



Title of PhD project	Evaluating the role of polypharmacy before and after cancer diagnosis using electronic health record data	
Supervisor	Dr Christopher Rentsch	LSHTM
Co-Supervisor	Professor Krishnan Bhaskaran	LSHTM
Brief description of project	<p>Polypharmacy, commonly defined as the concurrent use of five or more chronic medications, is increasingly prevalent, and is a strong predictor of drug-drug interactions and drug toxicity. Long-term and late effects of cancer, combined with ongoing management of other chronic conditions, make cancer survivors particularly vulnerable to polypharmacy and its adverse effects. Yet, existing research on polypharmacy is problematic largely because of small sample sizes, non-standardised definitions of polypharmacy, and inadequate adjustment for confounding by indication.</p> <p>Over recent years, advanced methods that account for time-varying confounding by indication have grown in popularity and accessibility, including propensity score-based methods and g-estimation. This project will investigate and compare methodological challenges associated with studying the role of polypharmacy in a cancer survivorship setting.</p> <p>The prospective student will have access to electronic health record data from the largest healthcare systems in each of the UK and US to compare and validate findings across country and healthcare system. Important outputs include, but are not limited to:</p> <ul style="list-style-type: none"> • Developing guidelines on identifying polypharmacy, designing studies involving polypharmacy, and choosing appropriate statistical analysis methods. • Developing open-source tools and algorithms for other researchers to use when measuring polypharmacy in routinely collected data 	
Skills we expect a student to develop/acquire whilst pursuing this project	<ul style="list-style-type: none"> • Management of large and complex e-Health data • Advanced pharmacoepidemiological methods • Dealing with bias and confounding in observational pharmacoepidemiological studies 	

	<ul style="list-style-type: none"> • Advanced coding in statistical software (e.g., Stata) • Transferable skills (e.g., managing and delivering a substantial project, literature reviewing, writing, presenting)
Particular <u>prior</u> educational requirements for a student undertaking this project	MSc Epidemiology with strong quantitative skills; MSc in Medical Statistics; or equivalent
Project key words	Pharmacoepidemiology Cancer Polypharmacy Statistics Causal Inference Real-World Evidence
Possible under 1+4 route? Master's options identified.	Yes LSHTM - MSc Epidemiology LSHTM - MSc Medical Statistics
MRC Core Skills developed through this project	Quantitative skills
MRC LID themes	Health Data Science
Further reading	Polypharmacy and patterns of prescription medication use among cancer survivors Polypharmacy in HIV: Recent Insights and Future Directions