viral Hepatitis (GHSS) at the 69th annual World

Health Assembly. The strategy sets a goal of eliminating hepatitis B and C by 2030 and includes prevention and treatment targets.⁸⁰

The metrics shown in **panel 9** were selected to align with both the *Lancet* Commission's recommendation and the GHSS. The first four link with the ten core indicators for monitoring and evaluating HBV and HCV infection recommended in a recent WHO document⁸¹ [A: document added to reference list] and will facilitate comparisons with other countries and allow year by year monitoring of progress. According to the WHO report, the ten core indicators are: (1) prevalence, (2) infrastructure for testing, (3) vaccination coverage of newborns for HBV, (4) needle and syringe distribution, (5) facility level injection safety, (6) people diagnosed, (7) treatment coverage or initiation, (8) HCV cure and HBV suppression numbers, (9) incidence of new infection, and (10) attributable mortality and morbidity.

Metric 7.1: number of HCV-infected patients treated with new HCV direct-acting antivirals and number of patients achieving cure or SVR12 (linked with WHO indicator 8)

This metric allows a direct comparison of numbers cured with numbers of newly diagnosed HCV infections as an indicator of progress towards eradication and reduction in prevalence, and allows comparison of treatment numbers with other European countries and the impact of initiatives for testing and treating HCV.

Treatment numbers in the UK are rising (figure 15). [A: ok to cite fig 15 here?] As of August 22, 2016, in England, 3482 patients with HCV have been started on treatment since April 1 (2.2% of the estimated 160 000 chronically infected cases),⁸² [A: reference was out of order; please check renumbering] with a target of 10 000 to be treated by the end of March, 2017 (6.3% of the prevalent population). The present focus of NHS England is on patients with advanced liver disease and plans to increase the proportion of patients on therapy year-on-year are dependent on an anticipated fall in drug costs as a consequence of increased competition. Despite the rise in therapy, eradication of HCV in England by 2030 is unachievable with these numbers, as it will take until 2032 to treat the known patient pool, without treating any new infections, and either a marked increase in funding or a reduction in the cost of treatment will be needed to achieve the goal of eradication. There are no new widespread testing programmes in place in England currently to increase diagnosis.

In Scotland in 2015, 1700 patients with HCV were treated, with similar numbers expected for 2016. This represents about 4.5% of the estimated 38 000 chronically infected cases (data from John Dillon). [A: please provide JD's institution and his written permission to cite data] In Wales, central funding was provided from 2015–16 with 464 patients treated and funding to treat 900 in 2016–17 (data from Brendan Healy). [A: please provide

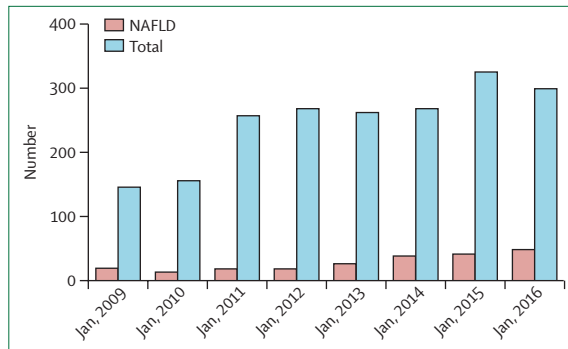


Figure 13: Proportion of adult elective NHS patients with NAFLD waiting for a liver transplant in the UK
 NAFLD=patients with NAFLD as either a primary or secondary diagnosis. All=total number of patients [A: awaiting liver transplant?]. Data from January snapshot of liver transplant list, courtesy of Elisa Allen, NHS Blood and Transplant. [A: figure title and legend correct? Two titles were provided in the original file; this version combines them. Please provide written permission from Elisa Allen to cite her as a source]

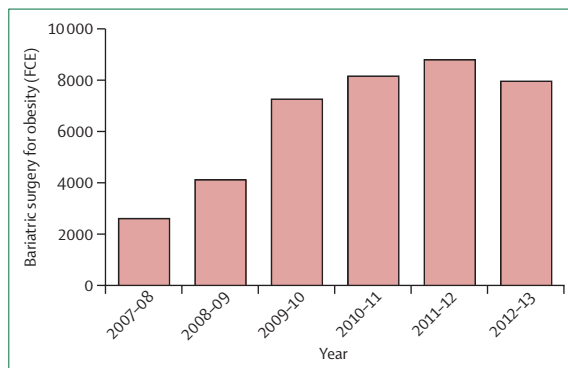


Figure 14: HES data on finished consultant episodes (FCE) for patients admitted for bariatric surgery [A: please spell out FCE]

BH's institution and his written permission to cite data] This represents 7.5% of the estimated 12 000 chronically infected cases.

By comparison, in Australia (where the price of therapy is capped to allow unlimited access), 22 470 individuals were started on treatment from March to June, 2016; close to 10% of the total infected population of 230 000 in just 4 months.⁸³ In Germany (where expenditure on antiviral drugs is estimated to be five times greater than in England) numbers started on treatment [A: correct?] are estimated to be stable at 25 000 per year since 2015 [A: this is less than one year; please clarify], 10% annually of their estimated prevalent pool [A: this sentence is unclear; please rephrase] of 250 000.⁸⁴ In Australia and Germany all of the known diagnosed HCV cases will be treated within a few years [A: please provide supporting reference for this broad statement] and there are plans for widespread testing programmes to diagnose the remaining cases.

Sustained viral response (SVR) rates for treatment initiated in 2016 are not yet known, but the earlier NHS England Early Access Programme for advanced liver

disease, which treated 467 patients (409 with decompensated cirrhosis), achieved an overall SVR rate of 81·6% (381/467). For genotype 1 infection, SVR was 90·5% (209/231) and 68·8% for genotype 3 (132/192).⁸⁰

Metric 7-2: number of patients diagnosed with HCV and HBV (linked with WHO indicators 2 and 6)

In England and Wales there were 11626 laboratory reports of newly diagnosed HCV infection in 2015 (11997 in 2014) (table 7). Some of these will be recent infections and others previously undiagnosed long standing chronic HCV. This is greater than the number of patients being treated.

Nearly all new cases of HCV infection arise in people

who inject drugs, with incidence remaining relatively stable (eight per 100 person-years in 2015 and seven per 100 person-years in 2011). The prevalence of HCV in people who inject drugs also shows no sign of reducing, with around 25% of these drug users being HCV antibody positive within 3 years of first injecting (figure 16).

For 2015, a total of 457 cases of acute or probable acute HBV infection were reported—an annual incidence of 0·83 per 100 000 population per year.⁸² [A: correct reference?]

Metric 7-3: mortality from HCV and HBV—number of HCV or HBV associated hepatocellular carcinomas, number of transplants for HCV or HBV, and HES data for bed days associated with HCV and HBV infection (linked to WHO indicator 10)

The PHE annual report on Hepatitis C in the UK for 2016 presents a new evaluation of HES data that allows estimation of the number of new cases of end-stage liver disease or hepatocellular carcinoma arising as a consequence of HCV infection. There are some limitations due to variations in datasets between UK countries. However, these show a fairly constant number of approximately 1800 new cases each year since 2010 (figure 17). [A: ok to cite here?]

Between 2005 and 2014, annual deaths from HCV-related end-stage liver disease and hepatocellular carcinoma in the UK rose from 215 to 457 (figure 18). [A: ok to cite here?] Although 2015 data are preliminary and should be interpreted with caution, it is encouraging to see an observed fall in mortality of 11%. This fall might be the result of new direct-acting antiviral drugs introduced from 2014–15, particularly for those individuals with advanced disease.

In the year to March 2015, 119 (19% of total) HCV-infected adult patients underwent an elective liver transplantation; in 2014 the number was 133 (21%).

Metric 7-4: numbers of infants starting and numbers completing a course of HBV vaccination (linked to WHO indicator 3)

PHE reports vaccine coverage data in England for three doses of hepatitis B vaccine in infants born to mothers positive for hepatitis B surface antigen (HBsAg) who reached the age of 1 year in this quarter (ie, those born between January and March, 2015), and coverage of four doses of vaccine in infants who reached two years of age (those born between January and March, 2014). The 2015 data shows 86% vaccine completion (1699 of 1987 infants) at 12 months and 74% completion (1681 of 2275) at 24 months. For the first quarter of 2016, the 12 and 24 month returns (data from 127 and 122 of 151 former primary care trusts, respectively) show that 91% of 481 infants received three doses of vaccine by 12 months and 69% of 495 infants received all four doses by 24 months.

Panel 9: Metrics for recommendation 7

7-1 Number of HCV-infected patients treated with new HCV direct-acting antivirals and number of patients achieving cure or SVR12

7-2 Number of patients diagnosed with HCV and HBV

7-3 Mortality from HCV and HBV: number of hepatocellular carcinomas associated with HCV or HBV, number of transplants for HCV or HBV, and HES data for bed days associated with HCV and HBV infection

7-4 Numbers of infants starting and numbers completing a course of HBV vaccination

7-5 Universal HBV vaccination offered by region (yes or no)

SVR12=sustained virus response at 12 weeks. [A: ok?]

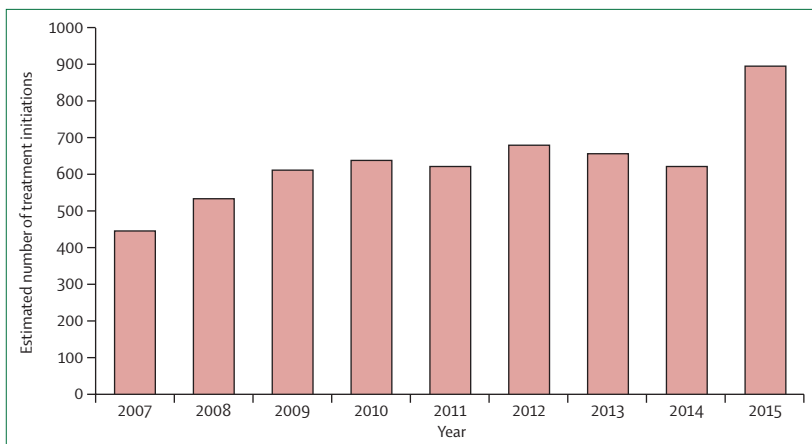


Figure 15: Numbers of patients treated for hepatitis C in the UK 82

Data from Scotland available by financial year were grouped with data by calendar year for other UK countries—eg, 2011–12 grouped with 2011. Data for Wales not available for 2007–10 and data for one [A: Welsh?] health board missing in 2014. Data for England for 2015 are provisional estimates for the 12-month period June, 2015–April, 2016, based on clinician-reported intention to treat where there is some robustness about intention to treat (eg, incomplete or other records excluded). [A: unclear, please clarify] Method of data collection changed in Wales in 2015 and these data [A: ie data for Wales for this year?] are provisional. Sources: Regional Hepatology Unit, Belfast Trust for Northern Ireland; Health Protection Scotland, using data supplied by hepatitis C treatment centres; Public Health Wales, using data from health boards; NHS England for 2015 provisional estimate for England; sentinel surveillance of hepatitis bloodborne virus testing for sampled estimates for 2012–14 for England; estimates from Roche sales, IMS supply chain manager, and Pharmex data for England for 2007–11.

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	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
East Midlands	259	402	588	576	515	673	672	549	591	401
East of England	684	695	794	706	607	844	776	707	792	840
London	1190	1017	966	856	968	2012	2789	3089	3836	4091
North East	245	141	167	275	317	310	301	360	305	233
North West	1380	1737	1666	2117	1807	1514	1797	1981	1496	1385
South East	379	786	1083	1147	1170	1300	1298	1137	1323	1331
South West	872	1046	1114	999	732	973	1111	997	983	1077
West Midlands	487	614	673	860	778	774	740	781	648	864
Yorkshire and Humber	1449	1363	1344	1091	981	1507	1376	1470	1513	1326
Wales	327	333	487	356	318	486	502	690	510	78
Total	7272	8134	8882	8983	8193	10393	11362	11761	11997	11626**

Table 7: Laboratory reports of hepatitis C by region (Public Health England Centre), England and Wales (2006–015)⁸⁵ [A: cited report added to reference list, please check]

Metric 7-5: has universal vaccination for HBV been introduced (yes or no)

At the time of writing, the UK government has accepted universal immunisation for hepatitis B but this has not been introduced.

Recommendation 8: Increasing awareness of liver disease in the general population, within the NHS, and, vitally, with governments; increasing the inclusion and involvement of liver patients and patient groups in new developments and ongoing work with national and local initiatives

Metric 8-1: government supported national liver plans

Panel 10 shows the metrics for recommendation 8. The initial *Lancet* Commission on Liver Disease's report highlighted that the increasing burden of liver disease in the UK was getting worse and that liver disease is the third most common cause of premature death, with a 400% increase since 1970 and a trajectory that continues to climb. In order to decrease this and improve care, treatment, and support for those with and affected by liver disease, national liver plans must be developed to outline clearly government supported actions; and improvements for liver health, from prevention through to cure, long-term support, and end-of-life care, must include liver health issues for children and adults. [A: previous sentence was slightly unclear - please confirm that the edited version retains your intended meaning] To support the national liver plan, a multidisciplinary implementation committee, with patient representation, should be formed to deliver and monitor its success. Additionally, to support the clinical elements of the plan's recommendations, a national clinical director for liver health must be appointed to lead on the improvements needed. [A: table has been removed and incorporated into the text] England, Northern Ireland, and Scotland have not yet published a national liver plan. In Wales, *Together for Health—Liver Disease Delivery Plan* was published in May, 2015,⁴ an implementation committee [A: has been, or is being?] developed with patient

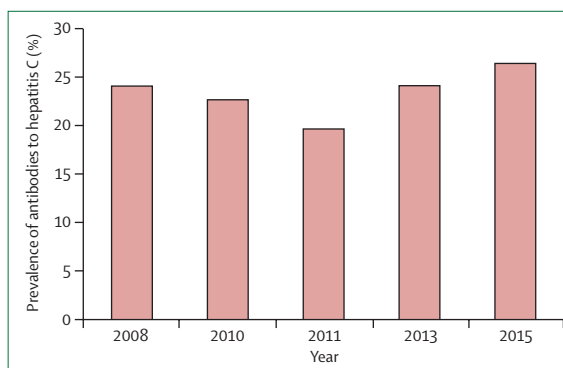


Figure 16: Estimated UK-wide prevalence of antibodies to hepatitis C among people who began injecting drugs in the previous three years, 2008–15

This figure uses data from two ongoing survey programmes that together cover the whole of the UK. Data from these surveys have been weighted by size of adult (age 16–64 years) population and then combined. The survey covering Scotland is not annual, so data are presented only for years where both surveys were done. Value for 2015 weighting is based on 2014 mid-population estimates. [A: please clarify, what is mid-population?] Sources: *Needle Exchange Surveillance Initiative* [A: ok?], University of West of Scotland and Health Protection Scotland; Unlinked Anonymous Monitoring survey of people who inject psychoactive drugs by Public Health England with assistance from Public Health Wales and Public Health Agency Northern Ireland. [A: please check retyped figure legend and confirm that you have obtained formal permission to reproduce (from PHE?)]

representation, and Andrew Yeoman was appointed as national clinical director in 2016. The recommendations are already having a positive effect in Wales and provide a benchmark for other countries.

Metric 8-2: Geographical variation in liver disease mortality: Public Health England local authority liver disease profiles

Variations in mortality rate from liver disease persist between local authorities in England with a four-fold variation in mortality rates for men and women—variation is 3·8 for men (52 per 100 000 in Blackpool compared with 13·7 per 100 000 in Buckinghamshire) and 4·3 for women (28 per 100 000 in Blackpool compared with 6·6 for 100 000 in Barnet). The variation is even more stark when years of life lost under age 75 years are

For Liver disease profiles in England see <http://fingertips.phe.org.uk/profile/liver-disease>.

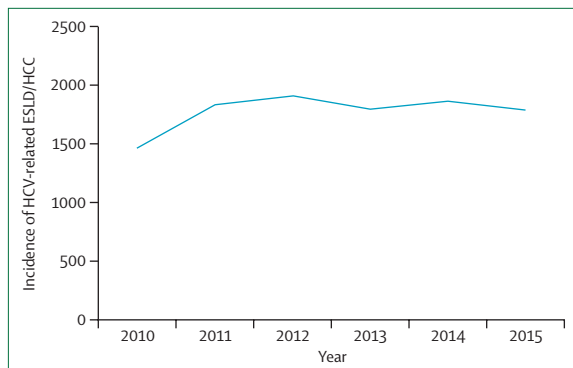


Figure 17: Preliminary estimates of incidence of HCV-related end-stage liver disease (ESLD) or hepatocellular carcinoma (HCC) in the UK, 2010-15

An episode of ESLD or HCC is defined as the first if there have been no previous episodes of ESLD or HCC for that individual in the previous 5 years (0.4% in England estimated to have had an episode >5 years earlier). ESLD defined by codes or text entries for ascites, bleeding oesophageal varices, hepatorenal syndrome, hepatic encephalopathy, or hepatic failure. 2015 data provisional for Wales and missing for Northern Ireland. In England, about 1.5% of individuals admitted had identifiers estimated to have had an episode >5 years earlier). Sources: HES, Health and Social Care Information Centre (England); Hospital Inpatient System (Northern Ireland); Patient Episode Database for Wales, NHS Wales Informatics Service (Wales); Health Protection Scotland in association with the Information Services Division (Scotland). [A: please check retyped figure legend and confirm that you have obtained formal permission to reproduce (from PHE?)]

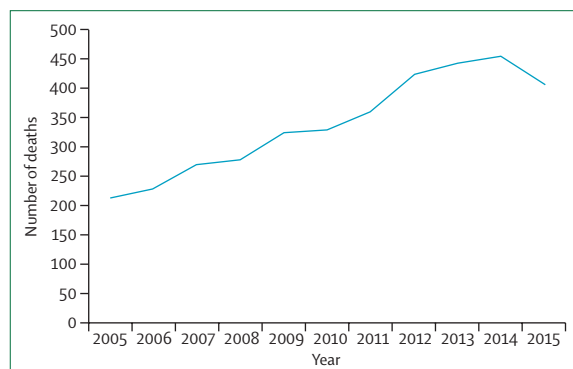


Figure 18: Deaths from end-stage liver disease or hepatocellular carcinoma in people with hepatitis C mentioned on the death certificate in the UK, 2005-15
ESLD defined by codes or text entries for ascites, bleeding oesophageal varices, hepatorenal syndrome, hepatic encephalopathy, or hepatic failure. 2015 data provisional for England and Wales and missing for Northern Ireland. Sources: Office for National Statistics for (England and Wales); deaths registration data from Northern Ireland Statistics and Research Agency (Northern Ireland); Health Protection Scotland in association with the Information Services Division (Scotland). [A: please check retyped figure legend and confirm that you have obtained formal permission to reproduce (from PHE?)]

compared, with a variation of 8.4 (89.3 years of life lost per 10 000 in Blackpool compared with 10.5 per 10 000 in Rutland). These variations reflect both variation in risk factors and variation in access to NHS Services. PHE will publish an updated *Atlas of Variation in Liver Disease*.

The *Lancet* [A: correct?] Commission recommends that all UK [A: correct?] countries develop local liver health profiles and use them to address inequalities and

priorities i with annual updates to evaluate success. At present, of the countries in the UK, only England has published a local liver health profile. [A: we have replaced table 10 with this sentence in order to save space – please confirm that the wording is ok].

Metric 8-3: inclusion and involvement of patient and patient support groups

To best address the holistic needs of patients it is vital to have their involvement in developments, service design, governance, and so on. There is still a need to ensure this involvement happens and all health officials and clinicians should advocate for this input when it is not present. In the Liver QuEST² project to support the improvement of hospital liver services, the peer review teams include patients but only a few DGHs have been visited.

The 22 Hepatitis C Operational Delivery Networks in England aim to have patient involvement throughout as soon as possible with the help and support of the Hepatitis C Trust. This involvement has not yet been audited [A: end of section amended as outlined in response to reviewers – please confirm that edited wording is correct]

Metric 8-4: public health sponsored public awareness campaigns for obesity and alcohol

To raise public awareness campaigns about the two main causes of liver disease, alcohol and obesity, must be developed and promoted effectively to ensure that the public is as informed as possible and empowered to make improvements to their lifestyle. Frequently updated national campaigns are vital to reverse the increasing burden of preventable liver disease. In assessing the value of these campaigns, cohorts will need to be studied for the effect on their lifestyle, body weight, and alcohol consumption, which are relatively easy measures to follow. [A: sentence added from response to reviewers– ok?]

Examples of government-funded national campaigns are shown in the appendix. [A: we are unable to include links in tables, so we would like to include this table as a web appendix – this way the links can remain in the table and readers can click straight through] Additionally, many charities, including Alcohol Concern, Cancer Research UK, Diabetes UK, and the British Liver Trust, have national campaigns that highlight the detrimental effects of obesity and alcohol on health.

General policy strategy in the devolved nations Scotland

[A: It is unusual to give individual contributing authors' names in the text, so I have deleted them in the following sections – if you would like to specify which authors were responsible for specific sections, please give these details in the Contributor's statement.] Alcohol use, obesity, and hepatitis C are more prevalent in Scotland than in the rest of the UK (figure 19). [A: ok to cite fig 19 here?]

See Online for appendix

the rest of the UK, the natural history of liver disease is of late presentation with decompensated liver disease or hepatocellular carcinoma, with a pressing need to develop strategies for earlier detection and more effective intervention. Scotland does not have an integrated liver plan but has a series of activities that cover the major causes and management of liver disease. These include an alcohol strategy, the sexual health and blood borne virus framework, and a department of health initiative to improve management of outpatients, the National Delivering Outpatient Integration Together (DO IT) Programme, with a workstream focussed on abnormal liver function tests.

The current Scottish alcohol strategy is undergoing review to add to and adjust existing policies in the light of experience with the strategy. Scottish Health Action on Alcohol Problems (SHAAP) with the support of the Scottish Government has brought together a working group to focus the strategy on alcohol-related liver disease, a major driver for mortality and costs. The main recommendations are for an assessment of liver fibrosis in all those presenting with alcohol excess [A: for clarity, please define alcohol excess] and prioritisation of those with evidence of advancing fibrosis in alcohol treatment. The group will recommend that people admitted to hospital with the consequences of alcohol-related liver disease receive standardised management in accordance with the BSG/BASL [A: please spell out] bundle and have follow-up treatment plans with alcohol services in place before discharge. How these interventions will be delivered is under consideration.

The existing alcohol strategy has had substantial effects on reducing alcohol-related mortality. In 2015, there were 1150 directly alcohol-related deaths (defined largely by alcohol-related liver disease), the third lowest annual total since 1997, compared with the peak of 1546 in 2006 (figure 20). It is speculated that the fall is secondary to the increases in the price of alcohol due to the economic downturn and policies banning alcohol multibuy promotions, which were not subject to legal challenge. This trend provides further indirect evidence that price is a key lever for change in alcohol-related mortality. Minimum unit pricing could have an even greater impact; it remains under judiciary review.

At the World Hepatitis summit [A: please hear (and month, if in 2016)] the Scottish Government signed the Glasgow Declaration committing to the elimination of HCV, and it remains committed to removing HCV as a substantial public health issue in Scotland. The government has committed to reduce HCV-related liver failure and hepatocellular carcinoma by 75% by 2020 from 2015 levels. HCV treatment targets have been exceeded, and with increased HCV prevention activity, have been associated with year-on-year falls in the prevalence of HCV. There is also early evidence of a fall in the numbers of patients presenting with HCV-related liver failure.

Panel 10: Metrics for recommendation 8

- 10-1 Government supported national liver plans
- 10-2 Regional variation in PHE health profiles
- 10-3 Inclusion and involvement of patient and patient support groups
- 10-4 PH [A: PHE?] sponsored campaigns in obesity and alcohol

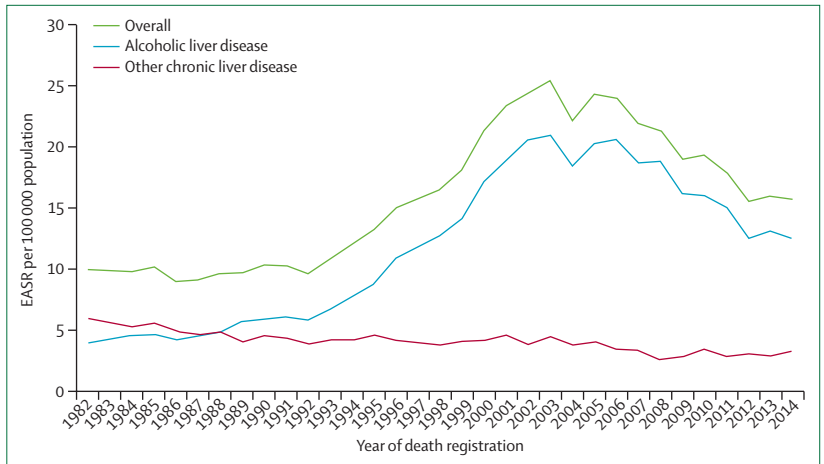


Figure 19: Deaths from chronic liver disease in Scotland, by condition [A: please confirm that figure title is correct] EASR=European age-standardised rate

The management of abnormal liver function tests continues to be a major challenge, with many patients not being investigated and only 1.4% converting [A: progressing? Or leading to?] into a diagnosis of liver disease in some series [A: reference?]. The DO IT programme ensures all patients with clinically significant liver disease are investigated, while limiting investigation of non-significant abnormalities of liver function tests [A: how does it do this?]. A pilot project currently nearing completion is using a minimal set of diagnostic criteria for liver diseases combined with automatic cascading of liver screen investigations on the original sample when first discovered to be abnormal. [A: please rephrase this sentence to clarify the meaning]. Preliminary results suggest that this process assigns a diagnosis of liver disease [A: do you know that this process assigns the correct diagnosis to these patients? How are these minimal diagnostic criteria validated or evaluated?] to more than 50% of patients on the basis of the liver screen and aetiological information. [A: what do you mean by "aetiological information"?].

Wales

[A: as above, A Yeoman's name deleted] In 2015, the Welsh Government launched a national strategy, [A: reference added] to tackle the rise in morbidity and mortality related to liver disease in Wales (which has

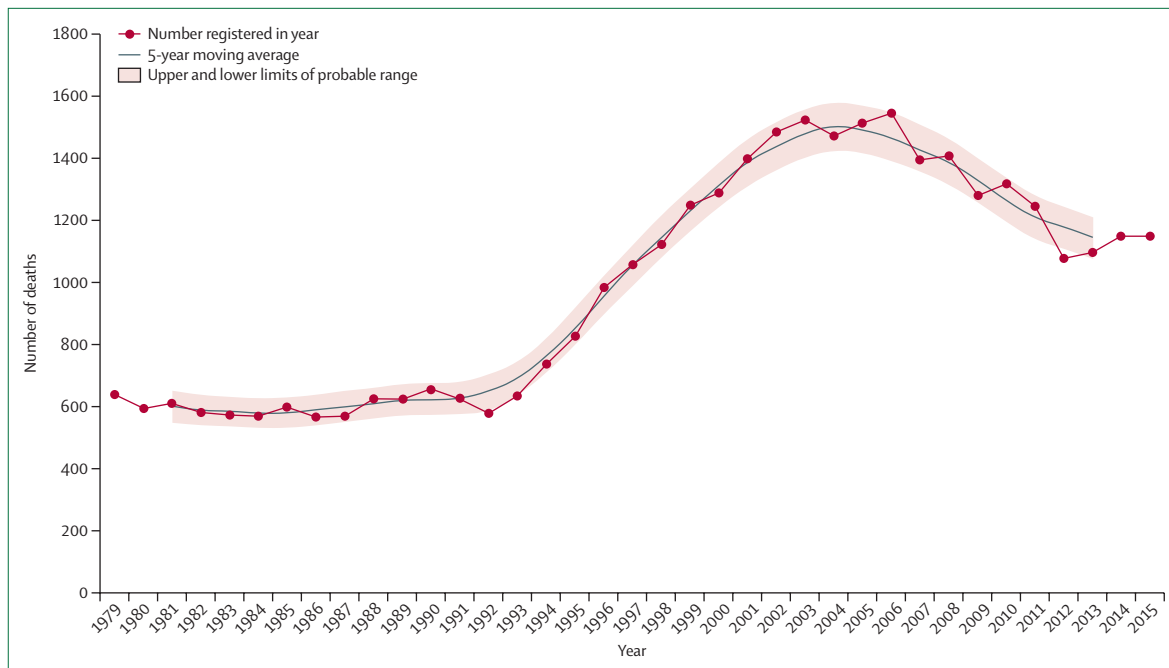


Figure 20: Alcohol-related deaths registered in Scotland, 1979–2015, showing probable range of values around 5-year moving average [A: please clarify meaning of 'moving average' and how probable range is determined]

Definitive alcohol-related deaths as used by the Office for National Statistics in 2006.86

mirrored that seen across the UK), the culmination of a collaboration between Public Health Wales, the Welsh Association of Gastroenterology and Endoscopy (WAGE), and key stakeholders, with an annual budget of £1 million from the Welsh Government.

The plan aims to improve activity across six key areas: prevention, early detection, fast and effective care, living with liver disease, improving information, and targeting research, each area with major objectives and metrics. Specific subgroups formed to date include the blood borne virus, early detection, and clinical services subgroups. A national clinical lead (0.2 whole time equivalent) has been appointed and a full-time administrator will support the delivery of objectives determined by the implementation group.

There have already been areas of substantial progress in the care of patients with liver disease in Wales. The Wales blood borne virus network, consisting of representatives from each of the six health boards in Wales and an external advisor, David Mutimer from the Birmingham Liver Unit, supported by an excellent, established network of specialist nurses, set criteria [A: please clarify what the criteria are for-referral to specialist treatment centres?] (Fibroscan [A: we avoid use of trade names – can this be changed to transient elastography?] >9.5 kPa or other urgent need for therapy) and set up a panel to discuss patients for appropriateness if discordant [A: please clarify: appropriate for..., and discordant from...] or with extenuating circumstances to ensure equitable access to new therapies across Wales.

This approach was supported by central government funding and, for the financial year 2015–16, delivered directly active antiviral therapy to 464 patients in Wales, most with cirrhosis or advanced fibrosis. For 2016–17, further funding has been agreed to treat approximately 900 patients, and the access criteria relaxed (Fibroscan 6 kPa [A: as above]). Treatment of this number of people on a recurrent basis should lead to a reduction in the population prevalence of the disease.

The network has also developed industry partnerships that have led to specific initiatives around diagnosis and provision of treatment to groups such as prisoners or people who inject drugs.

The Wales Harm Reduction Database has been awarded funding agreed through the liver plan to create a blood borne virus module that will cover the initial screening, consent and testing, diagnosis, and referral to specialist treatment services for patients who might have hepatitis B, hepatitis C, or HIV. It is expected that the module will be fully implemented, following training across Wales, early in 2017. A blood borne virus specific electronic clinical management system is also in development. Liver plan funding has also been allocated to the development of point of care testing in viral hepatitis.

The development of alcohol care teams based in secondary care was a key early priority identified in relation to liver disease in Wales [A: sentence edited for clarity, please confirm that the wording is correct]. Such services had previously been patchy or nonexistent. The

plan has supported health boards to develop their own regional plans for alcohol care teams, ensuring that alcohol misuse becomes an organisational priority in their integrated medium-term plans, with £1 million allocated over a 2-year period to pump-prime the development of alcohol care teams in each health board in Wales. To date, four health boards have had funding approved for this purpose, with the plans for the remaining two in an advanced stage of development.

Regarding the early diagnosis of liver disease and improvement of links with primary care, a pilot is currently running in one health board to ascertain the usefulness of reflexly [A: do you mean 'routinely?'] measuring aspartate transferase (AST) when alanine transaminase (ALT) is found to be elevated, so enabling calculation of the AST:ALT ratio, which the *Lancet* Commission had the potential to earlier identify patients with advanced fibrosis or cirrhosis (with those with a ration of >1 being referred for further assessment).

Given that the majority of patients with cirrhosis are diagnosed at the time of an admission with decompensation, it is hoped that this work will both lead to an earlier diagnosis of cirrhosis and avoid the need for the patient to return for another blood test. This approach has the potential to reduce GP workload (via reduced patient recall) and to reinforce the knowledge that minimal elevations of ALT can be associated with serious disease. This work will also help in the planned development of an all-Wales pathway for the management of abnormal liver function tests. A collaboration to improve public and patient knowledge of the risks of and care of liver disease is being developed alongside mature patient and carer support groups across Wales, which are also exploring wellness services that might link lifestyle factors recorded in such consultations [A: consultations in primary care?] with risks of liver disease. Work is being undertaken to improve access to liver transplantation for patient in Wales via the establishment of stronger regional networks and outreach clinics with transplant physicians.

Northern Ireland

[A: as above, author name deleted and section reworded to avoid single-author delivery] Northern Ireland is well behind England with respect to screening for early liver disease in the community, partly because of the different structures [A: of the health service?]. The NICE guidance on hepatitis B has not yet been fully implemented, owing to the resource implications of Fibroscan) [A: ok to change to transient elastography? Please explain the resource implications briefly or reword].

With respect to provision of services (recommendation 3), Northern Ireland has a single regional liver unit in Belfast. No other hospitals have more than 2 hepatologists, although most of the nine hospitals outside Belfast have one gastroenterologist with an interest in liver health. This represents an

improvement over the past 5 years, owing to recent appointments.

Northern Ireland is well served by the special arrangement with King's College Hospital in London [A: addition of 'in London' correct?], which functions as an outreach centre for specialist paediatric services and continuity of care in transition to adult services, with weekly meetings via video conference to the King's orthotopic liver transplantation listing meeting and a joint King's–Belfast clinic every 2 months. Northern Ireland is the single biggest referrer of patients to King's. The 2015 data [A: reference?] showed the highest number of patients listed for transplantation [A: 'for transplantation' correct?] per head of population (excluding the Isle of Man) although numbers fell back into the main stream, with 20–24 transplants per year. Survival data on 255 patients who had transplants up to 2012 (90·9% 1-year survival, 80·2% 5yr survival, EASL [A: please define EASL] 2014) showed that shared care arrangement deliver outstanding results [A: reference?].

Paediatric liver transplant work is done through Birmingham [A: in a particular hospital/centre?] by historical arrangement. To facilitate transition to adult services, hepatologists from Northern Ireland join those from Birmingham in seeing adolescent patients over 1–2 years at the paediatric clinic before they transition to the adult transplant service for follow-up. [A: please check that edited version is correct]

Northern Ireland is making excellent progress on alcohol care services and the Chief Medical Officer, Michael McBride, has been a strong supporter of this work. Data on the number of specialist nurses and alcohol care teams is covered in recommendations 2 and 5. Three consultant led alcohol care teams have been established in Northern Ireland, in Belfast and in two of the other four Trusts (personal communication Roger McCorry, Belfast Trust Alcohol Care Team [A: please provide consent to cite McCorry]). A regional alcohol care-pathway has also recently been completed to standardise alcohol screening and care across the province.

Northern Ireland has an excellent HCV treatment programme that is able to provide all NICE-approved treatments for patients in Northern Ireland. There is a single virology laboratory so that all results go through one centre and all treatment is delivered through the Regional Liver Unit in Belfast. There is also a hepatitis network for Northern Ireland—a collaborative effort between public health and ourselves [A: by 'ourselves' do you mean hepatologists?] that helps to address the wide range of issues with viral hepatitis, including screening, prevention, and treatment pathways.

Contributors

RW was responsible for planning and content for the executive summary and editorial [A: do you mean writing, editing, editorial direction?] of the paper as a whole. RA contributed to planning and content on district hospital and community services. JB contributed to content for the section on nursing care and training requirements. GA, MH, J Dyson, and LR

contributed to the section on improving hospital care, service planning, and survey data. GCW, RG, AL, and JV contributed to planning and content for the section on increasing awareness of liver disease. MEC and GF contributed to planning and content for viral hepatitis services. ND contributed to planning, preparation of images, and editorial [A: as above, please clarify] of the paper. AD, DK, AT, and MS contributed to planning and content relating to paediatric and transition services. J Dillon contributed to the progress report from Scotland. JF contributed to the section on current liver services and LiverQuest. IG, LH, SL, KM, and NS contributed to planning and content for the section on alcohol. PN and HR contributed to planning and content for the section on obesity. JO'G contributed to content for the section on liver transplantation and capacity. LH< KM, RP, SR, and JT contributed to content of the section on primary care. AY contributed to content for the section on Wales.

Declaration of interests

[A: please check that the statement is complete] MEC declares grant funding and personal fees from Gilead, Merck, Boehringer Ingelheim, Janssen, Roche, and Bristol-Myers Squibb. RA has received fees for speaking and advisory board attendance from AbbVie, Bristol-Myers Squibb, Intercept, and Norgine. MC reports grants, personal fees, and non-financial support from AbbVie, BMS, Gilead, Merck, and Janssen, outside the submitted work. All other authors declare no competing interests.

Acknowledgments

[A: please note that we require consent from all individuals mentioned in the acknowledgments] We thank Carla Lloyd (Birmingham Children's Hospital) for her contribution to data for Recommendation 4 and Helen Harris and Koye Balogun for their contributions to Recommendation 7. We thank Stephen Bergin (consultant in public health medicine, Faculty Public Health adviser, Northern Ireland), Gary Maxwell (Health Development Policy Branch, Department of Health), and Neil McDougall (consultant hepatologist, Belfast Health and Social Care Trust), who offered valuable assistance in gathering data relating to Northern Ireland. We thank Norgine for their unrestricted grant to the Foundation for Liver Research, which has enabled the Commission to work with Incisive Health in bringing the work of the Commission to the attention of Parliament. Incisive Health also produced the constituency liver profiles referred to in the introduction.

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