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## **Examining an alcohol health worker service's patient coverage**

### **Abstract**

Alcohol Health Workers (AHWs) have been found to be effective at reducing alcohol-related hospital admissions, but there is still a paucity of evidence in key areas. This is the first study to investigate what percentage of patients referred to an AHW service by alcohol screening tools are actually seen by the AHWs. The study – based in a large teaching hospital in the north of England – also investigates the impact of social deprivation on service usage. Research data come from a patient database and semi-structured interviews with AHWs. Further research is required to better understand the 'harm paradox' of patients' differential susceptibility to alcohol-related harm and how this might impact AHW service patient flow.

**Key Words:** Alcohol; Nursing; Health Services Research; Patient Discharge; Screening;

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**Conflict of interest:** none

### **Background**

In England during 2012/13 there were over one million alcohol-related hospital admissions where "an alcohol-related disease, injury or condition was the primary reason for admission or secondary diagnosis" (Public Health England,

2014: 9). In economic terms, the annual cost to the NHS of alcohol misuse is estimated at £3.5 billion, 78% of which is incurred for hospital-based care (HSCIC, 2013).

The introduction of Alcohol Health Workers (AHWs) to work directly with patients who misuse alcohol and to lessen the burden on the NHS was first recommended by the Royal College of Physicians in 2001 (RCP, 2001). There is strong evidence that brief interventions – where a patient has an appointment with an AHW to discuss current and previous drinking – are effective at improving patient outcomes (Baker et al., 2014).

### **Previous research**

An RCT conducted by Crawford et al. (2004) compared patients who were given a brief intervention and an information leaflet against control patients who only received the leaflet. They found the intervention group consumed fewer units per week at six months and had fewer visits to A&E over 12 months than the control group. A study by Cobain et al. (2011) found that the number of units drunk and the number of drinking days per week was significantly lower among patients attending a hospital providing brief interventions than those who attended a hospital where none were provided. There was, however, no statistically significant difference in the number of A&E attendances or length of hospital stay between the two cohorts.

Ryder et al. (2010) evaluated the effectiveness of an AHW service in Nottingham over five years. The authors found the number of number of alcohol units consumed, bed days, number of patients admitted for detoxification, and the number of violent incidents in the hospital where alcohol was a factor, were all reduced during the study period.

Research has shown that patients could benefit for up to 12 months after receiving brief interventions from AHWs (Crawford et al., 2004). There is,

however, a shortage of evidence showing that AHWs continue to make sustainable impacts on patients' drinking habits post discharge, with some research suggesting that at 12 months, referral to an Alcohol Health Worker is no longer more cost-effective than no intervention (Barrett et al., 2006).

There has been considerable recent growth in the number of AHWs in England (Thom et al., 2013). Previous work by two of this paper's authors established the extent of AHW provision at a national level through a survey of 48 hospitals in England that showed 45 of these had at least one AHW (Baker et al., 2014).

The survey also established the diversity of AHW provision, building on the work of Ward and Aulton (2010). AHWs are involved in assessment, identification and brief advice, liaison with outside agencies, detoxification support, education, follow-up and discharge planning, and management of repeat hospital attendees (Baker et al., 2014).

The AHWs were qualified nurses in 39 of the 48 hospitals surveyed by Baker et al. (2014), with the remaining nine employing staff with other qualifications or experience in substance misuse. Different terms are used by individual hospitals to describe the different professional background and expertise of those health professionals working as AHWs. In the survey, the majority of staff used the term Alcohol Liaison Nurse, with other titles including Alcohol Nurse and Substance Misuse Nurse (Baker et al., 2014). This paper follows Baker et al. (2014: 205) in defining AHWs as: "qualified and nonqualified nurses whose role is predominantly specialised in patient alcohol use".

### **The aim of the study**

The extent and diversity of AHW provision has been established by Baker et al. (2014). This paper aims to build on this research by turning attention to the lack of evidence about the patients that are attending these services. This will be

achieved by focusing on a specific AHW service.

There is a paucity of evidence about two important issues related to service coverage. Firstly, although several studies have showed that alcohol screening tools used by general healthcare staff – typically nurses or healthcare assistants – are effective in identifying those with alcohol-related needs (Barrett et al., 2006; Kaner et al., 2013; Drummond et al., 2014; Patton et al., 2014), there is no evidence that patients identified in this way are actually seen by AHWs (Public Health England, 2014). Data to investigate this were requested by the 2014 Public Health England report on alcohol to help illustrate the number of opportunities missed and inform “optimum disposition of existing staff resources” (Public Health England, 2014: 28). Alongside evaluating the available data of this type from a specific AHW service, this study will also aim to determine how the studied service could reduce the numbers of patients being missed.

Secondly, there is little information about the socio-economic status (SES) of the patients seen by AHWs and whether certain groups are consistently missed. Although there is little difference in alcohol consumption between people in the most deprived areas of the country and least deprived areas, those with lower SES are much more likely to experience worse alcohol-related harms (Smith and Foster, 2014). This is termed the ‘alcohol harm paradox’, described as the difference in susceptibility to the harmful effects of alcohol experienced by the most deprived groups in society (Bellis et al., 2016).

This may be due to under-reporting of drinking by those from lower SES groups, differences in drinking patterns, compounding factors like diet or general well-being, and differential access to health services (Bellis et al., 2016; Smith and Foster, 2014). While there is evidence on most of these factors from the UK and other countries, there is little research on the impact of differential access to health services (Smith and Foster, 2014). A better understanding of whether patients from different SES groups use the studied AHW service at different rates

could provide vital evidence about what impact access to health services has on the alcohol harm paradox.

This study, therefore, has two objectives:

1. To determine what proportion of patients referred to an AHW service are actually seen by an AHW, and how the service could reduce the numbers of patients being missed
2. To determine if there a link between deprivation and AHW service use in the study context

### **Study site**

This investigation focused on a large teaching hospital in northern England. As recommended by the University of York Ethics Panel, the exact location of the hospital will not be revealed in this paper and some key statistics about the city that could identify it will not be included. If this were not the case the identity of the AHWs who were interviewed could be revealed and their anonymity was guaranteed as part of their informed consent.

The metropolitan district in which the studied hospital is located encompasses the city, other outlying settlements, and extensive rural areas. Levels of unemployment are higher than the national average (ONS, 2013) and nearly half of the city's population lives in the most deprived 20% of areas in England, based on Index of Multiple Deprivation (IMD) scores (Noble et al. 2008). The city also has a higher rate of alcohol-related admissions than the national average (LAPE, 2015). The city has a high proportion of ethnic minorities and its population is younger than the national average (ONS, 2013).

The AHW service in 2013 consisted of three AHWs commissioned by an NHS Trust. The service was established in 2008, initially with one AHW. The other two AHWs started in 2010 and 2013 respectively. All patients admitted onto hospital wards were screened for drinking problems by general hospital staff

using the AUDIT-PC screening tool. If they scored higher than 5 (on a scale of 0-20), they were referred to the AHW team who provided brief interventions to patients and could refer them to appropriate external services. A database of all the patients seen by the AHWs has been maintained since the service's inception. This includes information on patient gender, age, level of alcohol use, postcode, and ethnic background. The AHWs also recorded the number of patients that were referred to the service but did not see an AHW. Personal data for these patients were not recorded.

## **Method**

This study used both quantitative and qualitative methods in a pragmatic mixed-methods design. Both the patient database kept by the AHW service and semi-structured interviews with two of the three AHWs were used to investigate the research objectives. Ethical approval was granted by the relevant NHS organisations and the University of York Health Sciences Department's Research Governance Committee.

### *Database*

Data for this study were collected between September 2008 and March 2012 during which 6,111 patients were referred to the AHWs. The AHWs were able to see 2,307 of these patients and all were included in the database used by the authors for this study. The database included information that could be used to identify individual patients – notably their NHS numbers and postcode. Before the database was transferred to the authors, NHS numbers were removed and patients' postcodes were replaced by data showing which of the 30 Local Authority Wards (LAWs) within the metropolitan district they lived in. These location data were present for 1,560 patients.

As the data were entered into the database in a free-text form by a number of individuals, it was cleaned to remove errors before analysis. Because some values in the database were ambiguous, an AHW was consulted on their meaning and all ambiguities were resolved. Census data from 2011 were used as the population denominator for each of the 30 LAWs with deprivation levels determined using Index of Multiple Deprivation (IMD) data. The database was stored on a password-protected computer and analysed using R (v. 3.1.3). An initial correlation analysis between service use by LAW and level of deprivation by LAW was used to determine the required statistical models. The relationship between these variables was then assessed using Poisson and quasiPoisson generalised linear models.

### *Interviews*

The two AHWs who had been working for the AHW service between September 2008 and March 2012 – the period covered by the database to which the authors had access – were sent a participant information sheet containing details about the study. Their written consent was obtained prior to interview. The semi-structured interviews were audio-recorded in a location where AHWs could not be overheard or disturbed to ensure any sensitive information disclosed remained confidential. The AHWs were asked about certain aspects of the service (e.g. how patients were admitted; the organisation of the service etc.) to understand current service procedures. They were also asked to comment on whether they thought improvements could be made.

Interview analysis was undertaken using Applied Thematic Analysis, as this technique is designed to answer research questions of a practical nature (Guest et al., 2012). After immersion in the data, 'open' codes were developed to represent the themes imposed by the research questions by attaching post-it notes to large paper printouts of the interview transcripts. Higher-level themes (axial codes) were applied to groups of open codes and also noted on the post-it



notes. These axial codes were derived by comparing open codes to one another, and were accepted or rejected by testing how open codes fitted underneath these provisional higher-level themes (Mays and Pope, 2006). The provisional themes, and the open codes that sat underneath them, were then rejected if they were not able to provide information that could help answer the research questions.

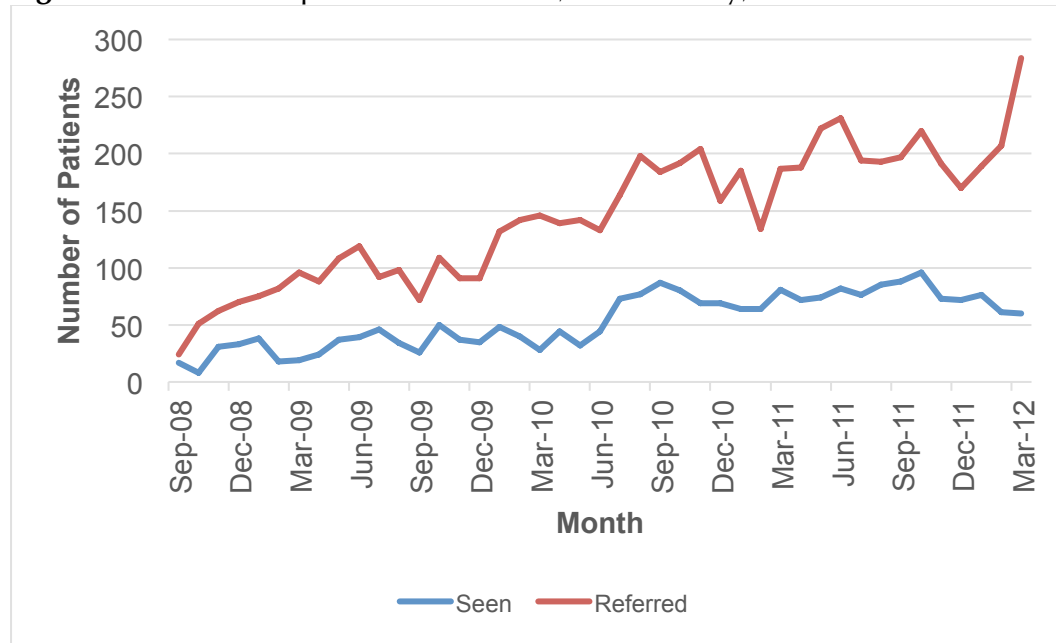
## **Results and discussion**

Of the 2,307 individuals in the database who had seen an AHW, 1,780 were male (77%) and 527 (23%) were female. The mean age of attendees was 47.3 years. Most were White (2,147; 93%), with attendees with Asian origin (104; 4.5%) the next most frequent ethnic background. Patients seen by AHWs were admitted to hospital for a variety of reasons; most frequently seizure, followed by alcohol withdrawal or symptoms associated with alcohol withdrawal such as delirium tremens and nausea.

*How many patients referred to the AHW service are seen by the AHWs?*

Overall, the monthly number of individuals referred to, and seen by, the AHWs increased during the period covered in the database. The exception was the downward trend in patients seen over the last five months (Figure 1).

**Figure 1.** Number of patients referred to, and seen by, AHWs



N = 6111 (all patients referred); Missing Values = 0

Between September 2008 and March 2012, 63% of referred patients did not see an AHW. This suggests effective screening tools do not guarantee that AHW services will capture all the patients who require their help.

Data from the interviews reveal some of the reasons why this is the case. The AHWs explained that most patients are missed because they are discharged from hospital before the service can undertake an assessment. The AHWs brought up this issue independently during interviews and both described it as 'very frustrating'.

Patients who enter the hospital go through a detoxification programme where they receive appropriate medication and support. Early discharge therefore puts patients at risk because they may suddenly stop drinking without this support. Alcohol withdrawal can be very damaging, often causing significant illness and even death (Trevisan et al., 1998). Both AHWs gave specific examples of how early discharges can affect a patient's ability to recover from alcohol misuse. One of these examples appears in Box 1 below.

**Box 1.** Case Study One – Young male with a congenital heart condition

“[He was] really motivated to stop [drinking, and] had already set-up a plan to go and stay with his father after discharge. On Monday he was started on a detox [but was] discharged later that day so he will have needed to have started drinking again. If we could have kept him in or referred him into a community team we could have seen that detox through [and] he would’ve [arrived] at his father’s abstinent from alcohol”. **AHW#1**

Both AHWs believed that early discharges that interrupt patients’ detoxification is also damaging for the service itself:

“[Patients] might have got into day one, day two [...] with detox. Then when they’re discharged, we have to [tell them] to go back home and start drinking again if they get withdrawal symptoms. It’s the major service deficit. That gap goes against everything we are trying to achieve: to stop [patients] coming back into hospital.” **AHW#1**

Normally, early discharge happens because of a lack of capacity in the service. Either the AHWs are busy with other patients or the patients have been admitted out of hours. The AHW service is in operation Monday to Friday between 8am and 6pm and AHW#1 stated these working hours are the best use of their current resources:

“For us to go 24/7, we’d need a team of five. I have done some work studying discharge rates on weekends and there are fewer admissions on a weekend. If you’ve got a limited resource, my view is that the best use of that resource is actually Monday to Friday.” **AHW#1**

Both AHWs, however, believed they should look to expand the hours of the AHW team if possible. AHW#2 said that expanding to seven-day cover would allow the Alcohol Care Team to be truly “hospital wide” and maximise the

number of patients they could capture. Nationally, AHW services have a variety of different working practices in relation to working hours (Ward and Aulton, 2010). Future research into the most effective working patterns could aid future funding decisions.

Another way to increase the capacity of the AHW service would be to increase funding to external, community services. A range of these support the AHW service and are designed to reduce patients' level of alcohol consumption and improve their independence both in residential and daily support settings. The AHWs produce Care Management Plans designed to ensure patients who regularly attend A&E are seen by the service. Patients who have attended A&E three times in one month or five times in six months – and for whom alcohol misuse was a contributing factor to their attendance – are targeted for intensive support. AHW#2 says the system has “had some really good results”, and gave an example (described in Box 2 below).

**Box 2.** Case Study Two – Male dependent drinker

“He was attending, staying for a while and then going, so not actually being properly processed. One weekend he was in 16 times, but we were struggling to capture him. I did a Care Management Plan and eventually [an external service to which the AHW team refers patients] did catch up with him. They are linking him with other services and his attendances [at the hospital] have gone down. It's going to be a slow process with him, but as it stands [he is] a success story.”

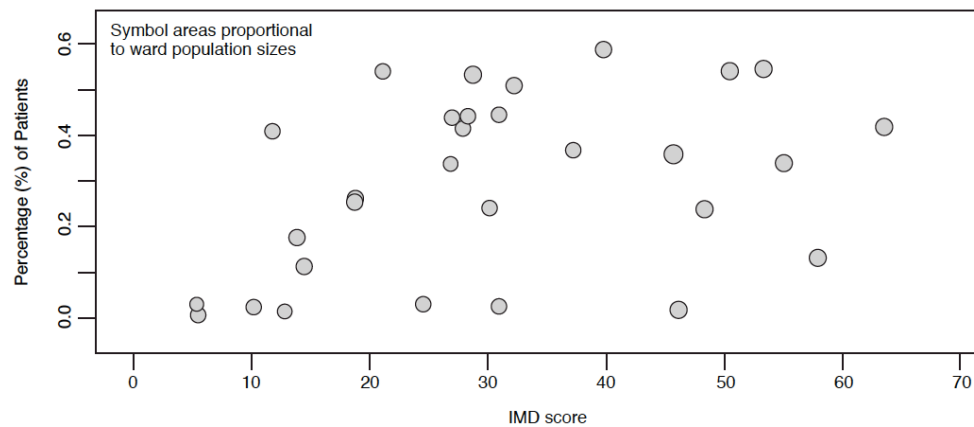
**AHW#2**

AHW#1 expressed concern that some of these external services do not have the capacity to deal with all the patients they refer. If they were strengthened it could reduce the number of returning patients and free up the AHWs to be able to see more of the patients they might otherwise miss.

*Is there is a link between deprivation and level of service use?*

Level of service use is defined here as the percentage of patients seen by the AHWs from each LAW when the population of the individual LAWs is the denominator. An initial plot (Figure 2) shows little correlation between the IMD score of each LAW and its level of service use.

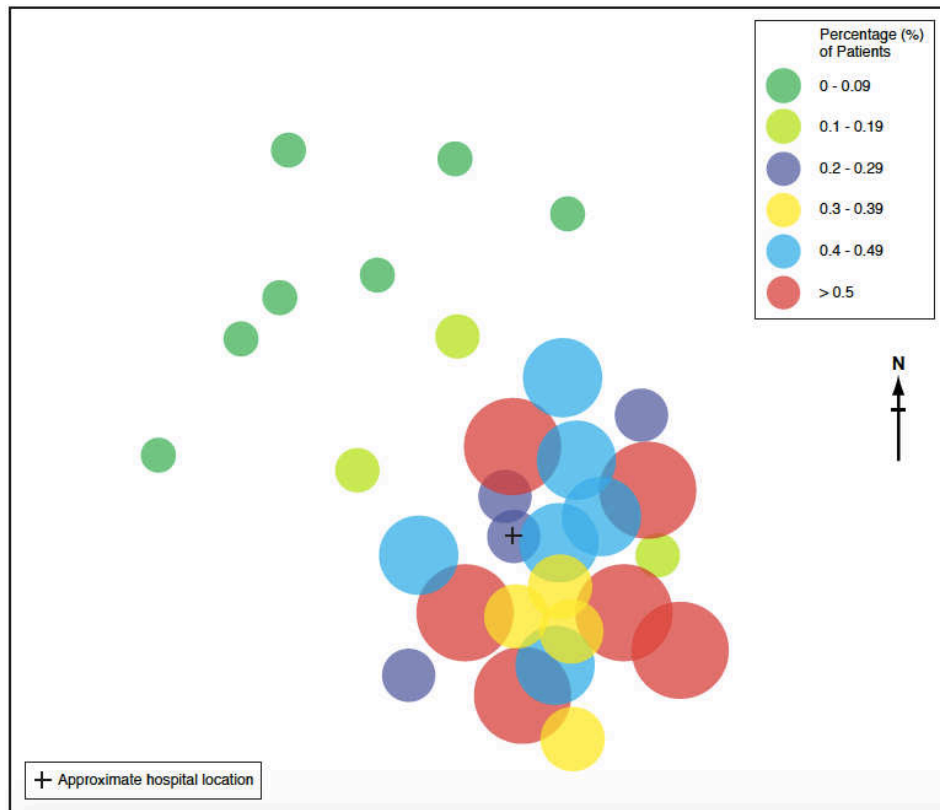
**Figure 2.** IMD score by level of service use in each LAW



$N = 1560$ ; Missing Values = 747

There is, however, a clear confounding factor that needs to be taken into account: the percentage of patients being seen by the AHWs drops significantly in the LAWs furthest away from the hospital and this can be seen in Figure 3 below.

**Figure 3.** Geographical representation of the percentage of patients from each local authority ward being seen by the alcohol health workers

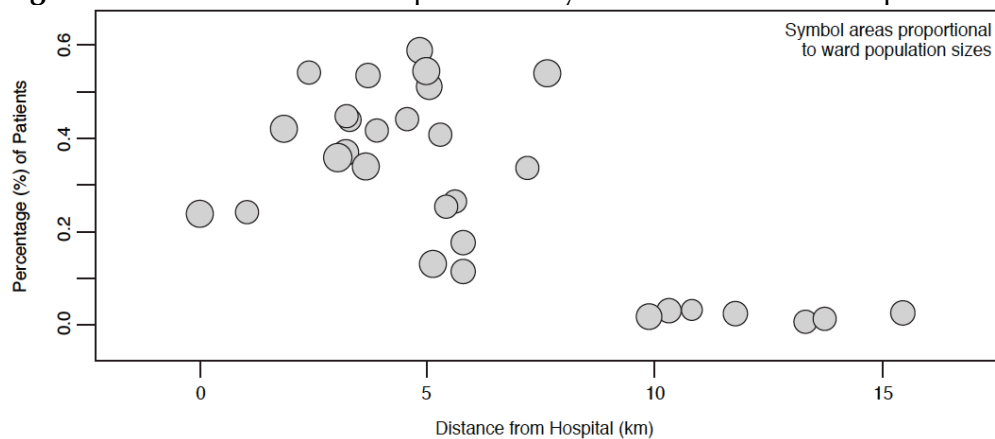


*N = 1560; Missing Values = 747*

*Diagram to scale; scale not shown to obscure study location*

Figure 4 below shows there is a clear drop-off in the level of service use at a distance of about 9km from the hospital. If social deprivation does have an effect on service uptake, any statistical analysis needs to take this into account.

**Figure 4.** Level of service use per LAW by distance from the hospital



*N = 1560; Missing Values = 747*

A Poisson generalised linear model with a log link (Faraway, 2005) was therefore used to assess the combined effects upon service uptake of both distance and deprivation. However, the assumptions for this model were not met, as the variability between LAWs was greater than expected under a standard Poisson model in which the numbers of service users are assumed to follow Poisson distributions in each ward. Therefore, a second model was fitted to just those LAWs within 9km of the hospital (thus excluding 16 patients), and this time using an over-dispersed Poisson model to account for the excess variability. Table 1 below shows the final output of this model.

**Table 1.** The combined effects upon service uptake of both distance from the hospital and deprivation

<b>Variables</b>	<b>Rate ratio</b>	<b>95% CI</b>	<b>p-value</b>
Distance from hospital	1.0185	1.1154-0.9300	0.696
Deprivation (IMD Score)	1.0045	1.0154-0.9937	0.422

This confirmed that the level of deprivation in the LAWs in which a patient lives does not have a statistically significant impact on their likelihood of attending the AHW service ( $p = 0.422$ ;  $N = 1544$ ). Because there is no clear correlation between deprivation and service uptake using this measure, it is therefore possible that people from all SES groups are being captured by the service at similar rates. Based on these results, there is no case for the more socially-deprived areas in this metropolitan district to have greater AHW provision.

There are potential confounding factors in this analysis. Firstly, because of the need to use LAWs as the statistical unit, the study doesn't take into consideration potential variability within an LAW. It could be that within LAWs, more deprived people may still be those who are more likely to be missed by the AHW service. Secondly, the analysis does not take into account any variability in general patient flow from different LAWs. There is another, smaller, general hospital that is located in the north of the metropolitan district. AHW#1 said that patients who live in the wards to the far north of the city

centre would be given the choice of whether to attend the large teaching hospital studied by the authors or the other general hospital by the ambulance crews. It could be that there are more people who misuse alcohol living in the less deprived areas in the north of the Metropolitan District, but they do not appear in these data because they choose to attend the other hospital. There may be an argument for evaluating whether this general hospital requires AHW provision to capture these patients living in the less-deprived areas of the metropolitan district. Future research could incorporate patient flow data from each LAW to the hospital studied to more accurately assess the impact of deprivation on the use of this AHW service.

## **Conclusion**

This study aimed to build on the research by Baker et al. (2014) published in this journal by evaluating a particular case study to determine what patients are being captured by an AHW service. It has shown that at the studied hospital, the AHWs were unable to see 63% of patients that were referred to them. Data such as these are important to illustrate opportunities missed and how to best use existing staff resources (Public Health England, 2014). Policies that could help to reduce the number of missed patients in this context included improving service capacity by increasing the number of nurses employed, evaluating a move to 7-day care, and strengthening and expanding the capacity of external community services.

The work of external community services to which patients are referred is seen as key to the success of AHW services by the AHWs at the hospital studied, but there is little research on these services and the whether or not AHWs have a sustainable impact on patients' drinking habits after discharge. Future research should therefore attempt to follow a cohort of patients through an AHW service in order to compare outcomes depending on where they are referred.



This study suggests there is no link between the deprivation level of the LAWs where patients live and their likelihood to use the AHW service. Based on the analysis of this case study, there is no basis for increasing AHW provision for more social-deprived areas. It is possible more patients who misuse alcohol from the less deprived wards north of the city are attending a different hospital. Further research into the impact of deprivation on AHW service usage (both at this hospital and others) should aim to analyse patient flow to all local hospitals as this could help determine if the alcohol harm paradox is caused, in part, by differential access to health service across different SES groups.

The AHWs interviewed for this study stated that the database has been of great benefit when demonstrating the service's value to funders. Other AHW services nationwide should aim to collect and analyse similar data as it could make a significant contribution to improving AHW provision. This could be particularly beneficial given that the evidence base for AHW provision is still weak and there is insufficient funding for AHW services nationally (Baker et al. 2014). Equally, qualitative research similar to that conducted in this study would enable policymakers to understand what reforms might improve AHW service efficiency and ensure best use of staffing resources.

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