**Article Type**

Review

**Title**

Quality of care assessment for people with multimorbidity.

**Running headline**

Assessing quality of care in multimorbidity

**Authors**

Valderas JM[1,2,3,4], Gangannagaripalli J[1], Nolte E[5], Boyd C[6,7], Roland M[8], Sarria-Santamera A[9,10,11,12], Jones E[1], Rijken M[13].

**Affiliations**

[1] Health Services & Policy Research, Exeter Collaboration for Academic Primary Care (APEx), University of Exeter, Exeter, UK.

[2] Institut Universitari d'Investigació en Atenció Primària (IDIAP Jordi Gol), Barcelona, Spain

[3] Threads & Yarns International Multimorbidity Research Network

[4] National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) South West, University of Exeter.

[5] London School of Hygiene & Tropical Medicine, London, UK.

[6] The Johns Hopkins School of Medicine, Baltimore, MD, USA.

[7] The Johns Hopkins Center on Aging and Health, Baltimore, MD, USA.

[8] Department of Public Health and Primary Care, University of Cambridge, Cambridge, UK

[9] Escuela Nacional de Sanidad, Instituto de Salud Carlos III, Madrid, Spain.

[10] Universidad de Alcalá, Alcalá de Henares, Madrid, Spain.

[11] Instituto Mixto de Investigación IMIENS, Escuela Nacional de Salud, Universidad Nacional de Educación a Distancia, Madrid, Spain.

[12] REDISSEC, Spanish Network of Health Services and Chronic Patients, Madrid, Spain.

[13] Netherlands Institute for Health Services Research (NIVEL), Utrecht, The Netherlands.

**Address for correspondence**

Jose M Valderas, Health Services & Policy Research, University of Exeter, St Luke's Campus, Magdalen Road, Exeter, EX1 2LU, United Kingdom. eMail: j.m.valderas@exeter.ac.uk; telephone: +44-1392-72-2755

**Abstract**

Multimorbidity, the simultaneous presence of multiple health conditions in an individual, is an increasingly common phenomenon globally. The systematic assessment of the quality of care delivered to people with multimorbidity will be key to informing the organisation of services for meeting their complex needs. Yet, current assessments tend to focus single conditions and do not capture the complex processes that are required for providing care for people with multimorbidity. We conducted a scoping review on quality of care and multimorbidity in selected databases in June 2018 and identified 86 documents eligible for review. We synthesized data qualitatively in terms of perceived challenges, evidence and proposed metrics. Findings reveal that the association between quality of care and multimorbidity is complex and depends on the conditions involved and the approach used for measuring quality. People with discordant multimorbidity may be disadvantaged by current approaches to quality assessment, particularly when they are linked to financial incentives. Available evidence highlights the need for a critical shift in our understanding of the underlying models of care that are better suited to meet the needs of this group and in which primary care will play a key role. Assessment frameworks that capture patient preferences and values and incorporate patients' voices in the form of patient reported experiences and outcomes of care will be critical towards the achievement of high performing health systems responsive to the needs of people with multimorbidity.

[250 words]

## Introduction

Chronic conditions contribute to a large proportion of the morbidity burden and pose a major challenge to health systems worldwide [1]. Response to chronic conditions is frequently complicated by multimorbidity, the simultaneous presence of multiple health conditions in an individual[2-5]. Multimorbidity challenges usual care delivery, which is frequently structured around pathways of care for single diseases[6-10]. Key principles have been proposed for the design of high performing health systems that meet the complex needs of people with multimorbidity, ranging from patient and caregiver engagement, to information systems, alignment of funding and incentives[11, 12]. Sustainable models of integrated care for multimorbidity currently being explored[13]. However, the evidence for how to effectively improve health outcomes for people with multimorbidity remains patchy[10, 14, 15], as confirmed by an updated systematic review[16]. A recent randomized evaluation of a complex multidimensional intervention simultaneously targeting medicines management, mental health and patient centredness has further highlighted the continued challenge of demonstrating evidence of effect in this complex population [17].

Efforts to improve the outcomes of care for people with multimorbidity can be supported by the rigorous monitoring and evaluation of service delivery as part of a health system performance framework to inform evidence based decision making[18-21]. There has been growing interest in the systematic evaluation of the quality of health care (the degree to which health services for individuals and populations increase the likelihood of desired outcomes and are consistent with current professional knowledge) [19, 22-25]. This has included considerable work into the development and use of quality indicators for a range of prevalent conditions, such as ischaemic disease, stroke, COPD, diabetes and cancer, with

some countries such as the United Kingdom or the USA linking performance based on these indicators to financial and non-financial incentives in an effort to improve the quality of care[19, 26, 27].

It has become increasingly clear, however, that a continued focus on the quality of care for conditions fails to capture the complex processes required for providing care across conditions, nor does it provide the right stimulus to improve those aspects of the service delivery process the care for people with multimorbidity, such as coordination and integration of care[6, 9, 28].

Overall there remains a need to systematically bring together the existing evidence base on efforts to assess the quality of care delivered to people with multimorbidity to help inform the development of an assessment framework that can then inform decision-making on the organisation and delivery of care that better meets the complex needs of people with multimorbidity. This paper seeks to contribute to this process by means of a scoping review that (i) explores how this issue has been framed in the literature, (ii) examines the empirical evidence of the association between quality of care and multimorbidity, and (iii) assesses metrics and frameworks that have been proposed for the evaluation of the quality of care delivered to people with multimorbidity.

## Methods

We conducted a scoping review of the literature on multimorbidity and health care performance assessment focussing on quality of health care processes and outcomes. We selected this approach as an established method for clarifying conceptual boundaries and

mapping out research areas that have not yet been extensively reviewed, and that are of complex and heterogeneous nature[29, 30].

We searched the following databases: OVID including MEDLINE, EMBASE, and Health Management Information Consortium (which includes the English Department of Health's Library and Information Services (DH-Data) and the King's Fund Information and Library Service), PubMed and the bibliographic database on multimorbidity maintained at the Health Services & Policy Research Group at the University of Exeter, which is updated weekly from ISI Web of Science and Google Scholar alerts for documents using the term "multimorbidity". We developed bespoke search strategies for each database using Boolean connectors to link two main blocks: multimorbidity and health care performance. We used the overarching term of 'health care performance' rather than the more narrow notion of 'quality of care processes and outcomes' to ensure the searches capture the wide range of work that may be of relevance to this study. This is based on our previous experience of conducting reviews of quality of care indicators that found that terms 'quality' and 'performance' are often used interchangeably, although the latter is typically understood as a broader, multidimensional concept that, in addition to quality, also includes dimensions of equity and efficiency[31]. While we recognize these important conceptual differences, in this paper, we will use the terms interchangeably also, reflecting the varying ways authors of papers included in this review have used these terms.

The search was implemented on 15th June 2018. We did not impose any restrictions on publication date, journal, type of publication or language. All citations were imported into the bibliographic manager EndNote. Duplicate citations were firstly removed automatically and subsequently through a manual process when needed.

A three-stage screening process was used to assess the relevance of studies identified in the search. Studies were eligible for inclusion if they made any reference to the assessment of health care quality for people with multimorbidity, with a specific focus on processes and outcomes of care. For the first level of screening, only the titles of citations were reviewed with a sensitive approach in which only documents whose scope was clearly outside the scope of this review were excluded. Title screening was piloted by three of the authors (JMV, JG, EJ) with 50 randomly selected titles in order to ensure consistent application of the eligibility criterion and then was subsequently applied independently by two reviewers (JG and EJ). In cases of disagreement the document was included in the next stage. The second level involved abstract review of the documents deemed potentially eligible in the previous step using the same inclusive and sensitive approach. The process was replicated for abstracts (pilot with 20 abstracts). In the third step, full texts of the documents deemed potentially eligible were screened (pilot with 5 papers). Disagreement was resolved at this stage by consensus. The characteristics of each full-text article were extracted by two reviewers (JG, EJ) using a standardized template. Based on a predefined framework, a narrative synthesis of the information contained in the included documents was conducted initially by two of the authors (JG, JMV) for comment and review by all authors. The proposed framework included: problem framing (justification of a focus on multimorbidity in the evaluation of health care quality); evidence (empirical data for the association between multimorbidity and the quality of process and outcomes of care); and measurement (metrics and frameworks that have been proposed for the evaluation of performance in the presence of multimorbidity). Formal assessment of the quality of includes studies was deemed inappropriate given the scope of the review and the broad range of types of articles retrieved.

## Results

*Search results*

The search retrieved 435 documents after removal of duplicates (Fig. 1), and after eligibility screening a total of 86 documents were finally included[7-9, 11, 13, 16, 28, 32-111]. The literature reviewed included a wide range of documents, including original studies using qualitative and quantitative research methods, systematic reviews, editorials and commentaries, reports, and policy briefs. The great majority originated in the US, Canada, selected European countries (UK, Netherlands, Ireland), New Zealand and Australia.

- FIGURE 1 ABOUT HERE -

*Framing of the problem and perceived challenges*

The literature reviewed justifies the need to focus on the evaluation of quality of care delivered to people with multimorbidity on grounds of the large numbers of those affected, and the impact of multimorbidity on health care processes and outcomes[104]. Concerns about the rising prevalence of multimorbidity are largely attributed to an increased prevalence of individual chronic conditions and to the association of multimorbidity with increasing age[38].

People with multimorbidity face a higher risk of complications of medical care, including pharmacological interactions and adverse drug events, avoidable admissions, and misalignment of multiple care plans proposed by different health professionals. These are perceived to be the result of higher service utilization in this population group (both more frequent and more varied utilization across multiple settings, and polypharmacy) as well as

the intrinsic complexity of their clinical management[38, 40, 45, 67, 81]. High levels of service utilization are generally seen as the key determinant of increased health care costs, poor patient satisfaction and, potentially, also a contributor to adverse health outcomes, which include poor quality of life, reduced ability to work and employability, and increased disability and mortality [85, 87, 91].

There is consensus in the reviewed literature that the main challenge posed by multimorbidity for achieving high health care performance is the current organization of health care following a "disease oriented". This has broad implications, ranging from care financing and reimbursement to the degree of applicability of current clinical practice guidelines to this patient group[90]. Disease orientated care results in fragmentation and lack of coordination and continuity of care, making people with multimorbidity particularly vulnerable during transitions of care[64]. The literature supports the key role played by primary care's patient focussed approach in contributing to both coordination and continuity of care[33, 52]. Lack of robust evidence on the most appropriate care for people with different multimorbidity profiles is recognized as a challenge for the provision of efficient and effective care[44]. The usually limited involvement of individuals in decision-making is perceived as a significant challenge for people with multimorbidity, as continued uncertainty about best management approaches makes effective patient engagement crucial[8].

*The association of multimorbidity and quality of care: empirical evidence*

Ricci-Cabello and colleagues have highlighted the complex association between quality of care and multimorbidity in their recent review, which found that the direction of the association seemed to depend on the constructs used for multimorbidity and quality assessment and their operationalization[89]. The quality of care appeared to be higher when quality was measured using condition/drug specific process or intermediate outcome

indicators, and worse when quality was measured using patient-centred reports of experiences of care[89]. Of note, studies that explored the related construct of comorbidity (which considers the presence of conditions in relation to an index disease) found that care quality may be higher for those with concordant conditions (e.g., those sharing a common pathophysiological pathway and therefore more likely to benefit from the same clinical management), and impaired by the presence of discordant conditions[89, 111].

Panagioti et al. focussed specifically on safety in people with multimorbidity, finding that patient safety events (and their type) varied by the nature of multimorbidity[86]. Thus people with physical and mental health conditions were found to be at a higher risk of safety incidents than those multimorbidity that did not involve mental health. Multimorbidity was also associated with increased risk of incidents that resulted in adverse outcomes[86].

*Quality metrics and assessment frameworks for care for people with multimorbidity*

Approaches to the evaluation of quality of care for people with multimorbidity in the reviewed literature frequently relies on aggregating disease specific indicators for the quality of processes and outcomes of care[63], which are typically derived from single disease oriented guidelines[36]. This additive model that considers quality of care for multimorbidity as the sum of estimates of quality of care for each individual condition is viewed critically[45], given the lack of robust empirical evidence supporting the validity of this approach[7]. Disease oriented guidelines may have limited applicability to people with multimorbidity[91], given their reliance on clinical trials which typically exclude medically complex patients or people undergoing multiple medical interventions. However, such patients are most commonly seen in clinical practice[90]. The additive approach does not account either for the potential of interactions between different treatments, between

treatments and diseases (with the first complicating the prognosis and management of the latter) and between diseases, with potentially harmful consequences[69]. The additive approach also means that quality of care for some diseases may be given priority when there is wide variation in the number of indicators available for each condition[92].

The reviewed literature supports the need for the development of multimorbidity specific performance measures that are based on data from the electronic health record[40] and that include outcomes and processes of care, where there is evidence that the latter lead to improved outcomes[57]. The literature identifies a number of domains, and related measures, that broadly focus on areas reflecting the deficiencies in the provision of health care for people with multimorbidity that we have described above, and the outcomes of interventions targeting multimorbidity[16] (Box 1). However, much of the literature focuses on individual domains rather than bringing them together as part of a comprehensive assessment framework.

- BOX 1 ABOUT HERE -

Experience in the development of multimorbidity specific performance measures is still limited[88]. The validity of such measures is contingent on the evidence supporting them and there remains paucity of research on best clinical approaches for people with multimorbidity [75]. However this is changing rapidly as an increasing body of research is being developed to address this gap[16].

A number of initiatives for the development of comprehensive frameworks for performance assessment for people with multimorbidity are identified in the literature. The Organisation for Economic Co-operation and Development (OECD) is developing survey based patient-

reported indicators for capturing the experience and outcomes of care for patients with one or more chronic conditions[83]. Two core principles for the development of these indicators are patient involvement and the enablement of providers to use information for quality improvement and shared decision making. In parallel, the International Consortium for Health Outcomes Measurement, an independent consortium which the explicit goal of improving health system performance through standardized measurement, reporting and use of patient outcomes, is developing a core set of outcomes for overall adult health with the explicit goal of ensuring relevance to people with multimorbidity [112]. The ongoing evidence-supported expert based consensus process presently considers the following domains: patient reported measures of self-efficacy and engagement, outcomes of care (symptoms, functioning and health related quality of life), and adherence to lifestyle recommendations[113]. Although these two initiatives were developed independently, they are increasingly being aligned to avoid duplications of efforts[114].

At national level, the Department of Health and Human Services (DHHS) of the US Federal Government has acknowledged that the promotion of best practices in caring for individuals with multimorbidity requires specific performance measures that consider the complex and dynamic nature of care for these patients[87]. A measurement framework to facilitate the development and refinement of such measures has been proposed in collaboration with the National Quality Forum (NQF). The framework is centred around patient and family goals and preferences for care in the context of multiple care sites and providers, the type of care they are receiving and considers the following priority domains for health care quality measurement, including 1) optimizing function, maintaining function, or preventing further decline in function; 2) seamless transitions between multiple providers and sites of care; 3) patient important outcomes (includes patient-reported outcomes and relevant disease-specific outcomes); 4) avoiding inappropriate, non-beneficial care, including at the end of life; 5)

access to a usual source of care; transparency of cost (total cost); 6) shared accountability across patients, families, and providers; and 7) shared decision-making[54, 57].

## Discussion

This review has identified a number of documented efforts to advance thinking, evidence and methods in the area of quality of care for people with multimorbidity. This emerging body of evidence and methods can be further developed towards a comprehensive assessment framework for an effective health system response to the rising burden of multimorbidity.

We used a scoping review to capture the complex and heterogenous body of evidence around multimorbidity and health care quality. We sought to be inclusive in the type and nature of documents considered for review using very broad search terms. Clearly any such approach may still miss relevant literature. More importantly perhaps, we will have not captured ongoing work on care quality and models for people with multimorbidity, which remains an emergent field, in particular ongoing work on indicator development. We recognize this limitation arguing that it would have required a different approach to the review and which was not feasible within the scope of this study. We believe, however, and within these limitations, that the retrieved literature, gives a broad perspective of the current state of the art of advances in this area.

Our review has identified a number of important lessons around the systematic assessment of the quality of processes and outcomes of care for people with multimorbidity.

First, although there is evidence that multimorbidity may be associated with higher performance as measured by disease specific indicators, current approaches to performance assessment may disadvantage people with multimorbidity, particularly for patients with discordant conditions. Available condition specific indicators do not provide the right

incentives for managing patients with multimorbidity and may act as a barrier for providing best care. Adjusting quality of care for multimorbidity (risk adjustment) or even incentivizing the delivery of care for people with multimorbidity offer only partial solutions as they would not need to address the core problem of the validity of the measures in this group of patients. Appropriate quality measures for multimorbidity are needed, and the frameworks reviewed in this paper may offer guidance in this direction, while in need for further development and support by evidence.

Second, measures of quality of care need to be consistent with the proposed models of care. Epidemiological transitions across the globe made it necessary to adapt models of care essentially oriented to an acute disease model (linear approach focussing on a single etiological agent and the delivery of a single treatment) to effectively respond to chronic conditions (iterative approach dealing with multiple etiological agents and multiple management options). A similar transition is needed from a single disease model to a multimorbidity model. Such a model (and the assessment of its performance) has to account for the need to integrate care across conditions and providers and recognize the importance of patient centred care with explicit goal setting and prioritization[7, 12, 93, 110, 115-117] (Figure 2).

- FIGURE 2 ABOUT HERE -

Third, the assessment of the quality of primary care should be at the core of evaluations of the care that people with multimorbidity receive. Transitions between providers and between episodes of care are critical to the needs of people with multimorbidity, requiring systematic coordination, continuity and comprehensiveness. Together with first contact care and person focus, these are also core functions of primary care[22, 118]. This well-established person

focussed approach to health care delivery can be considered the core model of care on which to base further developments oriented to improving care for people with multimorbidity[12, 22, 119], as the primary care focus of both the OECD PaRIS and ICHOM initiatives demonstrate.

Fourth, person centred care should be a guiding principle for the development of assessment frameworks. People centredness, a core value of health systems, acknowldeges that individual service users should be the key stakeholders[120]. Their values, goals and priorities should shape care delivery and individual care plans, and this should be reflected accordingly in quality indicators. It has been proposed that making care more person centred may also counter the care fragmentation, which is particularly detrimental to care of patients with multimorbidity, while increasing patient satisfaction[91].

Considering the evidence reviewed here, we identify two priority areas for further research and development. First, there is an urgent need to establish how to enable the routine collection of patient evaluations of health and health care using patient reported experience and outcome measures (PREMS and PROMs) and to incorporate these into comprehensive assessment frameworks[21, 107, 121-125]. Second, there is a need to advance approaches for the mesurement of the role of service users (and their carers) as active partners in service delivery. This is notoriously difficult to capture in current information systems and developing the methods for best documenting and evaluating performance on this issue should be a research priority[117, 126].

## Conclusion

Single disease approaches to the measurement of quality of care for people with multimorbidity do not capture the complexity of the processes involved in meeting the

complex needs of this population. This scoping review has identified important avenues for the further development of approaches for the systematic assessment of the quality of care for people with multimorbidity. Available evidence clearly highlights the need for a critical shift in our understanding of the underlying models of care for service models that are better suited to meet the needs of this group. Assessment frameworks that capture patient preferences and values and incorporate patients' voices in the form of patient reported experiences and outcomes of care will be critical to inform decision-making towards the achievement of high performing health systems.

[3409 words]

## Authors' contributions

JMV is the grantor. JMV designed the concept of the paper, which was agreed with CB, EN, MaR, MiR, and ASS. EJ, JG, and JMV had full access to all of the data in the study, implemented the search strategy, applied eligibility criteria, and extracted the information. JG and JMV conducted the analysis. ASS, CB, EN, JMV, MaR, and MiR contributed to the Session "Multimorbidity and Health Policy" of the International Symposium "Multimorbidity research at the cross-roads: developing the evidence for clinical practice and health policy" that took place on 21/05/2018 at the Nobel Forum, Karolinska Institutet, Stockholm, Sweden (for programme, presentations and lessons learned, see http://www.multimorbidity2018-stockholm.se and https://wol-prod-cdn.literatumonline.com/pb-assets/assets/13652796/Conference%20report%20Multimorbidity.pdf) and to a subsequent workshop where core aspects relevant to the development of the study were discussed. JMV drafted the first version of the manuscript, and all the authors (ASS, CB, EN, EJ, JG, JMV, MaR, and MiR) revised subsequent drafts critically for important intellectual content, and approved the final draft for publication.

## Conflict of interest statement

JMV has contributed as an advisor to the development of the OECD PARIS initiative. JMV is the chair of the ICHOM panel for Overall Adult Health core set.

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**Figure 1.** PRISMA Flowchart of the study selection process

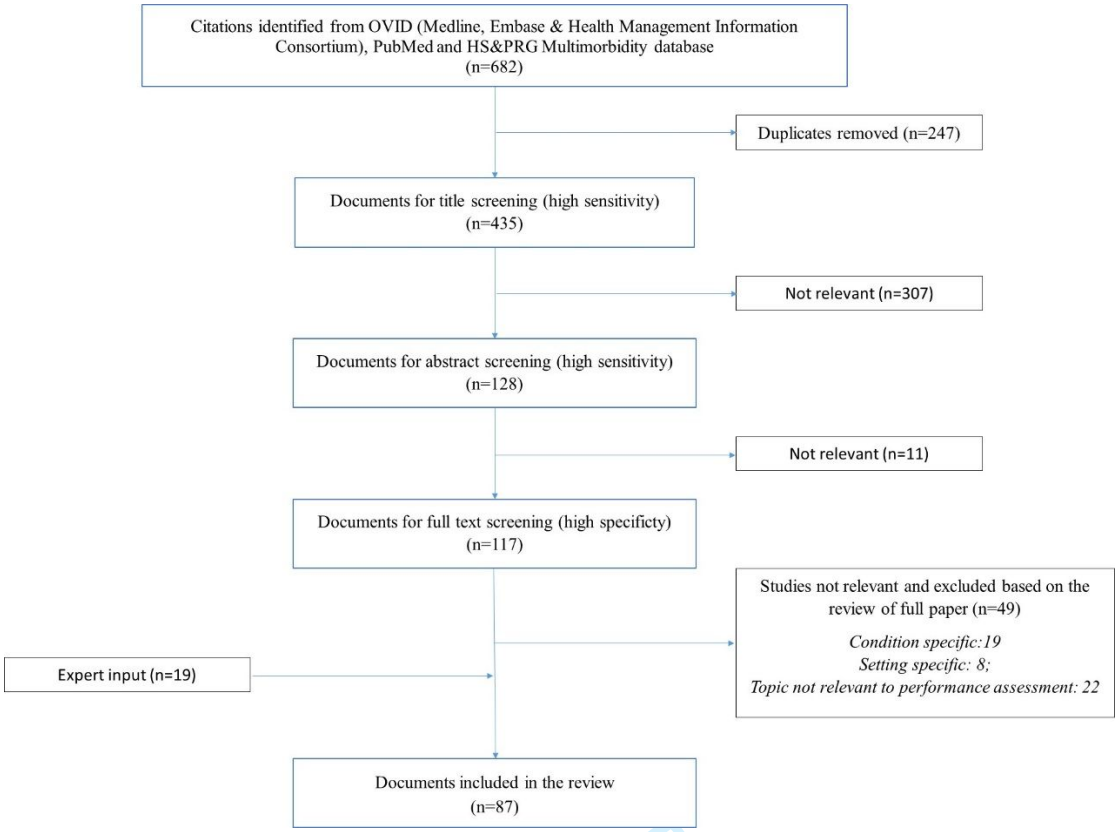
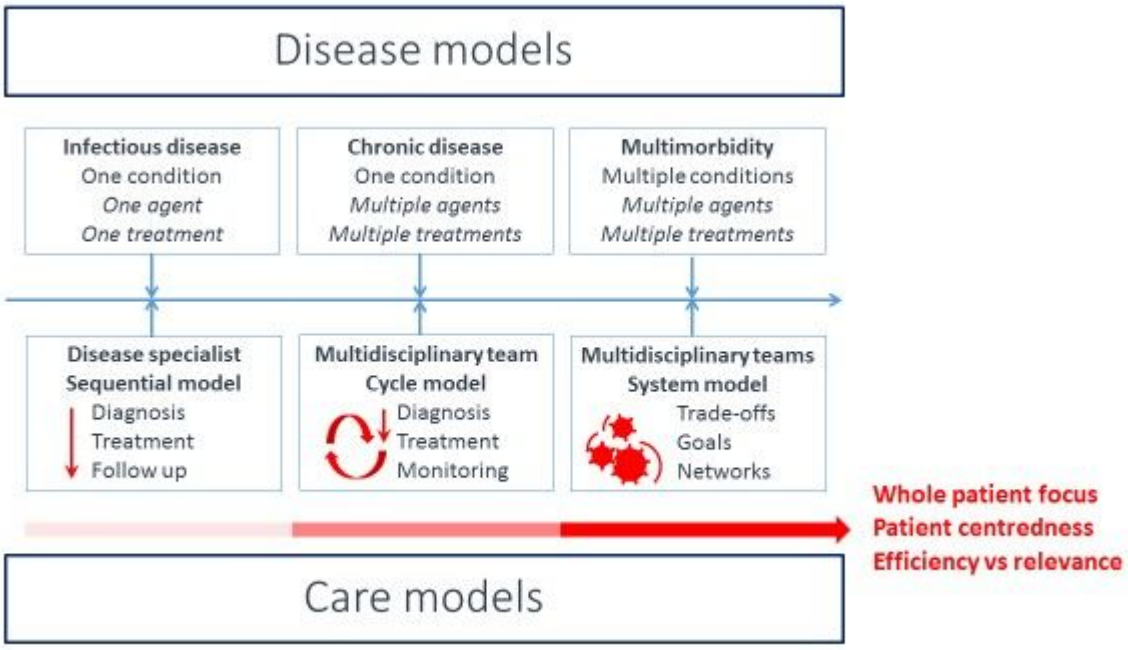


**Figure 2.** Models of care as informed by models of disease.



**Box 1. Domains relevant to quality of care and performance assessment in people with multimorbidity.**

*Process of care*

Continuity

Coordination

Comprehensiveness

Patient centredness

- Preferences elicitation
- Prioritisation
- Individualized goal setting
- Self-efficacy

Management of life style factors

Management of specific diseases

Medicines management

*Use of health services*

*Experience of care and satisfaction*

Experiences of care

Satisfaction with care

*Outcomes of care*

Patient reported outcomes (symptoms, functioning, health related quality of life)

Adverse events