

Name

Professor Kate O'Donnell

Job title

Professor of Primary Care R&D and Chair of SAPC

Organisation/Institution

Society for Academic Primary Care (SAPC)

Email address

Kate.O'Donnell@glasgow.ac.uk

Telephone number

0141 330 8329

Is this input submitted as an organisational or individual response?

Organisational

Are you happy for your response to be published by the Academy?

Yes

1. There is no standard definition of 'multimorbidity' – various different definitions are used. Which definitions (or aspects of definitions) do you think are most helpful to efforts to describe and understand multimorbidity?

The Society for Academic Primary Care (SAPC) is the foremost society for primary care research internationally, with a membership contributing to internationally excellent research, teaching and scholarship in primary care. In this response, we draw on the internationally excellent research conducted by many of our members. (See <https://sapc.ac.uk/>).

SAPC members have been instrumental in developing a definition of multimorbidity. For example, the seminal Lancet paper defined multimorbidity as "the presence of two or more disorders", including the co-existence of physical and mental health conditions¹. This definition is also used in the recent NICE guidelines². This numerical conceptualisation has also been used by Afshar et al in their epidemiological study of multimorbidity across low and middle-income countries³.

This definition is helpful, especially as it captures the co-existence of both physical and mental health disorders. However, with an increasingly aging population and the higher prevalence of multimorbidity in areas of deprivation, it does not capture the full complexity of multimorbidity. This raises two important issues to consider – both having implications for research and for professional practice.

First is the concept of concordant and discordant multimorbidity⁴. Concordant multimorbidity (i.e. the presence of two or more similar conditions such as type 2 diabetes and hypertension) can be addressed by treatment plans which are similar across the diseases. Discordant multimorbidity is where an individual has two or more conditions with very different symptoms, pathology and treatment. Research into the patterning of multimorbidity suggests that discordant combinations of physical and mental health conditions are common, especially when symptoms such as chronic pain are included⁵⁻⁷. Discordant multimorbidity will result in very different treatment plans, increase polypharmacy and so increase a person's treatment burden^{8,9}. Treatment burden is also related to a patient's capacity to cope, and individuals will not all respond in the same way to the burden of living and dealing with multiple conditions; capacity depends on both individual factors and wider, social factors including support networks, personal and social circumstance⁹⁻¹¹.

Second is the need to shift care from disease-focused orientation to a holistic patient goal-focused orientation¹². This has implications for the design and delivery of services, with more attention paid to patients' needs and wishes^{13,14}. Whilst patient centred care and shared decisions making are widely recognised as the gold standard, evidence suggests this approach is not universally adopted

by practitioners. As the prevalence of multimorbidity increases, it is urgent that this deficit is addressed. This has implications for our definition of multimorbidity, which needs to be refined to acknowledge and make explicit the need to consider what patients want and what they consider important when living with multimorbidity.

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2. What are the key data, and what data sources exist, on the prevalence, burden (including costs and impact on health systems) and determinants of multimorbidity? Are there significant gaps in such data and, if so, what are they?

Epidemiological work describing the prevalence and patterning of multimorbidity has drawn extensively on data collected in general practice/family medicine settings, both in the UK and internationally and often draws on electronic medical records or recording of medication. Work using data collected from 1.75 million patients attending 314 general practices in Scotland found that not only did multimorbidity increase with age, it also occurred up to 15 years earlier in people living in areas of socioeconomic deprivation compared to those living in affluent areas¹. Physical multimorbidity was also associated in an increase in unplanned hospital admissions².

Similar findings have been reported internationally. Fortin et al using Canadian prevalence studies demonstrated that patients attending primary care had a higher prevalence of multimorbidity than the general population³. A family practice-based research network in the US had similar results⁴, as did a team examining multimorbidity in elderly Australians⁵ and also work conducted in Catalonia⁶. The key factor in much of this work is that it has been conducted in primary care/family medicine, demonstrating the key role that this health care setting plays in (1) collecting routine data on the care of patients with multimorbidity; and (2) providing a setting where interventions can be developed and tested.

There is also increasing work on the impact of multimorbidity on patients, carers/families and on health professionals and systems. Much of this is focussed on the concept of treatment burden, i.e. the burden faced by patients and carers understanding and negotiating the complex demands that come with multimorbidity including polypharmacy, multiple hospital appointments and living with the difficulty and demands of multiple conditions⁷⁻¹³. Recent work has also suggested a role for adverse childhood experiences (ACE), with those experiencing ACEs more likely to present with multimorbidity in later life¹⁴.

Gaps include the need to fully understand the impact of concordant and discordant multimorbidity; the impact of the co-existence of physical ill-health with mental ill health and also with conditions of impairment such a dementia; living with chronic conditions and other conditions such as chronic pain or obesity; the financial impacts on both individuals and on health care systems.

Lastly, as multimorbidity is better described in low and middle-income countries there is an urgent need to begin to map how health care systems, where primary care as a system is often weak, can best respond to the challenges of caring for such populations.

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3. What are the key data, and what data sources exist, on the prevention of multimorbidity? Are there significant gaps in such data and, if so, what are they?

The prevention of multimorbidity is largely unaddressed. In some instances, the underlying risk factors will be inter-related, with the "big four" of smoking, obesity, physical inactivity and alcohol consumption playing a major role in the development of particular constellations of disease such as diabetes and cardiovascular disease. However, with a strong relationship between socioeconomic deprivation and the early onset of multiple morbidity¹, the social determinants of health – including poverty and health literacy – and life course influence are clearly also important.

This means that prevention needs to target not only individual-level factors but also wider public health interventions, as recently acknowledged by the National Prevention Research Initiative². Interventions to prevent multimorbidity need to recognise that patients have to address individual health-related risk factors within their wider social networks and neighbourhoods and that prioritising which risk factors they want to address is not always straightforward. Maintenance of behaviour change is also difficult; and so population-level, public health interventions may be a better approach to dealing with this potential "prevention burden".

Recent work describing an association between adverse childhood experiences and an increased risk of presenting with multimorbidity in later life also raises the possibility of preventive work targeting the life course and a potential role for earlier family or community-based interventions in the prevention or mitigation of multimorbidity³.

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4. What are the key data, and what data sources exist, on the management of multimorbidity? Are there significant gaps in such data; if so, what are they?

Research into the management of multimorbidity is in its infancy; again, much of the landmark work is being conducted by members of SAPC. As outlined in question 3, multimorbidity results in substantial treatment burden for patients and their carers/families, as well as for health care professionals and health systems. Patients report: poor care coordination; drug interactions; adverse drug events (ADEs); high treatment burden; poor access to mental health services; repeat diagnostic tests; conflicting appointments¹⁻⁴.

Staff report: difficulties using clinical guidelines for single diseases; insufficient time to manage care in routine appointments; and difficulties in coordinating care across multiple professionals/agencies^{3,5-9}. Issues related to poor adherence are particularly important in patients with multimorbidity and polypharmacy¹. Polypharmacy, the prescribing of 5 or more medications, increases the risk of adverse drug events and increases the complexity, regimen burden and the possibility of non-adherence. Poor health literacy (the motivation and ability to access, understand and use information in ways which promote and maintain good health) may contribute to non-adherence to medication and self-management strategies¹⁰. Poor adherence to prescribed medication has significant consequences, with an estimated 5-8% of UK hospital admissions are related to ineffective or inappropriate medication use.

Health systems are often focussed on single diseases; the same is also true of quality improvement initiatives¹¹. This means that management approaches and organisation of care often ignores the needs of multimorbid patients. This has led to a call for minimally-disruptive medicine, which takes account of patients multiple and, often, overlapping, needs and seeks to actively manage this to reduce the burden on patients¹².

In 2012, Smith et al conducted a systemic review of interventions designed to improve outcomes for patients with multimorbidity¹³. They found limited evidence and, where evidence did exist, the effects were mixed. The CARE Plus Study is one of few randomised controlled trials in this area; conducted in 8 deprived general practices in Glasgow, the intervention included longer structured consultations in general practice, practitioner and support and self-management support for patients¹⁴. This study found that the CARE Plus intervention significantly improved one domain of well-being (negative well-being), but not other aspects of well-being and that this approach was likely to be cost-effective. Thus, more work is needed in this area.

One area where there is a clear recognition of the burden that multimorbidity presents is polypharmacy¹⁵⁻¹⁷, which raises difficulties both for patients and their carers and for health care professionals. Regular medication reviews are essential for multimorbid patients, to confirm the continued need for different therapies, to reflect on potential drug interactions and to reduce, where possible, over prescribing. This highlights an increasing role for pharmacists as part of the primary care team caring for multimorbid patients¹³.

Work is also required to investigate and understand how best to manage multimorbidity in other patient groups, including minority ethnic groups, migrants and adults with low health literacy or learning disabilities. Finally, as outlined above, the need to move management from a disease-focused approach to one centred on patient goals requires a shift in the location of care management to one which takes a holistic and generalist view of patients and their wider lives. Family medicine, with its patient-centred, generalist approach, is the ideal setting but requires funding and support to manage the growing burden of multimorbidity in today's society – this is particularly true in low and middle-income countries where care is more likely to be hospital-centred rather than in the community¹⁸. The importance of a generalist approach to dealing with multiple conditions and the ensuing fragmentation of care that can result has been well articulated by others, including Kurt Stange in the US and Joanne Reeve in the UK¹⁹⁻²¹.

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5. What are the key sources of funding for research into multimorbidity? Are there gaps in funding and, if so, where?

There are serious deficiencies in funding opportunities, with many funders still interested only in single conditions; this is especially true of charities, which often have a single disease interest. However, even funders such as the MRC and Wellcome Trust have, in the past, preferred funding applications to focus on a single condition. NIHR and the CSO in Scotland have been notable exceptions to this.

6. What should the definition of 'multimorbidity' be? How would this definition improve research and/or treatment?

Our preference would be to adopt a single definition; that used by Barnett et al and recently adopted by NICE would seem to be the logical definition to use^{1,2}. An agreed definition will lead to more consistent and comparable research being conducted across settings and countries, regardless of income level or health system.

An agreed definition will also help researchers to take a more nuanced approach to describing clearly what they mean when they report on multimorbidity. For example, discordant multimorbidity may have a greater ‘‘multimorbidity impact’’ on patients than concordant multimorbidity. An agreed definition will enable researchers to move on and more clearly describe that components they are then addressing and to move the agenda on to consider important issues such as the development of holistic patient-centred approaches.

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2. National Institute for Health and Care Excellence. Multimorbidity: clinical assessment and management: NICE, 2016.

7. What are the priorities for research about the prevalence, burden and determinants of multimorbidity?

A clear and consistent definition will allow researchers to begin meaningful comparative work across countries with respect to prevalence and defining characteristics. More research is needed to understand how life course and structural inequalities contribute to the development of multimorbidity.

8. What are the priorities for research about the prevention of multimorbidity?

Prevention needs to address issues at the level of patients, communities and wider society. The implications of growing social inequalities on the development and escalation of multimorbidity needs to be addressed. Policy implications, for example how changes in legislation around smoking or minimal alcohol pricing, could have a later impact on the prevalence of some patterns of multimorbidity. Economic modelling of the long-term implications of such policies should address multimorbidity. Exploring the impact of family based interventions to reduce adverse childhood events on later longer-term multimorbidity is another area to consider.

9. What are the priorities for research about the management (as defined above) of patients with multimorbidity?

Much of the management of multimorbidity takes place in primary care and family practice. This needs to be recognised and be a prominent part of future funding calls for research in primary care.

Holistic approaches are often proposed as a priority by patients with multiple conditions. There is a need for greater collaborative approaches for research in the prevention and management of multimorbidity in primary care which brings together and involves patients, clinicians and researchers. A collaborative approach is needed which equally values the lived experiences of people living with multiple conditions and the experiences of people who care or support them either formally or informally. A co-production approach to research with people with multiple conditions has the potential to democratise research, develop health systems, and develop research to inform issues which are a priority for those living with multimorbidity. Participatory approaches to research may be considered particularly relevant for translational research with a key focus on creating change and optimising community participation. It is important for the Academy to consider how to meaningfully incorporate patient and public involvement and participatory approaches with stakeholder (which may include clinicians, voluntary or community or other organisations, health service organisations) to optimise the implementation or impact of the research for people living with multiple conditions or supporting them clinically. Adopting this approach might help inform best practices and recommendations and advice given to patients and clinicians that responds to their needs.



10. What should be the strategic response of both national and international research funders and agencies be to multimorbidity?

Multimorbidity needs to be clearly acknowledged as a funding priority across the spectrum of research. Shared, genetically mediated aetiological pathways may contribute to the co-morbidity of common chronic conditions. This indicates a role for research using genetic epidemiology approaches. Basic research may help understand how different conditions co-develop. Treatment options can be tested in clinical trials; research in health care management, health systems and health policy is crucial in order to understand how best to manage multimorbidity in order to support patients, carers and health care professionals. This will require patient and public involvement, as well as practitioners, to conduct high quality research in real world settings. We believe that the membership of SAPC, with their focus on primary care research, teaching and professional practice, are well equipped to rise to this challenge.