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Public Health Scotland

Increasing drug-related mortality over the last decade among Scotland's HCV-diagnosed PWID population

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Disclosures

None

Background

- In Scotland, drug-related mortality (DRM) rates are rising steeply
  - Reaching 30/100,000 (15-64 yrs) in 2018 and 32/100,000 in 2019
  - Annual DR deaths: 474 rising to 1187 between 2008 and 2018
- DRM rates for England & Wales are 25% that for Scotland
- Scotland ranks high within the European and international context
- Reports of decreasing DRM rates among younger ages (15-29 years) suggested an ageing cohort effect, but other explanations, such as evolving drug choices, possible

Research objectives

- Describe trends in DRM rates among a large cohort of PWID who have been diagnosed with hepatitis C (HCV) infection
  - This analysis can address ageing cohort hypothesis, as age and calendar time effects can be distinguished
  - In Scotland, HCV predominantly affects people who inject drugs (PWID)
- Quantify associations between risk factors and DR mortality rates
  - To better understand DRM risk in the HCV-diagnosed population
  - Underscore need for co-location of HCV testing and management with addiction services → build on Scotland's HCV Action Plan

Methods

- Retrospective study of open cohort of PWID diagnosed with HCV in Scotland, 2008-2018
  - Record-linkage of HCV diagnosis database to deaths registry (National Records of Scotland)
  - 'Likely' PWID (PWID reported & acquisition risk not-known) – 95.2% of HCV diagnoses
- DRM definition
  - Underlying or contributing cause according to ICD-10 categories
  - Drug disorders (F11-15,19), accidental or intentional self poisoning (X40-44, X60-64), assault by drugs (X85), poisoning: indet. (Y10-14)

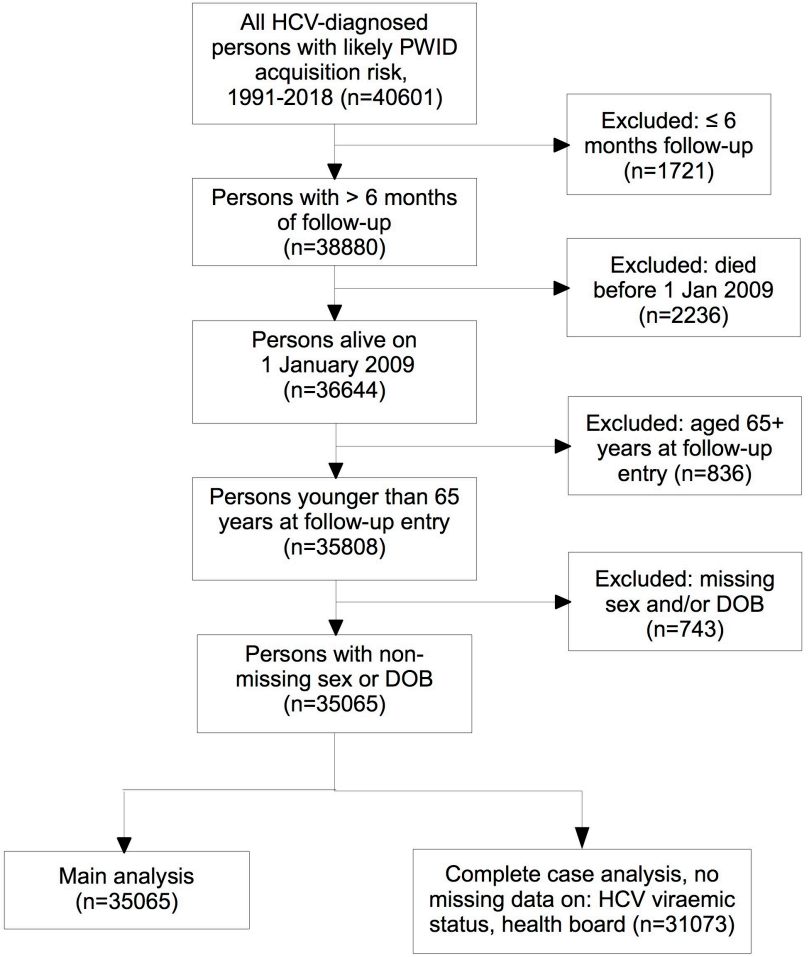
Methods (2)

- Statistical analysis
  - Follow-up began on 1 Jan 2009; censoring earliest of death from non-DR cause, date of 65th birthday, date of migration, or 31 Dec 2018
  - Lexis expansion to estimate DRM rates for *attained* age
  - Poisson regression to estimate rate ratios (RRs) associated with attained age-group, adjusting for sex, referral setting for HCV testing, viraemic status, region, period HCV diagnosis (<2009, 2009-2018)
  - Multiple imputation methods to address missing data on risk factors other than age and sex

Sensitivity analyses

- Potential bias due to earlier diagnosed members of cohort having longer follow-up
  - Higher likelihood of ceasing drug use → lower DRM rates
  - Censored follow-up at 3 years
- Restricted analysis to persons with *reported* injecting drug use as risk factor for HCV infection
  - Reduce heterogeneity by removing unknown (but likely small) number of never-injectors
- In addition, we conducted a complete-case analysis to compare to the principal results using multiple imputation

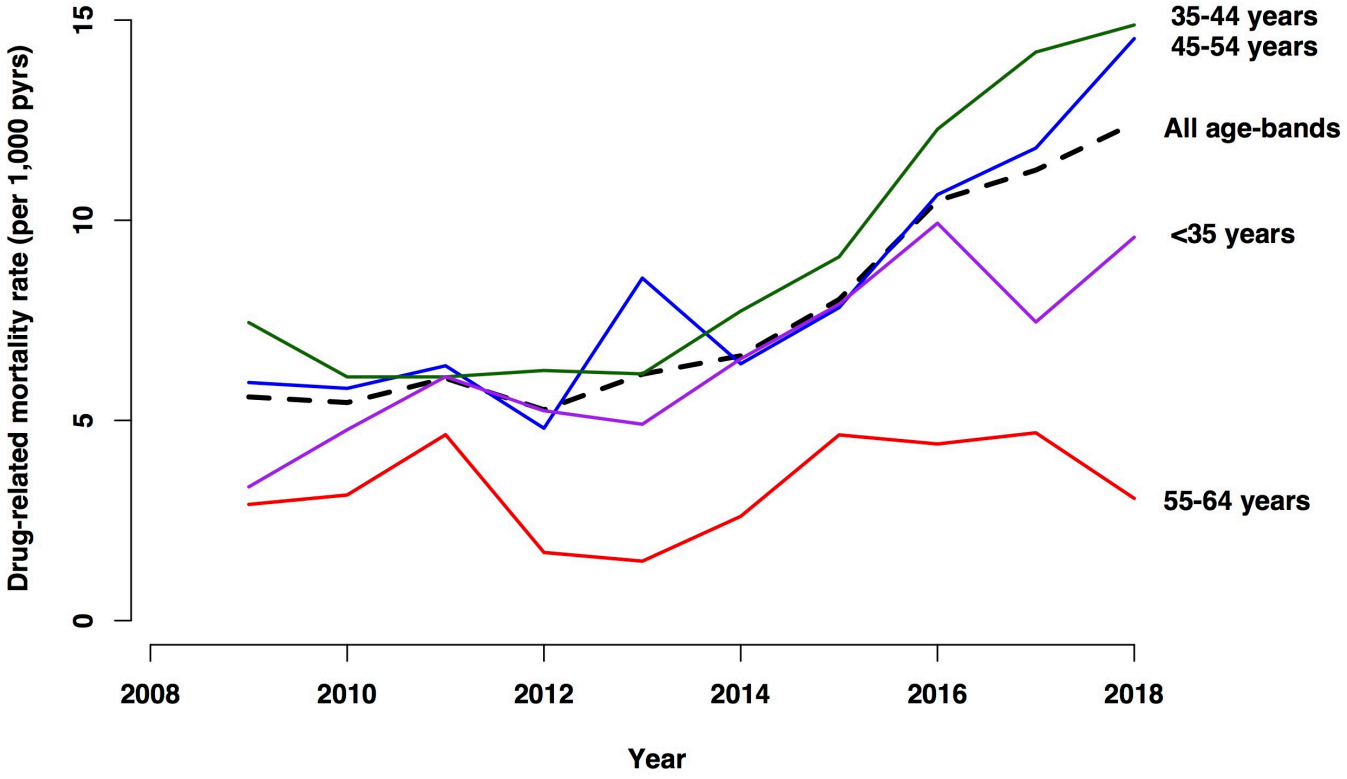
Study population flowchart



Results

- Among study population of 35,065 PWID:
  - 68% male, 36% aged <35 years at start of follow-up, 54% had been diagnosed with HCV <2009
  - 1900 DR deaths occurred over 236 914 person-years of follow-up
  - Annual DR deaths: 101 rising to 342 between 2009 and 2018
- Most DR deaths (70%) were due to overdose
  - 43% of which due to combination of opioids and benzodiazepines and psychotropic substances

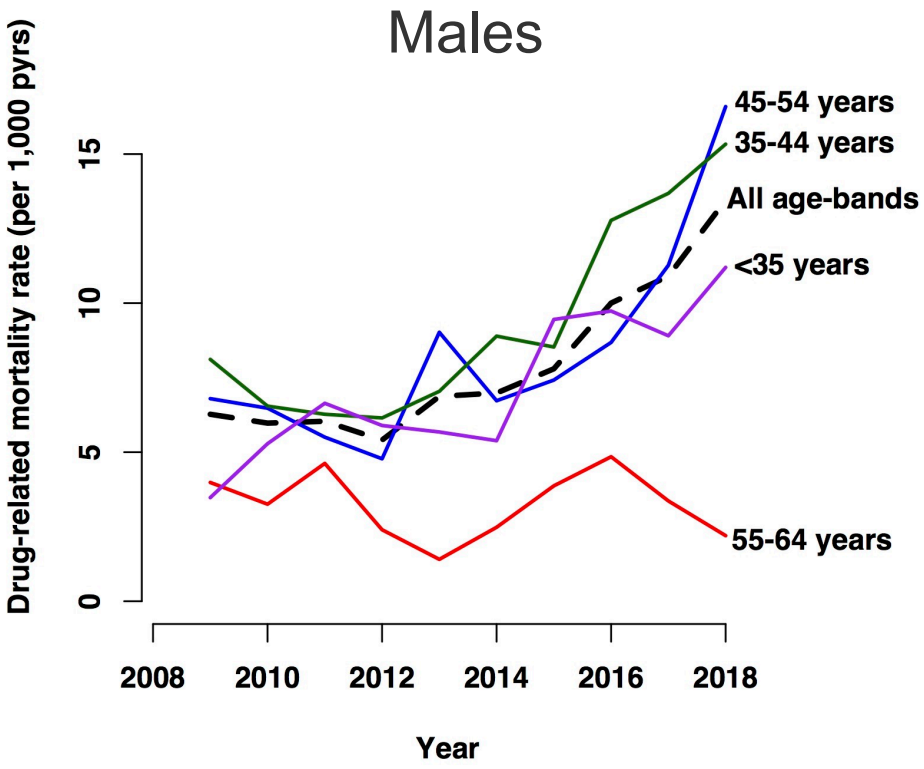
Results: DRM trend by attained age-group

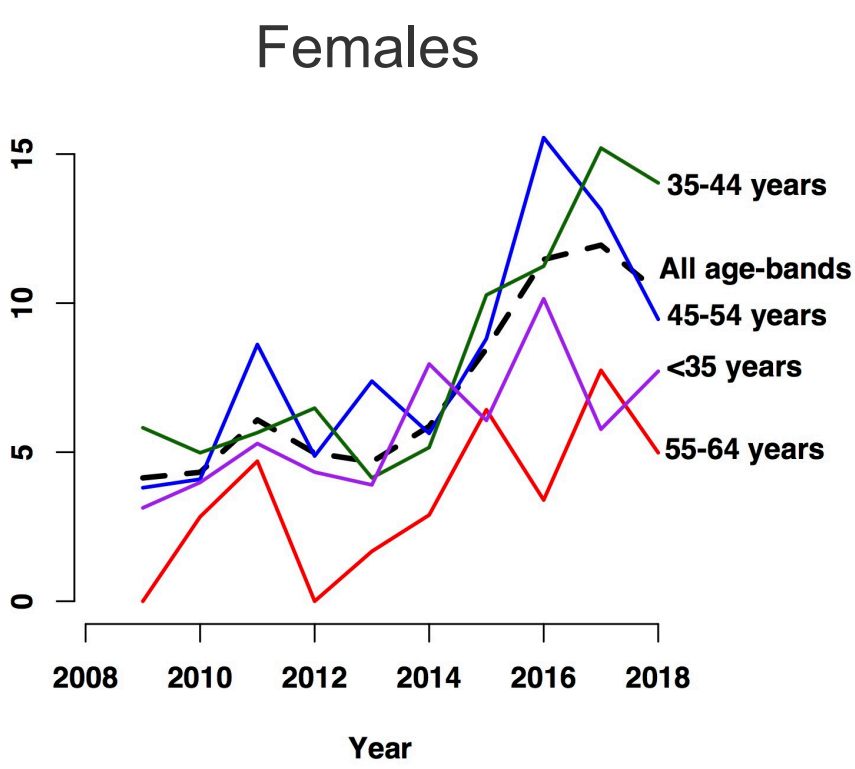


Rising trend for all age-groups except 55-64 years

Effect of attained age disentangled from calendar time

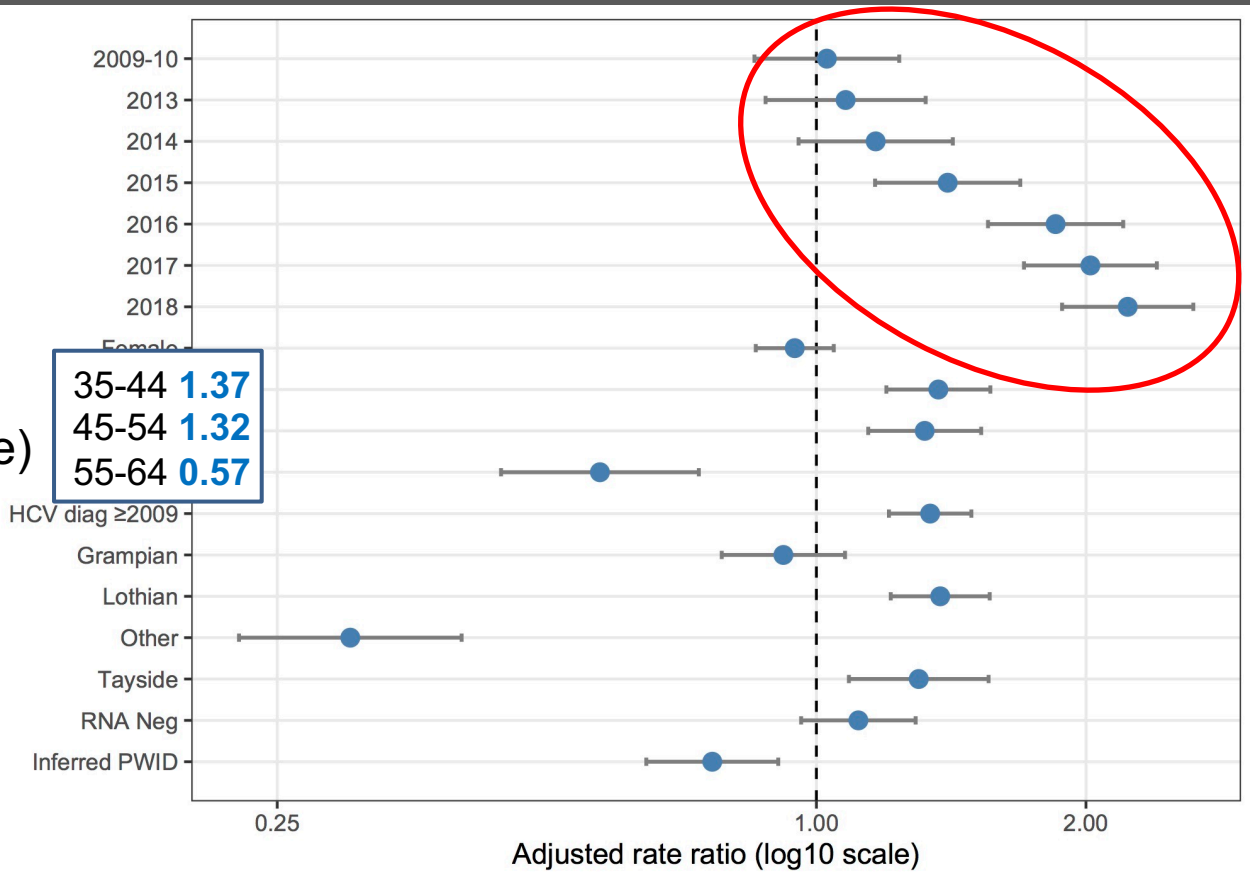
Results: DRM trend by age-group, stratified by sex





Results: risk factor regression analysis

RRs (attained age)



RRs increase with calendar period

Results: sensitivity analyses

- Censoring follow-up at 3 years (n=337 deaths)
  - Increasing DRM rate trend and persistent effects of attained age
- Restricting to persons with reported IDU as risk factor only
  - Very similar DRM trend, but with slightly attenuated RRs
- Complete case analysis (n=31,073) consistent with main analysis

Summary

- Our findings within the HCV-diagnosed PWID cohort replicates increasing DRM trends at the population level in Scotland
  - DRM rates increased with age (up to 45-54 years)
  - Compared with 2011/12, DRM rates increased from 43% to 125% between 2015 through 2018
  - Low DRM and lack of trend in 55-64 years may indicated cessation of injecting or competing causes of death
- HCV cohort provides a denominator population for estimating DRM rates and investigating risk factor associations

Summary (2)

- Limitations
  - Did not adjust for socioeconomic inequalities (eg. deprivation)
  - HCV acquisition risk data cannot distinguish between past and current injecting drug use
  - Aggregating not-known with reported IDU risk may have under-estimated the true DRM mortality rate among current PWID
- Rising DRM rates over the past decade in Scotland are not solely attributable to an ageing cohort effect.
- Strategies implemented for the elimination of HCV should also address the wider health harms among PWID

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