International Journal of Population Data Science

Journal Website: www.ijpds.org

Exploring cancer inequalities in Wales through linked health and administrative data

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Objectives

We aimed to conduct a proof-of-concept study assessing the feasibility of linking population-scale health and administrative data, including the ONS 2021 Census, within the Secure Anonymised Information Linkage (SAIL) Databank. Using curated cohort data, we demonstrate how linkage enables the evaluation of patterns in breast and bowel cancer screening uptake incidence.

Methods

We assessed the temporal coverage and scale of demographic, primary care, secondary care, and cancer service data from 2000 to 2024. After reviewing the availability of individual records, cancer diagnoses, and screening data, we evaluated the impact of narrowing inclusion criteria and linking multiple population-scale data sources to define an optimal study window (2018–2023). We created a general population cohort and sub-cohorts of individuals screened or diagnosed with breast or bowel cancer. We compared specific sociodemographic characteristics extracted from ONS 2021 Census data for these cohorts to identify sociodemographic patterns in cancer screening participation and diagnosis.

Results

A total of 2.6 million individuals (80% of the Welsh population) responded to the ONS 2021 Census and had linked data available within SAIL. Annual cancer diagnoses ranged from 2,400-3,050 for breast cancer and 2,300–2,800 for bowel cancer. Screening data showed high coverage, with invitations issued closely matching the estimated eligible population. On average, 70-75% of individuals invited for breast cancer screening attended, compared to 50-67% for bowel cancer screening.

Sociodemographic analysis revealed lower screening participation among individuals from more deprived areas (14% most deprived vs 23% least deprived), those with lower educational attainment, non-White ethnic groups, non-English speakers, single individuals, and those with poor health or disabilities. However, while no statistical comparisons were performed, cancer diagnosis appeared similar across sociodemographic groups.

Conclusions

We demonstrated the feasibility and value of linking multiple data sources, particularly the ONS 2021 Census. Through this new linkage opportunity within SAIL, we established study cohorts, identified cancer disparities and provided insights for understanding inequalities in cancer screening participation and outcomes, **informing future research and public health evaluation opportunities.**

https://doi.org/10.23889/ijpds.v10i3.3099