

Managing Multimorbidity

A Virtual Seminar

#MultimorbidityARC



I'd like to thank you for attending the virtual seminar on "Managing Multimorbidity"

Multimorbidity is a key challenge for modern healthcare as people are living longer often with multiple long-term conditions. At the moment:

- The majority of over 65s have 2 or more conditions
- The majority of over 75s have 3 or more conditions
- More people have 2 conditions than only have 1
- 19% of 40-69 year olds have at least 2 conditions
- 26% of 40-69 year olds have hypertension.

People suffering from other co-morbidities are more likely to die or be hospitalized from COVID-19.

The purpose of this event is to bring together academics alongside clinicians, public health professionals and others working in the field to present on the current research, discuss priorities and look for ways to work together for mutual benefit. It is also to generate ideas and discussions about priorities and future challenges to multimorbidity research.

In the event you will hear a number of examples of excellent practice from across the ARCs that cover the whole of England. We will also hear a number of presentations from key people who we work with closely in delivering a national research programme on multimorbidity.

Professor Chris Whitty, as well as being Chief Medical Officer for England and Chief Medical Adviser to the UK government, was also until August 2021, the Chief Executive of the NIHR. All of these roles give him a unique overview of the research priorities and how that links to other priorities.

Professor Gary Ford, is chair of the AHSN network as well as Chief Executive of Oxford AHSN. With their key role in implementation, Academic Health Science Networks (AHSNs) are vital partners in multimorbidity research.

Dr Madina Kara is the Multiple Long Term Conditions Strategy Lead at NIHR Office for Clinical Research Infrastructure (NOCRI), which has a key link between the life sciences industry and those working on the frontline in translational and implementation research.

As the lead ARC on Multimorbidity we are proud to organize this event and I'm grateful to all of the guest speakers, who have taken time out of his busy schedule to attend. I'm also grateful to the other ARCs who are presenting on their examples of good practice and innovative research. Finally, I'd like to thank the ARC East Midlands staff who helped arrange the event especially Michelle Brown.

I hope you enjoy the virtual seminar and look forward to working with you in the future.

Professor Kamlesh Khunti

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ARC West

Management of long-term conditions is a vital role for primary care. Care is often segmented around single conditions, yet many patients have multiple conditions at the same time, leading to care which is insufficiently responsive to patients' needs. Our team at ARC West have conducted highly cited research on the epidemiology, measurement, experience and management of multimorbidity, including the '3D' trial of a patient-centred approach (Lancet 2018). Building on this research, we are conducting three related projects:

Personalised primary care for patients with multimorbidity: The 3D approach achieved improvements in patient-centred care, but not health outcomes, and suffered from problems of implementation. We are applying learning from the 3D trial to optimise and implement a highly functional computerised template to support general practices in delivering key aspects of the NHS Personalised Care model, including care and support planning. Using mixed-methods research in three areas of the country, we will study how to promote implementation and how the template can be improved.

A comprehensive template is a necessary tool to support personalised care, but probably not sufficient to promote the system change needed. In a linked project we will explore the benefits of co- production with patients and training from Year of Care Partnerships, alongside the template, to improve care.

We have previously developed the Multimorbidity Treatment Burden Questionnaire to measure the 'work' that patients undertake to manage their conditions. In a third mixed-methods project we are seeking to understand how health care services can be organised to reduce this burden.

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ARC Northwest London

Multidisciplinary team (MDT) working for people living with frailty in the context of covid-19: a multi-professional training project

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Frailty, multimorbidity and polypharmacy affect increasing numbers of individuals in our health system. Requiring services from multiple health and social care providers, they are at significant risk of experiencing fragmentation in care. The Covid-19 pandemic (the pandemic) has further exacerbated problems of healthcare access and navigation, and social isolation for these individuals. MDT working is a key approach to addressing these issues, with integrated, joined up healthcare provision.

Funded by Harrow CCG, this project provided training in MDT working for primary and social care staff caring for individuals with frailty during the pandemic.

Three one-hour training sessions were delivered one month apart, focusing on building effective MDT working, effective MDTs in the context of frailty assessment, and improving MDTs around care home residents' needs. Training was designed to improve knowledge, skills, and confidence to work collaboratively within and across five Primary Care Networks in caring for people with frailty in the context of Covid-19. Researcher observation, pre- and post-training participant surveys, and a non- participant survey were used to evaluate the training.

Significant improvement in participants' knowledge and skills in MDT working resulted from the training, with participants reporting marked increase in understanding of roles of other professionals, patients and carers in the MDT, and in confidence contributing to discussions, managing frailty, and initiating advance care plans. Further implementation and research are needed to establish impact on patient care and health outcomes. However, initial evaluation suggests significant impact on professional knowledge, skills and confidence – likely to result in substantial improvements in joined- up care.

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Clustering Multimorbidity in Patients Hospitalised with COVID-19

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The impact of chronic disease on severity and outcomes of COVID-19 is now well established. Whilst studies have reported clusters of symptoms among COVID-19 patients, less is known about clusters of existing diagnoses. Understanding relationships between multimorbidity and COVID-19 could lead to improved risk management and care for those with multiple long-term conditions.

We used semantic clustering to establish similarity between patients in a random sample of 1,000 emergency hospital admissions in Northwest London (NWL) with a primary diagnosis of COVID-19. Data were extracted from NWL Discover, an integrated care dataset covering 2.3 million residents of NWL. This approach enabled us to empirically identify clusters of diagnoses, without specifying a list of conditions of interest a priori. Clusters were identified using agglomerative hierarchical clustering with Ward linkage.

One admission with no secondary diagnosis was excluded. 345 admissions were female and 654 were male. The median age was 66 (IQR 54 - 80). Six clusters were identified, including four in which pneumonia was the most commonly occurring secondary diagnosis after COVID-19. One such cluster included pneumonia (88% of patients), hypertension (79%), type 2 diabetes (62%), and respiratory failure (35%); another, pneumonia (81%) and kidney failure (38%). In the other two clusters, hypertension (57%) and cough (66%) were most common. In-hospital mortality spanned 3.7% to 33.0% across clusters ($p=0.0005$).

These findings are consistent with known risk factors for COVID-19 and allow for greater exploration of interaction between multimorbidity and COVID-19. Further research using larger samples will enable more granular understanding of clusters.

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Bridging research and practice to integrate care for young people experiencing a mental health crisis in the paediatric setting

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In the UK, 1 in 8 young people suffer from a clinically significant mental illness, equating to 112,000 in London. People with mental illness have three times as many emergency department attendances and five times as many emergency admissions.

A transformative patient-centred model of care for young people in mental health crisis is being implemented across three boroughs in North West London. The Best For You model uniquely integrates physical, mental health, in-patient, day and community care in a cohesive, comprehensive and innovative way using next-generation therapeutic interventions and digital tools. In person interventions are supported by curated digital resources. Covid-19 has increased digital help-seeking, and much clinical care can now be delivered remotely. The Digital Programme in Best For You has potential for integration with clinical services and community organisations that reinforce recovery and rehabilitation.

Our evaluation protocol has been co-produced with our public partners, who will continue to advise on and participate in the evaluation.

We co-produced a programme theory with the implementation team, based on a shared understanding of the programme objectives and evidence-based assumptions. Process maps of current service in acute and community settings helped shape our baseline for evaluation. Our systematic literature review suggests that the planned innovations are feasible.

We will evaluate the service improvement in Northwest London, engage new sites in collaborative learning, and carry out research with the aim of sharing lessons for implementing a programme scale up across different geography contexts.

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Evidencing models of integrated care for young people experiencing medical emergencies related to mental illness: A systematic review

Authors:

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There is an increasing prevalence of young people (YP) who suffer from a clinically significant mental illness, and one-third are not accessing psychiatric care. Mental illness increases medical emergencies three-fold and emergency admissions five-fold.

We conducted a systematic review to identify models of acute care for YP experiencing mental health crisis – to avoid lengthy and repeat hospitalisations (figure 1 shows the PRISMA flowchart).

Fourteen studies assessed innovations at various stages throughout the patient pathway to reduce emergency admissions, length of inpatient stay, or rehospitalisation. Innovations within the paediatric emergency department (PED) included multidisciplinary triage, rapid consultations, telemedicine consultations, telephone follow-up, and adjacent inpatient psychiatric care – all reducing emergency hospitalisation; yet telemedicine consultations increased time spent in PED. Innovations on the acute inpatient ward included guided meal supervision for eating disorders reducing length of stay, and risk-reduction counselling for suicide prevention reducing rehospitalisation. Post-discharge innovations were family-based therapy (FBT) for eating disorders, meditation with movement therapy for anxiety, and risk-targeted telephone follow-up – each reducing rehospitalisation. Yet, prolonging FBT over 20 sessions resulted in a rise in rehospitalisation. Therapeutic aftercare was associated with fewer readmissions.

Implications: Future studies should address methodological limitations by adjusting for illness severity and previous admissions between the pre- and post-intervention cohorts. Our team are working with a provider collaborative in northwest London to evaluate a new model of care within paediatric emergency medicine. The model comprises six innovations, including multidisciplinary triage and integrated care, interdisciplinary education, partial hospitalisation, digital innovations, and community care linkage.

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ARC South London

Managing multimorbidity in pregnancy: a focus on the physical-mental health interface in women with gestational diabetes

There is an increasing awareness of the interface between physical and mental health which contributes to the burden of multimorbidity. Specifically, there is a large body of research to support an association between depression and Type 2 diabetes but there has been less research exploring the relationship between gestational diabetes (diabetes that occurs for the first time during pregnancy) and anxiety and depression. Yet both of these are common conditions known to affect around 10% of pregnant women.

A package of research was undertaken, funded by the Medical Research Council, to explore this relationship in a large multi-ethnic population of women in Bradford (the Born in Bradford cohort) using epidemiological methods to investigate the association between primary care diagnoses of anxiety and depression and gestational diabetes. Socio-demographic inequalities were examined, including the role of ethnicity. The findings of this research and their implications for the management of multimorbidity in pregnancy will be discussed. The results of a public engagement event exploring the experiences of women with gestational diabetes will also be shared.

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Lung cancer deaths (England 2001-2017) - comorbidities: a national population-based analysis (completed project)

Population ageing has resulted in the average lung cancer patient being older and more likely to be living with one or more long-term health condition (comorbidity) at time of diagnosis. Understanding these population changes is important when planning healthcare services and allocating resources.

We used population-level data from the Office for National Statistics to determine actual and predicted patterns and trends in comorbidities for adults who died from lung cancer in England between 2001 and 2017.

There were 472,259 deaths from lung cancer during the study period (56.9% men; mean age 72.9 years, SD 10.7). Overall, 19.0% of lung cancer decedents had 1 comorbidity at time of death and 8.8% had ≥ 2 . The proportion of patients with comorbidities increased over time – between 2001 and 2017 decedents with 1 comorbidity increased 54.7% whilst those with ≥ 2 increased 294.7%. The most common comorbidities were chronic respiratory disease and cardiovascular disease, contributing to 18.5% (18.0-18.9) and 11.4% (11.0-11.7) of deaths in 2017. Dementia and chronic kidney disease had the greatest increase in prevalence, increasing 311% and 289% respectively.

Comorbid conditions are known to affect older patients disproportionately and our study suggests that if current trends continue, by 2032 more than 25% of lung cancer patients will be living with multiple comorbidities at the end of life. To deliver high-quality outcomes for these patients, oncology services need to urgently adapt and work across traditional boundaries of care. Novel areas for development include integration with dementia and chronic kidney disease services.

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What is the impact of multimorbidity on health service use and costs? A systematic review of UK literature

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This systematic review brings together UK literature exploring the relationship between multimorbidity and healthcare utilisation and costs. Understanding the healthcare use and cost consequences of multimorbidity may inform future interventions and funding implications in the UK.

A bidirectional citation search to completion (BCSC) method was followed to identify UK studies published since 2004. BCSC starts by selecting an initial set of relevant studies ('pearls'), based on expert knowledge and a systematic literature review, followed by an interactive review of references and citations of the 'pearls' to gather further appropriate literature. MEDLINE and grey literature were searched. Risk of bias in the selected studies was assessed with the National Institutes of Health National Heart, Lung, and Blood Institute quality assessment tool. Data were extracted and findings synthesised. Study heterogeneity was also assessed, with meta-analysis conducted where possible.

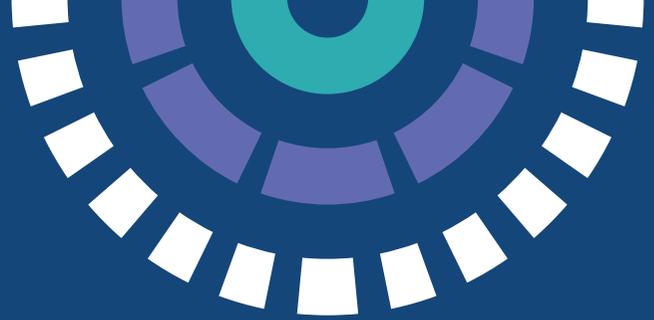
A total of seventeen studies were identified, seven predicting healthcare costs and 10 healthcare utilisation. Multimorbidity was found to be associated with increased utilisation (of primary care, dental care, emergency department and hospitalisations) and costs (hospital costs and total costs). Several studies demonstrated the high cost of depression and of hospitalisation associated with multimorbidity.

In the UK, multimorbidity results in higher healthcare utilisation and costs across care settings. Depression as a component of multimorbidity appears to disproportionately add to healthcare costs. Future research is needed to examine whether integrated care schemes offer efficiencies in healthcare provision for multimorbidity.

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Which multimorbidity clusters are associated with the highest primary care use? Fifteen years of evidence from the Lambeth DataNet

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Multimorbidity often results in more primary care consultations, but how the intensity of use varies across different combinations of Long Term Conditions (LTCs) is poorly understood. This study assesses the association between multimorbidity clusters and primary care consultations over time.

A retrospective longitudinal study design with data from the Lambeth DataNet was used. The study sample comprised 826,166 patients registered to one of 41 GP practices in Lambeth between 2005 and 2020. Primary care consultation rates were modelled using Generalised Estimating Equations to account for correlation over time. Key control variables were the total number of LTCs, five multimorbidity clusters and their interaction effects to assess if the impact of developing on more LTC on primary care consultations varies across clusters. Age, gender, ethnicity, the index of multiple deprivation, language, and polypharmacy (proxy of disease severity) were also accounted for.

Patients in the alcohol dependency, substance dependence, and HIV cluster have the highest rate of increase in primary care consultations as additional LTCs accumulate, followed by the mental health cluster (anxiety and depression). Differences by ethnic group are observed, with the largest rate of increase in the chronic liver disease and viral hepatitis cluster for individuals of Black or Asian ethnicity.

This study identified groups of multimorbid patients with the highest increases in primary care demand as additional LTCs develop. Targeting primary care interventions to individuals in these clusters may prevent further LTC acquisition and reduce pressure on an already overstretched primary care system.

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Multimorbidity and referrals to secondary care: Fifteen years of evidence from the Lambeth DataNet

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Referrals from primary to secondary care among multimorbid patients are poorly understood. This study aims to assess if referral rates are always higher among patients with multimorbidity or if they are concentrated among certain multimorbidity clusters.

A retrospective longitudinal study design with data from the Lambeth DataNet, electronic Referral System (e-RS) was used. The study sample comprised 826,166 patients registered to one of 41 GP practices in Lambeth between 2005 and 2020. The probability of being referred to secondary care was modelled using Generalised Estimating Equations to account for correlation over time. Key control variables were the total number of long-term conditions (LTC), five multimorbidity clusters, and their interaction effects to assess if the impact on referrals of developing one more LTC varies across clusters. Findings were adjusted for age, gender, ethnicity, deprivation, language and polypharmacy.

Individuals with multimorbidity were less often referred from primary to secondary care compared to those without multimorbidity (14% versus 18% in 2020). Important differences were observed among multimorbidity clusters. High referral clusters (higher odds of secondary care referral compared to individuals without multimorbidity) were the cardiovascular cluster (heart failure, PAD, Osteoporosis, Atrial fibrillation, CHD, CKD, Stroke/TIA, Dementia) with OR=1.11, 95% CI: 1.07-1.14 and the dependence clusters (alcohol dependency, substance dependence, HIV) with OR=1.08, 95% CI 1.02- 1.13.

Not all patients with multimorbidity experience higher referrals to secondary care than those without multimorbidity. This confirms the heterogeneous care needs of patients with multimorbidity although e-RS data does not capture unplanned/emergency referrals.

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Identifying longitudinal clusters of multimorbidity in an urban setting: a population-based cross-sectional study

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Globally, there is increasing research on clusters of multimorbidity, but few studies have investigated multimorbidity in urban contexts characterised by a young, multi-ethnic, deprived populations. This study identified clusters of associative multimorbidity in an urban setting.

This is a population-based retrospective cross-sectional study using electronic health records of 826,936 adults aged 18 years and over, registered between April 2005 to May 2020 in 41 general practices in one inner London borough. Multiple correspondence analysis and cluster analysis was used to identify groups of multimorbidity from 32 long-term conditions (LTCs).

The population, mean age 40 (SD15.6) years, had a prevalence of multimorbidity of 21% (n=174,881), with the median number of conditions being three and increasing with age. Analysis identified five consistent LTC clusters: 1) anxiety and depression (ratio of within- to between- sum of squares (WSS/BSS) <0.01 to <0.01); 2) heart failure, atrial fibrillation, chronic kidney disease (CKD), chronic heart disease (CHD), stroke/transient ischaemic attack (TIA), peripheral arterial disease (PAD), dementia and osteoporosis (WSS/BSS 0.09 to 0.12); 3) chronic pain, osteoarthritis, cancer, hypertension and diabetes (0.05 to 0.06); 4) chronic liver disease and viral hepatitis (WSS/BSS 0.02 to 0.03); 5) substance dependency, alcohol dependency and HIV (WSS/BSS 0.37 to 0.55).

Mental health problems, chronic pain, and at-risk behaviours leading to subsequent cardiovascular diseases are the important multimorbidity clusters identified in this young, urban population.

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Inequalities in developing multimorbidity over time: a population-based cohort study using Multistate Markov Chain Models

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We aimed to estimate the effect of social inequality on the evolution of multimorbidity, accounting for the sequence of disease development and disease recovery.

We conducted a retrospective cohort of adults (≥ 18 years) registered between April 2005 and May 2020 in general practices in one inner London borough (n=826,936). The development and resolution of 32 long term conditions (LTCs) were examined through the application of multistate Markov chain models.

Participants were followed up for a median of 4.2 years (IQR = 1.8 - 8.4); 77% entered the study with no LTCs, 14% with 1 LTC, 5% with 2 LTCs, and 4% with ≥ 3 LTCs. At the end of follow-up, 24% gained ≥ 1 LTCs, 12% had resolved LTCs and 3% died. In multistate models, deprivation (hazard ratio [HR] between 1.30 to 1.64), female sex (HR 1.13 to 1.20), and Black ethnicity (HR 1.20 to 1.30; vs White) were associated with increased risk of transition from one to two LTCs, and shorter time spent in a healthy state. Substance use was the strongest risk factor for multimorbidity with an 85% probability of gaining LTCs over the next year. Consistent disease sequences were identified including chronic pain or osteoarthritis followed by anxiety and depression; alcohol and substance dependency followed by viral hepatitis, and liver disease; and morbid obesity followed by diabetes, hypertension, and chronic pain.

Deprivation was associated with accelerated development of multimorbidity. Musculoskeletal disorders, morbid obesity and substance use represented common entry points to multimorbidity trajectories.

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Unreported bias from data linkage could lead to incorrect conclusions in multimorbidity research

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To study the co-existence of multiple long-term conditions, different data sources are often linked together. By linking datasets, one can get both a broader and more in-depth insight into the patient's medical history. A single, large dataset can overlook 25-50% of diagnoses, compared to using three different data sources. Such data linkage is however not straightforward and improper linkage can lead to substantial bias – unknown in both magnitude and direction. Several studies describe good practice when linking and analysing datasets, particularly emphasising transparency of the linkage process. However, only 15% of research papers linking routinely collected healthcare data for multi-morbidity research report how the data linkage processes were performed, and only 10% mention the corresponding quality. Records could be 'not linked' – or even falsely matched – for several reasons. A common approach is to use deterministic linkage based on NHS numbers to link the datasets. However, the NHS number could be missing, purposefully removed to indicate a mistaken entry, or wrongly recorded due to a technical issue. Population factors studied may then be associated with incomplete data linkage and could result in biased clinical outcomes – leading to false discoveries. Knowledge about how the data is collected, processed, and linked is key to assess potential bias. Well reported linkage processes and validated datasets are essential to produce high quality multimorbidity research from linked routinely collected data.

In this presentation, we will discuss these issues and propose guidance to reduce the bias from data linkage in multimorbidity research.

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Prevalence and variation of multimorbidity in South London: Working towards the evidence

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Having multiple long-term health conditions (MLTCs) is common and increasing in people, who are approaching the end of life, yet there is limited understanding of their prevalence and impact of any local variations. Our study aims to describe the prevalence and variation of MLTCs among people who died in 2018 in South London.

We extracted records from the Office for National Statistics (ONS) death registry, comprising adults (n=18,387) who died in 2018. We described the prevalence by deriving counts (0, 1, or ≥ 2+) & percentages of six conditions commonly studied in palliative care literature: chronic respiratory disease; diabetes; cardiovascular disease (CVDs); dementia, stroke, and chronic kidney disease (CKDs). Local variation was assessed by mapping the percentages of 2+ chronic conditions across Boroughs of South London.

We identified a total of 45 long-term health combinations (Figure 1). Diabetes and cardiovascular disease were the most prevalent combination, accounting for 19.7% of patients with 2+ conditions. Most people with 2+ chronic conditions died in a hospital. There were wide variations (4.35% to 48.70%) in the prevalence of people dying with two or more long-term conditions across South London (Figure 2).

Preliminary findings show variations in the prevalence of MLTCs among people who died in one year (pre-Covid-19) in South London. More research is needed to better understand the nature of socio-demographic determinants of MLTCs and the causes of variations so that services and support can be better targeted at prevention and joined-up responses to promote quality of life and of care.

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Doing research with people who have multiple long-term conditions: recommendations from a public involvement workshop

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Research with people with multiple long-term conditions is increasingly important to address the health and social care needs of a growing and ageing population. However, research methods and practices historically centred around specific diagnoses may not always be right for people with multiple long-term conditions, who can face additional barriers to participation.

In May 2021, a team spanning the palliative care, public health and social care themes of the NIHR Applied Research Collaboration (ARC) South London hosted a virtual public involvement workshop on health and social care research for people with multiple long-term conditions. The workshop provided an opportunity for people affected by multiple long-term conditions to contribute to an open discussion about how we can better conduct research with and for people affected by multiple long-term conditions.

Twenty-five people attended the event, including 16 members of the public, and 9 researchers. Recommendations resulting from the contributions and experiences of attendees included:

- Be compassionate and flexible
- Make space for discussing prior negative experiences and building trust
- Create opportunities for participants to socialise
- Understand and address diverse experiences of exclusion
- Ask people what they would like research on
- Use the arts to support communication

Each of these recommendations, accompanied by an elaboration of why this is particularly important for people living with multiple long-term conditions, and examples of how they might be achieved in practice, needs further discussion. Following further feedback from workshop participants and other members of our local ARC, these recommendations will be shared widely to support those researching in this field.

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Disease clusters of multiple long-term conditions in patients with myocardial infarction or stroke

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Patients with vascular conditions (myocardial infarction [MI: heart attack] and/or stroke) often present with other concomitant long-term conditions. Understanding onset and similarities between long-term conditions can inform changes in policy and practice of treatment pathways. This study of patients registered with 41 general practices in the London region of Lambeth between 2005–2021, examined the clustering of 32 long-term conditions.

Of 856,328 patients, 16,182 (2%) had a diagnosis of heart attack or stroke, with a median age of 41 (IQR: 33 – 52), of whom 53% (8,487) were males.

In patients with no vascular conditions, there were 8 main condition clusters, where all cardiovascular diseases were grouped with kidney disease, COPD, osteoporosis, and Parkinson's disease, whereas in patients with MI, patients' disease clusters were different with most permanent conditions grouping in one cluster including Parkinson's, HIV, mental health related conditions.

In patients with MI or stroke, there were 10 condition clusters. Patients with MI and/or stroke also presented with a cluster of kidney disease, diabetes, osteoarthritis, and stroke however MI and coronary heart disease presented in a separate cluster. With progression of age (those aged 55 and over), there was no change to the overall physical and mental conditions divide, however certain conditions did gravitate differently. Similar progression patterns were observed in patients without MI or stroke.

In this multi-ethnic population we have shown that more importance needs to be given to certain diseases and its prevention as they manifest together at middle age, aiming to better manage multiple long-term conditions.

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Chronological trajectories of common multiple long-term conditions in patients with myocardial infarction or stroke

Xiaohui Sun, Mo Yadegarfar, Alex Dregan, Charles Wolfe, Abdel Douiri

To prevent and manage multiple long-term vascular conditions, healthcare research ought to consider those in need throughout the course of life. We mapped chronological trajectories of common long term health conditions in myocardial infarction (MI) or stroke patients. Patients were registered with 41 general practices in Lambeth borough between 2005-2021. Incident cases were defined as the first-ever event recorded and were evaluated by age, sex, ethnicity, and deprivation status.

Of 856,328 registered patients, 16,182 had a diagnosis of MI or stroke, of whom 53% were males with a median age of 41 (IQR:33–52). 95% of MI patients were living with more than one long term conditions with half of them developed their second condition at the age of 24 (IQR:15–36). For stroke, multimorbidity was identified in 97% patients with a median age of 25 (IQR:16–37) for the onset of second long-term health conditions. The highest rates of multimorbid patients were found among second most deprived population for MI (45%) and stroke (47%) respectively. Hypertension was the most prevalent precursor for both MI and stroke. 41% of MI patients and 48% of stroke patients were found with preexisting hypertension diagnoses. The most common long-term conditions after MI or stroke incidences were hypertension and chronic kidney disease with 19% and 16% respectively for MI patients, 13% and 12% for stroke patients.

We provide insight into common chronological patterns and clusters of multiple long-term vascular conditions that could inform early priorities and plan for high risk groups to reduce the burden of vascular multimorbidity.

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CovPall Study: A multicentre national cohort study of symptom control, severity, survival, and associated factors during the COVID-19 pandemic

Presenters:

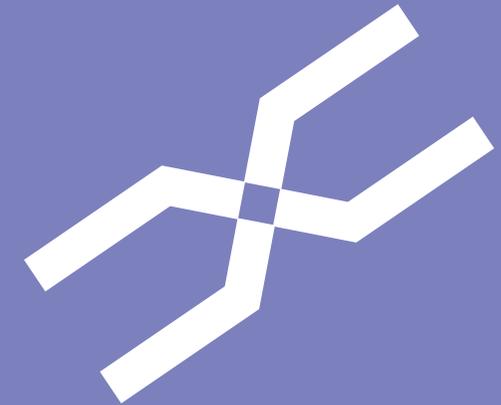
Dr Mevhibe B Hocaoglu and Professor Irene J Higginson with other members of the CovPall Team, on behalf of the CovPall team

Role of palliative care have been narrowly recognised despite its relevance to COVID-19, where patients may experience rapid deterioration, potential death or suffering irrespective of prognosis. The initial workstream of the CovPall Study, an international observational study that mapped palliative care role and response in the pandemic published elsewhere (Oluyase et al., 2021, Bradshaw et al., 2021), showed that more than 80% of the 458 palliative care services actively supported patients symptomatic and dying of COVID-19 (Oluyase et al., 2021), however recognition of palliative and end of life care services are essential in pandemics is overdue. The second workstream of the CovPall study is a multi-centre cohort study (CovPall) of 572 COVID-19 patients seen and treated by 29 palliative care services across England and Wales was conducted to (1) describe the demographic and clinical characteristics of a cohort of patients severely ill and dying from COVID-19 including the treatments, symptom trajectories and outcomes, (2) provide insights into the presentation of symptoms such as pain, breathlessness, anxiety, agitation, weakness, and drowsiness and how these symptoms were managed and (3) describe differential outcomes in patients whose care was initiated shortly after diagnosis of COVID-19, with patients who were referred late i.e., closer to their time of death and (4) modelling to identify symptoms and factors such as living with multiple long-term conditions that may be associated with worse outcomes. CovPall study has contributed to recognition of palliative care in pandemic response.

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ARC North Thames/York & Humber

Primrose-A/UCLP Frameworks. A MLTC Cross-ARC project in York/Humber and North Thames

People with severe mental illness experience some of the most profound health inequalities and this is a NHS Long term plan priority. Multi-morbidity drives this inequality; with the coexistence of multiple long-term conditions (such as diabetes and heart disease), which are potentially modifiable. This project builds on ten years of NIHR research and a strong collaboration between YH-ARC and ARC-North Thames.

In our research to date (known as the PRIMROSE programme) we have shown that by optimizing the management of cardiovascular disease (CVD) and CVD risk factors we can reduce healthcare costs and admissions. We will build on this evidence and model of care by incorporating the latest evidence-based frameworks for CVD risk factors. PRIMROSE-A (Adapted) is an improved version of the intervention, modified to include more social support via peer coaches, and increased focus on medication adherence (e.g. statins). It is currently being delivered in Camden, Inner London (2019- 21). We plan to extend implementation in the North Thames region and Yorkshire/Humber region.

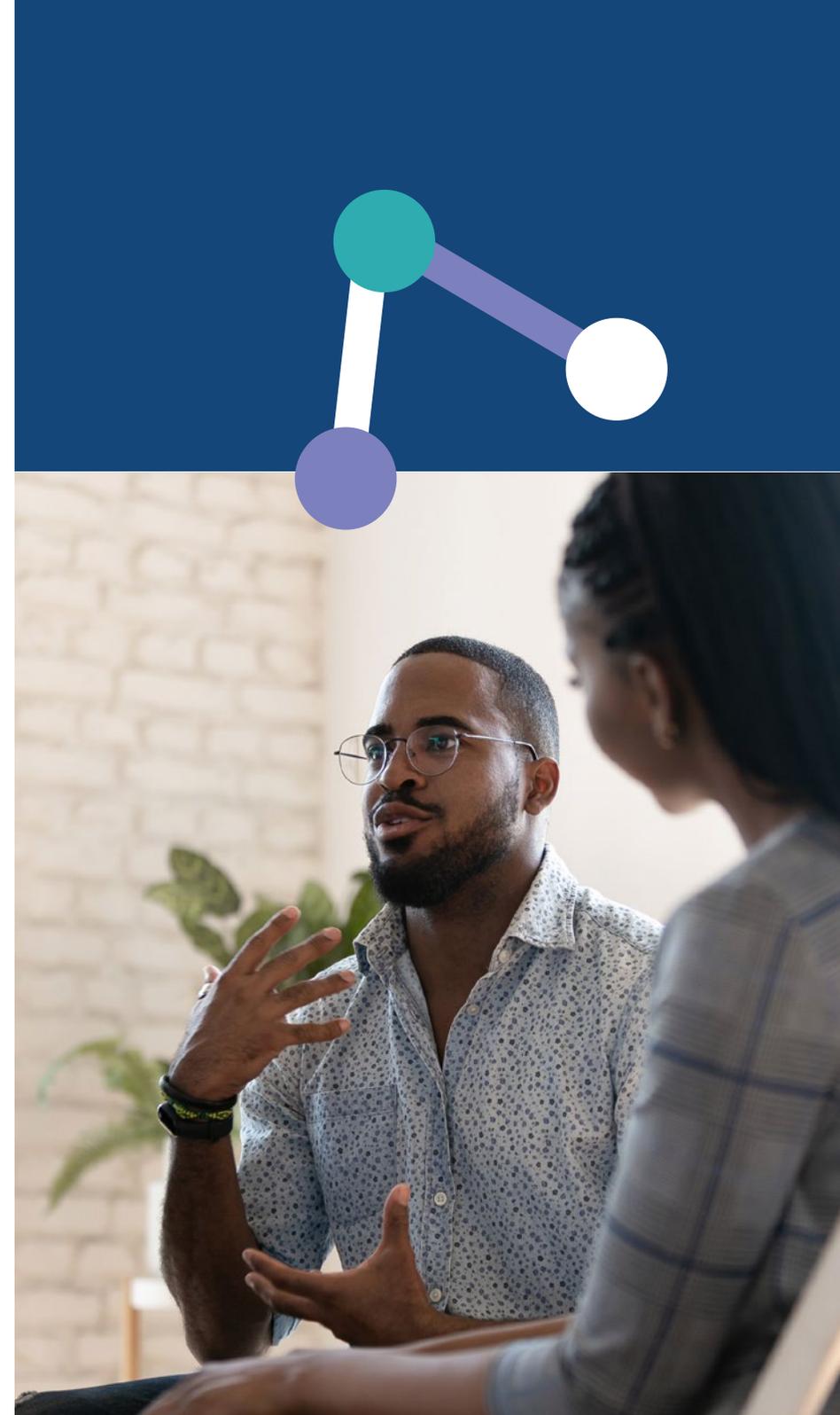
UCLP has evidence based Long Term Condition frameworks which have traction nationally. These frameworks will now update and augment PRIMROSE-A with implementation in the two regions. Both regions have major health inequalities and ethnically diverse populations.

We will use best implementation practice in the new settings so that the PRIMROSE-A programme has the best chance of benefitting people. People with lived experience of SMI have been at the centre of our work (with national recognition)

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ARC South West Peninsula

The SHERPA model of clinical reasoning for Multimorbidity

There is an increasing consensus that care for patients with multimorbidity should be informed by individuals' personal goals, their social context and the burden of care. How clinicians and patients should work together and agree priorities is much less clear. Patients and clinicians both recognise this gap.

The SHERPA model (Sharing Evidence Routine for a Patient-centred plan for Action) provides a framework for clinician and patients with complex needs to make decisions and plan care. It is a collaboration between the ARC/CLAHRC's making sense of evidence courses and complex intervention development/evaluation programmes. Publication of the SHERPA model in the Lancet (Jack et al 2018) likely represents a recognition that it's novelty lies in bringing together Sackett's clinical epidemiology with a whole person/system formulation approaches from clinical psychology and experienced physicians.

The model's 3 steps (share, link, plan) involve: Sharing different perspectives of biological, psychological and social problems; Linking these specific problems causally for that individual; Planning - though shared decision making - how to disrupt negative causal processes based both on clinical evidence and on patient/clinician judgements when clear clinical evidence is lacking.

In the absence of consultation models which provide a logical approach to bio-psycho-social care centred around the person rather than single diseases SHERPA has been picked up both by those developing international guidelines and by leaders of local training for nurses, GP trainees and now primary care training hubs. We seek further collaborations at the interface between service redesign, training and research. The presentation will provide this rationale, a worked example and challenges for clinicians taking up the training.

Jack E, Maskrey N, Byng R. SHERPA: a new model for clinical decision making in patients with multimorbidity. The Lancet. 2018; 392(10156):1397-9.

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ARC East Midlands

Cardio-metabolic multi-morbidities screening in places of work and worship using trained lay community health advocates: A cross sectional study

10% of the NHS budget (£10 billion pounds) is spent dealing with the management of diabetes and its resulting complications. There has been increased funding spent within the NHS for activities aimed at preventing the onset of T2DM by encouraging physical activity and a healthy balanced diet. Despite this extra investment some communities at high risk of developing long term health conditions, including those from particular do not access these programmes.

We have carried out extensive feasibility work across the midlands, which shows the added benefit of screening for long-term conditions including diabetes and cardiovascular disease in community settings including faith centres.

Through Cities Changing Diabetes we have established networks with local employers and faith communicates. We have scheduled two sets of three focus groups these focus groups will be used to shape the delivery and content of the training for CHAs. Our approach directly involves lay representatives from faith centres and workplaces delivering the screening intervention to members of their organisation.

We will deliver a training programme to 25 volunteers from local businesses and faith centres to equip them with an understanding of type 2 diabetes, including prevention strategies. Provide these volunteers with resources to allow them to conduct screening for Type 2 diabetes in their local communities.

We aim to engage with national faith networks and are already working with national business which will provide us with a possible route to wider scale/national implementation. As the national ARC lead for Health Inequalities and Ethnicity we will encourage involvement in the study from other successful ARCs across the UK.

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Electronic decision-support system accompanied by clinician training to prevent the de-intensification of potentially inappropriate medications (D-Med Study)

In the management of older people with type 2 diabetes, patients are sometimes prescribed inappropriate diabetes medications. Over-prescribing of medication can lead to blood sugar dropping to dangerous levels which increases the likelihood of falls, emergency hospital admissions and death. Guidelines are available but there is often therapeutic inertia which means the healthcare providers fail to de-intensify the medications prescribed.

In older people with diabetes, therapeutic inertia leads to potentially inappropriate medications not been stopped or changed. A lack of clear guidelines and training means that GPs and practice nurses are not confident in stopping, reducing or switching diabetes medications, and there is no clear process in place to support them. Therefore, we aim to develop and test an intervention which will deal with this problem.

We are working with GPs and practice nurses to design and deliver the intervention and a software company (PRIMIS) to produce a digital solution to improve the process of stopping diabetes treatments promptly and effectively.

We will recruit 40 GP practices from locations across England. Practices will be randomly allocated to one of two groups: usual care group or an enhanced care intervention group. We will compare the two groups, at the start of the study and at 12 months, to find out if the intervention makes a difference to the number of potentially inappropriate diabetes medications being prescribed in older patients.

This research will potentially reduce therapeutic inertia and improve the management of older people with type 2 diabetes. This will result in a reduction in hypoglycaemic events, falls and unnecessary hospital admissions.

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Complex intervention comprising text MESSaging and HEalthcare professional training for imPROving statin adherence in primary care: a pragmatic cluster-randomised controlled trial (MED- HELP)

Patients who either have or are at risk for cardiovascular disease are often prescribed statins. However, many patients struggle to take their statins regularly as prescribed and many patients may not be receiving the optimal statin dose as recommended by guidelines.

Medication non-adherence is a highly prevalent issue, particularly with statins. It can be problematic for people with multiple long-term conditions, as they often have to manage several medications at once, increasing the risk of non-adherence. The aim of the study is to improve statin adherence by providing patients with ongoing text message reminders and by delivering training to healthcare staff about intensification of statin prescribing.

We are working with local GPs and practice nurses to design the delivery of the intervention and a software company (PRIMIS) to extract and analyse routine data from GP Practices to evaluate the effect of the intervention.

We will recruit 40 GP practices from locations across England. Practices will be randomly allocated to either a usual care group or an enhanced care intervention group. The intervention group will have training to help them optimise statin prescriptions for their at-risk patients, and discuss non-adherence with patients. Regular reminder text messages to patients displaying signs of statin non-adherence, to support them to take their statins more regularly. This research will potentially improve statin adherence and optimise statin prescription habits in participating practices. This will result in a reduction in cholesterol in at-risk patients, and as such reduce the risk for future cardiovascular events.

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To understand ARC researchers' practices regarding the equality of participant involvement in the planning, delivery, and implementation stages of ARC EM research

Some people are more likely to suffer from poor health than others. As health services are informed by research, it is important that research studies represent all in society to ensure all receive the best healthcare. There is a lack of fairness in access to health services and health research. For example, a 2017 study found BME adults were less likely to have taken part in important medical research than any other group.

A challenge in Patient and Public Involvement and Engagement (PPIE), and research participant recruitment, is to include people with a wide range of experiences, including those who repeatedly find themselves at the margins of society, we will use an arts-based approach to develop a visual representation of a range of diversity characteristics (e.g. ethnicity, sexuality etc.). We will also create interview and survey questions to utilise with Principal Investigators, Project Managers and Research Associates of ARC EM studies from 2020 to 2023.

All participants will complete an online survey at the start and end of the projects. The interview and survey focus on how the studies recruit and engage participants across the range of diversity characteristics, and how they implement findings. We will also access data from each projects' equality monitoring procedures.

Increased understanding on representation and how studies work with individuals from seldom heard groups. Findings will be presented back to the public and workshops used to generate recommendations. This information will be used to change research practice to make it more representative. It could also identify strategies that may help overcome the often unidentified challenges of engaging seldom heard groups. Being "seldom heard" means that existing practices in organisations including universities and health and social care providers may not match the needs of all members of the public.

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