Serial Missed Appointments in the NHS- ‘missingness’

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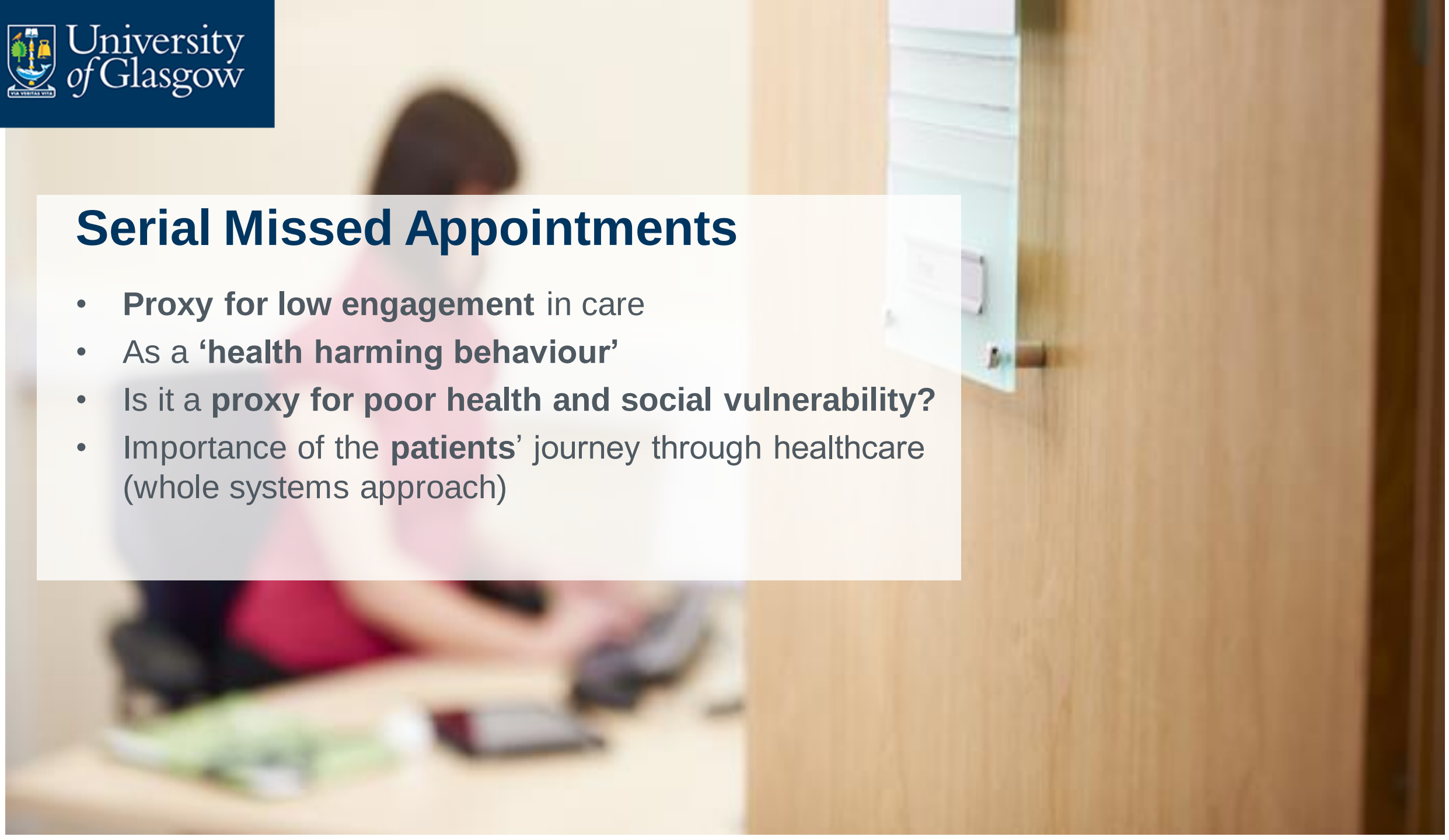
Outline

- Aim and context of SMA project
- Patient and practice demographics
- Morbidity and mortality
- Hospital utilisation
- Further work



Serial Missed Appointments

- **Proxy for low engagement** in care
- As a **'health harming behaviour'**
- Is it a **proxy for poor health and social vulnerability?**
- Importance of the **patients**' journey through healthcare (whole systems approach)

Scottish General Practice

- (almost all) **population coverage**
- **Universal access** & **free** at point of care
- Unique **patient record from birth to death**
- Major advances in electronic records recording & retrieval

Definition & analysis

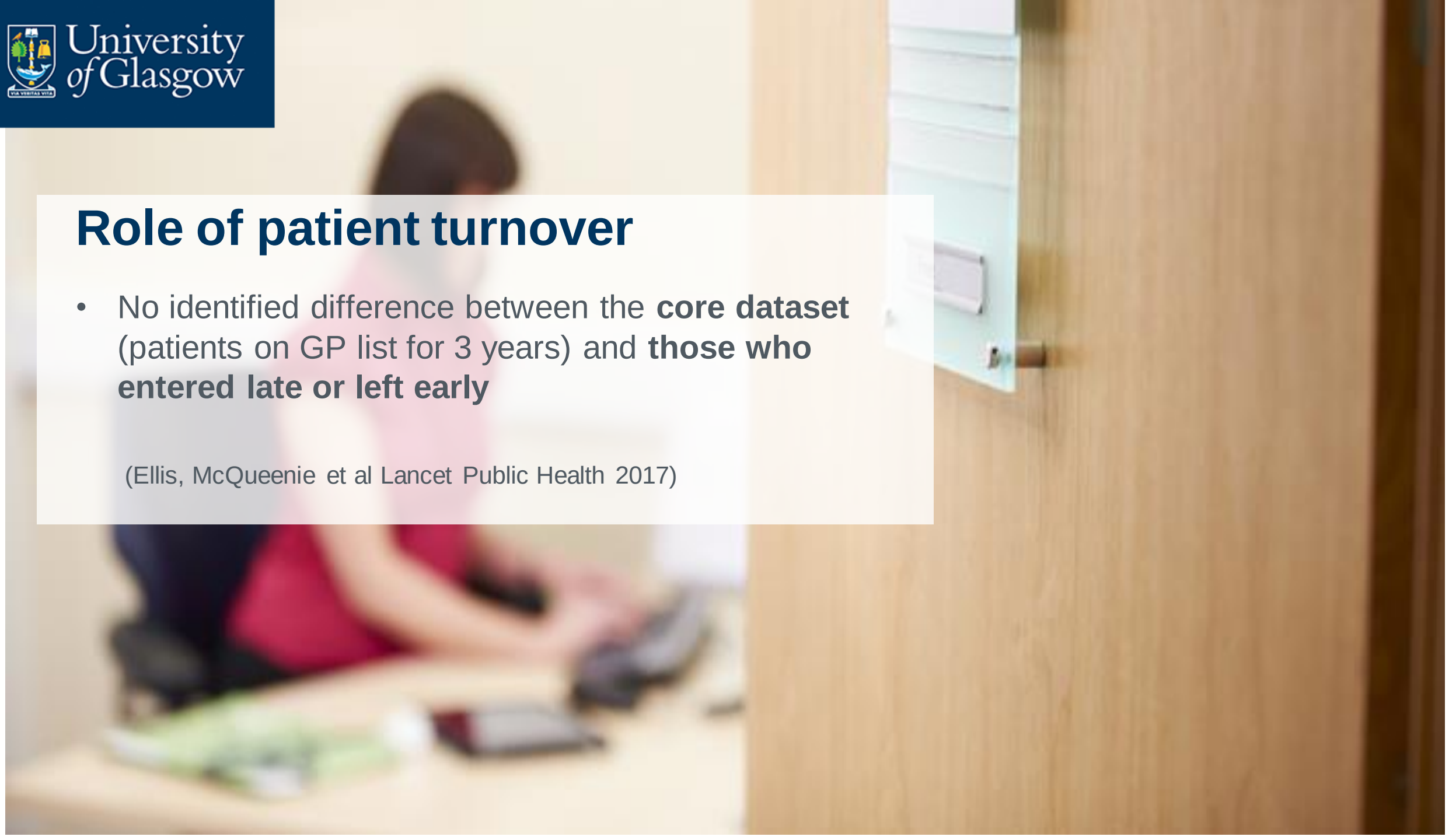
Average of primary care face to face appointments over previous **three years**

- **Never missed appointments per year, 0**
- **Low missed appointments per year, <1**
- **Medium missed appointments per year, 1-2**
- **High missed appointments per year, 2 or more**

Frequency counts

Negative Binomial Regression Modelling across 4 appointment groups

(Williamson et al BMJ Open 2017)



Role of patient turnover

- No identified difference between the **core dataset** (patients on GP list for 3 years) and **those who entered late or left early**

(Ellis, McQueenie et al Lancet Public Health 2017)

Missed appointments results

136 Scottish representative GP practices

550 083 patient records

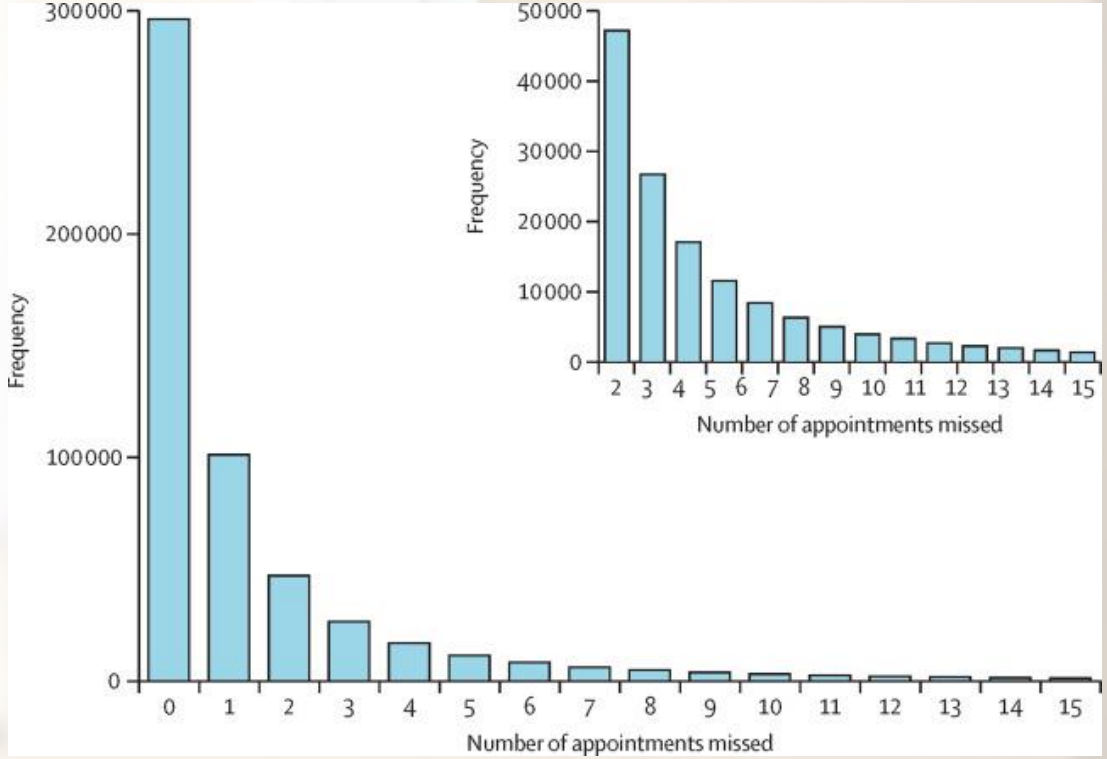
9 177 054 consultations

54·0% (297,002) missed no appointments

46·0% (212,155) missed one or more appointments

19·0% (104,461) missed more than two appointments

(Ellis, McQueenie et al Lancet Public Health 2017)



Patient demographic factors

- Most socio-economically deprived **(SIMD 1)** patients most likely to miss appointments (RRR 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) & **older than 90 years** (2·20, 2·09–2·29) more likely to miss appointments
- Effect of gender small
- Ethnicity poorly recorded (2.69% all records)

(Ellis, McQueenie 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**

(Ellis, McQueenie et al Lancet Public Health 2017)

Patient and practice demographics

- **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, McQueenie et al Lancet Public Health 2017)

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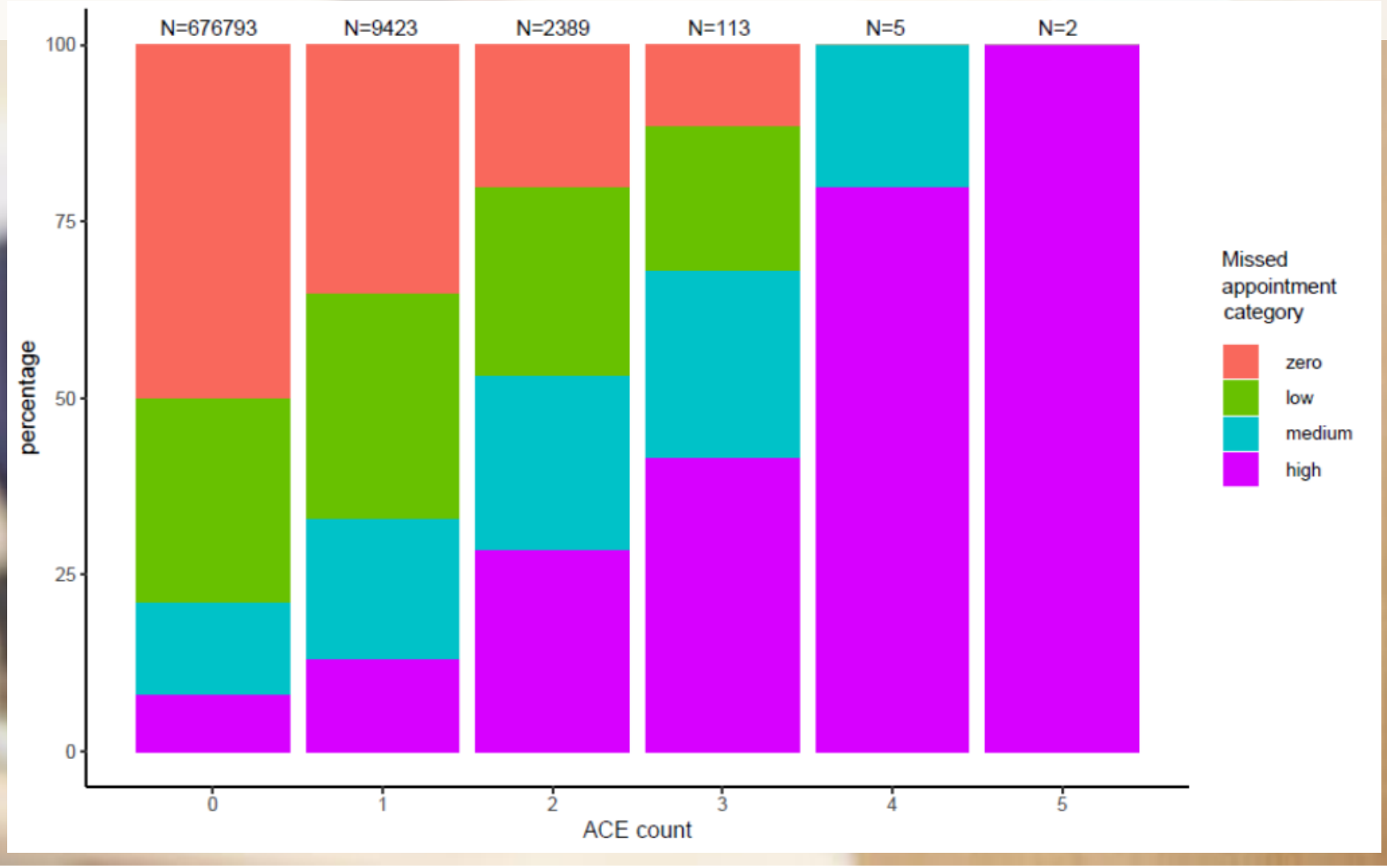
Adverse Childhood Experiences (Williamson et al BJGP Open 2020)



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Severe and Multiple Disadvantage (unpublished data)

SMD	Missed apt category				Total
	zero	low	medium	high	
0	430014 54.7 %	217980 27.7 %	88193 11.2 %	50358 6.4 %	786545 100 %
1	9482 25.6 %	10235 27.6 %	8697 23.4 %	8690 23.4 %	37104 100 %
2	86 13.1 %	135 20.5 %	168 25.5 %	270 41 %	659 100 %
3	<5 **	8 18.6 %	13 30.2 %	21 48.8 %	43 100 %
Total	439583 53.3 %	228358 27.7 %	97071 11.8 %	59339 7.2 %	824351 100 %

χ^2=25889.610 · df=9 · Cramer's V=0.102 · Fisher's p=0.000

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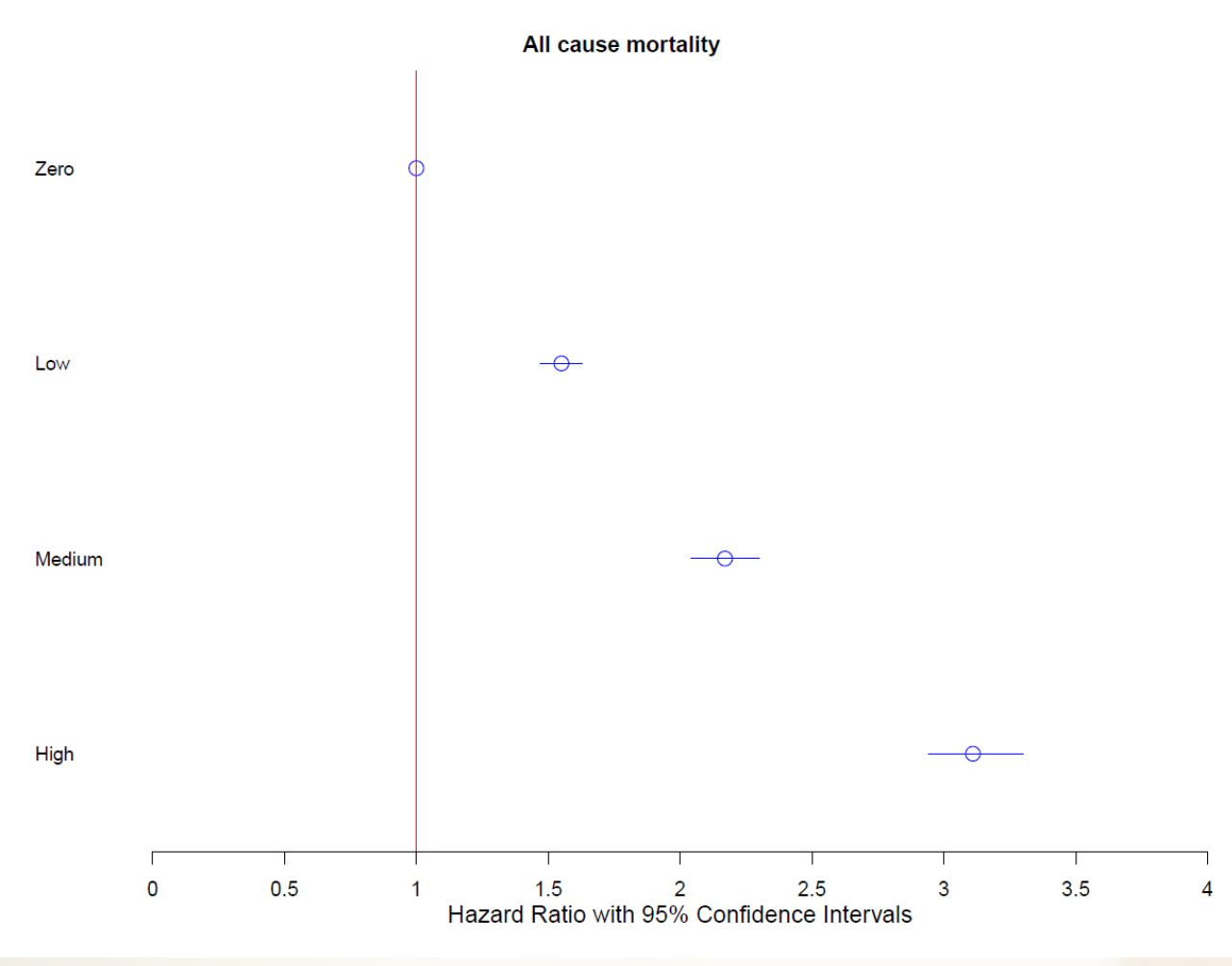
Multi-morbidity (Read code categories)

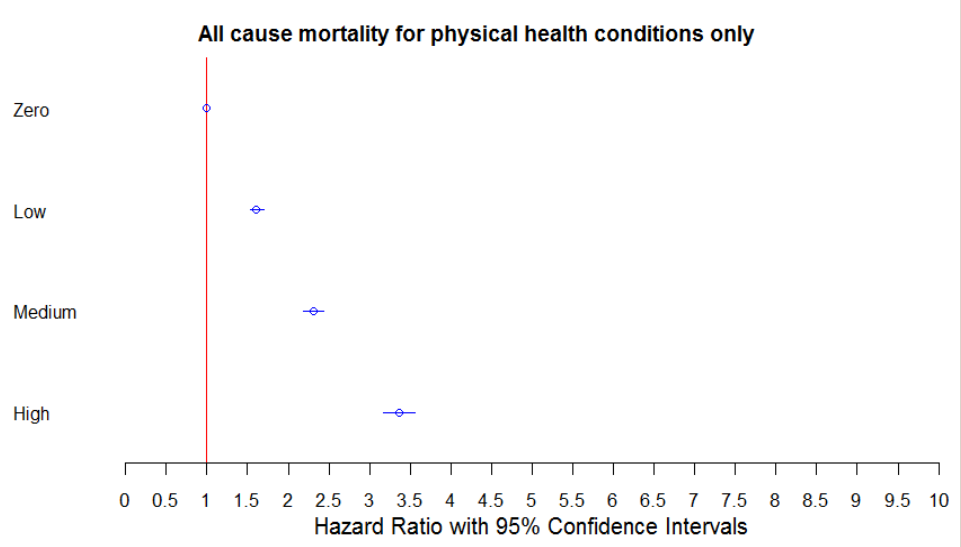
(McQueenie et al BMC Medicine, 2019)

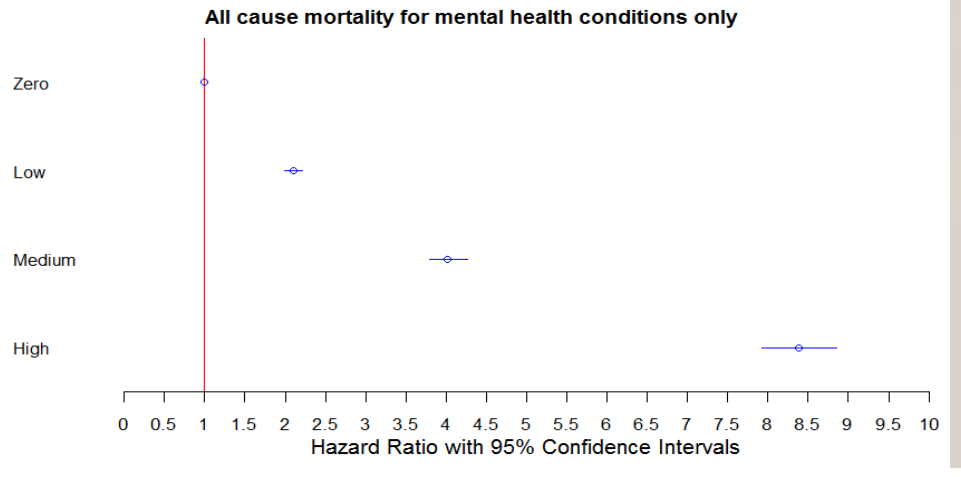
Missed Appointment Category	Number of long term conditions			Total
	None	One to three	Four plus	
zero	226190 51 %	182682 42 %	30720 7 %	439592 100 %
low	84556 37 %	111928 49 %	31881 14 %	228365 100 %
medium	22157 23 %	51569 53 %	23351 24 %	97077 100 %
high	5819 10 %	29714 50 %	23807 40 %	59340 100 %

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

(McQueenie et al BMC Medicine, 2019)







Causes of death (McQueenie et al BMC Medicine, 2019)

Only mental health-related long-term conditions

Missed appointment category	Number of deaths (% of group dead)	Mean age at death (SD)	Most common primary causes of death
Zero	69 (0.2%)	55.72 (20)	R99 (11.6), X70 (10.1), I219 (8.7)
Low	83 (0.4%)	54.68 (18.79)	R99 (21.6), X70 (12), I219 (6)
Medium	58 (0.6%)	53.1 (20.18)	R99 (19), X42 (6.9), Y14 (6.9)
High	53 (1.7%)	49.3 (20)	R99 (32), G309 (9.4), Y14 (5.6)

Key messages- morbidity and mortality

- Patients with **more long-term conditions** have increased risk of missing GP appointments (controlling for number of apts made)
- Patients missing appointments were at much greater risk of **all-cause mortality, the risk increasing with number of missed appointments** (independent of morbidities)

(McQueenie et al BMC Medicine, 2019)

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Key messages – morbidity and mortality

- 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** (after adjustment for all other mortality risks)

(McQueenie et al BMC Medicine, 2019)

Hospital utilization

- Patients missing **high numbers** of GP appointments were **higher users** of **hospital outpatient** (RRR 1.46, 95% CI) 1.44-1.47)*
- and **inpatient care** (general RRR 1.67, 95% CI 1.65-1.68)*, compared to patients missing no GP appointments
- **Emergency department use was the same across all groups (**RRR 1.00, 95% CI 0.99-1.01)*

*negative binomial regression modelling controlling for age, sex, SIMD and number of long-term conditions.

(Not yet published)

Hospital care 'missingness'

- Patients who had patterns of high missed GP appointments were **more likely** (RRR 1.62, 95% CI 1.60-1.64)* to **miss hospital outpatient appointments**
- Analysis of missed outpatient appointments by specialty ongoing- **psychiatry** stands out
- Patients with high missed GP appointments were **more likely** (RRR4.56 95%CI 4.31-4.81) to experience an **'irregular discharge' from inpatient care**
- No difference for ED 'left before care complete' between GP missed appointment category

*negative binomial regression modelling controlling for age, sex, SIMD and number of long-term conditions.

(Not yet published)

Further SMA work

- What we would like to have done:
  - **diagnosis codes for A&E, OP and admissions**
  - **GP OOH, NHS24 and ambulance data**
- What we are doing:
  - Writing papers (education, ADHD, unmet need, preventative health care)
  - Developing an SMA predictive model
    - **practices target existing SMA patients for care**
- Future plans- interventions
  - **involving key stakeholders in primary care, hospital care and experts by experience**
  - **Continued academic focus, service development and interventions evaluation**

Acknowledgements

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- DLDS Scot Gov
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Further information

http://www.gla.ac.uk/serialmissedappointments

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