Health Policy xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Health Policy

journal homepage: www.elsevier.com/locate/healthpol

Full-length article

Evaluation of minimum volume standards for surgery in the Netherlands (2003–2017): A successful policy?

Roos Mesman[a,*], Marjan J. Faber[b], Bart J.J.M. Berden[a,c], Gert P. Westert[b]

[a] Tias School for Business and Society, Tilburg University, Warandelaan 2, Postbus 90153, 5000 LE Tilburg, The Netherlands
[b] Radboud University Medical Center, Radboud Institute for Health Science, Scientific Institute for Quality of Healthcare (IQ healthcare), Postbus 9101 (114), 6500 HB Nijmegen, The Netherlands
[c] Elisabeth-Tweesteden Hospital, Hilvarenbeekseweg 60, 5022 GC Tilburg, The Netherlands

ARTICLE INFO

Article history:
Received 10 May 2017
Received in revised form
16 September 2017
Accepted 19 September 2017

Keywords:
Volume-outcome relationships
Quality improvement
Health care policy
Selective purchasing

ABSTRACT

Purpose: To evaluate the introduction and implications of minimum volume standards for surgery in Dutch health care from 2003 to 2017 and formulate policy lessons for other countries.
Setting: Dutch health care.
Principal findings: Three eras were identified, representing a trust-and-control cycle in keeping with changing roles of different stakeholders in Dutch context. In the first era 'regulated trust' (2003–2009), the Dutch Inspectorate introduced national volume criteria and relied on yearly hospital reported data for information on compliance. In the second era 'contract and control' (2009–2017), the effects of market-oriented reform became more evident. The Dutch government intervened in the market and health insurers introduced selective contracting. Medical professionals were prompted to reclaim the initiative. In the current era (2017-), a return of trust in self-regulation seems visible. The number of low- volume hospitals performing complex surgeries in the Netherlands has decreased and research has shown improved outcomes as a result.
Conclusions: Based on the Dutch experience, the following lessons can be useful for other health care systems: 1. professionals should be in the lead in the development of national quality standards 2. external pressure can be helpful for professionals to take the initiative and 3. volume remains a controversial quality measure. Future research and policies should focus on the underlying mechanism of volume-outcome relationships and overall effects of volume-based policies.

1. Introduction

Improving patient safety in high-risk care such as surgery has been a priority in many countries [1,2]. Since the 1970s, international peer-reviewed studies identified case volume as an important influential factor for better outcomes after surgery. Especially in high-risk surgery such as oesophageal resections and abdominal aortic surgery [3–22]. As in many other countries, these insights have been transferred into volume-based policy in the Netherlands. This policy is aimed at directing certain surgical procedures away from low-volume providers in an effort to reduce patients' risks of adverse outcomes. For this purpose, government bodies and payers (health insurers) enforce minimum volume standards. Although no health care system is alike, the Dutch context offers an interesting setting to evaluate the use of minimum volume standards over a 14-year period (2003–2017). The aim of this evaluation is to gain insight into minimum volume standards in the Dutch Health care system and to formulate policy lessons for other countries. We set out to answer the following research questions: How were minimum volume standards introduced in the Netherlands? What have been their implications? What lessons can be learned from Dutch experiences?

For a better understanding on the context of this paper, some background information on Dutch health care is required. Since the Second World War, the role of the Dutch government was focused on direct control of volumes, prices and productive capacity [23]. In 2006, a new Health Insurance Act came into effect and signified a fundamental reform in Dutch health care [24,25]. The system of public and private insurance was abolished and replaced by managed competition for providers and insurers. The new system introduced three markets: health care provision, health insurance

* Corresponding author.
E-mail addresses: roos.mesman@gmail.com (R. Mesman), Marjan.faber@radboudumc.nl (M.J. Faber), b.berden@etz.nl (B.J.J.M. Berden), Gert.westert@radboudumc.nl (G.P. Westert).

https://doi.org/10.1016/j.healthpol.2017.09.017
0168-8510/

and the purchasing of health care. The government switched from steering the system to safeguarding the proper functioning of these new markets. The Dutch Healthcare Authority (Nederlandse Zorgautoriteit, NZa) was established for this task and oversees the lawful implementation of the Health Insurance Act by all stakeholders [23,26]. In addition, the The Netherlands Authority for Consumers and Markets (ACM) supervises health insurers and health care providers, as these are subject to the Dutch Competition Act (Mededingingswet) [23]. ACM can track down and enforce the prohibition of cartels and abuse of a dominant market position as well as investigate consolidations.

Health insurers play a central role as prudent purchasers of health care, aiming for more value for money [24]. For this task, health care insurers can apply selective contracting of care (e.g. hospital care) [23–25]. Quality indicators are incorporated in their purchasing criteria, including volume thresholds. However, after more than a decade since the reform, selective purchasing based on quality is still very limited [27].

In Fig. 1 the actors and markets in Dutch health care are shown, as well as how volume-based initiatives play out on each market.

Despite increased market incentives, the Dutch government maintains the formal responsibility for the supervision and monitoring of the quality of the care delivered by both public and private providers [28]. The Dutch Health Care Inspectorate (IGZ) was founded in 1995 as a main advisory body to the Minister of Health, Welfare and Sport and is responsible for regulating quality of care provided by public and private providers [23,28,29]. In 2003, the Inspectorate introduced a set of Hospital Performance Indicators which were both obligatory and public [28]. This provided them with yearly data on the actual performance of every Dutch hospital. Despite governmental regulations on public health and quality of care, self-regulation has traditionally been an important characteristic of the Dutch health care system [23]. Medical professionals are united in national professional associations, which defend the interests of their specific group of medical specialists and facilitate scientific and professional development. For instance, professional associations maintain their own re-registration schemes and develop professional guidelines. Therefore, the Inspectorate highlights "working on the basis of trust in care providers' intrinsic motivation to offer the best possible care. (.) However, we shall not hesitate to impose strict enforcement measures if a care provider displays reckless behaviour, fails to learn from mistakes, or breaks the law" [29,30].

2. Materials and methods

2.1. Data sources and searches

To answer our research questions, we used multiple data sources. Firstly, we consulted research papers and Dutch policy reports to reconstruct important moments in the introduction and enforcement of minimum volume standards in the Netherlands. We focused on publications from the main stakeholders (medical associations, health insurers and government agencies such as the Inspectorate) and mainstream online health care news websites. Second, we obtained hospital reported data on surgical volume of all Dutch hospitals from the Dutch Hospital Database (2003–2016) and assessed yearly Inspectorate reports to assess trends and new developments in volume criteria (2003–2015).

Lastly, in April 2017, we conducted a systematic search in the PubMed electronic database in order to identify relevant studies describing the effects of centralization on surgical outcomes for various procedures in the Netherlands. The search strategy was ["netherlands"[MeSH Terms] OR "netherlands"[All Fields]] AND ((centralization[All Fields] OR centralisation[All Fields] OR regionalisation [All Fields] OR regionalization[All Fields]) OR ("volume"[All Fields] AND concentration[All Fields] AND surgery[All Fields])) AND ["2000/01/01"[PDAT]: "2017"[PDAT]]

This search identified 281 titles, of which 14 remained after screening of abstracts by applying the following inclusion criteria (supplementary file):

- Effects of centralization of care in Dutch hospitals on patient outcomes are assessed.
- Results must be based on empirical data,
- Published in English, no restrictions for year of publication,
- Full-text paper must be available for the researchers.

3. Results

From our analyses, three eras were identified during the introduction and enforcement of minimum volume standards. We start our overview in 2003, because volume indicators were introduced for the first time in that year by the Inspectorate. The first era ends in 2009, marking the beginning of increased government intervention and selective contracting by health insurers. The second era ends in 2017, indicating the end of the emphasis on 'contracts and control' apparent in policy changes made by the Inspectorate and health insurers. In the third era, professionals regain their leading role in establishing quality measures. Given these milestones, the three eras can be labelled as 'regulated trust' (2003–2009), 'contract and control' (2009–2016), 'return of trust' (2017-).

3.1. Introduction and enforcement of minimum volume standards

3.1.1. Regulated trust (2003–2009)

In 1993, The Health Council of the Netherlands, an independent scientific advisory body for government and parliament, published an influential report on quality and distribution of cancer care [31]. It triggered nationwide agreements on concentration of complex care, for instance for hematology, head and neck oncology and sarcoma [32]. Collective efforts for centralization and consensus on minimum volume standards took longer for other surgical procedures. For pancreatic resections, a 10-year plea for centralization in the surgical community did not result in a change in the referral pattern and reduction of the mortality rate [33]. Although professional associations included volume criteria in several guidelines, measures for enforcement were often lacking. The first national minimum volume standards were introduced by the Inspectorate in 2003 [28]. This marked the beginning of volume standards as a quality measure in the Netherlands in which three stakeholders have alternated in taking the lead: Dutch government (Inspectorate), medical professionals and health insurers.

When the Inspectorate introduced the first mandatory set of public performance indicators in 2003, two volume indicators of high-risk interventions were included: volume of repairs of unruptured abdominal aortic aneurysm and volume of resections for oesophageal carcinoma [28]. The Dutch Inspectorate made the following statement about the inclusion of volume criteria: "Practice makes perfect, or at least leads to expertise. With every action in general and especially for technically complex actions such as abdominal aortic aneurysm resections, it is clear that more experience with the procedure leads to lower risk of complications. This applies to the surgeon, but also to the whole surgical team, the anesthesiologist and the doctors and nurses on the Intensive Care Unit or ward" [34].

To minimize the administrative burden, volume criteria in the hospital performance indicator set are not reported on a team level, but on the level of the hospital location where the surgery is performed. Requiring hospitals to report on the number of high-

Please cite this article in press as: Mesman R, et al. Evaluation of minimum volume standards for surgery in the Netherlands (2003–2017): A successful policy? Health Policy (2017), https://doi.org/10.1016/j.healthpol.2017.09.017