Repeated missed appointments in general practice – what do they signify?

Phil Wilson
Centre for Rural Health
University of Aberdeen

Andrea Williamson, Ross McQueenie, University of Glasgow

David Ellis, Lancaster University

The team

- *Research team*
- Andrea Williamson, University of Glasgow
- Ross McQueenie, University of Glasgow
- David Ellis, Lancaster University
- Alex McConnachie, University of Glasgow
- Phil Wilson, University of Aberdeen

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

Outline

- Background and rationale
- Definition
- Patient demographics
- Practice demographics
- Health outcomes
- (Service use)
- (ACEs and social vulnerability)

Serial (Repeated) Missed Appointments

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- 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 via CHI
- Secure extract and analysis facilities in national Safe Haven

Missed appointments results

- 136 Scottish representative GP practices
- >800k patient records
- >11M 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, 2: e551–59)

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 most likely to miss appointments (RR 2·27, 95% CI 2·22–2·31)
- Most remotely located patients least 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) more likely to miss
- Effect of gender relatively small

(Ellis et al Lancet Public Health 2017, 2: e551–59)

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)

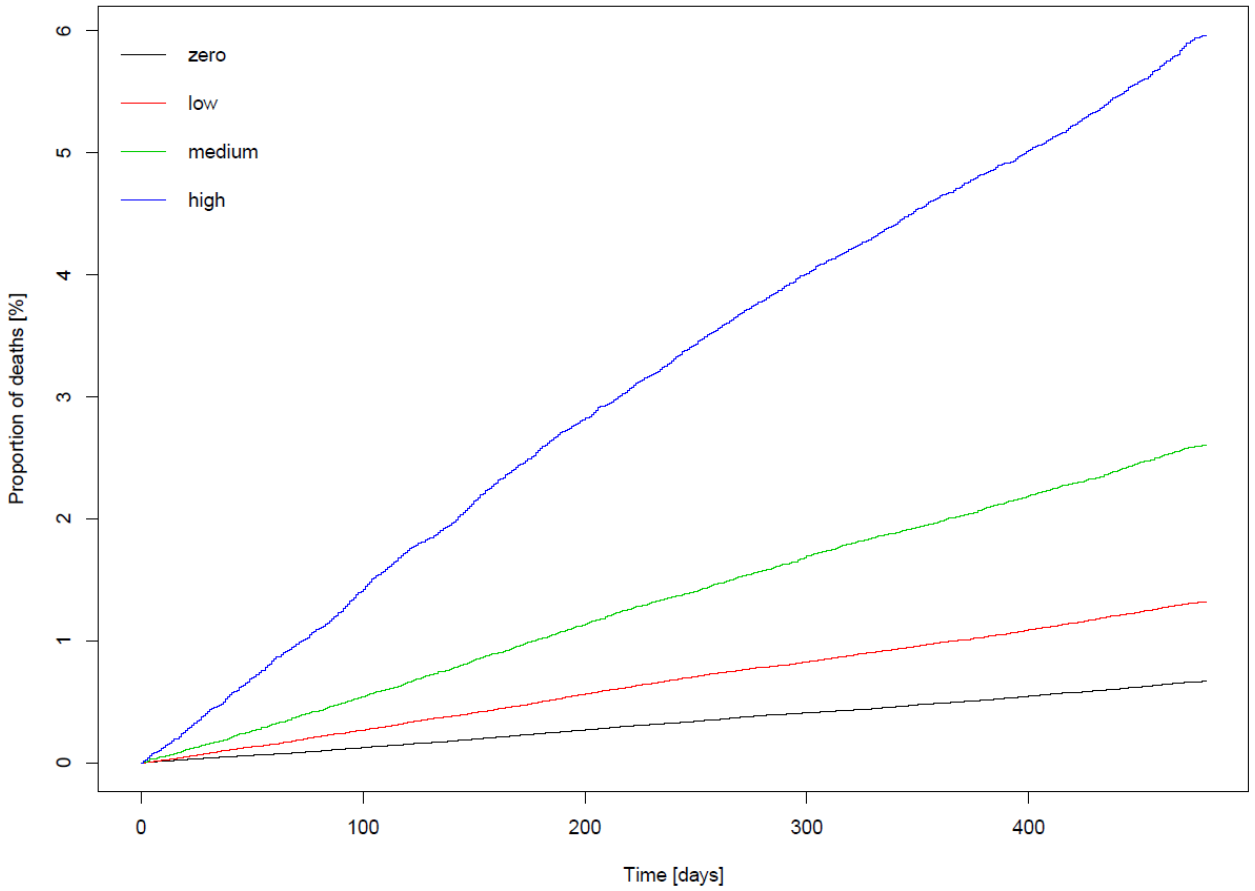
(Ellis et al Lancet Public Health 2017, 2: e551–59)

Multimorbidity (from major Read codes)

Missed Appointment Category	No long term conditions	One to three long term conditions	Four plus long term conditions	Total
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%)

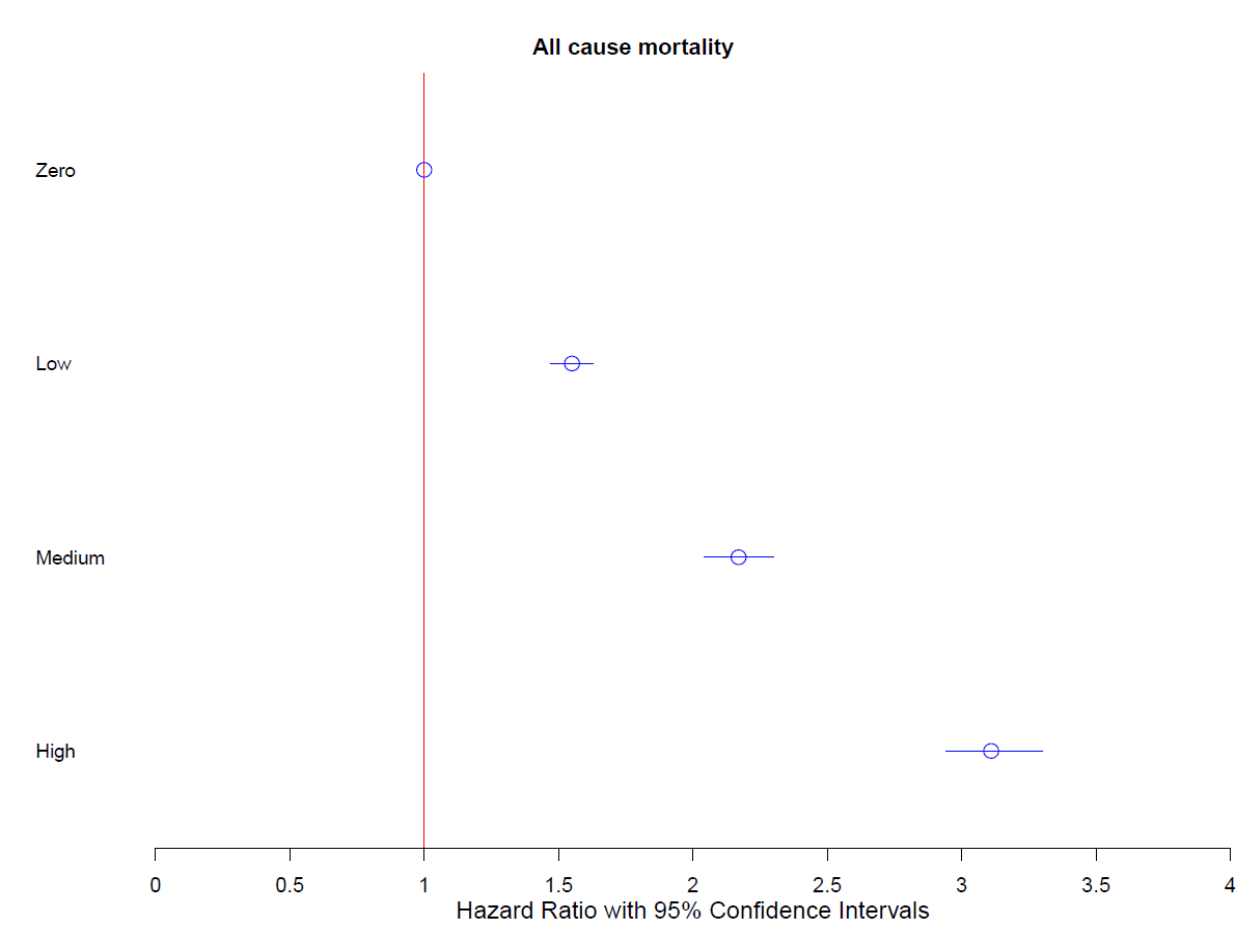
McQueenie et al, BMC Medicine 2019, 17: 2

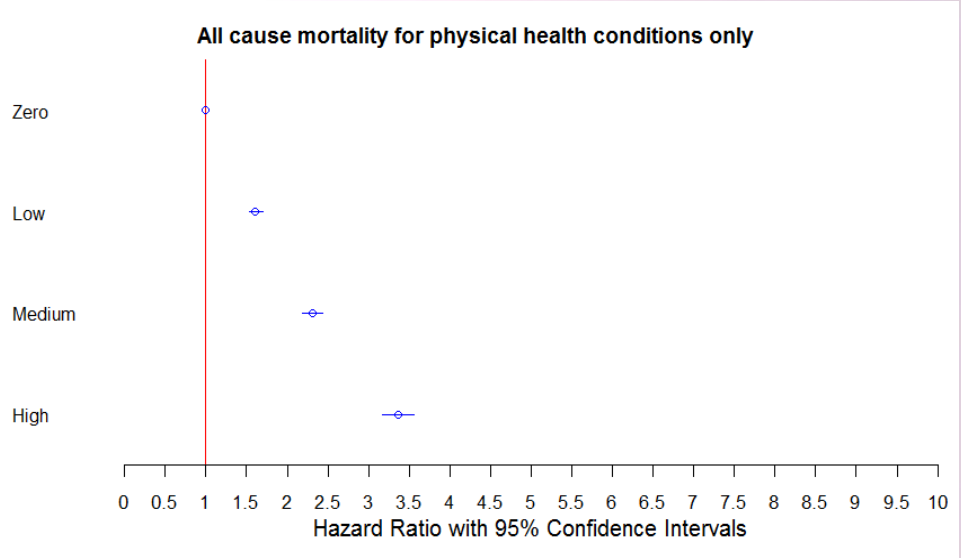
Risk of death – Kaplan-Meier

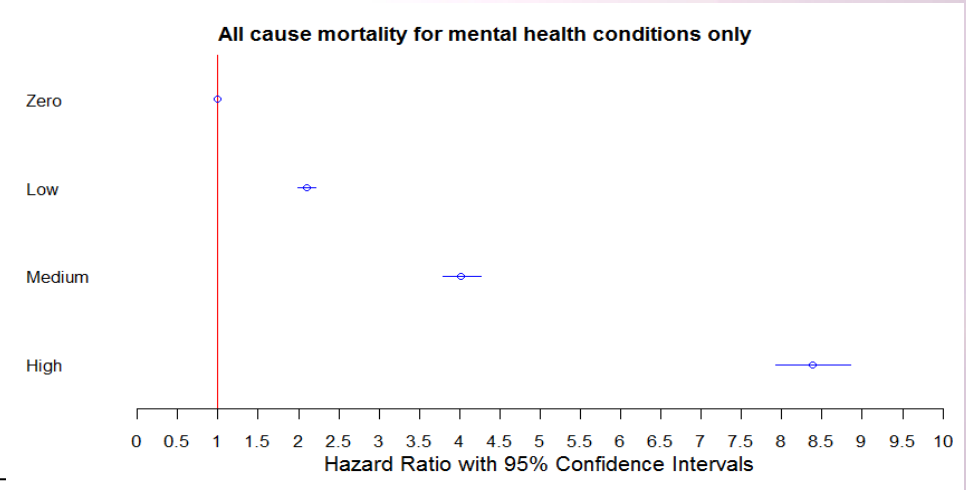


McQueenie et al, BMC Medicine 2019, 17: 2

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







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Causes of death

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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

Missed appointment Category	Number of deaths	Mean age at death (SD)	Most common primary causes of death (%)
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

Missed appointment Category	Number of deaths	Mean age at death (SD)	Most common primary causes of death (%)
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

Missed appointment Category	Number of deaths	Mean age at death (SD)	Most common primary causes of death (%)
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.

Service use

- Analysis in progress:
  - No excess A&E use among repeated non-attenders
  - Substantially increased inpatient and outpatient care among serial non-attenders

Adverse childhood experience

- Work in progress:
  - No easy way to extract ACE data from GP records!
  - Only 1% of patients had any identifiable ACE Read code
  - ACEs associated with a ~50% increased risk of missing any appointment

Summary

- Both patient demographic factors and practice factors influence risk of missing appointments
- Bigger numbers of long-term conditions are associated with increased risk for missing appointments
- Missing appointments is associated with greater use of inpatient and outpatient services, but not with A&E attendance
- 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
- Childhood adversity may be associated with missed appointments but data are poorly recorded.