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| Host department:Bristol |
| Potentially Inappropriate Testing: defining and measuring overuse and underuse of tests in primary care (The PIT STOP study) |
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| Proposed supervisory team:  |
| Dr Jessica Watson (Bristol) GP and Academic Clinical Lecturer with an expertise in primary care diagnostics and use of routine data including CPRD.Professor Penny Whiting (Bristol) Professor of clinical epidemiology with expertise in routinely collected data, consensus methods and systematic reviews. |
| Potential for cross consortium networking and educational opportunities: |
| The supervisory team are engaged in multiple national and international collaborations presenting opportunities for networking and training. The successful candidate will join SPCR doctoral students peers for regular training meetings and the SPCR Annual Trainees Event. They will have access to training and academic opportunities across the 10 consortium institutions and will join a peer-learning group. They will have a mentor, who will be a post-doctoral researcher from a different institution to the student. |
| Project description: |
| BackgroundHealthcare systems and the healthcare workforce in the UK are currently under unprecedented strain. Overuse of tests leads to unnecessary costs for the NHS, increased workload pressures on primary care clinicians, and can lead to anxiety for patients. Conversely underuse of tests risks delays in diagnosis, delays in treatment and potential risks to patient safety. Potentially inappropriate testing can be defined as any overuse or underuse of tests compared to national or international guidelines or compared to best available evidence. Examples of overuse could include excessive frequency of vitamin D testing, or use of prostate specific antigen tests in patients outside of the recommended age group. Examples of underuse could include underuse of microalbuminuria testing in patients with diabetes or underuse of pulmonary function testing in patients with asthma or COPD compared to guidelines. Aims and objectivesAim: The overall aim of this mixed methods PhD is to define and measure rates of potentially inappropriate testing in the UK and explore whether providing feedback on potentially inappropriate testing rates to primary care clinicians could help optimize test usage.Specific objectives:1. To conduct a systematic review of potentially inappropriate testing in primary care.
2. To develop consensus definitions of potentially inappropriate tests which could be operationalised in routine data using Dephi panel methods.
3. To use CPRD to measure rates of potentially inappropriate testing
4. To explore the use of dashboards to feedback rates of potentially inappropriate testing rates to primary care clinicians to help optimize test usage.

MethodsStage 1: Through a systematic review the student will identify specific tests with evidence of overuse or underuse in primary care. A systematic review conducted in 2017 identified 103 measures of inappropriateness (41 underuse and 62 overuse) from studies of 47 different diagnostic tests.1 The candidate will update this review to identify measures of potentially inappropriate testing for stage 2.Stage 2: Delphi panel to develop consensus definitions of potentially inappropriate testingThe student will use measures of potentially inappropriate testing from WP1 as the basis for a Delphi study to develop consensus definitions of overuse and underuse of tests. Delphi panel members will include primary care clinicians (GPs, nurses and allied health professionals), experts in diagnostic testing from secondary care (radiologists, clinical biochemists, microbiologists and laboratory staff) and patient representatives. As well as reaching consensus on measures of potentially inappropriate testing identified from stage 1, consensus panel members will also be invited to suggest additional measures of potentially inappropriate testing not identified by the review. Where possible we will ensure that these definitions can be operationalized into routine data collection to allow them to be incorporated into stage 3-4. Stage 3: Measure frequency of potentially inappropriate testingThe candidate will use routine UK primary care data from the Clinical Practice Research Datalink (CPRD) to measure rates of potentially inappropriate testing against the indicators defined in stage 2. They will measure patterns in potentially inappropriate testing over time, by GP practice, region, age, sex, ethnicity and socioeconomic deprivation. They will develop exemplar dashboards of inappropriate testing which could be shared with clinicians to allow them to visualize how their own practice compares to local and regional testing patterns. Stage 4: Focus groups with patients and clinicians to explore the use of dashboards to reduce potentially inappropriate testing. The candidate will hold focus groups with stakeholders including patients and clinicians from primary and secondary care, commissioners and researchers. They will share the findings from stage 1-3 including dashboards of potentially inappropriate testing. They will explore how this data could be used for research and quality improvement to improve appropriateness of testing, and explore barriers and facilitators to changing practice.If successful this project could form the foundation for a future cluster randomised trial to measure whether feedback to practices could optimise test usage in primary care. |
| Indicative project costs:  |
| The project is expected to cost between £25-30k. These costs would cover: Equipment (laptop, digital audio recorder), CPRD costs, PPIE costs (room hire, refreshments, contributor reimbursement), conference/training fees and open access fees. |
| Training and development provision by host: |
| *Formal training:* The training plan will be informed by an analysis of the academic needs of the PhD candidate carriedout in the first month. Training will be directed towards helping the candidate develop as anindependent researcher, as well as towards the needs of the PhD project. The PhD candidate will have access to formal training in epidemiology, statistics, research governance, qualitative research methods and systematic reviews provided by the University of Bristol Population Health Sciences Short Course programme. They will also have access to generic skills training courses offered by the Bristol Doctoral College which offers courses in time management, career development, writing skills, presentation skills and leadership. |
| *Informal training:* The student will be embedded within the Centre for Academic Primary Care (CAPC), and will be invited to attend regular departmental seminars and meetings. They will be have access to mentorship, a peer-learning group and annual training meetings. They will have opportunities to present their work internally at meetings and seminars in the department and externally at conferences. |
| *PPIE*: The Centre for Academic Primary Care at the University of Bristol has established strong PPIE links and PPIE co-ordinators. The PhD candidate will be supported by the CAPC PPIE co-ordinators to set up a PPIE group who will contribute to study design, interpretation of findings and dissemination activities. |

Reference:

1. O'Sullivan JW, Albasri A, Nicholson BD, et al. Overtesting and undertesting in primary care: a systematic review and meta-analysis. *BMJ open* 2018;8(2):e018557. doi: 10.1136/bmjopen-2017-018557 [published Online First: 2018/02/15]