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Chapter 8

General discussion

Today, Dutch nursing homes are confronted with two seemingly incompatible goals. They face the challenge of providing high quality care while reducing costs at the same time. As a result, most nursing homes are looking for ways to further streamline their care and support activities. It is this challenge that is addressed in this thesis. More specific, the main objective of the work presented in this thesis is to contribute to the optimization of daily nursing home operations, where optimal is defined as meeting the healthcare needs and time preferences of the nursing home clients in the most cost-efficient manner. To achieve this objective, knowledge and insights from the field of logistics were used.

In this chapter the results of the research presented in chapters 2 through 7 are considered in light of this overall objective. In the first section, the key findings are discussed alongside their implications for practice. Next, in Section 2, recommendations for future research are made.

8.1 Key findings and implications for practice

When it comes to nursing home care, the relevance of 'quality of care' differs from many other service settings. This is the case because nursing home clients are often in need of ongoing assistance with basic activities of daily living due to physical or psychological disabilities. Consequently, in order to live their lives according to their own preferences, nursing home clients depend greatly on being provided with the opportunity to influence the delivery of their own care. In other words, an important measure of quality of care in a nursing home context is the extent to which the needs and preferences of the clients are

being met. This view on quality is in line with a client-centred care approach, in which clients' wants, needs and preferences are respected and acted on and where clients are autonomous and able to decide for themselves. Unfortunately, in practice the influence of nursing home clients on the actual delivery of health care is still limited. Two important reasons for this lack of influence can be distilled from the work presented in this thesis.

First of all, the current state of affairs often leaves healthcare providers floundering in the dark as to how they should facilitate personal autonomy. To better understand the current struggle with the concept of personal autonomy in healthcare, we considered its historical-philosophical underpinnings. Three main traditions were identified: the Classical, the Modern and the Late Modern tradition. These three traditions still play a key role in current discussions on personal autonomy in healthcare. As such, Chapter 2 assists policy makers and managers to understand more fully the concept of patient autonomy and to help evaluate the trade-offs that their policy choices might entail.

The second reason for the lack of influence of nursing home clients on their own care is the shortcoming of knowledge and expertise on how to provide client-centred care without overstretching the budget. Most Dutch nursing homes are struggling to survive on the tight budgets provided to them, let alone giving substance to a more client-centered approach. The conceptual framework presented in Chapter 3 provides an integral approach to the understanding of the aspects that are of importance when it comes to efficiently meeting the healthcare needs and time preferences of nursing home clients. The framework facilitates the assessment of the logistical operations of a nursing home.

In order to make it possible for nursing home clients to live the lives they prefer, nursing homes should aim to deliver the necessary care and support as close as possible to the time preferences of their clients, i.e., minimizing earliness and delay. In practice however, when it comes to the coordination and timing of service delivery, nursing homes have to balance the goal of meeting clients' preferences with the efficient use of resources. In the second part of the thesis (chapters 4, 5, 6 and 7) this challenge is addressed by analyzing real-life nursing home data using quantitative methods stemming from Operations Research (OR). The results presented in these chapters reveal some valuable insights for nursing home managers and policy makers.

Chapter 4 investigates how the demand patterns of scheduled care of five Dutch nursing home departments fluctuate over time and over the course of

a day. Furthermore, this chapter also provides insight in the consequences of these fluctuations in terms of workload and waiting time, whereby the possible advantages of pooling care workers from multiple departments were taking into account. The results show that especially during the early morning the workload is high which results in (virtual) waiting times up to 40 minutes. It is also shown that increasing the scale of scheduling by pooling care workers from multiple departments can have a substantial positive effect on the average waiting times. This is in line with the findings presented in Chapter 5. This chapter shows that substantial efficiency gains can be achieved by increasing the scale of scheduling during the morning care (7:00-11:00 hours). These findings with respect to scale are of great practical importance, as there is a trend towards small-scale living facilities. With the results of this thesis in mind, policy makers and nursing home managers should not blindly focus on creating small-scale living facilities, without taking potential economies of scale into account. Hence, creating small-scale living facilities must not become be an end in itself.

Despite the fact that waiting times can be reduced by pooling care workers from multiple departments, during busy periods of the day, waiting times remain considerable (see Chapter 4). To meet demand during busy time intervals, more flexibility is required. A possible strategy would be to increase the functional flexibility of the workforce by enlarging care workers' jobs (i.e., blending tasks of different qualification levels). Chapter 5 shows that indeed considerable efficiency gains can be obtained by blending tasks of different qualification levels. As such, the assumption that differentiated practices provide nursing homes with the most efficient and effective use of scarce resources is open to question. Another possible strategy would be to increase the numerical flexibility by creating a flex pool. A flex pool consists of care workers who are on call and available for work as and when required. Supplementing a core team of full-time care workers with flex pool workers allows nursing homes managers to better balance their staffing levels over the course of a day.

The results presented in Chapter 6 show that queueing theory can be useful to gain insight in the real-life performance of the 'care on demand' process in a nursing home. Based on the analysis of real-life call button data a queueing model was developed. From a practical perspective, this queueing model provides a basis on which it is possible to develop a staffing support tool for care on demand activities. Such a tool allows nursing home managers to (1) determine the number of care workers required to sufficiently meet the needs

and preferences of the nursing home clients when it comes to care on demand and (2) to better understand the implications of their decisions (i.e., what-if scenarios). Such a tool has the potential to make an important contribution in the quest for more efficiency, without losing sight of the needs of clients.

Chapter 7 analyzed the performance of small-scale living facilities (SSLFs), focusing on the problem of meeting the time preferences of clients regarding the delivery of care and support. A simulation model is developed which resembles the current care delivery process in a nursing home department with four SSLFs. The model is used to examine the performance under various scenarios. In addition to the previous chapters, this chapter takes both scheduled and unscheduled care activities into account. The results presented in Chapter 7 show that to further improve the performance in the short run, the focus should lie on: increasing (1) the allocation flexibility of care workers and (2) the number of clients per SSLF. The presented simulation model is an important step to better understand the real-life performance of SSLFs and the underlying relationships involved. As such, it provides a basis for building a decision support tool for nursing home managers.

In conclusion, this thesis provides valuable insights for nursing home managers and policy makers regarding the optimization of nursing home operations. As such, the work presented in this thesis is an important first step towards high value(d) nursing home care.

8.2 Future research

When it comes to decision making in a nursing home setting, managers often rely on ad-hoc straightforward strategies. There is a considerable chance that these strategies fall short in meeting the expectations of the clients in an efficient manner. This thesis shows that data-driven methods stemming from the field of logistics and OR can support nursing home managers in efficiently meeting the preferences of their clients. However, in practice, there is a lack of reliable and valid data. Fortunately, due to developments in technology (e.g., ICT support for domestic tasks, robotics and registration systems), data generation is likely to increase exponentially in the near future. As such, an important future challenge will be to transform these data into tools that support decision making. This will be a challenging task as nursing home processes have many complex characteristics and research on nursing home operations from an applied mathematical perspective is still in its infancy.

Due to governmental measures, most Dutch elderly are forced to stay in their own houses instead of going to a nursing home or assisted living facility. Hence, clients with a demand for lighter types of care will no longer receive an indication for admitted patient care. Instead, they will receive care at home. Furthermore, clients will have to rely more on their own (personal) network and less on healthcare services provided by the government. Due to these reforms many of the traditional nursing homes will eventually disappear. According to a recent study (Zorgvisie, 2013), there is a threatened closure for 800 of the 2000 nursing homes as a result of these current reforms. However, many new private nursing have been opened in the recent years. This increasing private sector role will most likely lead to an increasing emphasis on streamlining operations.

When it comes to streamlining operations, we believe nursing home managers and scientists can benefit from insights derived from other service industries. For instance, like nursing homes, call-centers also face the challenge of efficiently handling high variability in demand while maintaining an acceptable level of service.