

Universal Screening for Alcohol Misuse in Acute Medical Admissions Identifies Cohort of Patients Age With High Risk of Alcohol Related Liver Disease - an Analysis of 50,000 Hospital Admissions

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1. Introduction & Aims

Most people who die from cirrhosis due to alcohol related liver disease (ARLD) have a history of recurrent admissions to hospital, representing missed opportunities for effective interventions.

Universal screening for alcohol misuse has been advocated but it is not known if this is achievable or effective at detecting individuals at high risk of ARLD.

Our key research questions were:

1. Is it feasible to screen all acute medical admissions for alcohol misuse?
2. Can a screening program be delivered 24 hours a day, 7 days a week and direct patients to an appropriate alcohol care pathway?
3. Can we identify those patients with recurrent hospital admissions, frequent emergency attendances and an increased risk of ARLD?

2. Methods

- Large acute hospital – 650,000 catchment population; 130,000 Emergency Dept (ED) attendances per annum. Highest alcohol related admissions in South East England (1,993 per 100,000 population per annum)
- All medical admissions (1st July 2011 – 31st March 2014) screened by admitting nurses using modified electronic Paddington Alcohol Test (mePAT) incorporated into hospital-wide bedside system for real-time, electronic capture of clinical information (VitalPAC, Figure 1)
- Data analysis of patient demographics, unit consumption, diagnosis, mortality and previous ED attendances and admissions.



Figure 1 VitalPAC data recording system and 3 screen grabs from alcohol module

- The mePAT calculates a gender-dependent weighted score (0-10) to determine the patient's alcohol risk status:
 - Low risk – mePAT 0-2
 - Increasing risk – mePAT 3-5
 - High risk – mePAT 6 or more

| Frequency | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Never | | | | | | |
| Less than once a week | | | | | | |
| Weekends only | | | | | | |
| Several days per week | | | | | | |
| Weekend + several days during week | | | | | | |
| Every day | | | | | | |
| Maximum units - Male | | | | | | |
| <=4 per day | | | | | | |
| >4 per day | | | | | | |
| >8 per day | | | | | | |
| Maximum units - Female | | | | | | |
| <=3 per day | | | | | | |
| >3 per day | | | | | | |
| >6 per day | | | | | | |
| Admission related | | | | | | |
| Yes | | | | | | |
| No | | | | | | |
| Concerned about patient's alcohol consumption | | | | | | |
| Yes | | | | | | |
| No | | | | | | |
| Symptoms of withdrawal | | | | | | |
| Yes | | | | | | |
| No | | | | | | |

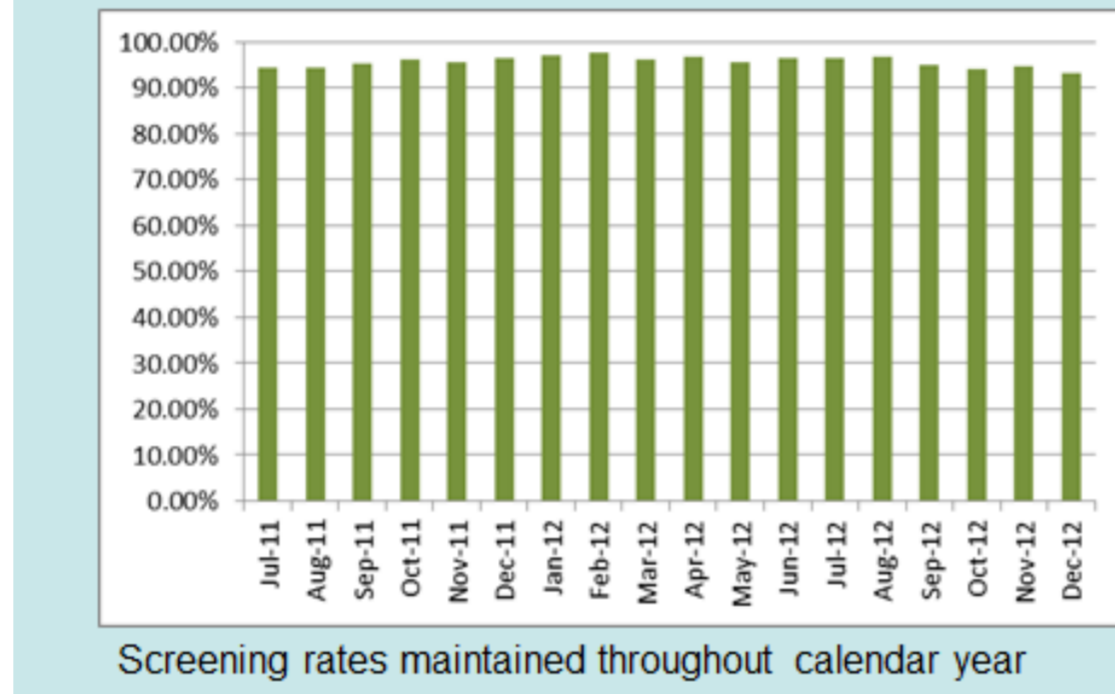
Screening and clinical pathway

| mePAT Score | Risk of Alcohol Harm | Pathway |
|-------------|----------------------|--|
| 0-2 | Lower | No routine intervention |
| 3-5 | Increasing | Identification & brief advice (IBA) |
| 6-10 | Higher | Full AUDIT score and Alcohol Specialist Nursing Service (ASNS) support |

3. Results

3.1 Patient population

53,165 medical admissions of whom 48,211 (91%) completed VitalPAC alcohol screening



| Characteristic | All AMU Admissions | Patients Screened | Patients Not Screened |
|---|--------------------|-------------------|-----------------------|
| Gender | 27,765 (52.2%) | 25,204 (52.3%) | 2,561 (5.1%) |
| Female | 25,400 (47.8%) | 23,027 (47.7%) | 2,373 (4.9%) |
| Male | 27,765 (52.2%) | 25,204 (52.3%) | 2,561 (5.1%) |
| Admission Age (Years) | 67.60 (20.11) | 67.79 (19.97) | 65.71 (21.26) |
| Mean (SD) | 3.387 (6.37%) | 2.976 (6.17%) | 4.11 (8.30%) |
| p Value | | | <0.001 |
| In-hospital Deaths (%) | 81.27 (11.15) | 81.22 (11.10) | 81.67 (11.49) |
| Mean (SD) | 1.0 (4) | 1.0 (4) | 1.0 (4) |
| p Value | | | 0.851 |
| Previous Hospital Admissions | 1.0 (4) | 1.0 (4) | 1.0 (4) |
| Mean (SD) | 3.06 (5.39) | 3.06 (5.39) | 3.08 (5.43) |
| p Value | | | 0.067 |
| Previous ED Attendances | 1.0 (3) | 1.0 (3) | 1.0 (3) |
| Mean (SD) | 2.90 (6.22) | 2.87 (6.13) | 3.19 (7.05) |
| p Value | | | 0.001 |
| Length of Stay (Days) | 2.77 (0.86-7.98) | 2.85 (0.92-8.09) | 1.90 (0.44-6.32) |
| Mean (SD) | 7.15 (12.39) | 7.26 (12.17) | 6.03 (14.30) |
| p Value | | | <0.001 |
| Same Day Discharge (%) | 7.370 (14.81%) | 6.022 (13.31%) | 1.348 (29.67%) |
| p Value | | | <0.001 |
| Self-discharge (%) | 970 (1.95%) | 817 (1.81%) | 153 (3.37%) |
| p Value | | | <0.001 |
| Vital signs Recorded (%) | 52,823 (99.36%) | 48,206 (99.99%) | 4,617 (92.29%) |
| p Value | | | <0.001 |
| High Early Warning Score (EWS) on admission (%) | 4,731 (9.00%) | 4,306 (9.00%) | 425 (9.29%) |
| p Value | | | 0.801 |
| Not Alert on admission (%) | 1,365 (2.58%) | 1,196 (2.48%) | 169 (3.65%) |
| p Value | | | <0.001 |

3.2 Who were the unscreened patients?

- Alcohol screening had to be mandatory at hospital admission (otherwise uptake rate fell from 96% to 80%)
- Critically ill or early self-discharge? A mixture of both...
- Unscreened vs screened admissions:
 - Higher mortality rate (8.3% vs 6.2%; p<0.001)
 - Reduced consciousness (3.7% vs 2.5%; p<0.001)
 - Same day discharge (29.7% vs 13.3%; p<0.001)
 - Self discharge (3.4% vs 1.8%; p<0.001)

3.3 Universal alcohol screening identifies:

- Frequent ED attenders
- Recurrent admissions
- Younger age of death

| Characteristics | Risk of Alcohol Harm | | |
|------------------------|----------------------|---------------------------|----------------------|
| | mePAT 0-2 Lower Risk | mePAT 3-5 Increasing Risk | mePAT ≥6 Higher Risk |
| Gender | 45,168 (93.7%) | 1,122 (2.3%) | 1,921 (4.0%) |
| Female | 24,272 (54%) | 347 (30.9%) | 585 (30.5%) |
| Male | 20,896 (46%) | 775 (69.1%) | 1,336 (69.5%) |
| Admission Age | 68.76 (19.84) | 57.17 (18.02) | 51.23 (14.26) |
| Mean (SD) | * | <0.001 | <0.001 |
| p value | <0.001 | <0.001 | * |
| In-hospital Deaths (%) | 2,894 (6.41%) | 27 (2.41%) | 55 (2.86%) |
| Mean (SD) | * | <0.001 | <0.001 |
| p value | <0.001 | 0.453 | |
| Age at Death | 81.75 (10.52) | 69.33 (11.58) | 58.99 (14.44) |
| Mean (SD) | * | <0.001 | <0.001 |
| p value | <0.001 | <0.001 | * |
| Hospital Admissions | 1 (0-4) | 1 (0-3) | 2 (0-6) |
| Median (IQR) | 3.00 (5-33) | 2.92 (5-25) | 4.74 (6-59) |
| Mean (SD) | * | <0.001 | <0.001 |
| p value | <0.001 | <0.001 | * |
| ED Attendances | 1 (0-3) | 1 (0-4) | 3 (1-9) |
| Median (IQR) | 2.64 (5-52) | 3.81 (7-89) | 7.68 (12-80) |
| Mean (SD) | * | 0.948 | <0.001 |
| p value | <0.001 | <0.001 | * |

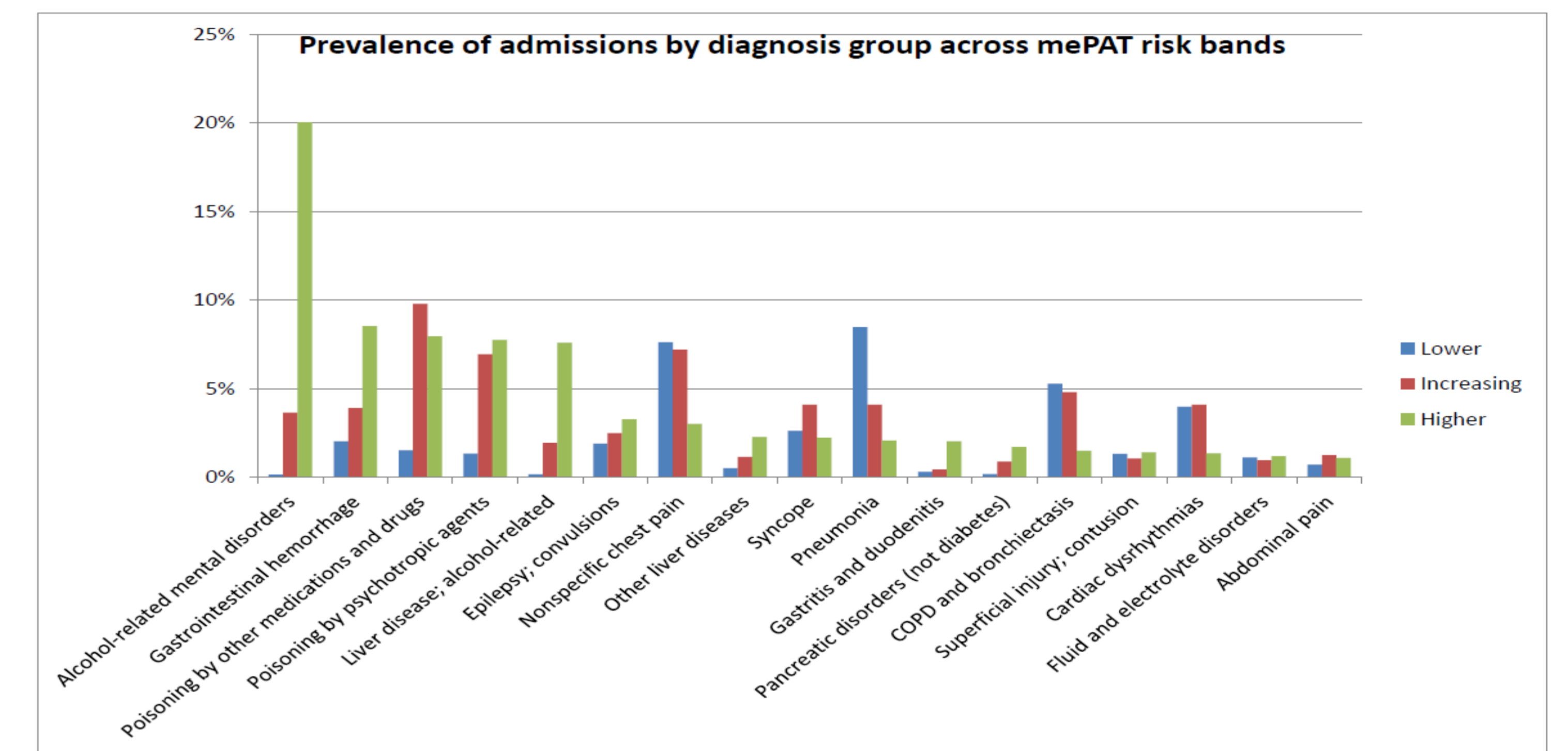
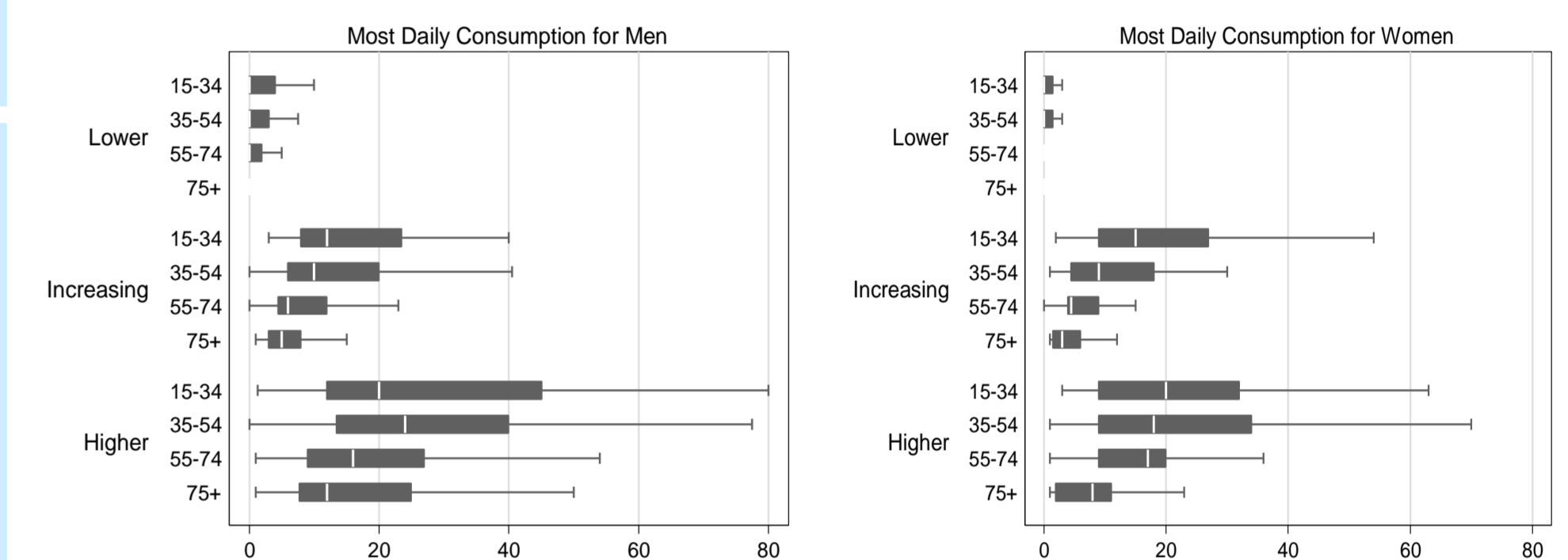
3.4 Identification of dependency & harmful drinking

- Some 1,135 (81.30%) of patients seen by the ASNS had an AUDIT score >20, suggesting dependency.
- This group were younger, and had more admissions and more ED attendances (p=0.001) than those with a score <20.
- Screening identified a highly dependent cohort of 527 (37.7%) patients who scored the maximum AUDIT value of 40. This group had the highest numbers of ED attendances and admissions.

| Characteristics | AUDIT Score | | | |
|---------------------|---------------|---------------|---------------|---------------|
| | No Score | 0-19 | 20-40 | 40 |
| Gender | 77 (5.5%) | 184 (13.2%) | 1135 (81.3%) | 527 (37.7%) |
| Female | 25 (5.9%) | 60 (14.2%) | 338 (79.9%) | 132 (31.2%) |
| Male | 52 (5.3%) | 124 (12.7%) | 797 (81.9%) | 395 (40.6%) |
| Mean Age | 52.96 (14.94) | 58.04 (17.96) | 50.16 (12.76) | 48.20 (11.49) |
| Mean (SD) | * | <0.001 | <0.001 | |
| p value | | | | |
| Deaths (%) | 7 (9.09%) | 7 (3.80%) | 29 (2.56%) | 8 (1.52%) |
| p Value | | | 0.335 | |
| Age at Death | 62.00 (11.41) | 71.04 (22.34) | 55.91 (13.21) | 49.71 (14.18) |
| Mean (SD) | * | 0.127 | | |
| p Value | | | | |
| Previous Admissions | 2 (0-8) | 1 (0-5) | 2 (0-6) | 3 (1-9) |
| Median (IQR) | 5.16 (6-60) | 3.66 (5-28) | 4.65 (6-37) | 6.17 (7-11) |
| Mean (SD) | * | 0.042 | | |
| p Value | | | | |
| ED attendances | 3 (1-13) | 1.5 (0-4) | 7.58 (12.59) | 5 (2-14) |
| Median (IQR) | 8.68 (13-61) | 3.41 (5-54) | <0.001 | 10.45 (15-21) |
| Mean (SD) | * | | | |
| p Value | | | | |

3.5 Higher risk patients have a distinct diagnostic profile

- Higher risk (mePAT >6) patients had a distinct admission profile with mental health disorders, GI bleeding and ARLD most frequent codes.
- Liver, pancreatic and digestive disorders accounted for 22.1% of primary admission codes in the higher risk group compared to just 3.2% in the lower risk category.



4. Conclusions

- Universal screening for alcohol misuse is achievable and can be delivered 24 hours a day, 7 days a week.
- Screening identifies a highly dependent cohort with frequent ED attendances, recurrent admissions and an elevated risk of ARLD.
- Additional patients at increasing risk of alcohol harm can be identified in a range of general medical presentations.
- These patients can be targeted with effective interventions to reduce the burden of alcohol related harm.

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