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Estimating community health needs against a Triple Aim background: What can we learn from current predictive risk models?

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ABSTRACT

Introduction: To support providers and commissioners in accurately assessing their local populations' health needs, this study produces an overview of Dutch predictive risk models for health care, focusing specifically on the type, combination and relevance of included determinants for achieving the Triple Aim (improved health, better care experience, and lower costs).
Methods: We conducted a mixed-methods study combining document analyses, interviews and a Delphi study. Predictive risk models were identified based on a web search and expert input. Participating in the study were Dutch experts in predictive risk modelling (interviews; $n = 11$) and experts in healthcare delivery, insurance and/or funding methodology (Delphi panel; $n = 15$).
Results: Ten predictive risk models were analysed, comprising 17 unique determinants. Twelve were considered relevant by experts for estimating community health needs. Although some compositional similarities were identified between models, the combination and operationalisation of determinants varied considerably.
Conclusions: Existing predictive risk models provide a good starting point, but optimally balancing resources and targeting interventions on the community level will likely require a more holistic approach to health needs assessment. Development of additional determinants, such as measures of people's lifestyle and social network, may require policies pushing the integration of routine data from different (healthcare) sources.

1. Introduction

Amidst pressures to slowdown the level of public spending on health, many Western governments have to sustain an ageing population with increasing and changing long-term health needs [1]. Community-focused, integrated care is seen as an important means to meet this challenge, and is promoted as such in current policies across the globe. In both England and the United States, for example, provider networks – called clinical commissioning groups (CCGs) and accountable care organisations (ACOs), respectively – were recently introduced to encourage clinicians to reshape services in a more joined-up and seamless way

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that meets local population health needs [2,3]. Similarly, in 2013, the Dutch Minister of Health, Welfare and Sports appointed nine intersectoral provider networks aiming to rearrange health services based on population needs as 'pioneer sites' to be monitored over the coming years [4]. Ultimately, these policies are thought to push towards achieving the so-called 'Triple Aim' formulated by Berwick et al. [5], that is, improved population health, better care experience, and lower overall per capita costs.

Actually creating community-focused, integrated care in practice is nevertheless a daunting task, with many international health systems still characterised by fragmented organisational structures [6]. Changes are needed, amongst others, in funding models, operations and processes, and performance measurement [7]. However, one basic condition to make any endeavour towards the Triple Aim actionable is the ability to accurately estimate local populations' health needs and use this information to design, specify and procure services that meet those needs, within the resources available [8]. Thus, one of the primary aims of introducing CCGs in England was to increase GPs' influence in commissioning services for their communities, based on the premise that using GPs' clinical knowledge will lead to more informed, efficient resource allocation. CCGs are now responsible for commissioning the majority of health services, including elective hospital care and community services, and control around two-thirds of the English NHS budget [3]. In the US, the introduction of ACOs has similarly transferred a degree of financial responsibility to healthcare providers. When an ACO succeeds in both delivering high-quality care and slowing spending growth, it shares in the savings it achieves [3].

While governments underwrite the importance of 'continual analysis of community health needs' to enable execution of the Triple Aim, it is generally left up to provider networks like CCGs and ACOs to develop or acquire a suitable instrument to do so [9,10]. In many countries, this has led to a renewed interest in predictive risk models, which use relationships in historic, administrative health data to estimate the future health service use and/or costs of individuals or populations [11]. However, given the complexity and sheer number of available alternatives, choosing a predictive risk model is not an easy task for provider networks. Moreover, considerable debate has sparked in some countries, amongst which the Netherlands, about the value of existing predictive risk models for predicting community health needs against a Triple Aim background. Concerns are, for example, that efficiency is impossible to incentivise when estimations of future needs are based on past service consumption, as is the case in most current models. Also, there is a lack of insight into which determinants are relevant to predict population health needs when seeking to fulfil the Triple Aim through community-based, integrated care. The aim of this paper is to further the debate in the Netherlands, while at the same time sharing relevant insights with stakeholders in other countries facing similar challenges. For this purpose, an overview is presented of current Dutch predictive risk models, focusing specifically on the type and combination of included determinants and their relevance for estimating population health needs against a Triple Aim background.

2. Methods

To produce and analyse a compositional overview of Dutch predictive risk models, we applied a mixed-methods approach combining document analyses, interviews, and a Delphi study. Predictive risk models were identified based on a web search and input from the study's Scientific Advisory Board, which gathered representatives from eight professional bodies, including national associations of GPs, nurses and health insurers, primary and integrated care associations, and the Dutch Healthcare Authority and Ministry of Health, Welfare and Sports. To search the web, we entered Dutch search terms related to health needs assessment – e.g. 'prediction of care needs', 'prediction of care demands', 'prediction of care use', 'prediction of care costs' – into the Google search engine. The output of the web search was presented to the Scientific Advisory Board, which added further suggestions for models not identified online. To be included in the study, models had to: (1) combine two or more determinants correlated with health service use or costs (as a reflection of health needs [12]); (2) use these determinants prospectively to estimate and/or influence future service use or costs; and (3) focus on general practice, chronic care (delivered by primary care-based provider networks) and/or community care. Based on these criteria, a purposive sample of predictive risk models was included.

To collect qualitative data on these models, we did an extensive document study synthesizing evidence from articles and reports on model development, model updates and/or performance evaluations. In case of newer, less well published models, we complemented any available documentation with semi-structured interviews with one or more key informant(s) actively involved in the model development. Thus, one researcher (AE) conducted nine interviews with eleven key informants. The interview guide covered the following issues: (1) model objectives; (2) basic model features; and (3) included determinants. With permission of the respondents, all interviews were recorded and transcribed.

Document and interview data were analysed descriptively using a purposely-built data matrix based on the interview guide. The determinants included in each model were extracted and classified according to Andersen and Newman's Behavioural Model of Health Service Use [13]. This theoretical framework, which is one of the most widely used models for analysing health care utilisation [14,15], assumes that people's health care consumption is a function of societal determinants, health system features, and individual determinants (see Fig. 1). The latter constitute the focus of this study and can be differentiated into predisposing, enabling and illness level factors. Predisposing factors relate to people's personal predisposition to use health services and include, for example, age and sex. Enabling factors are contextual variables, like income and health insurance status, which can either support or impede an individual's service use. Illness level factors, finally, are indicators of health status – both perceived and evaluated – such as the presence of a chronic disease [13–15].