

How should health policy respond to the growing challenge of multimorbidity?

We need patient-centred care, with more emphasis on generalist rather than specialist care and better integration between general practice, hospitals and social care



Chris Salisbury (University of Bristol); Bruce Guthrie (University of Dundee); Peter Bower (University of Manchester); Stewart W Mercer (University of Glasgow)

Summary

There is growing awareness internationally of the increasing number of people living with multiple long-term health conditions, known as multimorbidity. Health services, including the NHS, need to adapt to address this challenge.

People with multimorbidity are more likely to experience poor quality of life and poor physical and mental health. They use both general practice and hospital services far more than often than the general population. Treatment itself can be an additional burden if they need to take numerous prescribed drugs and attend frequent health care appointments.

More and more people are living with multimorbidity. A major driver of this is that people are living longer. Multimorbidity poses major challenges for health care systems around the world, which are largely designed to manage individual diseases and episodes of illness. These need to be re-orientated towards providing care for people who have several long-standing health conditions at the same time, many of which are manageable but not curable.

There will need to be a new relationship between patients and health care professionals, which will engage patients more in managing their health conditions themselves. Health care services need to invest in better generalist care and become less focussed on care for single diseases, and closer integration of health and social care will be necessary.

What is multimorbidity?

Multimorbidity is usually defined as the existence of two or more long term health conditions in the same individual.¹

Many of these conditions are not curable but can be managed to help reduce adverse symptoms, slow deterioration, and enable people to adapt their lives to cope better. Managing long-term conditions well requires actions from both the patient and the health care system.

How common is multimorbidity?

Determining the number of people affected is difficult because it depends on the number of health conditions included in the definition of multimorbidity. However it is

clear that the prevalence of multimorbidity increases with age and is higher in less affluent areas.² A large Scottish study, examining 40 significant long-term health conditions, found that two out of three people aged 65 years or over had two or more of these conditions, rising to more than eight out of ten of those aged over 85.³ Multimorbidity is therefore the norm for older people in developed countries such as the UK.

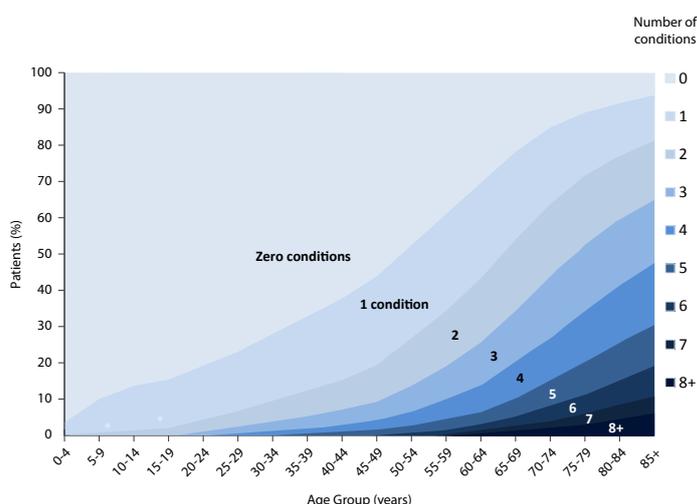


Figure 1: Number of chronic disorders by age-group. (adapted from Barnett et al 2012)³

However, multimorbidity is not just a problem of the elderly. Because there are more middle-aged than elderly people in the population, there are actually more people with multimorbidity aged under rather than over 65 years old.⁴

The number of people in the population with long-term health conditions such as diabetes, heart disease and dementia is rising for several reasons. These include the ageing population, increases in obesity, and improvements in medical care so that people survive longer with conditions that in the past would have been fatal. As the prevalence of most long-term conditions increases, so does the number of people living with multimorbidity. Between 2015 and 2035 the number of older people with four or more long term conditions will double, and a third of these people will have mental health problems such as depression, or dementia or cognitive impairment.⁴

¹ The Academy of Medical Sciences. [Multimorbidity: a priority for global health research](#). London; 2018 April 2018.

² Violan C, Foguet-Boreu Q, Flores-Mateo G, Salisbury C, Blom J, Freitag M, et al. Prevalence, determinants and patterns of multimorbidity in primary care: a systematic review of observational studies. *PLoS One* 2014; 9(7): e102149. DOI: [10.1371/journal.pone.0102149](#)

³ Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *Lancet* 2012; 380(9836): 37-43. DOI: [10.1016/S0140-6736\(12\)60240-2](#)

⁴ Kingston A, Robinson L, Booth H, Knapp M, Jagger C for the MODEM project. Projections of multi-morbidity in the older population in England to 2035: estimates from the Population Ageing and Care Simulation (PACSim) model, *Age and Ageing*, 47 (3) 374-380. DOI: [10.1093/ageing/afx201](#)



What is the problem for the NHS?

People with multimorbidity account for a disproportionately high number of consultations in general practice and their treatment is expensive because they are likely to be prescribed numerous drugs.

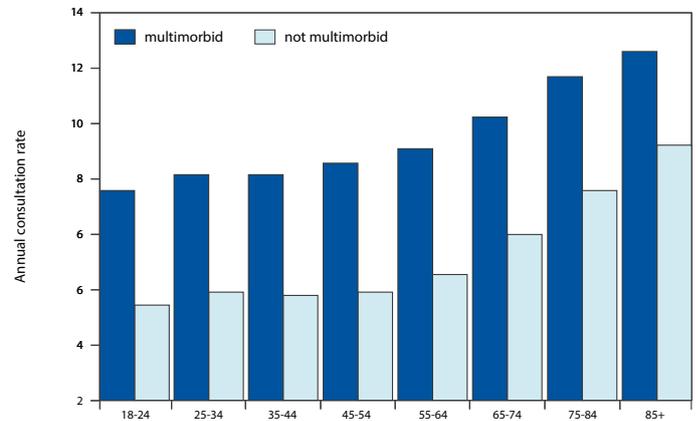


Figure 2: Annual general practice consultation rate by age and multimorbidity status²

Why is multimorbidity a problem for patients?

Compared with people with single health problems, people with multimorbidity are more likely to have a reduced quality of life, impaired function, worse general health and an increased risk of premature death.

People with multiple physical health problems are more likely to have poor mental health, and this in turn makes them less likely to manage their physical health problems well.

People with multimorbidity are often prescribed large numbers of drugs, expected to make many changes to life-style and to attend numerous health care appointments. Therefore, treatment itself can be a major burden for patients, in addition to the burden of being ill.

Because patients with multimorbidity receive care from a number of different organisations and individual clinicians they often experience poor continuity of care. They can feel that their care is not joined-up since different clinicians often only focus on one aspect of their problems and no-one treats them as a 'whole person'. That is because care is often disease-focused rather than patient-centred.

"I always feel you're better going to the same doctor to see him about yourself, instead of explaining to the next doctor or another doctor which has not been seeing you about it."¹

People with multimorbidity also have high rates of emergency hospital admissions and attendance at out-patient appointments. In one study, only 10% of patients had four or more physical health conditions, but these patients accounted for more than a third of all unplanned admissions to hospital and almost half of potentially preventable unplanned admissions.³

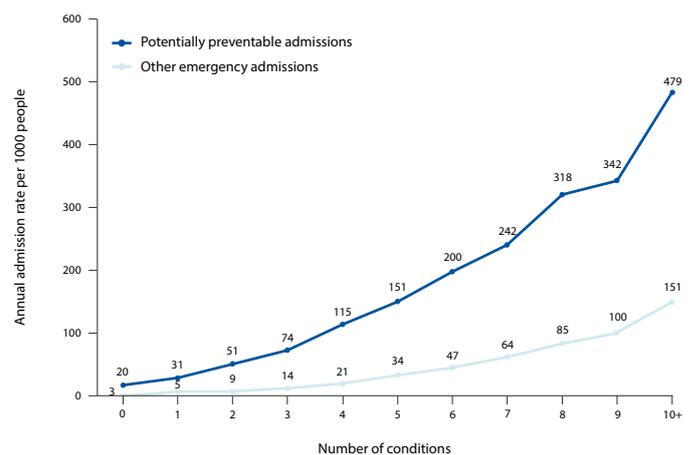


Figure 3: Rates of hospital admissions in patients with multimorbidity³

¹ Salisbury C, Man MS, Bower P, Guthrie B, Chaplin K, Gaunt DM, et al. Management of multimorbidity using a patient-centred care model: a pragmatic cluster-randomised trial of the 3D approach. *Lancet*. 2018. 392:41-50. DOI: [10.1016/S0140-6736\(18\)31308-4](https://doi.org/10.1016/S0140-6736(18)31308-4)

² Salisbury C, Johnson LR, Purdy S, Valderas JM, Montgomery AA. Epidemiology and impact of multimorbidity in primary care: a retrospective cohort study. *Br J Gen Pract*. 2011;61(582):e12-e21. DOI: [10.3399/bjgp11X548929](https://doi.org/10.3399/bjgp11X548929)

³ Payne R.A, Abel G.A, Guthrie B, Mercer S.W. The effect of physical multimorbidity, mental health conditions and socioeconomic deprivation on unplanned admissions to hospital: a retrospective cohort study *CMAJ* Feb 2013, cmaj.121349; DOI: [10.1503/cmaj.121349](https://doi.org/10.1503/cmaj.121349)

There is an almost exponential relationship between the number of health conditions affecting an individual and their use of health care resources.¹

In the US, it is estimated that people with multimorbidity account for more than two-thirds of all health care spending.

The economic impact of increasing multimorbidity in the population is therefore very substantial. We need to consider new ways of providing health care which more effectively support self-care, reduce inefficiencies and reduce reliance on expensive hospital care.

Medicine in all developed countries is organised around specialities which are defined by disease or body system. The care experienced by patients in hospital is to some extent dictated by which speciality deals with the initial cause of admission. But since most hospital admissions involve people with long-term conditions, and most of these patients have multimorbidity, better generalist care is needed to ensure appropriate care, and a timely and well co-ordinated handover to care outside hospital.

Similarly, specialists in out-patient departments understandably tend to focus on problems within their domain of expertise, but this can mean that a patient's other problems get less attention or that they have to be referred between different specialists.

“There is a weakness on co-morbidity. The computer can't cope with two concepts in one bite. I'm not worried about it, but what it means in practice is that a patient with co-morbidity gets maybe three or four letters a year as opposed to one letter a year. Because they get the letter for heart disease and then they get the letter for asthma, then they get the letter for diabetes” (GP 09)²

The focus on single diseases impacts general practice as well as hospitals. Within the UK, the care of long term conditions is increasingly organised around care pathways, protocols and treatment guidelines for each specific disease. However, this approach is problematic for people with multimorbidity.

“so you have a guy with ischaemic heart disease who automatically has to go on five agents and then he's got diabetes, he's got another three agents and if you were to take each of the conditions, not necessarily diseases, maybe just lipidaemia or whatever, and put them on the best management protocol for that particular condition, you know, they're straight away on 20 different agents, and if you stop any of those then you're not following the guidelines for each of those.” (GP6)³

Most treatment guidelines have been developed for less complex people with single health conditions and their recommendations may not be applicable to people with multimorbidity.

If health professionals try to follow several different disease-specific protocols for the same patient, this may lead to advice which is burdensome, contradictory or inappropriate in the light of the patient's other conditions.

“Somebody with diabetes, you encourage them to exercise, [but] maybe if they've got a respiratory condition, it stops them from doing that. So sometimes your advice conflicts, you know, when you've got multiple problems.”
PN 2 (27 yrs qualified: Practice Nurse)⁴

¹ Lehnert T, et al. (2011). Health Care Utilization and Costs of Elderly Persons with Multiple Chronic Conditions. *Medical Care Research and Review* 68(4), 387–420. DOI: [10.1177/1077558711399580](https://doi.org/10.1177/1077558711399580)

² Peter Bower, Wendy Macdonald, Elaine Harkness, Linda Gask, Tony Kendrick, Jose M Valderas, Chris Dickens, Tom Blakeman, Bonnie Sibbald; Multimorbidity, service organization and clinical decision making in primary care: a qualitative study, *Family Practice*, Volume 28, Issue 5, 1 October 2011, Pages 579–587. DOI: [10.1093/fampra/cmr018](https://doi.org/10.1093/fampra/cmr018)

³ Smith SM, O'Kelly S, O'Dowd T. GPs' and pharmacists' experiences of managing multimorbidity: a 'Pandora's box'. *Br J Gen Pract.* 2010. 60(576):285-94. DOI: [10.3399/bjgp10X514756](https://doi.org/10.3399/bjgp10X514756)

⁴ Coventry PA, Fisher L, Kenning C, Bee P, Bower P. Capacity, responsibility, and motivation: a critical qualitative evaluation of patient and practitioner views about barriers to self-management in people with multimorbidity. *BMC Health Serv Res.* Oct 31 2014;14(1):536. DOI: [10.1186/s12913-014-0536-y](https://doi.org/10.1186/s12913-014-0536-y) Published under licence CC BY 2.0.

What are the solutions?

Several national and international bodies have recognised these problems and have published reports about multimorbidity (see Further Reading). Although these reports have different purposes and audiences, there is a lot of overlap in their recommendations.

Think carefully about the risks and benefits, for people with multimorbidity, of individual treatments recommended in guidance for single health conditions. Discuss this with the patient alongside their preferences for care and treatment.¹

Summary of recommendations from major reports

Local health care provider level

1. Identify patients with multimorbidity or other complex health needs and prioritise them for pro-active, co-ordinated care.
2. Arrange regular comprehensive review of patients' problems according to their individual circumstances.
3. Focus disease management on quality of life and function as well as disease control.
4. Tailor treatment recommendations to each individual's priorities and situation.
5. Balance risks and benefits of treatment while seeking to reduce treatment burden (particularly from taking too many prescribed drugs).
6. Promote patient self-management: engage patients in decisions about their care; agree an individualised care plan and provide patients with support to follow it.
7. Provide better support for care givers.

Regional or national level

8. Coordinate services to be delivered by a multi-disciplinary team in the community, but with one clearly identified professional who has responsibility for coordinating care. This is likely to be the GP or another member of the primary health care team.
9. Develop clinical information systems which provide decision support and facilitate communication between care providers based on shared record systems .
10. Integrate health and social care services and physical and mental health care.
11. Train more generalists and organise systems around generalist primary care services rather than structuring services around specialisms and sub-specialisms.
12. Reform payment systems to encourage collaboration between providers and adequately compensate for complexity; remove systems which lead to inappropriate treatment or fragmentation of care.
13. Reprioritise research funding. There are major gaps in knowledge about the causes and determinants of multimorbidity, how to manage individual patients with multimorbidity and how to organise care for them. These are priorities for research.

¹ National Guideline Centre. [Multimorbidity: clinical assessment and management](#). London: National Institute for Health and Care Excellence; 2016.



Evidence has been summarised in a [Cochrane systematic review](#)¹, [NICE guidelines on multimorbidity](#)², and a recent report from the [Academy of Medical Sciences](#)³. All of these reports acknowledge that there are major gaps in our knowledge about how best to manage people with multimorbidity.

*Multimorbidity refers to the existence of multiple medical conditions in a single individual. The issue is a growing global health concern but the available evidence on its causes, impact, and treatment is currently inadequate.*³

Cochrane Review

- Explored the evidence on the effectiveness of interventions to improve the management of multimorbidity in primary care and community settings
- Most recent version (2016) included 18 high quality randomised controlled trials
- Found no consistent evidence about interventions that improved clinical outcomes or reduced costs

NICE Guidelines

- Several recommendations made about identification and management of multimorbidity and frailty, including about the kind of care which should be provided
- Strength of evidence to support most of these recommendations was low to moderate
- Specific recommendation made that research was needed to examine different ways of organising

general practice to better serve the needs of people with multimorbidity

Academy of Medical Sciences

- Takes a global perspective
- Identified inconsistency in definitions of multimorbidity and recommended a consensus definition
- Highlighted the need for more research into the causes and burden of multimorbidity; determinants and patterns of multimorbidity (including the most common clusters of conditions, their causes and effects); how to improve treatment for patients; and how to organise health care systems to address multimorbidity

Given this limited evidence, we conducted the [3D trial](#), the largest evaluation to date of an approach to managing multimorbidity. The findings from the 3D trial were published in the [Lancet](#) in June 2018.

¹ National Guideline Centre. [Multimorbidity: clinical assessment and management](#). London: National Institute for Health and Care Excellence; 2016.

² Smith SM, Wallace E, O'Dowd T, Fortin M. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database of Systematic Reviews*. 2016(3). DOI: [10.1002/14651858.CD006560.pub3](#)

³ The Academy of Medical Sciences. [Multimorbidity: a priority for global health research](#). London; 2018 April 2018.

The 3D approach: designed to reflect the international consensus that care for multimorbidity should be patient-centred, focus on quality-of-life, and promote self-management towards agreed goals.¹

One named responsible GP

Each patient was allocated one GP to be responsible for their care and was encouraged to see the same GP whenever possible

Regular 'whole person' review

Patients offered six-monthly comprehensive "3D" reviews, each consisting of two appointments which were longer than usual

First appointment (nurse): agenda setting

- Nurse asks patient about the health problems that bother them most
- particularly asking about pain, function, quality of life
- screening for depression and dementia
- providing disease-specific care required, according to the individual patient's combination of diseases
- findings shared as a printed 'agenda' for the patient to discuss with their GP

Pharmacist review of medication

- Pharmacist reviews the patient's medical records

Second appointment (GP): agreeing a plan

- GP considers the nurse and pharmacist reviews
- discusses how well patient is getting on with their current treatment
- discusses the patient's needs and goals
- agrees a collaborative health plan, which specifies how the patient and clinicians will address the agreed goals over the next six months
- patient given a printed copy of the plan, including results of tests

¹ Salisbury C, Man MS, Bower P, Guthrie B, Chaplin K, Gaunt DM, et al. Management of multimorbidity using a patient-centred care model: a pragmatic cluster-randomised trial of the 3D approach. *Lancet*. 2018;392(10141):41-50. DOI: [10.1016/S0140-6736\(18\)31308-4](https://doi.org/10.1016/S0140-6736(18)31308-4)

The 3D Trial

Based on the existing evidence and international consensus on 'best practice', we believed that the patient-centred "3D" approach for patients with multimorbidity had the potential to improve patients' quality of life, make their care more patient-centred and reduce their burden of illness and treatment compared with usual care.

The aim of the 3D trial was to test whether these outcomes were actually improved.

Trial methods:

The 3D approach was evaluated in a randomised controlled trial in general practices in England and Scotland

16 practices provided the 3D approach while 17 practices continued usual care.

1,546 adult patients, each suffering from three or more different types of major long-term health conditions, took part.

Measures of success included patients' quality-of-life, experience of patient-centred care, illness burden and treatment burden. We also assessed use of health care services, including continuity of care, and cost-effectiveness.

We interviewed patients and staff to understand how 3D worked, and how it could be improved.

Findings:

At the outset of the trial, patients had poor quality of life with a third of them experiencing depression as well as multiple physical health problems. Many also reported problems with the organisation of their care.

After 15 months follow-up there was no significant difference on average between patients in the practices providing the 3D approach or usual care in terms of quality-of-life, illness burden or treatment burden.

However, patients in practices providing the 3D approach reported significant improvements in patient-

centred care. They felt more able to discuss the problems that were most important to them, their care was better co-ordinated, and they were more satisfied with their overall health care.

The cost of providing the 3D approach was not significantly higher than the cost of usual care.

"So the great thing about this is that they're looking at you as a whole being and taking everything into account and that is very new" [3D trial participant]¹

Interpretation:

The 3D approach improved patients' experience of patient-centred care but not their health outcomes.

It is arguable that improved patient-centred care is itself sufficient reason to roll out the 3D approach more widely, given that it is not significantly more expensive.

From the interviews with patients and staff it was clear that most patients preferred the 3D approach, but it took time for practices to adapt to the new way of working particularly in a system that was organised and incentivised through the GP payment system to provide 'disease-focused' care. The effectiveness of the 3D approach might improve over time and if it became normal practice.



The 3D Study:
Improving whole person care

Funding: National Institute for Health Research. The views and opinions expressed in this report are those of the authors and do not necessarily reflect those of the NIHR, the NHS or the Department of Health.

¹ Salisbury C, Man MS, Bower P, Guthrie B, Chaplin K, Gaunt DM, et al. Management of multimorbidity using a patient-centred care model: a pragmatic cluster-randomised trial of the 3D approach. *Lancet*. 2018;392(10141):41-50. DOI: [10.1016/S0140-6736\(18\)31308-4](https://doi.org/10.1016/S0140-6736(18)31308-4)

Implications for health policy

The challenge for health care

More people in the UK are living with multimorbidity. This impacts on the health and well-being of patients, and places great pressure on the NHS. Current models of care, largely focused on the care of individual diseases such as diabetes or heart disease, are becoming increasingly expensive and yet are failing to meet patients' needs for whole person, patient-centred care.

Does research point to a solution?

The problems caused by multimorbidity are clear, but the solutions less so. There are many gaps in current knowledge, highlighted in several recent national and international reports. Even though the volume of evidence from high quality research is limited, based on the 3D trial and previous studies it seems unlikely that currently proposed models to improve care for multimorbidity will lead to rapid improvements in patients' quality of life or health outcomes.^{1,2}

The difficulty of improving quality of life in people with multimorbidity

This may be because the problems that most affect the quality of life of patients with multimorbidity are complex and deep-seated. Quality of life, including health, is affected by factors such as income, employment, housing and education as well as health care. Solving the patient's problems may require actions beyond the current remit or vision for the health service, for example requiring social care (although health services may have a role in referring patients to this).

There are few new approaches to providing health care for long-term conditions which have been shown to improve quality of life even for patients with single conditions, never mind in people with complex multimorbidity. For example, many innovations which are currently widely promoted (such as in the field of digital health) have not been shown to improve patient's quality of life in randomised controlled trials.

What could be done to make a difference?

The lack of evidence from research for benefit in terms of improved quality of life does not necessarily undermine the consensus recommendations. These recommendations have wide support.

To really make a difference to the health and wellbeing of patients with multimorbidity, interventions will probably need to be more intensive and provided over a longer period than any of the evaluations which have been conducted so far.

They will also probably have to be introduced at a whole system level, since meaningful change is likely to involve changes in the ways in which general practice, hospitals and social care work together. There is also likely to be an increasingly important role for voluntary and community services.

Moving towards a health care system designed to meet the needs of large numbers of people with multimorbidity will require radical re-organisation involving a rebalancing of resources towards high quality health and social care provided in the community, with a greater role for specialists in advising, supporting and monitoring care provided outside hospitals.

These are major changes which will take time.

In the meantime, the 3D approach represents a fairly simple, low cost intervention which demonstrably improves the care of patients whose needs are not being met by current services.

Although improving quality of life and health outcomes for patients with multimorbidity is clearly challenging, there is good evidence from the recent 3D trial¹ as well as from earlier studies² that new approaches can lead to improvements in the way in which care is provided and patients with multimorbidity experience their health care.

Providing a patient-centred rather than disease-focused approach leads to care which is more joined up, respects patients' wishes and priorities, and is more attuned to their perceived needs. This may be a worthwhile end in itself.

¹ Salisbury C, Man MS, Bower P, Guthrie B, Chaplin K, Gaunt DM, et al. Management of multimorbidity using a patient-centred care model: a pragmatic cluster-randomised trial of the 3D approach. *Lancet*. 2018;392(10141):41-50. DOI: [10.1016/S0140-6736\(18\)31308-4](https://doi.org/10.1016/S0140-6736(18)31308-4)

² Smith SM, Soubhi H, Fortin M, Hudon C, O'Dowd T. Managing patients with multimorbidity: systematic review of interventions in primary care and community settings *BMJ* 2012; 345 :e5205. DOI: [10.1136/bmj.e5205](https://doi.org/10.1136/bmj.e5205)

Policy recommendations

- Promote patient-centred approaches to the management of multimorbidity in primary care, such as the 3D model. This will require training, support and changes in incentives.
- Develop and evaluate new approaches to managing patients with multimorbidity within hospitals.
- Explore new models of integration of primary and community care, hospital care and social care which enable better co-ordination and support for people with multimorbidity. This is likely to require substantial changes in commissioning and funding mechanisms, and a rebalancing of resources. These aims are being pursued by 'sustainability and transformation partnerships' and in some areas by 'integrated care systems'.¹ These should give high priority to improving care for patients with multimorbidity, and it will be important to learn lessons from the experience of pilot sites.
- Better integration of primary, secondary and social care will not come about through organisational change alone – it will also require major cultural change for care providers and managers. This is likely to require changes to professional education, training and regulation.
- Improving care for the large and increasing number of people with multimorbidity will require a step-change in engaging people and enabling them to manage their own health and long-term conditions. This will require co-ordinated action across many aspects of government and public life, including not only health policy but also education, welfare, transport, and policies which impact on public health issues such as healthy eating, exercise, smoking and alcohol consumption.
- Several of the major chronic diseases affecting people with multimorbidity have common risk factors, such as smoking, obesity and lack of physical activity. The benefits of addressing these lifestyle problems will be magnified through preventing many different diseases.

¹ Ham C, [Making sense of integrated care systems, integrated care partnerships and accountable care organisations in the NHS in England](#). King's Fund.

Further reading

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Contact for further information:

Chris Salisbury, Professor of Primary Health Care, University of Bristol. c.salisbury@bristol.ac.uk

Centre for Academic Primary Care (CAPC), Department of Population Health, Bristol Medical School, University of Bristol.

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