Serial missed attendance in primary care – data linkage study

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The team

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- Participating GP practices
- Albasoft (TTP)
- Ellen Lynch, Scottish Government Health Dept
- Data Sharing and Linkage Service

Outline

- Background and rationale
- Definition
- Patient demographics
- Practice demographics
- Health outcomes
- Social vulnerability

Serial (Repeated) Missed Appointments

- New area for research
- Proxy for low/dysfunctional engagement in care
- A 'health harming behaviour'?
- Reflects poor health and social vulnerability?

- Novel patient level data
- GP 'Read codes'
- Large data set & linkage potential
- Secure extract and analysis facilities

Missed appointments results

- 136 Scottish representative GP practices
- 550 083 patient records
- 9 177 054 consultations

- 54·0% missed no appointments over 3 years
- 46·0% missed one or more appointments over 3 years
- 19·0% missed more than two appointments over three years

(Ellis, McQueenie, Wilson, Williamson, Lancet Public Health 2017)

Definition & analysis

- Average of primary care face to face appointments over previous three years
  - Never missed appointments: 0 per year
  - Low missed appointments: <1 per year
  - Medium missed appointments: 1-2 per year
  - High missed appointments: 2 or more per year

- Frequency counts
- Negative Binomial Regression Modelling across 4 appointment groups

Patient demographic factors

- Most socio-economically deprived (SIMD 1) patients <u>most</u> likely to miss appointments (RR 2·27, 95% CI 2·22–2·31)

- Most remotely located patients <u>least</u> likely to miss appointments (RR 0.37, 0.36–0.38)

- Patients aged 16–30 years (1·21, 1·19–1·23), patients older than 90 years (2·20, 2·09–2·29) <u>more</u> likely to miss

- Effect of gender relatively small

(Ellis et al Lancet Public Health 2017)
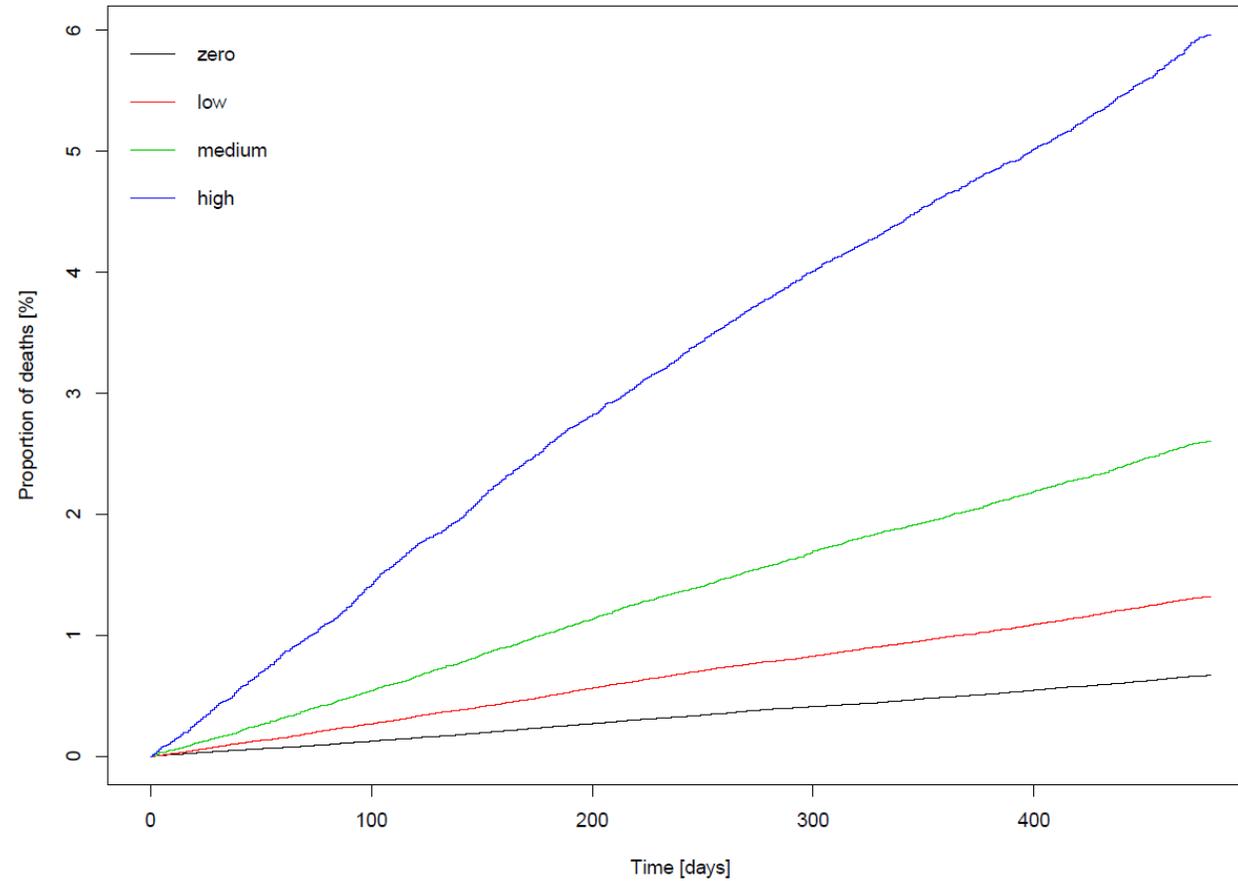
GP Practice demographic factors

- Appointment delay 2–3 days (RRR 2·54, 95% CI 2·46–2·62) most strongly associated with non-attendance
- Urban GP practices more strongly associated with missed appointments
- More deprived patients registered with GP practices in more affluent settings have the highest risk of missing appointments
- Practice factors have a larger effect than patient factors but a model combining both patient and practice factors gave a higher Cox-Snell pseudo R^2 value (0·66) than models using either group of factors separately (patients only R^2=0·54;practice only R^2=0·63)

(Ellis et al Lancet Public Health 2017)

Multimorbidity (from major Read codes)

Missed Appointment Category	Number of long term conditions			Total
	None	One to three	Four plus	
zero	226190 51 %	182682 42 %	30720 7 %	439592 100 %
low	84556 37 %	111928 49 %	31881 14 %	228365 100 %
medium	22157 23 %	51569 53 %	23351 24 %	97077 100 %
high	5819 10 %	29714 50 %	23807 40 %	59340 100 %

Risk of death – Kaplan-Meier

Risk of death – Cox regression: adjusted for age, sex, demographics, practice factors and number of long-term conditions
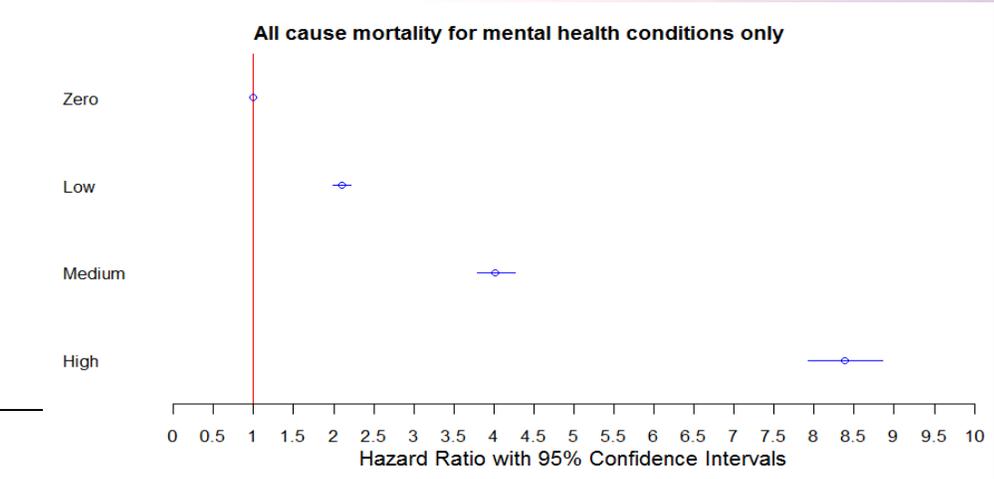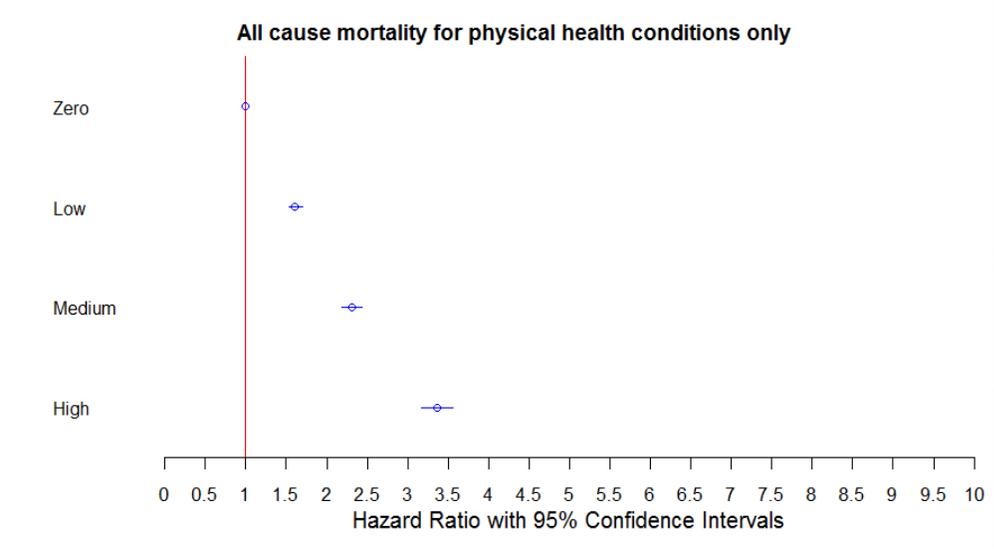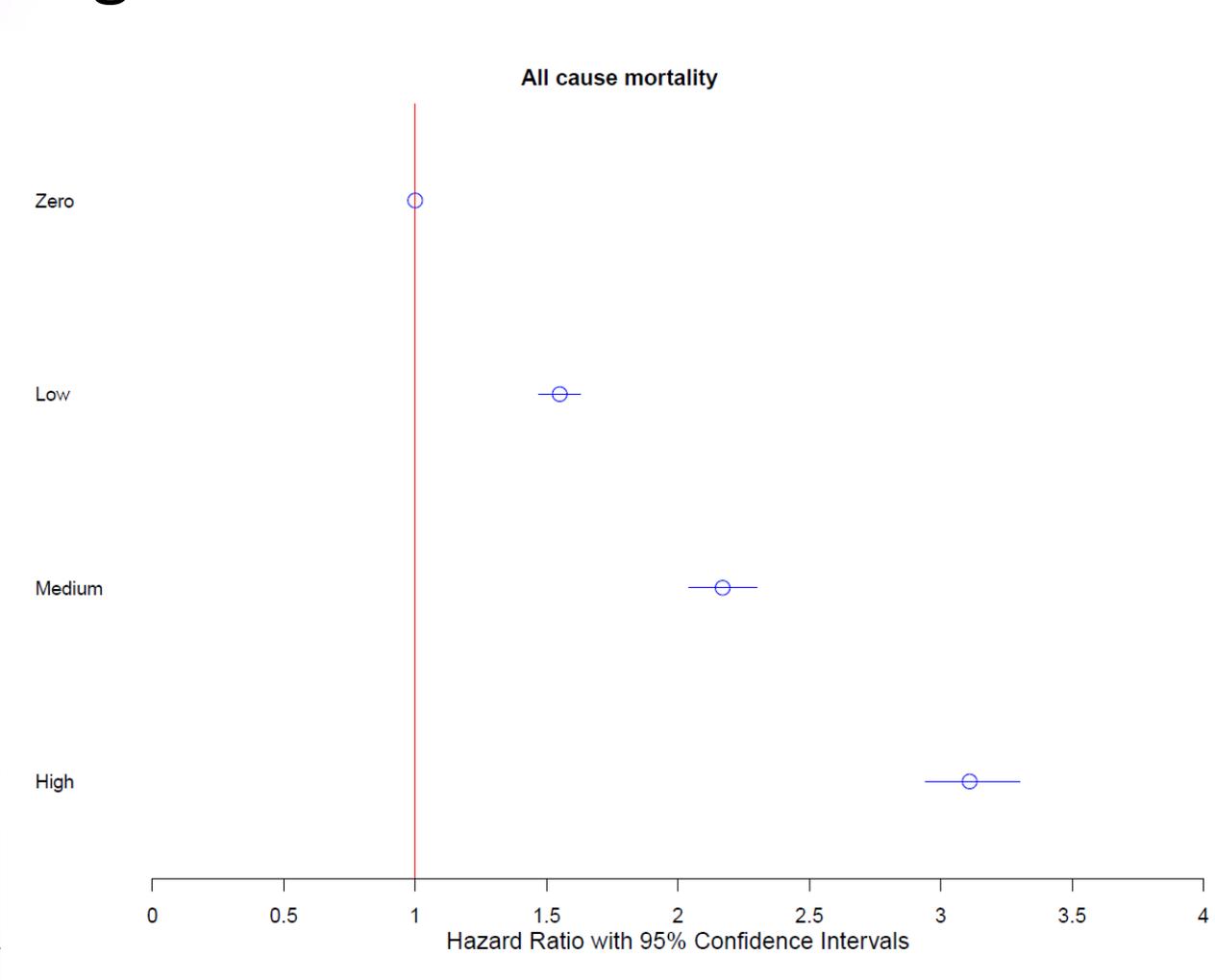
Causes of death

No long-term conditions			
Missed appointment Category	Number of deaths	Mean age at death (SD)	Most common primary causes of death (%)
Zero	262	68.06 (21.09)	I219 (8.4), C349 (5.7), R99 (5.7)
Low	119	64.38 (21.78)	R99 (10), G309 (9.2), I259 (5)
Medium	41	62.56 (23.08)	C349(9.8), R99(9.8), C221(7.3)
High	24	56.79(27.14)	R99(25), F019(8.3),N40(8.3)
Only mental long-term conditions			
Zero	69	55.72(20)	R99(11.6), X70(10.1), I219(8.7)
Low	83	54.68(18.79)	R99(21.6), X70 (12), I219 (6)
Medium	58	53.1(20.18)	R99(19), X42 (6.9), Y14 (6.9)
High	53	49.3(20)	R99(32), G309 (9.4), Y14(5.6)
Only physical long-term conditions			
Zero	1399	77.12(12.34)	C349(8.3), I219(7.3), I259(3.2)
Low	1361	77.46(13.36)	I219(7.3), C349(6),I259(4.2)
Medium	1025	78.93(12.54)	C349(8.1), I219 (6.4), I259 (4.6)
High	1241	79.97(13.27)	C349(6.1), I219 (5.8), I259 (4.2)
Both physical and mental long-term conditions			
Zero	1193	76.65(13.53)	G309 (7.5), F03(6.9), I219(6.2)
Low	1432	76.56(13.59)	G309 (6.7), F03(6.2), I219(5.5)
Medium	1372	75.01(14.93)	G309 (6), F019(5.8),I219(5.3)
High	2114	76.19(15.29)	F019(7.9),G309(6.4),F03(5.9)

I219 Acute myocardial infarction, unspecified; C349 Malignant neoplasm of unspecified part of bronchus or lung; R99 Ill-defined and unknown cause of mortality; G309 Alzheimer's disease, unspecified; I259 Chronic ischemic heart disease, unspecified; C221 Intrahepatic bile duct carcinoma; F019 Vascular dementia, unspecified; N40 Benign prostatic hyperplasia; X70 Intentional self-harm by hanging, strangulation and suffocation; X42 Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified; Y14 Poisoning by and exposure to other and unspecified drugs, medicaments and biological substances, undetermined intent; F03 Unspecified dementia.

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Summary

- Patients with increased numbers of long-term conditions have increased risk of missing general practice appointments despite controlling for number of appointments made

- Patients missing appointments were at much greater risk of all-cause mortality, the risk increasing with the number of missed appointments

- Patients with long-term mental-health conditions missing >2 appointments per year had >8x risk of all-cause mortality compared with those who missed no appointments.

- These patients died at a younger age, and commonly from non-natural external factors

- Missing appointments repeatedly seems to be a powerful marker for greatly increased risk of mortality, particularly among those without physical long-term conditions