



# How to evaluate population management? Transforming the Care Continuum Alliance population health guide toward a broadly applicable analytical framework

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## ARTICLE INFO

### Article history:

Received 20 February 2014

Received in revised form

13 November 2014

Accepted 1 December 2014

### Keywords:

Population management  
Population health management  
Analytical framework  
Evaluation

## ABSTRACT

Many countries face the persistent twin challenge of providing high-quality care while keeping health systems affordable and accessible. As a result, the interest for more efficient strategies to stimulate population health is increasing. A possible successful strategy is population management (PM). PM strives to address health needs for the population at-risk and the chronically ill at all points along the health continuum by integrating services across health care, prevention, social care and welfare. The Care Continuum Alliance (CCA) population health guide, which recently changed their name in Population Health Alliance (PHA) provides a useful instrument for implementing and evaluating such innovative approaches. This framework is developed for PM specifically and describes the core elements of the PM-concept on the basis of six subsequent interrelated steps.

The aim of this article is to transform the CCA framework into an analytical framework. Quantitative methods are refined and we operationalized a set of indicators to measure the impact of PM in terms of the Triple Aim (population health, quality of care and cost per capita). Additionally, we added a qualitative part to gain insight into the implementation process of PM. This resulted in a broadly applicable analytical framework based on a mixed-methods approach. In the coming years, the analytical framework will be applied within the Dutch Monitor Population Management to derive transferable 'lessons learned' and to methodologically underpin the concept of PM.

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## 1. Introduction

The coming decades, health care demands will increase as a consequence of aging populations and emerging

technological innovations [1,2]. At the same time, resources are limited, in particular during these times of low economic growth. As a result, providing high-quality care, while remaining affordable and accessible, has become a pertinent challenge for many health systems [3–5]. Moreover, the nature of health care delivery is changing since chronic diseases are detected at an earlier age and emerging medical technologies have improved treatment possibilities. These developments result in longer lives for people with diseases using more expensive technological innovations. Therefore, the health needs

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of chronically ill and frail elderly should be managed within daily life and beyond medical care. Public health, social care, welfare, and employers should be involved in addressing these needs as well.

In response to these issues, initiatives have been developed internationally, aiming to integrate services across health care, prevention, social care and welfare, often labeled as population (health) management (PM) [6–12]. Several definitions of PM were formulated (see Appendix 1 [38–54]), but an unambiguous and broadly agreed definition is lacking. In general, PM initiatives strive to address health needs at all points along the continuum of health and well-being for a specified population by integrating services across health care, prevention, social care and welfare. The impact of these PM initiatives is increasingly assessed by the extent to which they contribute to the Triple Aim. The Triple Aim, as formulated by Berwick et al. [13], pursues simultaneously: (1) to improve (experienced) quality of care, (2) to improve the health of the population, and (3) to reduce per capita costs (or cost growth).

Numerous conceptual models for framing and/or evaluating complex interventions and reforms like PM exist [8,14–18], but most of these models are applicable to a part of PM like chronic care [14,17], public health [15] or for a specific organization model [16]. The most useful model for PM seems to be the Care Continuum Alliance (CCA) model [9,10]. The CCA, which recently changed their name into Population Health Alliance (PHA), is an industry trade group of stakeholders that provides services aimed at improving population health [19]. Although it is not the only model developed for PM specifically, the CCA model is the most comprehensive model for evaluating PM and it conveys the core elements of the concept of PM on the basis of six subsequent steps. However, the CCA model lacks a detailed operationalization of these six steps. Next to that, the CCA model is predominantly quantitatively oriented, concentrating on a quantitative effect evaluation in terms of the intended outcomes. A qualitative evaluation of the implementation process of PM initiatives in addition to the quantitative evaluation is needed for deriving transferable 'lessons learned'. In addition, the CCA model's focus is on the implementation and evaluation of PM within an individual PM site, while it is also of interest to evaluate and compare several PM initiatives.

Therefore, the aim of this article is to transform the CCA model toward an analytical framework, applicable for comparing PM sites across regions and countries. First, we start with a general description of the CCA model [9,10]. Next, we describe the proposed adjustments to the current model. Finally, we will discuss the limitations and future development areas.

## 2. The Care Continuum Alliance (CCA) model

The CCA framework describes the core elements of the concept of PM and consists of 6 subsequent steps, although we noticed that these steps slightly differ between and within the different CCA reports [9,10].

### 1. Population identification

Starting point is the identification of the population, based on different characteristics/criteria like geographical location of citizens, inclusion in a health insurance program, or enrollment in a GP practice.

### 2. Health assessment

The 'health assessment' step of the CCA model refers to the efforts to assess the health of the population identified in step 1. This step results in detailed 'snapshots' of the enrolled population. This assignment is data-driven and is depending on available information like basic demographic data, epidemiological data, clinical registration data, pharmacy and laboratory data, claims data and population surveys. The model emphasizes that profound analyses are necessary to gain in-depth insight in the health needs of the targeted (sub)populations.

### 3. Risk stratification

Based on the outcomes of step 2, individuals will be stratified into meaningful categories for intervention targeting. The model states that this stratification should include categories that represent the continuum of care in the population, from prevention to palliative care.

### 4. Patient-centered interventions

Step 4 concerns the implementation of patient-centered interventions. Ideally, a set of interventions is implemented which covers the whole spectrum; from public health interventions to stimulate healthy lifestyle till palliative care interventions to provide the best possible quality of life for people approaching the end of life. In this manner, the model depicts that public health interventions and health care interventions are complementary and strive the same goal, namely to increase the health of the population.

### 5. Impact evaluation

An important aspect of the CCA model is the evaluation of the effects of the interventions. The goals as stated in the CCA model (psychosocial outcomes, behavior change, clinical and health status, patient and provider productivity, patient and provider satisfaction, quality of life, financial outcomes) show large overlap with the Triple Aims domains.

### 6. Quality improvement process

Finally, the CCA model also emphasizes the importance of a continuous quality improvement process. Based on steering information derived from the impact evaluation (step 5), continuous learning cycles need to be implemented by the PM organization. These cycles are not limited to changes in the content of the 'interventions' (step 4); they also focus on all other steps.

## 3. Expanding the CCA model and transforming it into an analytical framework

We expand the CCA model in multiple ways. First, we refined and further operationalized the current CCA quantitative methods and instruments. In the remainder of this paragraph, we present the adjustments and refinements we propose in each step of the CCA model. After that, we add a qualitative part to the CCA model, which gives the

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