

UTILISATION OF ADMINISTRATIVE DATA IN HEALTH RESEARCH: THE ANTIDEPRESSANT SOCIAL PRESCRIBING PROJECT AS AN EXAMPLE OF PRACTICE



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BACKGROUND

Over the past few years, there has been what has been called a 'big data' revolution^[1]. This refers to the increasing availability of previously unavailable types of data for social, economic and health research. Many organisations and governments across the world are increasing access to their routinely collected data via open access datasets, online platforms and registries^[2].

Big data, particularly administrative data, presents great opportunity for understanding population health and improving health service provision^[1]. Nordic countries are currently at the cutting edge of utilizing administrative data for health research. For decades the Nordic countries have been standardizing, streamlining and linking their administrative datasets, such as hospital records and prescription databases, into 'registries' for academic research^[2,3]. This allows them to produce large health-focused population-based studies – in many cases the entire country can act as the sample.

Here in the United Kingdom (UK), steps have been taken to move towards a Nordic style system of open access for academic researchers to routinely collected data^[2]. However, the process of accessing administrative data here can still be complex and challenging for many reasons, such as: lack of legislation for data sharing; inadequate structural resources; costs; and timeliness^[1,2]. Fortunately, a few initiatives have navigated the process of access, a primary example being the the Administrative Data Research Network (ADRN).

What is 'big data'?

There are many definitions of big data, and the types of data that the term may apply to. It generally refers to data that is big in terms of its scale, complexity and sheer number of potential utilisations^[1,2]. There are many types of big data, such as social media data, business data and administrative data.

THE ADMINISTRATIVE DATA RESEARCH NETWORK

The ADRN, funded by the Economic and Social Research Council, was established following the publication of the Administrative Data Taskforce in 2012. According to the report the UK was lagging behind other developed countries with regards to the effective use of de-identified administrative data for research. **The purpose of the ADRN is to provide a single point of access for academic researchers who want to use government data for their research.** The base of the ADRN structure is the administrative data research centre (ADRC). There are four ADRCs in each country of the UK, each led by an academic institution. Each ADRC works in partnership with their national statistics authority. These statistics authorities act as the single point of access for researchers. The intention of the single point of access is to improve researcher access to data, and enable linkage of datasets across government departments. Each point of access is legally bound to screen researchers, provide mandatory researcher training on handling sensitive information, and provide secure environments for researchers to access data in. With regards to the data provided, each point of access undertakes the task of negotiating data access with the data providers, and also securely de-identifying and linking the data prior to researcher access. Strict procedures and protocols for de-identification and linkage are followed by each statistics authority/point of access. This ensures that individual or group privacy is not compromised by use of administrative data for research.

What types of health data can be accessed via ADRC-NI?

Business Services Organisation
Dental claims and registrations data
Enhanced Prescribing Database
Ophthalmic claims data
GP registration data
NISRA Census Office
Long-term health condition
Long-term disability
Unpaid caring responsibility
General health

THE ADMINISTRATIVE DATA RESEARCH CENTRE FOR NORTHERN IRELAND (ADRC-NI)

The ADRC-NI is the branch of the ADRN that operates in Northern Ireland (NI), jointly led by Queens University Belfast and Ulster University, and providing access to administrative data for research purposes in partnership with the Northern Ireland Statistics and Research Agency (NISRA). Subject to project approval based on feasibility and potential for public benefit, access can be granted to a range of administrative data, such as Census data, Health and Social Care data and Education Authority data.

In line with ADRN protocols, researcher access to administrative data in NI can at present be provided to academic researchers only; non-academic agencies must work with an academic partner. The single point of access for the researcher is the NISRA Research Support Unit. NISRA Census branch currently act as the 'trusted third-party' to whom data-providers release their data. Data from data providers is securely linked using one-way encryption methods and anonymised at point of use. NISRA take privacy protection very seriously. All projects must have ADRN approval, and Office for Research Ethics (ORECNI) approval if health data is used. In order to access data in the secure environment, researchers must undergo a criminal record check, Secure Users of Research Environments (SURE) training and NISRA approved researcher training.



THE ANTIDEPRESSANT SOCIAL PRESCRIBING PROJECT (ADSOPP)

A health-based research project facilitated by ADRC-NI

RATIONALE

High rates of antidepressant prescription in NI

'The Script Report'^[4] indicates that NI prescribes proportionately more antidepressants than 23 other European countries.

Between April to September 2013, GPs in NI prescribed enough antidepressants to give every member of the population a 27-day supply; the same statistics for England and Wales were 10 days and 19 days respectively.

Evidence suggests that social, economic, health and area-level factors are contributing to antidepressant use in NI^[4].

GPs lack alternatives to antidepressant therapy

The Mental Health Foundation surveyed 200 UK general practitioners and found 66% had prescribed an antidepressant because a suitable alternative was not available^[5].

Targeted social prescribing to high-risk groups

Social prescribing is a means of enabling primary care services to refer people to local non-clinical services^[6]. Mental health is linked to social and environmental factors, such as access to treatment^[6]. Targeting social prescribing to individuals at high-risk of antidepressant prescription is a method of maximising the range of support to those most in need.

AIM

The project team aims to develop a set of NI-wide indicators detailing the socio-economic context of antidepressant prescribing in NI. This will support Aware NI, our non-academic project partner, in their efforts to develop and implement effective and coordinated social intervention programs by (i) generating 'risk' profiles specific to identified hotspots using personal and household socio-demographic and socio-economic data and (ii) identifying 'vulnerability' at a personal, social and economic level through longitudinal change modelling.

METHODS

PARTICIPANTS AND PROCEDURES: Data were derived from the 2011 NI Census and the Enhanced Prescribing Database (EPD). These two datasets were linked with death records for the study period (2011-2015), and healthcare registration information. Successful linkage of 92.6% of the 2011 NI Census cases with the EPD was achieved. There were 959,382 individuals aged 25-74 in the sample for this analysis.

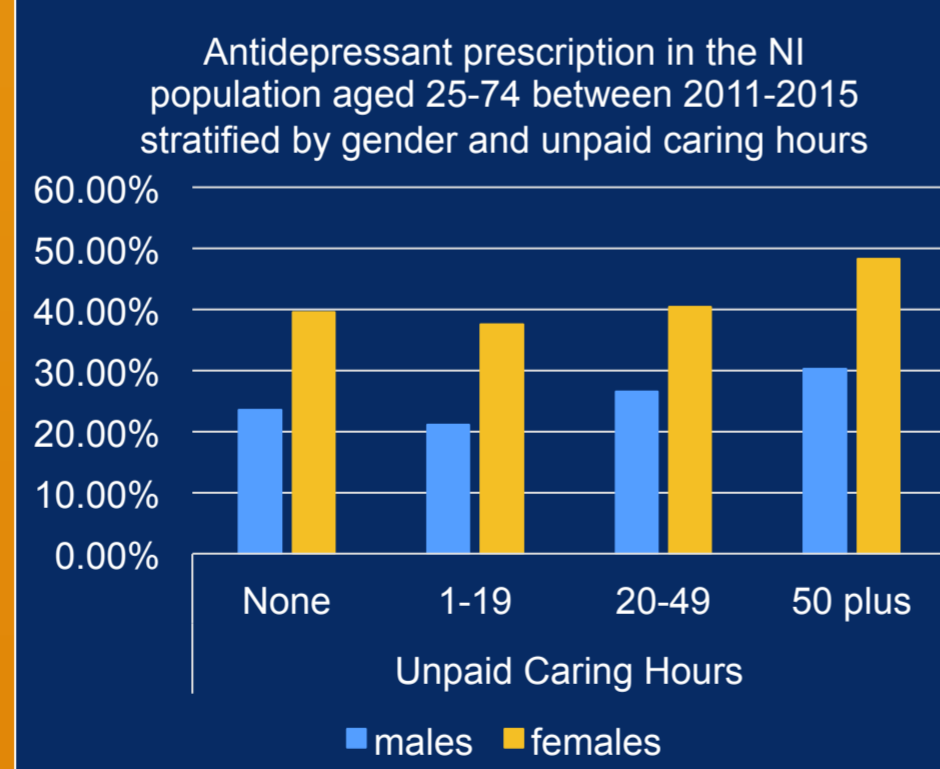
MEASURES: Social, economic and health factor data was derived from the 2011 NI Census. The antidepressant data were coded (0/1) to indicate 'no antidepressant prescriptions' or 'one or more antidepressant prescriptions' during the 5-year study period.

ANALYSIS STRATEGY: Binary logistic regression analyses were conducted using SPSS 24. It was expected that the predictors would produce a statistically significant model for antidepressant prescription. Predictors were included in the model simultaneously. χ^2 Tests were used to assess the goodness of model fit.

RESULTS: associations of risk factors with 5-year antidepressant prescribing (2011-2015) in the NI population aged 25-74 years

UNPAID CARING FOR AN INDIVIDUAL WITH A LONG-TERM HEALTH CONDITION

None (None)	reference
1-19 Hours	OR = 0.97 (0.96-0.99), p = <0.05
20-49 Hours	OR = 1.28 (1.25-1.31), p = <0.05
50 plus Hours	OR = 1.53 (1.50-1.56), p = <0.05



Multivariate Odds Ratios from binary logistic regression analyses of antidepressant prescription to 25-74 year olds in NI (2011-2015) and risk factors.

Gender (ref: male)	2.17(2.15-2.19)*	Ratable value of property (ref: OO: =>£160,000)	
Age group (years) (ref: 25-29)		OO: => £115,000	1.09(1.05-1.13)*
30-34	1.13(1.11-1.16)*	OO: => £90,000	1.16(1.12-1.20)*
35-39	1.25(1.22-1.28)*	OO: => £70,000	1.22(1.19-1.27)*
40-44	1.27(1.25-1.30)*	OO: <£70,000	1.34(1.29-1.38)*
45-49	1.28(1.25-1.30)*	OO: value not assigned	1.10(1.06-1.15)*
50-54	1.20(1.18-1.23)*	Private rent	1.42(1.37-1.48)*
55-59	1.11(1.09-1.14)*	Social rent	1.59(1.54-1.65)*
60-64	0.94(0.92-0.97)*	Unpaid caring hours (ref: None)	
65-69	0.89(0.87-0.91)*	1-19	1.07(1.05-1.09)*
70-74	0.81(0.79-0.84)*	20-49	1.16(1.13-1.20)*
Educational qualifications (ref: Degree plus)		50+	1.24(1.22-1.27)*
Intermediate	1.24(1.22-1.26)*	Marital status (ref: Married)	
No qualifications	1.29(1.27-1.31)*	Never married	0.90(0.89-0.91)*
Social Class (ref: Higher professional)		Separated/Widowed/Divorced	1.19(1.18-1.21)*
Lower professional	1.18(1.16-1.21)*	General Health (ref: Good)	
Intermediate	1.25(1.22-1.28)*	Fair	2.11(2.08-2.13)*
Self-employed	1.15(1.12-1.17)*	Poor	2.97(2.91-3.03)*
Semi-routine	1.29(1.26-1.32)*	Mental health condition declared (ref: No condition declared)	3.54(3.48-3.61)*
Routine	1.23(1.21-1.26)*	Urbanicity (ref: Rural)	
Other	1.27(1.24-1.31)*	Urban	1.08(1.06-1.09)*
		Intermediate	1.14(1.13-1.15)*
		Summary Deprivation (NIMDM 2010) (ref: most deprived)	0.997(0.995-0.998)*

OO: owner-occupier, NIMDM 2010: Northern Ireland Multiple Deprivation Measure 2010
Control variables: Religion, Ethnicity
*p = <0.05, CI = 95%

NEXT STEPS

ADSOPP is continuing to build upon these initial descriptive results and is moving towards:

- Calculating Defined Daily Doses of BNF Chapter 4.3.1-4.3.3 antidepressant medications
- Modeling longitudinal changes by linking Census-based records from 2001 and 2011
- Mapping urban-rural variations in antidepressant prescription

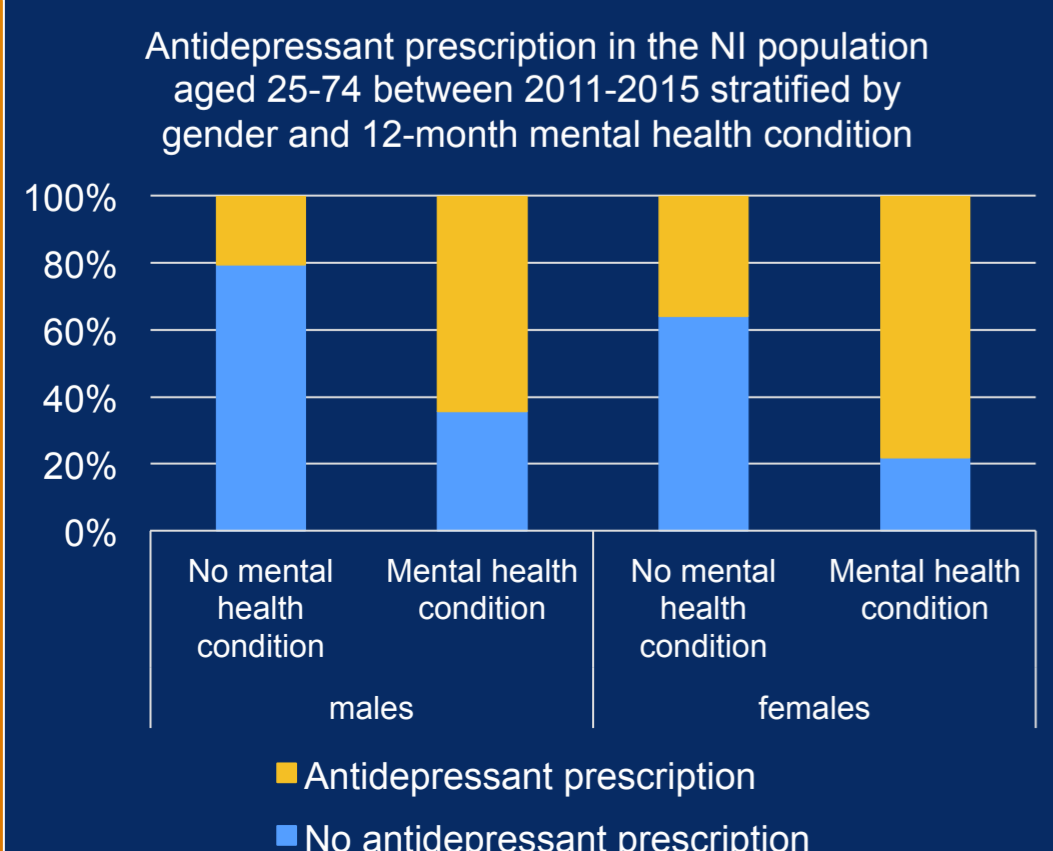
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Further information on administrative data research and the ADRN, ADRC-NI and NISRA is available on their respective websites.

MENTAL HEALTH CONDITION

None declared	reference
Mental health condition declared	OR = 6.62 (6.52-6.73), p = <0.05



GENERAL HEALTH

Good	reference
Fair	OR = 2.69 (2.67-2.71), p = <0.05
Bad	OR = 4.98 (4.90-5.06), p = <0.05

