

* *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?

Please provide references for any published research, and highlight any other initiatives related to multimorbidity that the Academy may be interested in.

There are several aspects related with multimorbidity definition but, in our opinion, the starting point for a helpful definition to understand multimorbidity should be a simple general definition of multimorbidity that would fit any study addressing one or several aspects of multimorbidity, avoiding any confusion with comorbidity. As a result of a bibliometric analysis (1), we found several definitions of multimorbidity. However, the most used general definition of multimorbidity in the medical literature was “more than one or multiple chronic or long-term diseases/conditions”. This simple definition carries important aspects. First, only chronic diseases/conditions are considered. Second, any co-occurrence of two or more disease/conditions falls within the definition. Third, the absence of an index disease is implicit. A general definition of multimorbidity should be distinguished from what we call “operational definition” of multimorbidity. The simplest operational definition of multimorbidity has two components: the list of diagnoses considered, and the cut-off for the number of diagnoses used to determine the presence of multimorbidity.

- 1) Almirall J, Fortin M. The coexistence of terms to describe the presence of multiple concurrent diseases. *Journal of Comorbidity*. 2013;3(1):4-9.

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?

Regarding the prevalence and costs of multimorbidity, there is a collection of references that can be consulted in the web page

https://www.usherbrooke.ca/crmcspl/fileadmin/sites/crmcspl/documents/Publications_on_multi_morbidity_01.pdf under the items "3.1 Prevalence" and "4 Economic studies", respectively.

We consider that the main gap in prevalence studies is the diversity of methodologies used by different authors, which translates in a diversity of findings that are difficult to compare (1).

- 1) Fortin M, Stewart M, Poitras ME, Almirall J, Maddocks H. A systematic review of prevalence studies on multimorbidity: toward a more uniform methodology. *Ann Fam Med*. 2012;10(2):142-151.

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?

Modifiable lifestyle factors have been found to predict incident multimorbidity (1), and the presence of unhealthy lifestyle factors has been associated with the likelihood of multimorbidity (2). Furthermore, accumulating unhealthy lifestyle factors progressively increased the likelihood of multimorbidity (2). Therefore, the promotion of healthy lifestyles and to maximize the number of healthy lifestyles in each individual has been hypothesised to be a preventive intervention in the fight against multimorbidity (2).

More data are necessary to support these findings.

- 1) Wikstrom K, Lindstrom J, Harald K, Peltonen M, Laatikainen T. Clinical and lifestyle-related risk factors for incident multimorbidity: 10-year follow-up of Finnish population-based cohorts 1982-2012. *Eur J Intern Med*. 2015;26(3):211-216.
- 2) Fortin M, Haggerty J, Almirall J, Bouhali T, Sasseville M, Lemieux M. Lifestyle factors and multimorbidity: a cross sectional study. *BMC Public Health*. 2014;14(1):686.

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.

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

Looking forward

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

In the response to question 1, we mentioned a simple general definition of multimorbidity. In research, the definition of multimorbidity should be an element for agglutinating and identifying studies addressing this problem which should help researchers to correctly classify their work. We know about studies on multimorbidity using the word comorbidity that are lost among the vast group of articles addressing the latter concept. Conversely, as multimorbidity becomes increasingly a subject of interest, some authors confuse their work on comorbidities as a multimorbidity study.

In practice, the definition should be an element useful for helping organizing the care that is provided to this population with multiple chronic conditions.

Regarding the operational definition of multimorbidity, we have proposed the use of a list of at least 12 diagnoses (1). For the cut-off for the number of diagnoses, the most frequently used are two or more and three or more diagnoses. Some researchers have reported both in their work. We think that the use of three or more diagnoses likely better identifies patients with higher needs and is more discriminating than two or more diagnoses (1).

1) Fortin M, Stewart M, Poitras ME, Almirall J, Maddocks H. A systematic review of prevalence studies on multimorbidity: toward a more uniform methodology. *Ann Fam Med*. 2012;10(2):142-151.

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

A priority for research about prevalence and burden of multimorbidity is to reach the most possible uniformity in methodology to allow comparisons of findings between different studies.

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

More studies are needed on the association of modifiable lifestyle factors and multimorbidity. Promotion of healthy lifestyles may become an intervention in the prevention of multimorbidity.

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

We definitely need more intervention on multimorbidity. Please see The most recent Cochrane Systematic review on interventions in multimorbidity by Smith S et al. You can also visit <http://www.paceinmm.recherche.usherbrooke.ca>

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

I think scaling up effective intervention and reevaluation in different context could be the motivation for a joint strategy internationally.