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QUAIL: Quality Analyser for Interpreting Linkage

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Metrics, such as precision and recall, are required to understand the quality of a linked product, yet standardised methods of quality assurance are seldom adopted. This is particularly true of the approaches to sample size selection for error estimation, which can lead to uncertainty. To overcome these issues, we present QUAIL – the QUality ANAlyser for INTerpreting LINKage – a project that aims to provide a package of recommended researched methodologies and tools to streamline the quality assurance process of linked data. We will highlight the key processes and considerations made in the development of QUAIL and its sub-modules. QUAIL incorporates methodological innovations to facilitate quality assurance. Areas of

work include candidate link creation for the purpose of false positive and false negative estimation, stratification, sampling, clerical review, and the computation of key quality metrics, including precision and recall, as well as their corresponding confidence intervals. QUAIL enhances the efficiency and reliability of linkage quality assessment by embedding best-practice linkage methodologies into an automated and generalisable process. This reduces operational overhead, mitigates human error, and promotes standardisation across projects. By providing robust and transparent quality metrics, QUAIL supports informed decision-making about linkage strategies, data usability, and downstream analyses.

