**Phylogenetics of a Recent HIV Outbreak among People who Inject Drugs in Scotland**

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### Background
- People who inject drugs (PWID) are at high risk for HIV if they share equipment
- Harm reduction in the UK and the rest of Europe dramatically decreased incidence in this group in the 1980s
- Recently a number of PWID outbreaks have been reported in Greece\(^1\), Romania\(^2\) and Ireland\(^3\), linked to the economic recession, funding cuts, homelessness and the injection of new psychoactive substances
- In 2014 a rise of subtype C HIV diagnoses with two drug resistant mutations among PWID was noted in Scotland
- We used phylogenetic analysis to investigate whether cases were related and whether the strain had spread elsewhere in the UK

### Methods
- Phylogenetic analysis of viral sequences provides an alternative and independent route to reconstructing transmission networks
- The West of Scotland specialist virology centre sequences pol for all new HIV diagnoses
- The National Health Service portal collects clinical notes, including hepatitis C status, date of last negative, sex, risk group, age, nationality, history of drug use, incarceration and homelessness
- All Scottish subtype C sequences were analysed (n=228)
- Closely related sequences from the UK HIV Drug Resistance Database (n=762) and from public databases (n=1144) were used as background

### Conclusions
- Over 100 linked HIV cases among PWID in Scotland, the biggest outbreak since the 1980s
- The strain hasn’t been detected outside Scotland. Single network
- PWID with a history of homelessness were over-represented
- High rates of hepatitis C suggested needle sharing
- Rapid growth was seen after 2008, indicating a possible role for the economic recession
- Harm reduction services were not reduced in Scotland; however these are not being accessed.
- No association was seen between the outbreak and cocaine injection (and no patients reported injecting new psychoactive substances)
- Recent PWID outbreaks highlight a need for real-time phylogenetic analysis

### Results
- **1. Identification of outbreak cluster**
- **2. Spread among PWID has been rapid and recent**
- **3. The role of needle sharing and homelessness**
  - Individuals in the outbreak were mostly male (61%), white British (99%), HCV positive (99%).
  - 40% had a recorded history of incarceration and 45% reported having been homeless.
  - We ran two binary logistic regression models

Comparing outbreak members to other subtype C diagnoses in Scotland:
- PWID is a strong predictor: OR 124 (p<0.0001)

Comparing outbreak members to other Scottish HIV+ PWID:
- Homelessness is a significant predictor: adjusted OR 3.91 (p=0.02)
- No role for cocaine injection (which increases injection frequency)

### References

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![Bill & Melinda Gates Foundation](image)