

* *Mandatory fields*

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Definitions

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?

In light of the lack of standard definition of multimorbidity, different studies have used different definitions. In our work on multimorbidity to date, we have used two approaches. The first approach, when multimorbidity is considered as the main study outcome or exposure, is to use the number of conditions the number of chronic conditions to define multimorbidity. However, even using the number of conditions to define multimorbidity, there are certain variations adopted with either considering just data on conditions captured by the datasets,^{1,2} or using a more comprehensive approach including more conditions based on previous epidemiological work,³ systematic review⁴ and the QOF conditions.⁵ The second approach, when multimorbidity is considered as a confounder, is to use Charlson comorbidity index which provides a weighted score for the presence of different multimorbidity. Simple disease count is the most commonly used method to measure multimorbidity to date⁶⁻¹⁰ and work well in defining the epidemiology and burden of multimorbidity in the population. Whereas, morbidity indices may work better when predicting the adverse outcomes. There is also some debate around the inclusion of some conditions like pain, myocardial infarction and cataract etc. as these are manifestations of other conditions or are acute events which may resolve however, there is no clarity on their use in defining multimorbidity. However, multimorbidity may have a different meaning to an individual and is defined very differently in different research resulting in difficulties in comparison of the literature to date.

Current knowledge base

When answering these questions, please consider both national and international populations of high, middle, and low income countries. Please provide examples and case studies to illustrate your arguments where appropriate. Please provide references for any published research.

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?

There have been a number of studies on multimorbidity in the last five years assessing the prevalence, health care costs and impact on health systems. The key study from the UK including 1,751,841 participants found the prevalence of multimorbidity to be 23.2%.³ Similar work has also been carried out in Canada,⁶ Germany,¹¹ and other European countries.¹² Studies have also explored the long-term trends in multimorbidity,^{2,13} patterns of multimorbidity both nationally^{8,14-20} and globally²¹ as well as potential lifestyle factors that may affect the development of multimorbidity.^{2,7,13,22-25} However, more work is required in assessing the role of sociodemographic, environmental, physical and health care factors in multimorbidity and its outcomes. Also, there is a lack of evidence on the epidemiology of multimorbidity from developing countries and very few studies to date have addressed this issue in lower and middle income countries.²⁶⁻²⁹

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?

In my opinion, there isn't a strong evidence-base on the prevention of multimorbidity. As, discussed above some studies have assessed the role of lifestyle factors in prevention of multimorbidity, but other factors like ethnicity, green space, psychosocial elements haven't been studied in much detail. Some studies are now presenting trajectories of multimorbidity^{30,31} which may be helpful in pointing out the ideal time for prevention interventions. Nevertheless, there is a heap of evidence on secondary prevention of cardiometabolic conditions which could all be combined to explore the best ways to prevent multimorbidity.

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?

The term 'management' here could refer to clinical interventions designed to specifically treat patients with multimorbidity as well as strategies for the delivery of healthcare services patients with multimorbidity. The term also refers to a wide range of management approaches that may differ by the specific diseases that co-exist.

The first key resource for the management of multimorbidity in the UK is the newly published NICE guidance on the clinical assessment and management of multimorbidity.³² To my knowledge, no other national guidelines exist for multimorbidity across the world. There is not much known in terms of what works best in the management of multimorbidity. A few interventions have been developed and piloted to manage multimorbidity. A systematic review on management of patients with multimorbidity summarises the existing interventions and evidence of their effectiveness.³³ The OPTIMAL study was an occupational therapy led six weeks community-based programme which has shown to increase physical activity, self-efficacy and quality of life for patients with multimorbidity.³⁴ Other interventions are currently being tested including extended consultation length (the Care-Plus Study, Scotland), comprehensive assessments and care plans (the 3D Study),³⁵ improvement in physical activity (MAP study, Leicester) and multi-faceted interventions including care plans, consultations with nurse care workers and geriatricians (Patient Integrated Care project, Leicester). The Joint Action on Chronic Disease (JA-CHRODIS) has a multimorbidity work package and are currently working towards creating a multimorbidity care model which could potentially be implemented in European Health Care Settings.

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

The NIHR launched a themed call on multimorbidities in older people last year in which several NIHR programmes participated. Researchers could potentially make use of the ODA funding to study the issue of multimorbidity in developing countries. The EU has funded JA-CHRODIS and would potentially be a funding source for multimorbidity projects. The NIH has also provided funding for projects looking at multimorbidity and alzheimers disease. What could improve is availability of small pots of fund to conduct preliminary baseline work before applications for bigger programmes of work can be made.

Looking forward

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

There needs to be a standard approach to defining multimorbidity. Simple disease count may still be useful for a snapshot of the problem but it can result in misclassification. For example an average 30 year old man with migraine and asthma with a healthy lifestyle and good quality of life is considered the same as someone with diabetes and heart failure, which may not be a true comparison. Therefore, the definition of multimorbidity should encompass a weighted-index taking into account severity of different conditions, and a standard set of core chronic conditions, with a potential to add other conditions. This will help make the study findings somewhat comparable.

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

The prevalence, burden and determinants of multimorbidity need to be explored in lower and middle income countries, for which there isn't a large body of work at the moment.

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

There should be more research into how a person's surroundings and environment may affect the development of multimorbidity and whether modifying any of these factors can delay the onset of multimorbidity or prevent it. There also needs to be more work on collating and comparing evidence on the secondary prevention of chronic conditions which may also help in prevention of multimorbidity. A multi-disciplinary integrated approach including health and social care as well as public health and policies need to gather to discuss potential strategies which could be tested to prevent multimorbidity.

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

Currently, a number of different interventions are being tested for multimorbidity, however each intervention focuses on a different outcome as there isn't a standard outcome for multimorbidity trials. Development of a core outcome set for multimorbidity studies is ongoing and will provide a standard way to compare different multimorbidity management interventions. There also needs to be more work on how different interventions and patient environments affect mortality in people with multimorbidity, along with their impact on the quality of life.

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

An initiative such as JA-CHRODIS needs to be launched at a global level including not only European or developed countries but also working towards improving outcomes and prevention

and effective management of multimorbidity in other regions especially the lower and middle income countries.

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