

Variation matters and should be included in health care research for comparison of outcomes

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Background: Health care is provided under the conditions in which people live and under the rules and regulations of a prevailing health system. As a consequence, ‘local’ circumstances are an important determinant of the actual care that can be provided and its effects on the health of individuals and populations. This plays in particular, but not exclusively, a role in community-based primary health care. Although this is generally accepted, there is little insight in the *impact* of the setting and context in which health care is provided on the outcome of care. **Aim:** This paper argues the case to use this natural variation within and between countries as an opportunity to be used as a form of natural experiment in health research. **Arguments:** We argue that analysing and comparing outcomes across settings, that is comparative outcomes of interventions that have been performed under different health care conditions will improve the understanding of how the real-life setting in which health care is provided – including the health system, the socio-economic circumstances and prevailing cultural values – do determine outcome of care. **Recommendations:** To facilitate comparison of research findings across health systems and different socio-economic and cultural contexts, we recommend a more detailed reporting of the conditions and circumstances under which health research has been performed. A set of core variables is proposed for studies in primary health care.

Key words: health systems; international collaboration; primary health care development; primary health care policy

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Rationale for context informing comparative outcome research to advance improvements in health systems and primary care

Most health problems are managed in the community, where a large majority of the population

are cared for, most of the time (Green *et al.*, 2001). As a consequence, local circumstances define the care that can be provided. This applies to the health system itself and its resources, as well as to the socio-economic circumstances and determinants of health (CSDH, 2008). Primary health care with its community base exemplifies the requirement for considering the context of care delivery and the variability it creates in the health status of the population it serves. Every setting is unique and its attributes need to be understood as a precondition for implementing quality care

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(van Weel, 2007). What is true for primary health care is true for health care in general: that it is shaped by the circumstances in which it is provided. A strategy for diagnosis, prevention or treatment that is effective in one setting is not necessarily effective elsewhere (Siregar *et al.*, 2011).

Variation under which health care is provided is considered within some empirical paradigms as a research bias, which needs to be accounted for via study design and analysis. This paper argues the case to use this variation as an asset, to help to explain how seemingly similar interventions produce diverse outcomes. We argue that analysing and comparing outcomes across settings, that is comparative outcomes, allows us to understand the attributes of context, or real-life setting and conditions, that co-determine outcomes of care. Moreover, to advance scientific knowledge about the impact of context on variability in the quality and outcomes of care we specify a set of core variables that might be considered in conducting such research in primary care.

Understanding the attributes of the context and conditions in which health care is delivered, and the way this enhances or impedes its impact is important to further the effectiveness and quality of care. Comparisons of outcome of care between settings can be powerful in this regard. A recent example of the benefits of considering variability comes from a review of randomised trials conducted into health workers in sub-Saharan Africa, which identified nine contextual factors associated with performance (Blacklock *et al.*, 2016). International collaboration can support health systems to innovate and change (van Weel *et al.*, 2015). For example, pharma care coverage is a hot topic in many countries because all are challenged to produce optimal value for investment. The experience in Quebec was the first jurisdiction to institute mandatory universal prescription drug coverage through a public and private insurance approach, other regions and countries could learn from this experience through a comparison with their own performance: The Quebec policy reform showed a reversal of the international trend for poorer compliance in the most economically disadvantaged (Tamblyn *et al.*, 2014). Advancing the capacity to conduct international comparisons provides unique opportunities to examine the role of different health systems and policies on health outcomes and equity.

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It is important in this context to clarify and critically appraise the nature of outcomes that need to be considered in health systems and community-based primary care research. A good example is the ‘paradox of primary care’; while subspecialists may achieve better disease-specific results, in comparison to generalists – primary care results in enhanced population health (Stange and Ferrer, 2009). Functional health status (Huber *et al.*, 2011) may be a more relevant outcome to inform primary health care and public health, than markers of disease while the latter will be pertinent to subspecialist interventions. Outcome selection will be justified by the study focus; specifically the impact of care on patients or populations, and/or the process or structure in which care is provided (Donabedian, 1988; 2005).

Implications and measuring quality

To compare outcomes of care asks for an analysis of the most important differences and similarities between settings. Understanding and interpreting variation are key features of comparative outcome research and this is at-odds with those paradigms of health research that aim to control the circumstances in which interventions are studied. Future research will continue to require the use of more sophisticated choice of designs that are appropriate for comparisons of complex interventions in different contexts, that will need to be informed by the views of multiple stakeholders including consumers and policy makers. Combining different domains and data sets (The National Centre for Geographic and Resource Analysis) is of great importance, while not all that matters may have been or can be, quantified. Capturing quantitative and qualitative data will enhance the understanding of differences between settings, requiring the use of use of matrices to combine mixed methods (Miles *et al.*, 1984). A substantial literature exists on alternative research paradigms for dealing with local context, both how to characterise it and how to modify trial design to measure its impact, founded in principles of realistic evaluation first developed about 20 years ago (Tilley and Pawson, 1997).

The quality of such research is marked by the richness of naturally available variation that can be included in the study of natural experiments,

enriched by the availability of substantial advancements in methodologies to control for potential biases in observational research. This is essential for research to support practice and move

from the creation of knowledge about what interventions *can* work to insight of their value of what works under different prevailing health care contexts that will allow us to optimise their effects. To achieve the expected advancement in the health of the population, we need to balance considerations and research investment to accelerate the transition from efficacy to effectiveness to implementation and to innovation in care (Box 1).

Box 1 From efficacy to system redesign

Research paradigm	Questions addressed
Efficacy	Does this intervention work under controlled conditions?
Effectiveness	Does the intervention improve the health outcome of the patient when applied in everyday conditions?
Implementation	Can the intervention work when applied across settings?
System redesign	How to structure the system to facilitate relevant interventions?

The issue: describing the context, especially in relation to primary care

Box 2 presents attributes that should be measured in assessing the context of care. To illustrate its application, a powerful example from two countries with highly comparable population health and socio-economic status, and also comparable level of medical education, is used as it shows the impact of an essentially different basis of financing general practice. This is especially notable in primary health care where professionals specialise *in-depth* in the patients' context, so as to be able to address the full *breadth* of their health problems. Comparing outcomes between primary health care studies therefore would benefit

Box 2 Antibiotics prescribed for respiratory conditions: Belgium and the Netherlands

Resistance to antibiotics is an important health problem that continues to increase and unnecessary prescribing is a major driver of this problem (Goossens *et al.*, 2005). There are marked differences between Belgium and the Netherlands in this respect, with much higher use in Belgium. Most prescriptions of antibiotics are initiated in primary health care, and in both countries evidence-based guidelines are available that promote restrained use of antibiotics (Belgian Antibiotic Policy Coordination Committee, 2008; Dutch College of General Practitioners, 2015).

The two countries are highly comparable in their population health status and socio-economic circumstances, and the main reason to explain the differences in prescriptions has to be found in the structure of the health care system. In the Netherlands patients are allocated to a family practice, receive all their health care through that practice with their family physician receiving capitation payment, Belgian patients are free to contact any family practice and family physicians are payed on the basis of discrete items for service delivered.

While the Dutch health care structure is relatively neutral to the actual content of care provided, in Belgium prescriptions play a role in securing practice income and binding patients to a practice. This may illustrate that insight into understand differences in prescribing and use of antibiotics depends on an understanding of the health system. A more restrained prescribing of antibiotics can be expected from a redesign of the Belgian health system.

from a standardisation of how to describe the setting and context. To support comparative outcome studies we propose the development of a core set of primary health care sensitive measures.

Measuring the context of health care

A number of domains can be distinguished in the real-life world in which health care is provided, and which can be included in the reporting of studies to support policy makers and may facilitate the generation of hypotheses of ‘context that matters’:

- Health system

Structure of health care towards access: navigated through primary health care versus patients’

freedom to access every physician; insurance and coverage (including that for mental health); availability of services; financial barriers for patients (co-payment, deductible); payment of provider (capitation, item for service, performance incentives); the contract relation between patient and provider: patients listing (rostered) with primary health care practices).

- Social welfare

Pensions; unemployment benefits; sickness benefits; community support services for social needs.

- Population and society

Population demographics (gender, age, social class, education and employment status, ethnicity, religious convictions, health status markers).

Box 3 Presentation of information on context of care

Domain	Item	Information	Presentation
Health system	Structure	Yes/no primary care based	Narrative
	Insurance	No/restricted/comprehensive	Narrative
	Financial barriers	Yes/no co-payment, deductible	Narrative, \$
	Availability services	Waiting lists, shortages	Narrative, numbers/ population
	Provider payment	Capitation/item for service/ performance incentives	Narrative
	Patient’s contractual relation with provider	Preferential provider/rostering- panels of patients/free access	Narrative
Social welfare	Pensions	Yes/no	Narrative
	Unemployment benefits	Yes/no	Narrative
	Sickness benefits	Yes/no	Narrative
	Community support services	Yes/no	Narrative
Population and society	Demographics	Age	Standard age classes
		Sex	F/M
		Social class	Standard class
		Education	
		Ethnicity	
	Religion		
	Population health	Life expectancy	
		Main causes of death	
		Dominant health problems	
Objectives of interventions	Diagnostic	Rule-in/rule-out/risk assessment	Narrative
	Therapeutic	Preventive/curative/palliative/ functioning	Narrative

- Objectives of diagnosis and treatment

A diagnostic intervention can aim to rule-in or rule-out a health problem or specify individual risk status. Treatment can have the objective to prevent a health problem, cure it, provide palliation and symptom relief or improve functional capacity.

Consistent reporting of the study context will ensure rigour in comparative outcome analysis and inform professionals, policy makers and service users how the context of care may enhance or impede outcome. A proposal to standardise descriptions is given in Box 3.

Conclusion

This paper has argued the case for comparative outcome research to support the development of (primary) health care interventions, the implementation of novel approaches and redesign of the health system. This requires the explicit and where possible standardised presentations of the context. Research methodology for comparative outcome studies is available, but its relevance is undervalued. Part of the problem is that national funding agents often restrict the use of their funds to their own national jurisdiction. To overcome this problem innovations in the funding of health research are needed (van Weel *et al.*, 2015). First and foremost, though, is to understand the scientific and health benefits that can be realised by comparing the outcomes of health interventions across countries and jurisdictions. Routinely presenting information of studies' setting and context could help raising awareness of its importance and help generate more specific hypotheses for further in-depth research.

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