



Estimating the Prevalence of Alcohol Dependence in Europe Using Routine Hospital Discharge Data: An Ecological Study

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Declarations of Interest

None

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Background

The 'Jellinek Estimation Formula' was developed in 1942
The first quantitative model estimating prevalence of 'alcoholism' [Jellinek 1942]

Many methods used to estimate national prevalence of alcohol dependence (AD)
The 'gold-standard' is typically cross-sectional surveys [Edwards et al. 1973]

Dramatic increase in last decade in access to routine administrative data
Annual reporting in Europe of hospitalisation rates using ICD coding [WHO 1993]

Aim

To explore the feasibility of using routine hospital discharge data, at the level of countries within Europe, to estimate the general population prevalence of AD

Methods: Data Collection

European Core Health Indicators (ECHI) data tool extracted annual rate of hospital discharges due to any wholly-attributable alcohol condition as defined by ICD-10 ^[ECHI]

For available counties systematically searched Medline, EMBASE, PsychINFO and Google for national cross-sectional studies reporting an AD prevalence estimate

Where no cross-sectional AD prevalence estimates were available in the literature, estimates were taken from the WHO Global Status Report on Alcohol and Health 2018 ^[WHO 2018]

Methods: Data Analysis

Scatter graphs generated and Pearson correlation coefficients calculated between each condition's discharge rate and national AD prevalence estimate

Linear regression prediction AD prevalence model generated based on most strongly correlated hospital discharge condition

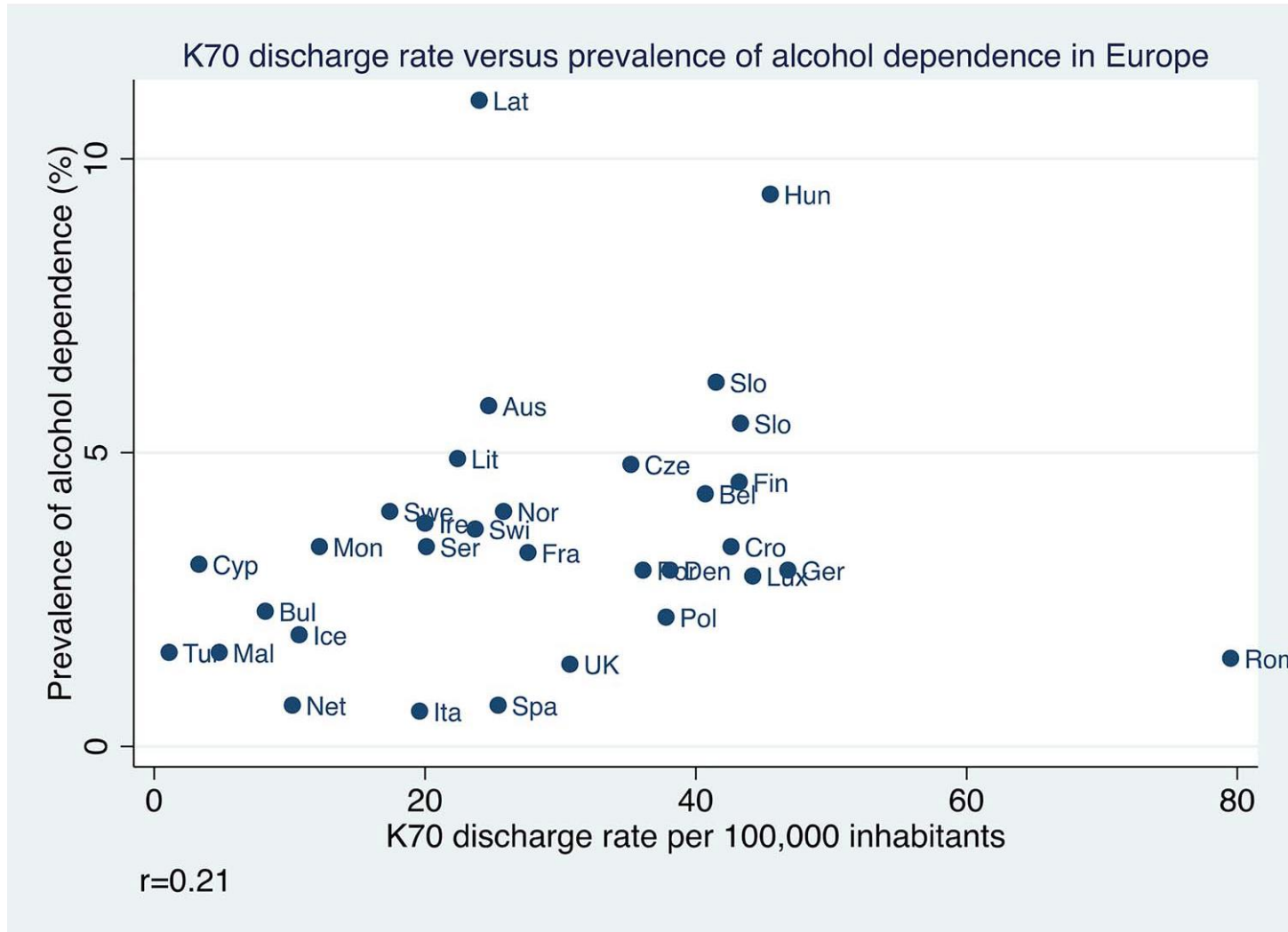
Generated prediction model estimates and compared to those from national estimates, and for historical interest, from estimates generated using the 'Jellinek Estimation Formula' [Jellinek 1942]

Results

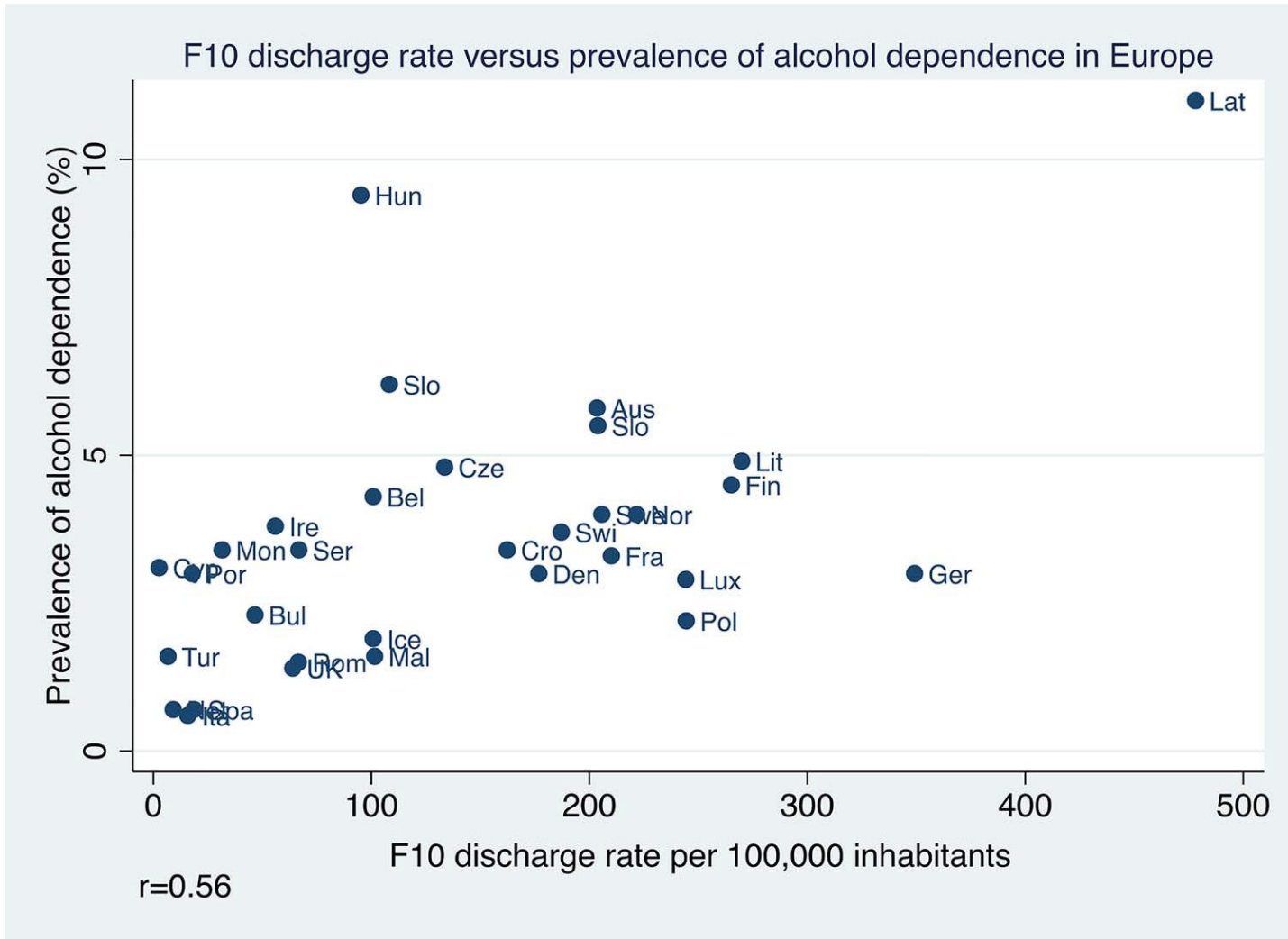
The ECHI reported 32 European national annual hospital discharge rates of:
K70 (alcoholic liver disease), and
F10 (mental and behavioural disorders due to alcohol)

Nationally representative cross-sectional AD prevalence estimates were available for 9 countries. The remaining 23 were available in the WHO report ^[WHO 2018]

Results



Results



$$\text{Prevalence of AD (\%)} = (\text{Annual F10 hospital discharge rate per 100,000 inhabitants} / 88) + 2$$

Results

66.6% of estimates from cross-sectional surveys, and 20% from the 'Jellinek Estimation Formula' were not significantly different to those generated using the F10 discharge rate

Country	Prevalence of AD as reported by cross-sectional survey (%) 95% CI	Prevalence of AD as reported by WHO (%)	Predicted prevalence of AD using the 'Jellinek Estimation Formula' (%) 95% CI	Predicted prevalence of AD using F10 hospital discharges (%) 95% CI	Country	Prevalence of AD as reported by cross-sectional survey (%) 95% CI	Prevalence of AD as reported by WHO (%)	Predicted prevalence of AD using the 'Jellinek Estimation Formula' (%) 95% CI	Predicted prevalence of AD using F10 hospital discharges (%) 95% CI
Austria	-	5.8	3.2 (1.9 - 4.6)	4.3 (3.6 - 5.1)	Luxembourg	-	2.9	5.5 (5.0-6.0)	4.8 (3.9 - 5.7)
Belgium	-	4.3	9.1 (8.1-10.0)	3.1 (2.4 - 3.9)	Malta	-	1.6	4.9 (4.1-5.7)	3.2 (2.5 - 3.9)
Bulgaria	-	2.3	7.0 (6.8-7.2)	2.5 (1.7 - 3.4)	Montenegro	-	3.4	5.1 (4.0-6.2)	2.4 (1.4 - 3.3)
Croatia	-	3.4	2.9 (2.2-3.5)	3.9 (3.2 - 4.5)	Netherlands	0.7 (0.3-1.1)	0.6	14.2 (11.2-17.4)	2.1 (1.1 - 3.1)
Cyprus	-	3.1	5.3 (4.0-6.5)	2.0 (1.0 - 3.1)	Norway	-	4.0	13.3 (11.1-15.4)	4.5 (3.7 - 5.4)
Czechia	4.8 (3.8-5.8)	2.8	6.4 (5.4-7.4)	3.5 (2.9 - 4.2)	Poland	2.2 (1.8-2.7)	2.2	4.2 (4.0-4.4)	4.8 (3.9 - 5.7)
Denmark	3.0 (2.4-3.8)	3.9	13.9 (13.3-14.5)	4.0 (3.3 - 4.7)	Portugal	-	3.0	19.7 (17.7-21.7)	2.2 (1.2 - 3.2)
Finland	-	4.5	2.3 (1.2-3.3)	5.0 (4.0 - 6.0)	Romania	1.5 (0.3-2.8)	1.3	3.1 (2.6-3.6)	2.8 (2.0 - 3.6)
France	-	3.3	9.6 (8.8-10.4)	4.4 (3.6 - 5.2)	Serbia	-	3.4	7.3 (7.0-7.7)	2.8 (2.0 -3.6)
Germany	3.0 (2.5-3.6)	3.5	2.9 (2.1 - 3.7)	6.0 (4.6 - 7.4)	Slovakia	-	5.5	2.3 (1.7-2.9)	4.3 (3.6 -5.1)
Hungary	-	9.4	5.1 (4.4-5.8)	3.1 (2.4 - 3.8)	Slovenia	-	6.2	20.4 (16.4-24.2)	3.2 (2.5 - 3.9)
Iceland	-	1.9	10.5 (9.9-11.0)	3.1 (2.4 - 3.9)	Spain	-	0.7	12.0 (11.5-12.5)	2.2 (1.2 - 3.2)
Ireland	-	3.8	10.7 (10.0-11.4)	2.6 (1.8 - 3.5)	Sweden	4.0 (3.9-4.1)	5.1	3.9 (3.3-4.5)	4.3 (3.6 - 5.1)
Italy	-	0.6	7.0 (6.0-8.1)	2.2 (1.2 -3.2)	Switzerland	3.7 (3.6-3.8)	4.3	1.2 (1.0-1.4)	4.1 (3.4 - 4.9)
Latvia	11.0 (10.9-11.1)	10.4	2.0 (0.3-3.7)	7.5 (5.3 - 9.6)	Turkey	-	1.6	5.0 (3.9-6.1)	2.1 (1.0 - 3.1)
Lithuania	-	4.9	35.4 (32.0-38.8)	5.1 (4.1 - 6.1)	United Kingdom	-	1.4	9.7 (9.0-10.4)	2.7 (1.9 - 3.5)

Conclusions

Country-level AD prevalence estimates generated using annual F10 hospital discharge rates are likely to provide information of some utility, particularly when limited other sources of information are available or when examining relative trends over time or between regions

There is currently insufficient evidence to make a definitive recommendation to use hospital discharge data to estimate the absolute prevalence of AD per country in Europe

References

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