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Addressing unwarranted variation: literature review on methods for influencing practice

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Contents

Figures

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1. Introduction

This literature review focuses on methods used overseas for **identifying and reducing unwarranted variation in health care** with a view of informing the approach in New Zealand.

> *Information in the NHS* [National Health Service] *atlas is illuminating but changing practice is what matters.* (Mays 2011)

1.1 Background

Variation in medical practice has become a major topic of inquiry for health services researchers. Investigators have frequently documented variation in the way in which health services are delivered, both among individual clinicians and across geographic areas, and have found that such variation often cannot be explained by demographic factors or other determinants of health need. The existence of such unexplained variation has provoked questions about the effectiveness, efficiency and quality of health care services.

Observations of variation have consequently been used to justify a variety of policies aimed at reducing variability, such as greater emphasis upon outcomes research, feedback to practitioners, and closely monitored performance measures.

Not all variation is undesirable, however. The trick is in

> reducing the bad variation, which reflects the limits of professional knowledge and failures in its application, while preserving the good variation that makes care patient centred. (Mulley 2010)

John Wennberg, who has championed research into clinical variation in the United States (US) over four decades (including founding the innovative Dartmouth Atlas of Health Care (2014)) defines unwarranted variation in health care as variation that cannot be explained on the basis of illness, medical evidence or patient preference (Wennberg 2010). Wennberg (2011) groups clinical care into three categories for understanding variation:

1. **Effective care** is defined as interventions for which the benefits far outweigh the risks; in this case the 'right' rate of treatment is almost every patient defined by evidence-based guidelines to be in need. Unwarranted variation is generally a matter of underuse.
2. **Preference-sensitive care** is when more than one generally accepted treatment option is available, such as elective surgery. The right rate should depend on informed patient choice, but treatment rates can vary extensively because of differences in professional opinion.
3. **Supply-sensitive care** comprises clinical activities such as doctor visits, diagnostic tests and hospital admissions, for which the frequency of use relates to the capacity of the local health care system. The key issue with this one is that, at least in the US, those living in regions with a high-intensity pattern of care have worse or no better survival than those living in low-intensity regions. This means that greater intensity of care does not necessarily equate to improved outcomes.

Collating and presenting evidence of health care variations is a key first step. Knowledge does not, unfortunately, always lead to action. The purpose of this literature review, therefore, is to set out approaches that have been and are being used overseas to identify and manage unwarranted variation.

Search terms

When searching for relevant literature, we used the following terms:

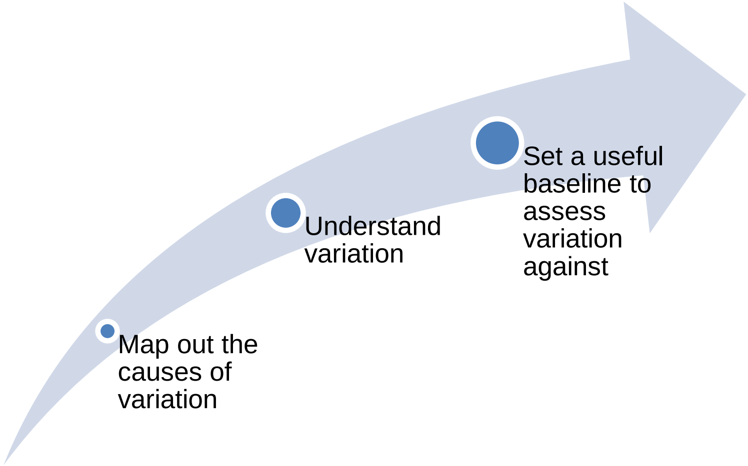
- managing (unwarranted) variation in health care
- reducing (unwarranted) variation in health care
- variation and quality improvement
- Atlas of Variation to drive change/influence practice
- Atlas of Healthcare Variation in practice.

2. Identifying unwarranted variation

Not all variation is undesirable.

> If all variation were bad, solutions would be easy. The difficulty is in reducing the bad variation, which reflects the limits of professional knowledge and failures in its application, while preserving the good variation that makes care patient centred. When we fail, we provide services to patients who don't need or wouldn't choose them while we withhold the same services from people who do or would, generally making far more costly errors of overuse than of underuse. (Mulley 2010)

In order to reduce bad or unwarranted variation, it first needs to be accurately identified. This section outlines the key steps to achieve this.



It is very difficult to understand local variation and identify whether it is warranted or unwarranted from a national level or District Health Board-level analyses. Local initiatives and analyses are required to identify unwarranted variation.

2.1 Mapping out causes of variation

A useful starting point in separating out the good (warranted variation) from the bad (unwarranted variation) is to map out the possible causes of variation and identify which causes are important.

The King's Fund report *Variations in Health Care – the Good, the Bad and the Inexplicable* (Appleby and Raleigh 2011) presents a diagrammatic map of potential causes of variation which illustrates the complexity of the interactions at play. This is reproduced below:

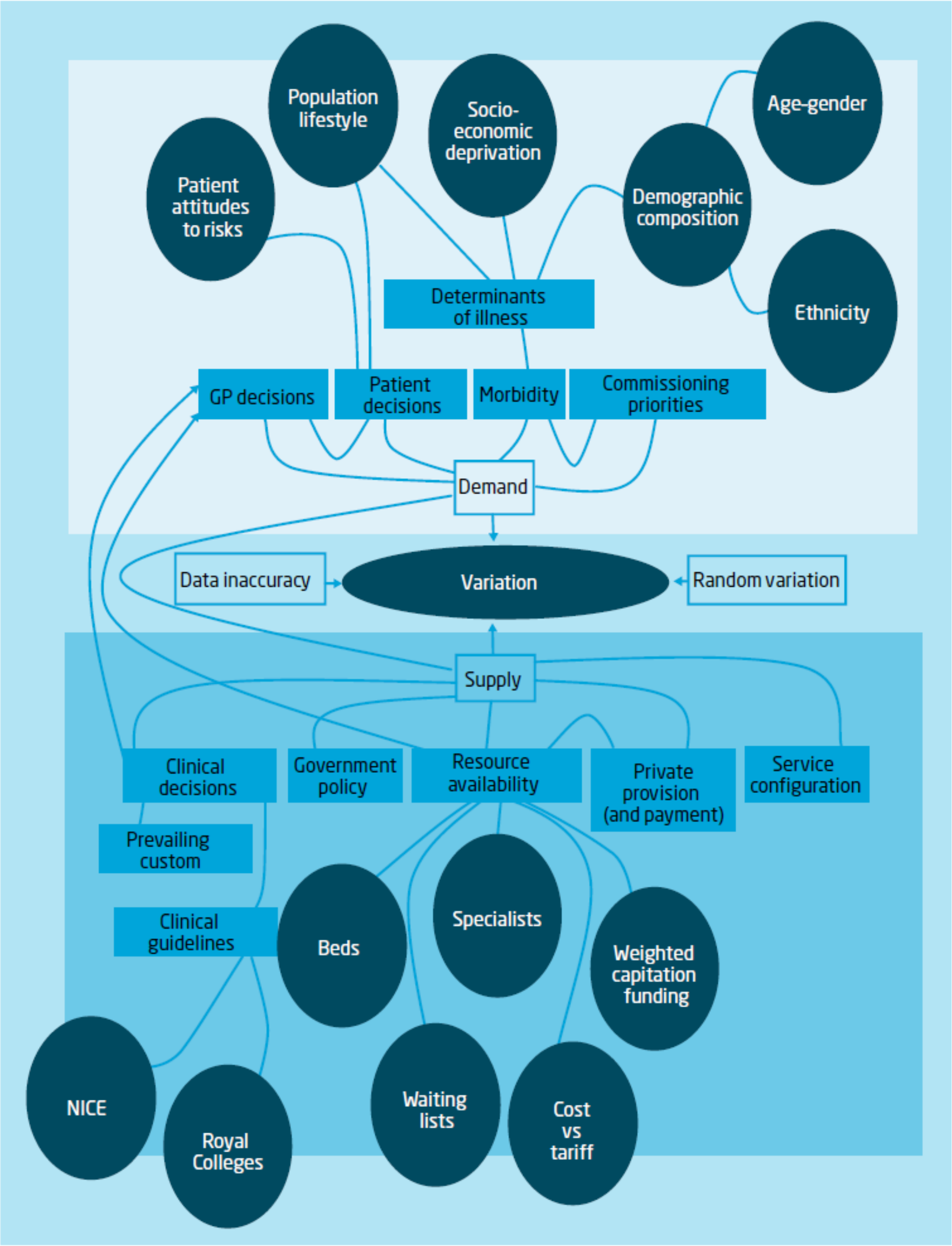


Figure 1. Mapping causes of variation – diagram replicated from the King's Fund report (Appleby and Raleigh 2011)

2.2 Establishment of a focused programme of work

Identifying which causes are important relies on an empirical approach which may involve statistical and qualitative research. Establishment of a focused programme of work with clinician involvement is useful not only to identify causes of variation at a specific local level, but also to prioritise those variations and causes that have the most important impact on equity, effectiveness, efficiency and patient health outcomes (Appleby and Raleigh 2011).

2.3 Understanding variation

Wennberg's (2010) grouping of the different types of variation (effective care, preference-sensitive care and supply-sensitive care) is a useful framework in helping to categorise good (warranted) and bad (unwarranted) variation.

2.3.1 Effective care

Unwarranted variation under this category tends to be a matter of underuse

Wennberg's research has shown that when there is strong evidence and a professional consensus that an intervention is effective, there tends to be little or no variation in clinical practice (eg, surgery following a hip fracture) (Wennberg 2010). Admission rates for these conditions can be predicted from knowledge of population statistics. Clinical practice variations occur where there is weak evidence and professional uncertainty on what is effective (Wennberg 2010, Appleby and Raleigh 2011). Despite Wennberg's findings, in New Zealand, in the case of the Cardiovascular Disease (CVD) Atlas, where there is strong evidence and professional consensus, there was still considerable variation found – so the relationship is not always clear.

The degree to which care is organised and coordinated seems to matter: there is less underuse in regions where specialists, primary care doctors and others practise 'team medicine'. There is also less underuse in regions where care may be easier to coordinate: those that have fewer doctors managing the care of chronically ill patients and have more primary care doctors relative to the number of specialists (Right Care 2010; Wennberg 2011).

2.3.2 Preference-sensitive care

More than one generally accepted treatment option is available, such as in elective surgery

This should be about patient choice. It is important to remember that patients in regions with low elective surgery rates are not necessarily going untreated – some patients with arthritis of the knee or hip get non-surgical treatments or try lifestyle modifications.

Although patients should choose their treatment, in everyday practice they delegate decision-making to physicians, and the decision is therefore strongly influenced by local medical opinion.

Successfully reducing unwarranted variation under this category requires a clinical environment that supports shared decision-making and encourages the active engagement of patients in the choice of treatment.

2.3.3 Supply-sensitive care

Mostly related to chronic conditions – unwarranted variation under this category tends to be a matter of overuse

If the resource is available, it is more liable to be used than if it is not (Appleby and Raleigh 2011).

There is little research on the optimum frequencies of use of supply-sensitive care. However, Wennberg has found that variation under this category tends to relate to overuse of services, at least in the US. Wennberg also found that people living in regions with a high-intensity pattern of care – who, by virtue of where they are treated, receive more visits, imaging examinations and admissions – have worse or no better survival than those living in low-intensity regions (Wennberg 2011).

Wennberg suggests the focus under this category should be on converting the ‘black box’ of supply-sensitive care into evidence-based care that is effective or preference-sensitive. Improvement requires the integration of primary and specialty care into organised systems capable of coordinating care; rationalising the clinical pathways for managing the population of those with chronic illnesses; and adjusting capacity to reflect the requirements for efficient use of resources.

2.4 Setting the baseline

To decide what an appropriate level of care is, and what you are assessing variation against, the following steps are useful:

1. Conduct benchmarking to allow comparison of local practices and providers and comparison with similar localities nationally (Right Care 2012).
2. Examine variation in outcomes and clinical activity (Right Care 2012).
3. Draw insights from the data – assess what works well and what does not work well in the specific care-delivery process. Organisations can create a shared baseline – basically their preferred standard of care or best practice for a particular condition or procedure. With the shared baseline serving as a marker, variations can then easily be identified and classified as either warranted or unwarranted (Alexander et al 2012). Focusing on the process leading to individual clinical decisions is more useful than specifying the outcome of decisions (Appleby and Raleigh 2011).

The Institute for Health Innovation (IHI) has created simulations of typical health care scenarios (IHI n.d.), which users can view and interact with at www.SIMUL8.com/IHI

Simulations serve as a tool to:

- understand the impact of variation
- test different scenarios to improve processes.

3. Managing unwarranted variation

The existence of persistent unwarranted variations in health care directly impacts on equity of access to services, the health outcomes of populations and efficient use of resources (Appleby and Raleigh 2011). Managing unwarranted variation is essential to quality improvement.

Identification of and information about unwarranted variation does not always lead to action and it is not enough to influence practice – information tends to serve as a 'tin opener' (Carter et al 1995). Decision-makers need to know where to direct efforts to deal with unwarranted variation, as well as knowing when to actively promote warranted variation through a greater focus on informed patient preferences and better information on effectiveness.

After identifying unwarranted variation, the goal is to engage local clinicians in the drive to redesign care and improve outcomes. Clinical processes may need to be reconfigured to support the delivery of evidence-based care, to eradicate unwarranted variation, and to embed change into the care culture in an effort to avoid any future unintended variation.

An important area of focus needs to be on tackling clinical decisions through greater emphasis on shared decision-making with patients as a way of eliminating unwarranted – and promoting warranted – variation (Appleby and Raleigh 2011). The move in New Zealand towards integrated care and Integrated Family Health Centres may be a good opportunity to implement shared decision-making as a way of reducing unwarranted variation.

3.1 Process for managing unwarranted variation

The *NHS Atlas of Variation in Healthcare for People with Respiratory Disease* (Right Care 2012) provides useful guidance on how to manage unwarranted variation. The following steps are recommended to influence practice and drive change (once locally relevant data have been analysed and unwarranted variation has been identified):

- Systematically and routinely collate and publish data on variations (Appleby and Raleigh 2011). Relevant local data should be used (Right Care 2012).
- Conduct benchmarking to allow comparison of local practices and providers and comparison with similar localities nationally (Right Care 2012).
- Examine variation in outcomes and clinical activity (Right Care 2012).
- Develop a clear narrative to explain why unwarranted variation matters locally. A useful example of this is the *LSE/Right Care Project on NHS Commissioners' Use of the NHS Atlas of Variation in Healthcare – Case Studies of Local Uptake* (London School of Economics, Right Care 2012).
- Identify the important questions the narrative raises about the structure and delivery of care (Right Care 2012).
- Audit whether evidence-based care and good practice is being delivered in a systematic way (Right Care 2012).
- Take a population-based systems approach to reducing unwarranted variation to ensure the delivery of better value and better outcomes for patients and the local population (Right Care 2012).
- Monitor variation over time (Right Care 2012).

The narrative about unwarranted variation is the most crucial step on the pathway from data to change. The narrative helps clinicians and commissioners to understand the magnitude of the problem locally, the impact on population outcomes and the opportunity costs of not reducing unwarranted variation. It helps both leaders and clinicians to take responsibility for local variations in care and outcomes and the need for change in local services, to acknowledge that being 'above average' is not enough, to ask searching questions about how care is delivered across the entire pathway, and to explore solutions that can be owned by both the clinical community and the commissioning community (Right Care 2012).

The American Hospital Association's (2011) *Health Care Leader Action Guide: Understanding and Managing Variation* outlines six steps to understanding and managing variation.

1. Determine your strategic focus to reducing variation.
2. Set measurable goals.
3. Acquire and analyse data.
4. Understand your data.
5. Identify areas of focus.
6. Implement improvements.

Once the strategic areas of focus have been identified, the guide recommends implementing the following improvements.

- Provide feedback of performance data at the provider level.
- Standardise processes of care by using checklists and other clinical and operational protocols.
- Implement evidence-based guidelines and pathways.
- Utilise evidence-based appropriateness criteria.
- Use quality-improvement interventions (such as Lean, Toyota Production System, Six Sigma, Plan-Do-Study-Act).
- Initiate culture change toward safety, improvement, transparency and excellence.

The guide concludes that by approaching the management and reduction of variation through a systematic improvement process in focused areas, inappropriate variation can be reduced to improve overall outcomes.

3.2 Tools to reduce unwarranted variation

Robin Gauld's (University of Otago) research into hospital variation in the US sought to investigate what is being done to counter unwarranted variation in a sample of hospitals in the US (Gauld et al 2011). It looked at the individual hospital experience, particularly at whether hospitals consider unwarranted variations to be a concern and, if so, whether they have strategies in place to combat this. Case studies were conducted at five 'high-performing' hospitals, and a survey of acute care hospitals was conducted in four states. The research produced a mix of strategies used by hospitals to reduce unwarranted variation:

- benchmarking
- clinical practice guidelines
- blinded report cards
- opinion leader education
- pay for performance
- patient engagement
- unblinded report cards.

- adding computerised process steps
- aggressive case management
- concurrent rounds and immediate intervention by a quality analyst
- daily reports on compliance sent to department heads
- interactive discussion with the whole staff every two months during which any areas of real or perceived variance are discussed and consensus is built regarding how to move forward
- interdisciplinary team planning
- peer reviews
- performance improvement teams
- pre-printed discharge orders with checkboxes
- re-engineered discharge processes
- standardised system related to that care.

General Electric (GE) Healthcare's report on *Eliminating Unwarranted Variation in Care* (Alexander et al 2012) recommends the following technology solutions:

- clinical surveillance dashboards to enable quality improvement by providing timely and actionable information at the point of care
- health information exchanges that connect IT systems across a community to create a longitudinal medical record (such exchange helps to fill in the gaps where traditional systemic boundaries occur)
- population health management tools to coordinate, simplify and optimise the delivery of care across systems and populations
- connectivity tools that tie together multiple IT systems, creating a comprehensive view of the patient condition

- analytics (retrospective, predictive and prospective) to evaluate patient data to determine and assuage risk factors (eg, for readmission)
- patient portals to engage patients in their own care, assuring adherence to the standardised, optimal treatment protocols.

3.3 Recommendations on areas of focus

Most of Wennberg's (2010) recommendations for health care reform in the US may also apply to New Zealand.

- Promote organised systems of health care delivery to prevent underuse of effective care. As discussed earlier, team medicine seems to lead to less unwarranted variation.
- Establish informed patient choice as the ethical and legal standard for decisions surrounding elective surgeries, drugs, tests and procedures, and care at the end of life. In terms of preference-sensitive care, treating patients according to their preferences, and not giving them treatments they do not want, requires a clinical environment that supports shared decision-making and encourages the active engagement of patients in the choice of treatment.
- Improve the science of health care delivery. In terms of supply-sensitive care, the most important challenge to the clinical and research communities is to rationalise the clinical pathways for managing chronic disease: to undertake the clinical research required to convert supply-sensitive care into evidence-based care that is effective or preference-sensitive.

Wennberg suggests these goals might be accomplished by:

- promoting the growth of organised care by providing economic incentives to providers who accept responsibility for caring for their population of loyal patients – not just in the acute phase but throughout the course of their illness, a strategy that seems particularly suited for chronically ill patients. The economic incentive is shared savings – the opportunity for providers who become more efficient to retain part of the savings to reinvest in care and reduction of debt. The shared savings strategy could result in large rewards for providers in high-cost regions who reduce their inpatient spending to the per capita levels of providers in low-cost regions.

- promoting shared decision-making and establishing informed patient choice, including changes in laws governing malpractice to provide greater immunity to physicians who provide high-quality shared decision-making, demonstration projects, economic incentives and the assumption by primary care physicians of advocacy and professional accountability for ensuring informed patient choice as a standard of practice.

The King’s Fund report further suggests that local health organisations should be required to publicly justify and explain in a consistent way their relative position on key aspects of health care variation, and that it may also be necessary to explore the development of harder-edged, locally focused incentives to encourage action to deal with unwarranted variation (Appleby and Raleigh 2011).

3.4 Identified enablers

Some key enablers identified through the literature are:

- leadership – medical director
- having a focused programme of work
- administrative support
- clinician buy-in
- adequate information technology
- team-based approaches.

4. Barriers to managing unwarranted variation

Gauld et al's (2011) research identified a range of reasons survey respondents raised for not considering variation to be a concern. These included:

- 'in early stage of trying to reach consensus'
- 'just beginning to tackle this project'
- 'lack of administrative support'
- 'lack of leadership, no medical director to set standards. It [variation] also brings in a lot of additional revenue'
- 'neither the will nor the resources'
- 'physicians resist guideline-based decision-making, citing fear of malpractice'
- 'resources'
- 'strategies thus far have failed; information technology incomplete'

The case studies of 'high-performing' hospitals suggest that concerns about unwarranted variation are real but that developing and implementing strategies to act on these concerns is an emerging activity. The ability to monitor and analyse patterns was limited to those with well-developed electronic medical record systems, adding weight to evidence that these systems need to be implemented more widely. Three of the case study hospitals had yet to develop a focused programme for unwarranted variation; however, implicit within one of these was the notion that the collaborative group practice model alleviates variation. The physician organisations seemed more involved in variation work but used a range of approaches as may be expected in the diversity of the US hospital marketplace.

A recent NHS Atlas of Variation in Healthcare report (NHS 2011) notes that in responding to variation, frequently the first response is that the data is wrong. However, even if the data are not completely accurate, the variations that can be observed in quality, outcome, activity, expenditure and value are too great to be explained only by differences in the recording and analysis of the data.

One of the challenges GE authors (Alexander et al 2012) identified is the difficulty in sharing information across providers. So even if provider organisations have best practice protocols in place, it is difficult to share these practices in the community in a timely, consistent fashion – within institutions, across institutions, and across regional and national boundaries. More specifically, provider organisations struggle to connect disparate and non-standard data from fragmented IT systems, access relevant and timely information and identify root causes that lead to unwarranted variation. This same challenge applies in a New Zealand context. A move towards shared care records may minimise this barrier.

5. Lessons from international experience

5.1 An evaluation of the NHS Atlas of Variation in Healthcare

The article ‘From data to decisions? Exploring how healthcare payers respond to the NHS Atlas of Variation in Healthcare in England’ (Schang et al 2014) explores to what extent and how Primary Care Trusts (PCTs) in England have used the NHS Atlas of Variation in Healthcare (which has highlighted small area variation in rates of expenditure, activity and outcome). The research involved a survey of 53 PCT Chief Executives (out of 151).

Just under half (25 of 53) of the respondents reported not using the Atlas either because they were not aware of it, lacked staff capacity to analyse it, or did not perceive it as applicable to local decision-making. Just over half (28 of 53) reported the Atlas as serving as a prompt to understand variations and as a visual tool to facilitate communication with clinicians. Achieving clarity on which variations are unwarranted and agreeing on responsibilities for action appeared to be important factors in moving from initial information-gathering towards decisions about resource allocation and behavioural change.

The authors commented that generic hurdles to using research evidence – such as awareness, acceptance and perceived applicability of the data (Glasziou and Haynes 2005) – appear to be relevant for variations research. Once these barriers have been overcome, it appears that Atlases of Variation can serve as a ‘tin opener’ (Carter et al 1995) to inform strategic planning by health care payers. They may also help communicate strategic problems to clinicians. However, additional factors appear to be necessary for moving beyond an initial stage of gathering and communicating data towards subsequent stages of the decision-making process where data are analysed and action is taken. Decision-makers need to be able to achieve some clarity and consistency on the definition and operationalisation of the concept of unwarranted variation. Agreements on responsibilities for action and leadership also appear to influence the uptake of variations data.

The article concludes that many payers have been unable to use information on small area variations in expenditure, activity and outcome. To change this, appropriate tools are required to understand the causes of unexplained variation – in particular, unwarranted variation – and enable remedial actions to be prioritised in terms of their contribution to population health.

The authors present a useful framework for moving from data on variations to decisions on resource-allocation.

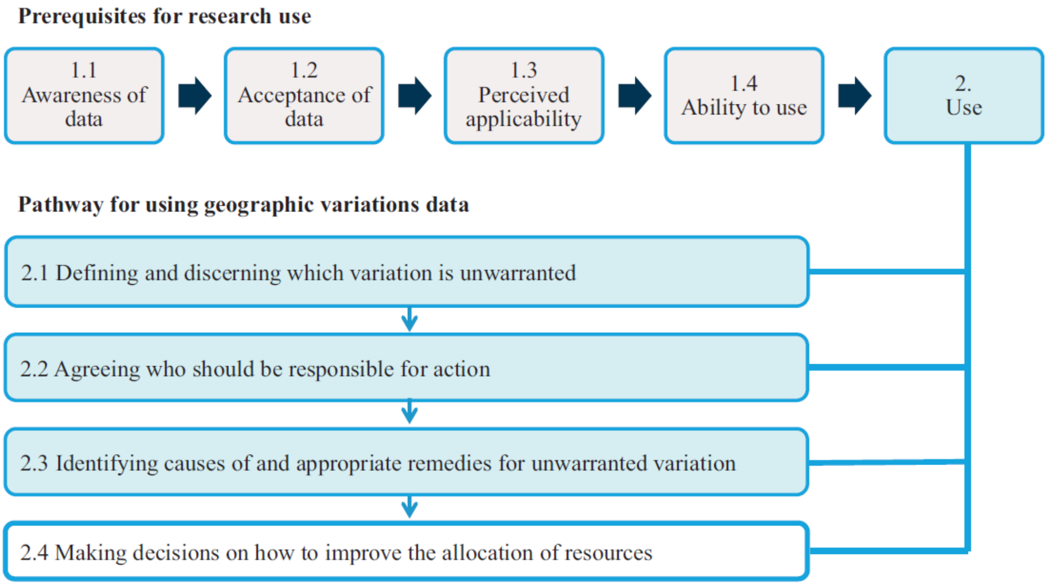


Figure 2. Framework presented by Schang et al (2014)

5.2 Spanish Atlas of Variation

Early in the 2000s, Spain launched an initiative named Atlas VPM: Atlas of Variations in Medical Practice in the Spanish National Health System. The original idea was based on the interest in exploring whether Wennberg’s uncertainty hypothesis and research findings still held when observing the Spanish National Health Service. Bernal-Delgado et al (2014) describe the Atlas of Variation in Spain. They note that the uncertainty hypothesis would state the following.

- Differences in disease patterns and other demand side factors would not substantially explain variability in medical practice.
- Variation would tend to be smaller when the degree of agreement on the value of a particular procedure is high. Conversely, variation would tend to be larger when uncertainty about the relative value of a given procedure is the rule.
- Consequently, the more the uncertainty the more the room for physicians to subjectively weight the value of the procedure, based upon their heuristic learning and beliefs, enabling supply-side factors.

The Atlas VPM Group noted that the wealth of information produced by the Atlas of Healthcare Variation allows for meaningful benchmarking tailored at policy-relevant levels of analysis, supporting focused action to enhance the system's performance. A sustained initiative able to monitor variations over time and investigate the factors underpinning them is a powerful tool in supporting evidence-based policy-making and evaluating the impact of implemented measures.

The Atlas VPM Group identified several issues that should be taken into account to realise the full potential of this information.

- The conceptual framework used in interpreting results should fit the stakeholders' structure of incentives and organisational conditionings built into the institutional arrangements in each country. This way the results' relevance for action and local acceptability is improved.
- Variations analysis is a monitoring tool rather than a firm diagnosis; it helps in guiding further investigation: focusing scrutiny on those geographical units showing non-expected behaviour and on those technologies for which the phenomena is more dramatic or may entail more opportunity costs or inequity issues.
- Sophisticated modelling of clinical practice variation phenomena, introducing innovating probabilistic and multilevel methods, and appropriate statistical treatment of some of the main hindrances are needed. The final goal of strengthening the analytical apparatus is to enhance the reliability of the results and thus improve the quality of the decisions that could be made on their basis.
- The value of variation studies will depend on the specificity of the models analysing underlying factors. There is not a general causal model explaining variation; conversely, underlying factors may be different or affect variation across procedures and contexts differently.

- Good models support suitable attribution of responsibility to different decision-making levels: the decisions can be tracked back and their specific impact on the observed variations carefully explored in conjunction with other factors.
- From a performance measurement perspective, eliciting interdependence across areas allows analysts to identify the relative weight of within neighbourhood vs neighbourhood level factors in the production of unwarranted variations and therefore better focus health care policies and planning.

5.3 The Dutch approach to unwarranted variation

Westert and Faber (2011) note that supply levels in the Netherlands vary less than in the US. This is because health care supply in the Netherlands was (until 2006) centrally planned and controlled by the government. Variations in delivery of health care are not insignificant, however. The 2010 Dutch health care performance report notes remarkable variations in quality and price of health care between care providers. For instance, the percentage of unplanned caesarean sections carried out in low-risk pregnancies varied from 7.3 percent to 30.2 percent across hospitals. This variation is unwarranted because it is to a large extent unrelated to patient-based factors.

Shared decision-making in preference-sensitive care is still a novelty in the international health care sector. Recent Consumer Quality Index questionnaire data on experiences of Dutch hospital patients shed some light on this. Only 50 percent of patients with a malignant breast condition (n=393) or spinal disc herniation (n=1521) reported that they were fully involved in decision-making about treatment and care in a survey conducted by the independent non-profit organisation Consumer Experience Centre. A fifth of patients said they were ‘never/sometimes’ involved. An enormous challenge here is to enhance the patient’s role in determining the use of preference-sensitive care. Variation in these cases is unwarranted if it is predominantly doctor driven and not related to patients’ preferences.

Since the introduction of managed competition into the Dutch health system in 2006, the volume and fees of elective surgery are set by free negotiation between health insurers and providers. As might be expected, given the fact that shared decision-making is still a novelty, the volume of preference-sensitive care went up rapidly and regional variation increased. The number of cataract procedures, for example, increased by roughly 25 percent between 2005 and 2010. Furthermore, in areas with centres that specialised in certain procedures, the rates of those procedures were much higher than in other areas. Apparently the indication for a surgical procedure varies substantially across hospitals. Since the Dutch prefer to get their care nearby, geography seems to matter: what you get depends on where you live. Similar results were observed for prostatectomies and tonsillectomies.

In the Netherlands, where general practitioners act as the gatekeeper of the health care system, bundled payment was recently introduced for chronic diseases – for example, diabetes, chronic obstructive pulmonary disease and management of cardiovascular risk. Under this system, insurers pay a single fee to a newly created contracting entity – the ‘care group’ – to cover a full range of care for a fixed period. The care provided is defined by national guidelines. General practitioners have taken a central position in the care groups. The new system is to bring down unwarranted variation and fragmentation of care. Early signs show that the delivery of diabetes care has improved as a result of the enhanced coordination of care, but it is too soon to see differences in outcomes (such as avoidable hospital admissions).

5.4 Clinical practice variation in Australia

Kennedy (2010) notes the Clinical Excellence Commission has been involved in clinical improvement projects in transfusion medicine, paediatric emergency care, bacteraemia associated with central line insertion, and patients with deteriorating conditions in intensive care units. This work indicates that clinical practice variation is widespread across New South Wales hospitals, with baseline measures recording wide variation in practice. Its publication of an annual chartbook since 2007 has also revealed widespread variation between area health services in New South Wales in rates of key clinical interventions, such as caesarean section, that cannot be explained by demographic or acuity factors alone.

The most common initiative to reduce unwanted variation in clinical practice is the development and implementation of clinical practice guidelines, evidence-based pathways and clinical protocols. As evidence shows, however, development is not enough. In Australia, there have been several recent national initiatives to develop, disseminate and implement best practice. These include the Australian Satellite of the Cochrane Effective Practice and Organisation of Care (EPOC) Group, and the National Institute of Clinical Studies Clinical Practice Guidelines Portal and Register, which provides a central repository of established and planned clinical practice guidelines across Australia.

In terms of barriers to implementation of best practice, the National Institute of Clinical Studies (2006) identified six key levels:

1. the guidelines themselves – whether they are considered feasible, credible, accessible and attractive
2. professionals’ individual levels of awareness, knowledge, attitude, motivation to change and behavioural routines
3. patients’ knowledge, skills, attitude and compliance
4. professionals’ social context – opinion of colleagues, culture of the network, and level of collaboration and leadership
5. organisational context – infrastructural elements supporting or inhibiting uptake (eg, staff, processes, capacities, resources and structures)
6. economic and political context – broader influences supporting or inhibiting uptake, such as financial arrangements, regulations and policies.

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