Coventry and Warwickshire VTS, CRN West Midlands and Warwick Medical School

'Primary Care Research and Audit in Coventry and Warwickshire'

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PRESENTER'S DETAILS		
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PRESENTATION DETAILS (total max 250 words - not including title)

Co-Authors	**Title of Study**
Ali Ridha, Hannah Reichel, Mishkat Sehata, William Proto, Farah Kidy, Sarah Hillman, Dan Todkill (all at Warwick Medical School)	Using machine learning to identity groups of similar GP practices and improve prescribing benchmarking.

What's the problem you are tackling? (Background)

In order to improve prescribing habits, GP practices are regularly given feedback on their level of prescribing of certain drug classes. For example, Coventry and Rugby CCG return information on practice antibacterial prescribing on a monthly basis, compared to prescribing overall in the CCG. However, given the heterogeneity of list patient characteristics between practices, within-CCG comparisons may not provide a fair benchmark. We use machine learning to define groups (or "clusters") of similar GP practices nationally, and explore whether such a grouping may provide an improved benchmarking comparator.

How did/will you do it? (Method)

An unlabelled dataset of all primary care practices in England was curated to include: QOF-reported disease prevalence, smoking and obesity prevalence, index of multiple deprivation score, list size, age and sex-structure (2017/2018). K-medioid clustering was used to determine a classification of practice types. To explore whether this classification effectively discriminated prescribing, the distributions of antibiotic prescribing rates in each cluster were compared.

What did you find? (Results)

Five clusters of GP practice were defined, broadly distinguishable by their overall prevalence of chronic disease, level of socioeconomic deprivation and age distribution. The clusters demonstrated geographical patterning throughout England. Each cluster had a significantly different distribution of antibiotic prescribing rates ($p < 0.001$ for all), suggesting that comparisons within CCGs alone may result in misclassification of high- or low-prescribing practices.

Why does this matter? (Conclusion)

Machine learning successfully identified groups of practices with similar patient characteristics. Providing more accurate benchmarking of an individual practice's prescribing, by comparing them to other practices with similar patient characteristics, would more convincingly identify high-volume prescribers which require intervention.