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| Host department:Manchester |
| Project Title: |
| Optimising technology-based physical activity interventions in patients with cardiometabolic conditions in primary care |
| Proposed supervisory team: Names and areas of expertise to be included |
| 1. Maria Panagioti (Primary supervisor), Senior Lecturer in Primary Care, University of Manchester: expertise in evidence synthesis, quality and safety of patient care, multimorbidity and long-term conditions, mental health
2. Mamas Mamas, Prof of cardiology and consultant cardiologist, Keele University: expertise in cardiovascular and epidemiology research involving EHRs

Other supervisors and project advisors may include:1. Alexander Hodkinson (Co-supervisor), Research Fellow in Evidence Based Medicine: expertise in meta-analysis including IPD meta-analysis and network meta-analysis and analysis of primary care electronic health records (EHRs)
2. Darren Ashcroft, Prof of Pharmacoepidemiology, University of Manchester: expertise in epidemiology involving EHRs
3. Evangelos Kontopantelis, Prof of Heath Data sciences, University of Manchester: expertise in statistical methodology and epidemiology of EHRs
4. Claire Planner, Research Associate in Primary care research, University of Manchester: expertise in mental health, public involvement & engagement and patient-centred trials
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| Potential for cross consortium networking and educational opportunities: |
| *Networking:* There will be opportunities to network and build collaborations at UK based conferences such as the NIHR showcase which is a network of 9 of the most elite primary care schools and is free to attend, the Health Services Research UK conference and SAPC annual conference. The student will also have opportunities to attend at least one major national/international conference in evidence synthesis (Cochrane Colloquium, EBMLive (free), and the Evidence Synthesis Hackathon (free)) or with a focus on physical activity (Health-enhancing physical activity (HEPA) Europe 2022 Conference).  |
| Project description: |
| *Background*Regular physical activity provides health benefits and contributes to the prevention and control of cardiometabolic conditions (such as cardiovascular diseases, diabetes, being overweight/obese) and reduces adverse patient outcomes, health care use and overall mortality. However, the COVID-19 pandemic has led to multiple challenges for people’s health and well-being. In our recent meta-analysis using study level and individual patient level data, we found that wearable activity tackers, smartphone fitness apps and lifestyle intervention programmes have been found to be promising technology which can be used to support people during life disruptions, and at the time of a global crisis where people’s physical activity routines are most at risk. However, major uncertainties remain about which type(s) of trackers/apps are most effective at boosting physical activity levels and it’s unclear whether certain patient factors are associated with the ‘real-life’ effectiveness for prescribing lifestyle interventions in primary care. Moreover, we have showed that the use of wearable physical activity trackers mostly benefit people with cardiometabolic conditions when combined with regular contacts/encouragement by primary care professionals suggesting that the role of primary care professionals is crucial for the success of these programmes. This PhD proposal will assess the impact of the safety measures, activity patterns, and the efficacy of using commercial wearable activity trackers and prescribing lifestyle intervention programmes in patients with cardiometabolic conditions in primary care. *Specific aims*1. Determine the impact of the Covid-19 safety measures on physical activity patterns in patients with cardiometabolic conditions.
2. Assess the use of commercial wearable activity trackers and other devices for improving physical activity in patients with cardiometabolic conditions
3. Assess the use and real-life effectiveness of prescribed lifestyle intervention programmes in primary care patients with cardiometabolic conditions.
4. Co-produce primary care provider-led strategies to promote ‘physical activity’ in people with cardiometabolic conditions

*Methods*Phase 1: Mixed methods reviewA mixed methods review involving observational research will examine what impacts the Covid-19 safety measures (i.e., lockdown, restrictions, society and sports club closures; reduced contact with primary care professionals) have had on physical activity patterns among highly ‘inactive’ adults most at risk.Phase 2: Network meta-analysis This will be a network meta-analysis of RCTs to assess the use of commercial wearable activity trackers (Fitbits, accelerometers, and pedometers), smartphone fitness apps, and other devices for monitoring physical activity in patients with cardiometabolic conditions. Primary outcomes of interest will be steps-per-day, moderate to vigorous physical activity (MVPA) and self-reported physical activity.Phase 3: Cohort analysis using EHRsThe study will focus on the use and real-life effectiveness of lifestyle intervention programmes in primary care through analysing EHRs from the Clinical Practice Research Datalink (CPRD). Because of the large number of patients included in the CPRD and the extensive time horizon during which these patients were observed, we will be able to study immediate benefits and long-run effects. Analysis will involve regression models adjusting for key patient level covariates (age, gender, ethnicity, deprivation, comorbidities). Phase 4: Co-produce primary care provider-led strategies to promote ‘physical activity’ in people with cardiometabolic conditions In this stage we will co-produce primary care provider-led strategies to promote the regular use of physical activity programmes among people with cardiometabolic conditions using a series of workshops and consensus exercises with different stakeholders (primary care professionals, patients and carers) which take into consideration the needs of underserved groups (e.g. low socioeconomic status, ethnicity and poor mental health or other disabilities). |
| Training and development provision by host: |
| *Formal training:* Depending on existing skills and needs of student –* Systematic review and meta-analysis training course, University of Manchester (year 1)
* 3-day training course on ‘Indirect and Mixed Treatment Comparisons’, Leicester and Bristol Universities (year 1
* Applied Epidemiology training course (MPH Public Health Web-based learning), University of Manchester (year 2): covers epidemiological analysis of EHRs data
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| *Informal training:* Throughout the PhD, the student will have opportunities to attend university training courses and departmental seminars which offer training in planning a PhD, time management, presentations, viva preparation, writing up, publications, and career development**.**  |
| *PPIE:* PPIE will be embedded throughout the PhD programme and the PPIE group with four PRIMER members will meet twice yearly with the student and members of the supervisory team to discuss the research aims, selection of variables for the analyses, patient/provider faced materials, the meaning of the findings and the dissemination approach. |