

## If you say so

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# If you say so: A mixed-method study of hospital mergers and quality of care

Daan Westra • Federica Angeli • Ron Kemp • Maarten Batterink • Jan Reitsma

**Background:** Despite a lack of supporting evidence, hospitals continue to merge in pursuit of quality improvements.

**Purpose:** We seek to develop a more thorough understanding of the quality effects of hospital mergers by integrating various theoretical perspectives using a mixed-methods design.

**Methodology:** Quantitatively, we tested the quality effect of all consummated hospital mergers in the Netherlands between 2008 and 2014 on 15 quality indicators (with 82 measurements at hospital, department, and disease levels) using a difference-in-difference approach with Bonferroni correction. Qualitatively, we conducted three comparative case studies to examine how hospital executives, managers, and medical professionals perceive the quality impact of hospital mergers.

**Results:** Our quantitative results reveal few significant effects of hospital mergers on quality of care at all levels. After applying Bonferroni correction, two quality indicators are negatively associated with hospital mergers. However, the qualitative results indicate that hospital staff have positive perceptions of the mergers' quality implications, resulting from scale and shock effects.

**Conclusion:** The perceptions of hospital staff regarding mergers diametrically oppose their measurable effects. However, the operationalization of quality by hospital staff members differs considerably from the way it is quantitatively measured. The positive perceptions of hospital staff toward mergers could further contribute to the institutionalization of mergers as a quality improvement strategy.

**Practice Implications:** Hospital managers seeking measurable quality improvements should be wary of merging, despite potential positive perceptions toward it within the organization. In case they do decide to merge, mitigating difficulties in the postmerger integration processes seem most pertinent to achieve measurable effects.

**Key words:** hospitals, mergers and acquisitions, mixed-methods, quality of care, scale, the Netherlands

In most Western countries, between 30% and 50% of all health expenditure is spent on hospital care (OECD, 2019). At the hands of what has been dubbed “merger mania,” hospital markets have become increasingly consolidated during the past two decades (Barro & Cutler, 2000; Gaynor et al., 2015). Mergers are typically viewed as rational decisions that are taken based on strategic considerations, in pursuit of quality or efficiency improvements (e.g., Bazzoli

et al., 2002; Bogue et al., 1995) or as a combination of these drivers (Postma & Roos, 2016). Although hospital mergers should ultimately improve patient outcomes (Garside, 1999), the evidence surrounding their effects is highly mixed (Gaynor et al., 2015). In fact, mergers have been shown to increase prices, whereas research fails to corroborate the notion that hospital mergers have a positive impact on quality of care (Gaynor et al., 2015, 2012; Hayford, 2012; Ho & Hamilton, 2000; Romano & Balan, 2011). As a result, the effect of hospital mergers on consumer welfare has been questioned (Gaynor et al., 2015), which is particularly relevant given the increasing antitrust scrutiny of hospital mergers (Capps et al., 2010). However, the lack of evidence for quality improvements following mergers also raises the question why hospitals continue to merge in pursuit of quality improvements.

Despite the multidimensional nature of quality (Institute of Medicine, 2001), empirical work has mainly studied the effect of mergers on mortality rates, readmission rates, early discharges, and safety indicators (Gaynor et al., 2015; Romano & Balan, 2011). The lack of empirical support for postmerger quality improvements could therefore be because empirical work has focused on the “wrong” dimensions of quality. Alternatively, the challenges associated with the postmerger integration process, such as cultural clashes,

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limited sharing of good practices, and lack of managerial control (Fulop et al., 2005; Lega, 2005), have also been offered as explanations why quality effects fail to materialize after hospital mergers. However, neither explanation adequately explains why hospitals insist on merging to improve their quality of care despite evidence to the contrary. Another stream of research suggests that hospital mergers are a “managerial fashion,” driven by institutional and political motives besides rational arguments (e.g., Comtois et al., 2004; Kitchener, 2002). External pressures (Postma & Roos, 2016) and remaining legitimate (Arndt & Bigelow, 2000) have both been described as part of the reason hospitals merge. Furthermore, Comtois et al. (2004) argue that, taken for granted perceptions of hospital mergers reinforce their rational rhetoric, which could explain why hospitals continue to merge in pursuit of quality gains. Although both perspectives toward hospital mergers are well established, few studies investigate them simultaneously.

In this study, we aim to integrate the existing perspectives toward hospital mergers using a mixed-methods design. That is, we quantitatively model the effect of hospital mergers on various quality indicators at multiple levels and concurrently study the perceived quality effects by hospital executives, managers, and medical professionals through multiple-case studies. To the best of our knowledge, this is the first study to utilize a mixed-method approach to study hospital mergers. The approach allows us to juxtapose the quantitative and qualitative findings and to identify any discrepancies between measurable and perceived quality effects of hospital mergers. In doing so, it addresses the quality question of hospital mergers from multiple theoretical perspectives and provide insights into whether merging in pursuit of quality gains is indeed a rational choice for hospitals or whether it constitutes a rationalized practice. Therefore, our study is particularly pertinent to hospital managers contemplating mergers in an attempt to improve quality of care. Readers interested in the implications of the quantitative results for antitrust enforcement are referred to the discussion of Boers and Kemp (2017).

## Theory

Resource dependence theory (Pfeffer & Salancik, 1978), the associated resource-based view (Barney, 1991), and strategic choice theory (Child, 1997) are arguably the most commonly adopted perspective in hospital merger literature (Postma & Roos, 2016). The resource-based perspective perceives mergers as an opportunity for hospitals to acquire key resources needed to deliver their services. Through this lens, mergers are vehicles that enable hospitals to offer highly specialized services (e.g., by meeting volume requirements for those services), generate economies of scale and scope, avoid duplication of resource by consolidating services, and facilitate knowledge exchange (i.e., learning; Gaynor & Vogt, 2000; Postma & Roos, 2016). The basic notion of this perspective is that mergers increase hospitals’ size and that larger hospitals can use their resources more efficiently and consequently deliver higher quality services at lower costs. Expanding the scope of the

service offering to include more complex and specialized services by merging is the main mechanism through which mergers might influence quality of care in this perspective (Bazzoli et al., 2002). However, empirical support is lacking (Gaynor et al., 2015).

The strategic choice perspective perceives mergers as a way by which hospitals attempt to increase their bargaining power (e.g., Barro & Cutler, 2000; Fuchs, 1997; Harrison, 2007). This body of literature suggests that merging with or acquiring other service providers within their market constitutes a way for hospitals to increase their market share (Bazzoli et al., 2002). The improved market position improves the bargaining power of hospitals, which in turn enables them to negotiate lower prices with their suppliers and higher prices with their purchasers (Harrison, 2007). Half of all hospital executives who have been involved in a merger indicate that improving their hospital’s bargaining position vis-à-vis suppliers, purchasers, as well as other health care providers is one of the reasons for the merger (Postma & Roos, 2016). By emphasizing the role of bargaining power, the strategic perspective thus focuses mainly on the effect of mergers on hospital prices rather than on quality of care. Empirical evidence demonstrates that mergers indeed seem to increase prices (Gaynor et al., 2015).

Given the heavily institutionalized nature of the health care sector and the strong influence of regulatory and normative pressures on hospitals’ behavior (e.g., Comtois et al., 2004), some scholars have also used institutional theory (cf. Scott, 2008) to study hospital mergers. In this perspective, organizations adopt increasingly similar structures and practices as a result of coercive, normative, and mimetic forces (DiMaggio & Powell, 1983). Governments or third-party payers pressuring or forcing hospitals to merge (Gaynor et al., 2012; Postma & Roos, 2016) constitute examples of coercive mechanisms. Similarly, hospital mergers, even those in other countries or continents, foster mimicry in the sector and further increase merger behavior by institutionalizing it as “the expected thing to do” (Arndt & Bigelow, 2000; Comtois et al., 2004). The institutional perspective further posits that the commonly held perception (i.e., “rationalized myths”) of adopting specific structures further outweighs its actual (i.e., measurable) benefits (Meyer & Rowan, 1977). The “myth-like” status of mergers in health care (Kitchener, 2002) primarily manifests itself in the “bigger is better myth” (Lega, 2005). This myth is further assumed to apply to financial performance as well as quality of care, allowing hospitals to reconcile the conflicting professional and business logics inherent to hybrid organizations (Kitchener, 2002).

The various perspectives toward hospital mergers have developed relatively independently. This is in part a result of the fact that they follow different methodological approaches. Literature using the resource-based and strategic perspective of hospital mergers typically tests the associated hypotheses using quantitative approaches, whereas studies using the institutional perspective mainly utilize qualitative methodologies. However, empirical research highlights that hospital mergers are driven by a combination of factors and motives, including tenets from various perspectives

(Comtois et al., 2004; Postma & Roos, 2016). Nevertheless, very few (if any) studies draw on multiple theoretical perspectives and both methodological approaches to understand the phenomenon. Bridging this gap is thus imperative to our understanding of hospital mergers.

## Methods

### Setting and Approach

We used a concurrent mixed-methods design (Ivankova, 2014) to study the effect of hospital mergers on quality of care. In the quantitative stage, we used a difference-in-difference (DID) approach (Donald & Lang, 2007) to estimate the effect of consummated hospital mergers on various indicators of quality of care at three levels (i.e., disease, department, and hospital levels). The qualitative stage consisted of a multiple-case study (Eisenhardt, 1989) of three consummated hospital mergers to assess the perceived quality effects of the merger by hospital staff. In three meetings, we discussed the overall design, relevant cases, and initial findings of the study with an advisory committee consisting of one representative from the health authority, two representatives from hospital associations, one representative of health insurers, two hospital employees, and two former hospital Chief Executive Officers (CEOs; one of whom is also the former chairman of the Health Care Inspectorate).

We conducted our study in the Netherlands, where hospitals are nonprofit foundations that are selectively contracted by private health insurers and that provide all types of outpatient care and inpatient secondary care (Kroneman et al., 2016). In 2014, the Netherlands counted 85 general hospitals, 8 academic hospitals, 65 specialized hospitals, and 268 independent treatment centers (Kroneman et al., 2016). Approximately 70% of all hospital prices are market determined, whereas the remaining 30% are centrally maximized (Kroneman et al., 2016). Hospitals are required to acquire merger approval from the antitrust authority (i.e., the Netherlands Authority for Consumers and Markets). Between 2006 and 2016, the Authority for Consumers and Markets has approved 25 hospital mergers and has denied one. Although (one of) the formerly independent hospital(s) can continue to operate as a location after a merge, most merged hospitals reorganize and relocate services to specific locations postmerger (Kroneman et al., 2016), similar to hospital mergers in other settings (Bogue et al., 1995).

### Quantitative Stage

**Sample.** Our quantitative analysis included all consummated hospital mergers between 2008 and 2014 in the Netherlands. The Dutch antitrust authority approved 16 hospital mergers during this period. One hospital obtained approval to merge twice during the study period, and two mergers remained unconsummated. We excluded these cases from the analysis to retain a sample of 13 mergers. All approved mergers occurred between general hospitals. In the Netherlands, all general hospitals “provide practically all forms of outpatient care as well as inpatient secondary care” (Kroneman et al., 2016, p. 144). Our analytical approach

requires a reference (i.e., control group) consisting of hospitals similar to the merged hospitals. We excluded academic hospitals, specialized hospitals, and independent treatment centers from the reference group because these provide different services. Because the availability of data varied per quality indicator (i.e., dependent variable), the sample size differed per dependent variable (see Table 3). Across the various models, the average sample size was eight merged hospitals, with a reference group of 48 hospitals. The smallest sample in our analysis (for one of the waiting time indicators) was 12 hospitals (i.e., 10 in the reference group and 2 consummated mergers).

**Data.** We used four data sources for our quality indicators at disease, department, and hospital levels. First, we used disease-specific quality indicators of the National Health Care Institute (see Van der Wees et al., 2014, for a more detailed description). Dutch hospitals are legally obliged to provide information for a growing number of such indicators. The indicators are publically available and jointly developed by patients, medical specialists, and health insurers. Given the adaptations of these indicators over time, only six indicators could be included for the duration of our study period. Second, at the disease level, we used patient experience measures of the Miletus Foundation. The Miletus Foundation is an initiative of Dutch health insurers, which measures patient experienced quality using the so-called Consumer Quality Index (see Van der Wees et al., 2014, for a more detailed description). Four indicators, pertaining to three conditions (i.e., breast cancer, cataract surgery, and hip or knee replacements), had sufficient data points available to be incorporated. Third, we used hospital-level indicators of the Health Care Inspectorate. This independent agency monitors quality of care in the Netherlands, and hospitals are obliged to report data on a basic set of quality indicators annually (see Leistikow et al., 2017, for a description of the inspectorate’s responsibilities). Three indicators were available for the duration of our study period. Lastly, we used data regarding waiting times (at disease, department, and hospital levels) and mortality rates (at hospital level) of the Dutch Health Authority. Since 2008, Dutch hospitals are obliged to publish waiting times for elective treatments, and these have been used in prior research (e.g., Beukers et al., 2014). Hospitals have voluntarily submitted mortality ratios to the health authority since 2011. Since 2014, hospitals are obliged to submit these ratios.

**Variables.** In line with existing literature (e.g., Ho & Hamilton, 2000; Romano & Balan, 2011), we used multiple quality indicators as dependent variable to capture the multi-dimensional nature of quality of care. Ultimately, we included 15 quality indicators, spanning measurements at the hospital, department, and/or disease level. The 15 quality indicators resulted in 82 measurements, 11 at hospital level, 28 at department level, and 43 at disease level. Table 1 contains an overview of the indicators, levels, and accompanying data sources. Furthermore, we modeled the year in which the antitrust authority approved a merger, allowing two independent

**TABLE 1: Quality indicators included in the quantitative stage, their definition, and source**

Indicator	Measures	Measurement population/specification	Description	Source	Data availability
<b>Hospital-level indicators</b>					
Malnutrition screening	2	-Children -Adults	% of specified patient population screened for malnutrition	IGZ	2007–2012
Pain measurement	2	-Recovery room -Nursing ward	% of clinical surgery patients for which a standardized pain measurement score was registered at specified location	IGZ	2007–2012
Delirium risk	1	-Patients aged 70 years and older	% of departments or outpatient clinics, which recorded a delirium risk score for more than 80% of all patients	IGZ	2010–2013
Waiting time <sup>a</sup>	4	-Overall -Diagnostic services -Treatment -Outpatient clinic	Average waiting (in weeks)	NZa	2010–January 2016
Mortality rate	2	-Unadjusted -Standardized	Total mortality per number of admissions and standardized mortality ratio	NZa	2011–2013
<b>Department-level indicators</b>					
Waiting time <sup>a</sup>	28	-Various departments	Waiting time in weeks	NZa	2010 – January 2016
<b>Disease-level indicators</b>					
Postsurgical pain	1	-Adenoid and tonsil patients	% of (adeno) tonsillectomy patients with severe postoperative pain, VAS/NRS > 7	ZiNL	2008–2013
Local anesthetic use	1	-Inguinal hernia patients	% of inguinal hernia operations with local anesthesia	ZiNL	2011–2014
Outpatient services	1	-Inguinal hernia patients	% of inguinal hernia operations carried out in outpatient clinic	ZiNL	2008–2011
Readmission rate	2	-Breast cancer patients with ablation surgery -Breast cancer patients with breast-conserving surgery	% of patients with locally recurrent breast cancer within 5 years	ZiNL	2008–2013
Unsuccessful surgeries	1	-Breast cancer patients with breast-conserving surgery	% of patients with irradiability after first breast-conserving operation of a primary mamma carcinoma (invasive and ductal carcinoma in situ)	ZiNL	2008–2010
Duplex examinations	1	-Patients with varices	% of duplex examination of the superficial and the deep system of patients with varices	ZiNL	2010–2014

*(continues)*



**TABLE 1: Quality indicators included in the quantitative stage, their definition, and source, Continued**

Indicator	Measures	Measurement population/specification	Description	Source	Data availability
Communication with nurses	2	-Cataract patients -Patients with hip/knee replacement	Consumer Quality Index for communication with the nurse	Miletus Foundation	2007, 2009, 2010, 2013, 2014
Communication with specialists	2	-Cataract patients -Patients with hip/knee replacement	Consumer Quality Index for communication with the specialist	Miletus Foundation	2007, 2009, 2010, 2013, 2014
Pain management	1	-Patients with hip/knee replacement	Consumer Quality Index for pain management of patient who underwent a hip or knee replacement	Miletus Foundation	2007, 2009, 2010, 2013, 2014
Treatment by staff	1	-Breast cancer patients	Consumer Quality Index for treatment by staff and information provision	Miletus Foundation	2009, 2012–2015
Waiting time <sup>a</sup>	30	-Various conditions	Waiting time in weeks	NZa	2010 – January 2016

Note. IGZ = Dutch Healthcare Inspectorate; NZa = Dutch Healthcare Authority; ZINL = Dutch Healthcare Institute.

<sup>a</sup>Waiting time is considered one quality indicator, with measurements at multiple levels.

hospitals to merge into one legal entity, as the moment of merger. Lastly, several common predictors of hospital performance served as control variables. These were hospital size (operationalized as the number of beds for models with hospital-wide quality indicators and the number of procedures performed for disease-specific quality indicators), teaching status (a binary variable), the population density of the hospital's primary service area, and the number of competitors in a 20-km radius. Lastly, we included a hospital's baseline score for a given quality indicator, years since the baseline measurement, and an interaction between both to account for floor and ceiling effects.

**Analysis.** We used a DID analysis to statistically test the effect of hospital mergers on quality of care. The DID approach is the most common way to analyze the effect of consummated hospital mergers (Gaynor et al., 2012; Romano & Balan, 2011). In this approach, the difference in premerger and postmerger quality measures of the merging hospitals (i.e., the “intervention group”) are compared with the difference in quality measures of comparable hospitals (i.e., the “control group”; Gaynor & Town, 2012). The DID model approach assumes that, if it were not for the merger, the quality scores of the merged hospital would develop in a similar trend as those of the hospitals in the control group (i.e., the so-called counterfactual). The DID estimate represents the difference between the observed trend of quality measures of merged hospitals and the counterfactual. Because the analysis requires at least one premerger and one postmerger observation, we based our analysis on data from 2007 until 2015. Each of the 82 quality measures served as separate dependent variables, resulting in 82 DID models.

Our data structure is inherently nested. That is, for each quality measure, we have observations for each hospital in

multiple years. For merged hospitals, observations of the independent hospitals premerger are further nested in the merged hospital postmerger. To account for this clustering of observations within merged organizations and over time, all models were carried out as a multilevel model (Snijders & Bosker, 2012). The merged hospital and the reporting years were both treated as levels. Lastly, we applied a Bonferroni correction to our results to mitigate the increased probability of Type 1 errors because of running multiple tests. We present the significance levels of our DID estimates with and without Bonferroni correction.

### Qualitative Stage

**Sampling.** The qualitative stage consisted of three purposefully sampled case studies of consummated hospital mergers in the Netherlands. Following the principles of maximum variation sampling, we selected cases that differed in terms of size, date of merger, and reason for the merger. We studied a merger between two small hospitals, a merger between two medium-sized hospitals, and a merger between a large and a small hospital. Two merger cases occurred rather recently, whereas the other occurred more than 10 years ago. Respondents in the recent merger cases were less prone to recall bias, whereas the respondents in the older merger case were more capable of identifying to what extent quality effects had materialized and persisted. Lastly, we studied one merger in which one hospital acquired another in financial difficulties and two in which the merging hospitals mutually pursued scale economies. Table 2 contains a brief description of the three selected cases and the respondents.

**Data collection.** The antitrust authority invited the selected cases to participate in the study. In each of the

**TABLE 2: Description of the cases used during the qualitative stage**

	Case 1	Case 2	Case 3
Year merger was consummated	2016	2015	2006
Premerger size of organizations	One large and one small hospital	Two mid-sized hospitals	Two small hospitals
Distance between locations	20 km	11 km	7 km
Travel time between locations	16 minutes	13 minutes	11 minutes
Degree of premerger cooperation	Partial; patient referrals were common and some specialists were contracted by both hospitals	Limited; cooperation occurred for some specialties, in others both hospitals were mainly competitors	Partial; some specialists were contracted by both hospitals
Reason of merger	Failing firm: risk of bankruptcy of one of the organizations	Strategic: strengthening hospitals' regional position	Efficiency: strengthening hospitals profile by increasing scale
<b>Respondents</b>			
Executives	1	1	1
Medical specialists	5	2	2
Managerial staff	1	3	1

hospitals, we interviewed the CEO, the quality and safety manager, and several medical specialists (including the chief medical officer). Hospitals were free to identify which medical specialists we could interview. In total, 17 face-to-face interviews took place across the three cases in the first half of 2016. We interviewed three CEOs, nine medical specialists, and five other staff members (see Table 2). Each interview transpired at the location of the case under study and was conducted in Dutch, the respondents' native language (quotes were translated by the authors). In a few instances, we interviewed multiple respondents (i.e., medical specialists) simultaneously. The interviews followed a semistructured approach, and respondents were asked about the goals of the merger, the (impact of the) merger itself, the merger process, the expected and obtained quality effects, and alternative ways (i.e., other than merging) these effects could have been reached (for a more detailed overview of the specific themes, see text, Supplemental Digital Content 1, <http://links.lww.com/HCMR/A76>). We made minutes of each interview and subsequently compiled these into detailed case reports, in which we refrained from analyzing and interpreting the data as much as possible. In a member-checking stage, respondents had the opportunity to reflect on the reports, and all reports were approved mid-2016.

**Analysis.** We followed a comparative approach to analyze the data. In order to become familiar with the data and develop initial codes (Eisenhardt, 1989), two researchers (one of whom attended the interviews) independently conducted a within-case analysis of each of the three case reports. They focused on the expected and obtained quality effects of the merger. This resulted in a list of the quality effects of the merger for each case, with associated excerpts from the case

reports. Using these excerpts, we subsequently identified the directional views of respondents (i.e., whether they felt that the merger had a positive, negative, or no impact on a specific quality element), the mechanisms and processes through which it was or was not reached, and whether it constituted an a priori motive of the merger. Third, we identified cross-case patterns (Eisenhardt, 1989) by comparing how quality elements, the associated directional views, mechanisms, and relation to the merger motives differed across the three cases. In a final step, both researchers compared their coding structures and categorized the quality effects into meaningful categorizations, resulting in the overall findings. We present both the convergent and divergent findings across cases.

## Results

### Quantitative Results

Table 3 displays the DID estimates for the models in which the hospital merger had a statistically significant association with the quality measurement. The table includes the regular and Bonferroni-corrected significance levels and the sample size of each model, specified in terms of the number of mergers (where a merged hospital constitutes one organization) and the number of hospitals in the reference group. For the results of all 82 models (i.e., including those with nonsignificant results, see Supplemental Digital Content 2 <http://links.lww.com/HCMR/A77>). Estimates and significance levels of the control variables and results of models without control variables can be found in a report produced by the Antitrust Authority (in Dutch) or can be obtained from the authors upon request.

**TABLE 3: Sample size and difference-in-difference (DID) estimates of the statistically significant associations between hospital mergers and quality of care**

	Merged hospitals <i>n</i>	Hospitals in reference group <i>n</i>	DID estimate	Significance level	Significance level after Bonferroni correction	Note
<b>Hospital-level indicators</b>						
Malnutrition screening–Adults	1	55	−0.125	**		1)
Mortality rate–Unadjusted	5	46	0.001	**		1)
Pain measurements–Nursing ward	8	55	−0.098	***	***	2)
Waiting time–Diagnosis	10	56	0.458	**		
Waiting time–Outpatient clinic	10	56	0.218	*		
Waiting time–Overall	10	56	0.121	†		
<b>Department-level indicators</b>						
Waiting time–Allergology	4	17	2.272	†		
Waiting time–Cardiology	10	56	0.413	*		
Waiting time–Gynecology/obstetrics	10	56	−0.332	*		
Waiting time–Oral surgery	10	51	0.671	†		
Waiting time–Pediatrics	10	56	0.567	***	*	
Waiting time–Psychiatry	6	31	−1.246	*		
Waiting time–Rheumatology	10	48	1.159	*		
Waiting time–Surgery	10	56	0.288	**		
<b>Treatment-level indicators</b>						
Waiting time–Abdominoplasty	10	43	1.200	†		
Waiting time–Breast reduction	10	46	1.796	*		
Waiting time–Gastroscopy	10	54	1.103	***	*	
Waiting time–Spinal disc hernia–Neurosurgery	10	38	0.969	*		
Waiting time–Sterilization (man)–Surgery	3	15	−1.194	*		
Waiting time–Sterilization (man)–Urology	10	55	0.761	*		
Waiting time–Tympanostomy tube	10	55	0.429	†		
Waiting time–Varicose veins–Dermatology	3	19	2.467	**		
<p>Note. Control variables (i.e., hospital size, teaching status, competition, population density of the primary service area, and baseline quality scores) are omitted from the table. Results including omitted control variables and summary statistics can be obtained from the authors upon request. 1) Due to convergence problems for the multilevel models, clustered standard errors were used instead. 2) Due to convergence problems, this indicator was aggregated to the enterprise level.</p> <p>† &lt; .10. *<i>p</i> &lt; .05. **<i>p</i> &lt; .01. ***<i>p</i> &lt; .001.</p>						

At hospital level, four quality indicators and five measurements display significant negative results at the .05 confidence level and one measurement displays significant results at the .10 confidence level before applying Bonferroni

correction. More specifically, in merged hospitals, a lower percentage of adult patients are screened for malnutrition, and pain measurements are conducted on a lower percentage of patients in the nursing ward than expected based on the



observations in the control group. Furthermore, the overall waiting time, waiting time for diagnostic services, and waiting time for the outpatient clinic increased in merged hospitals, as did the unadjusted mortality ratio. The reduction in the percentage of patients for whom pain measurements are conducted in the nursing ward is the only significant result after applying the Bonferroni correction.

At the department level, we find significant effects of hospital mergers on 6 of the 28 waiting time measurements at the .05 confidence level. In four departments (cardiology, surgery, pediatrics, and rheumatology), the waiting time in merged hospitals increased significantly compared to that in nonmerged hospitals. In two departments (i.e., gynecology/obstetrics and psychiatry), the waiting time decreased significantly compared to that in merged hospitals. The increased waiting time in the pediatrics department is the only significant result at the department level after applying the Bonferroni correction.

At the treatment level, we find significant effects of hospital mergers on six measures within the waiting time indicator at the .05 confidence level. The waiting time of these six treatments has increased significantly in the postmerger period. Only one increase remains significant after Bonferroni correction (i.e., for gastroscopy). Our results display no significant impact of mergers on the patient-perceived quality indicators or any of the indicators from the National Health Care Institute.

## Qualitative Results

The respondents across the three cases mentioned that the consummated merger resulted in several positive as well as negative quality effects. These can be categorized into effects that are due to the increased size of the organization following the merger (i.e., scale effects) or constitute a “by-product” of the merger event (i.e., shock effects). In all cases, respondents further indicated that they expected these effects to be measurable within a few years (i.e., between 2 and 8 years) postmerger. When asked which indicators they believed would be positively influenced by the merger, they mentioned waiting times, number of complaints, readmission rates, clinical audit indicators, indicators from the health care inspectorate, patient satisfaction scores, and the number of incidents. Some respondents explicitly mentioned standardized mortality rates as an invalid quality indicator, and some cautioned that indicators could temporarily decrease during the postmerger integration process. Conversely, some respondents indicated that they consider quality of care to be quantitatively unmeasurable; “As professionals, we did not manage to define quality of care. So we cannot measure it, let alone associate it to the effect of mergers” (Case 3). In what follows, we described the scale and shock effects and their perceived directionality (i.e., positive, neutral, or negative effects) in more detail. Table 4 summarizes all effects and their directions according to the respondents per case.

**Scale effects.** The respondents in our case studies identified various effects that are associated to the increased size of the postmerger hospital. They perceived these so-called “scale effects” to have positive as well as negative influences on quality of care. Four positive scale effects were also

mentioned as a priori goals of the mergers. These were facilitating (sub)specialization of medical specialists, being able to offer 24/7 services, meeting externally imposed volume requirements, and retaining the status of teaching hospital. In all three cases, respondents indicated that these goals were realized following the merger or that the organization was in the process of realizing these goals. Regarding the first three motives, respondents implicitly or explicitly referenced an assumed volume–outcome relationship by internal or external stakeholders. They indicated, for example, “Why would somebody be considered qualified for something at night, when we do not consider that person qualified for the same thing during the day?” (Case 1) and “Currently the department is large enough with sufficient capabilities for subspecialization” (Case 3). However, across the cases, respondents were also critical of this relationship. Some mentioned that it applies only below a certain threshold; “The benefit of larger volumes is finite. With breast cancer, it is at approximately 50 patients. Treating 100 or 200 will not matter. It will only generate disintegration” (Case 3). Others mentioned the lack of scientific evidence supporting the relation; “Volume requirements are not always evidence based and different interests play a role in formulating them” (Case 1). Still others indicated adverse effects; “Becoming overly specialized in a certain field leads to compartmentalization, which can actually have a negative effect” (Case 3). Lastly, some respondents indicated that reconfiguring the service offering to maximize volume in one location postmerger was highly political; “Reconfiguring one location into an elective center and another into a high-complex care center proved politically impossible” (Case 2) and “We decided to reconfigure one location to an inpatient facility. Later, a political power play made us switch the designation of both locations. It was difficult to make a rational choice regarding reconfiguration because both hospitals were initially of a similar size” (Case 3).

Respondents further indicated that the larger postmerger hospital ensured patients’ accessibility to care. That is, they described how the merger enabled the hospital to continue offering particular services. “Board members of both hospital considered it imperative that as many services as possible were offered in the region. If we did not merge, some of the services could no longer be offered in the region” (Case 2). In some cases, merging also allowed the hospital to expand into new service areas by meeting volume requirements of services they did not previously meet, for example; “By merging, we hope to attract specific patient populations for which neither organization currently meets the minimum volume requirements” (Case 2). In addition, respondents indicated that retaining teaching status made the organization more attractive as an employer, enabling the merged hospital to attract better qualified professionals and to host residents who ask critical questions. Respondents perceived both as a positive influence on quality of care. “The merger contributes to retaining the teaching status of the hospital which in itself is beneficial for the quality of care. It further makes the hospital more attractive as an employer” (Case 1). However, respondents also found a large organization to be more bureaucratic, which they considered a negative effect of merging. Respondents mentioned, for example, “The organization becomes

**TABLE 4: Perceived quality effects of hospital mergers reported in the case studies**

	Mentioned in:			Motive of merger?
	Case 1	Case 2	Case 3	
<b>Positive scale effects</b>				
Subspecialization	X	X	X	Yes
24/7 availability	X	X	X	Yes
Meeting volume requirements	X	X	X	Yes
Retaining teaching status	X	X	X	Yes
Attractive employer	X	X	X	
Improved multidisciplinary communication	X	X		
Handling complications	X			
Purchasing power	X			
Efficient support services		X		
<b>Negative scale effects</b>				
Sluggish, anonymous organization	X	X	X	
Within-specialty fragmentation	X		X	
Issues with multiple location		X	X	
Diverging (political) interests		X	X	
Less personal patient relations	X			
Accessibility for patients			X	
<b>Positive shock effects</b>				
Learning (e.g., exchanging best practices)	X	X	X	
Shared electronic records	X	X		
Redefining roles and responsibilities	X			
Fewer patient relocations			X	
<b>Negative shock effects</b>				
Cultural clash	X	X	X	
Distractions due to (job)insecurities	X	X	X	

larger and more sluggish, the command and control structure becomes more formal. It will be harder to walk into the CEO's office for example" (Case 2) and "Bigger scale makes the organization more anonymous" (Case 1).

**Shock effects.** Besides scale effects, respondents also mentioned various shock effects of the merger event itself. Similar to the scale effects, they perceived both positive and negative shock effects. Exchanging best practices and using the same electronic medical record were the two most prominent shock effects discussed by the respondents across almost all cases. Respondents considered using the same electronic medical record a precondition to a quality-enhancing merger

and illustrated that it allowed them to deliver service in multiple locations at the patients' convenience; "Because all locations will operate on the same electronic medical record, pre- and postsurgical care can be delivered in the outpatient clinic closest to a patient's home" (Case 1) and "Implementing a uniform electronic patient record was actually a precondition of the merger taking place" (Case 2).

Respondents further indicated that the shock of the merger resulted in an exchange of protocols, which facilitated a critical review of the way things should be done. Respondents indicated, for example, "The momentum of the merger can be used to gain insight into best practices. We want to transfer best practices of one department to the other,

preferably while simultaneously innovating in order to make the sum greater than the individual parts” (Case 2). However, sharing knowledge and learning from one another were not self-evident processes. Respondents mentioned, for example, “Cultural differences persisted for several years after the merger” (Case 2) and “Initially, the merger served a clear vision and ambition. [...] It took until 8-years postmerger for culture clashes to disappear. At the end of the day, the merger still felt as a forced marriage to many people.” (Case 3). Respondents considered commitment from (senior) professionals crucial to integrating the two organizations; “The emphasis of the integration was on getting everybody on the same page, especially the medical specialists, and showing them this was the way forward and there was no way back. To get employees committed, we involved them directly in the formation of their own departments” (Case 2).

Lastly, in all cases, respondents also suggested that shock effects distracted from the primary process and that it could have a negative effect on quality of care. They described cultural clashes as the strongest negative shock-related effect in all cases. Mergers further caused (prolonged) insecurity among staff members. Respondents indicated “The merger can cause insecurities among the staff related to the security of their jobs.” (Case 1) and “The entire preparation phase, including acquiring a license from the antitrust authority and with that the insecurity, took years” (Case 2). However, across the cases, respondents did feel that adequate management, particularly for hospitals with repeated merger experience (which all cases had), could mitigate a merger’s downsides; “The experience we have with prior mergers could be helpful in this regard” (Case 1).

## Discussion

In this article, we studied the influence of hospital mergers on quality of care using a mixed-methods approach. We used a DID approach to test the effect of hospital mergers on 15 quality indicators (with 82 measurements at various levels) and three case studies to study the perception of hospital staff toward mergers. In line with previous research (Gaynor et al., 2012; Ho & Hamilton, 2000; Romano & Balan, 2011), our quantitative findings indicate few significant effects of hospital mergers on quality of care. The significant effects we do find suggest that hospital mergers reduce quality of care. However, these are predominantly waiting times, which are difficult to interpret as a quality indicator (Kenis, 2006). Au contraire, our qualitative results indicate that, overall, the respondents in all three cases felt that the merger had a positive impact on quality of care. However, respondents did disagree about the specific benefits and magnitude of particular mechanisms through which these effects materialized. These were also largely consistent with previous literature (e.g., Bazzoli et al., 2002; Fulop et al., 2002; Postma & Roos, 2016) and several effects constituted explicit *ex ante* goals of the merger.

Juxtaposing the quantitative and qualitative reveals two main observations. First, the way in which stakeholders’ operationalize quality in the qualitative results differs considerably from the way it is operationalized in the quantitative approach. The qualitative results indicate that hospital staff

predominantly “looks inward” when discussing quality effects of mergers. They operationalize quality mainly in the form of structure or process indicators. For example, respondents discuss supply-side factors, such as availability of services at the market (i.e., services can be preserved for the geographical market) or hospital (i.e., specific subspecializations are available 24/7) levels, and intraorganizational factors, such as interprofessional learning, and attracting and retaining highly skilled professionals. The respondents consider these elements quality improvements in and of themselves. Instead, the quantitative measurements mainly capture patient-level outcomes. None of the respondents mentioned these quantitative indicators as an effect or goal of the merger. Some respondents even felt that it is impossible to measure quality of care in a quantitative sense. Nevertheless, when probed about the matter, the majority of respondents did expect significant improvements of outcome measures following the structural and process-related improvements during the merger, including on several of the quality indicators used in our quantitative analysis (i.e., waiting time, indicators from the health care inspectorate, and patient perception scores). Our quantitative results are inconsistent with these expectations, however.

A possible explanation for the lack of measurable quality effects is that they might require a longer time span to materialize. Several respondents expected that it would take up to 8 years for such effects to be noticeable. Although our data did not allow us to test whether this was indeed the case, empirical studies of hospital market structure, which are not sensitive to time effects, indicate that hospitals in more concentrated markets (e.g., due to mergers) do not provide higher quality of care (Gaynor et al., 2015). Our qualitative results suggest that quality might actually deteriorate during the postmerger integration process, which is more congruent with our quantitative findings and consistent with previous research or the postmerger integration process (Fulop et al., 2002, 2005). In line with the work of Fulop et al. (2002), our qualitative results indicate that cultural clashes, political power plays, insecurities among staff, and the role of professionals are main points of attention during this process. Although the qualitative results suggest that merger experience and adequate management can mitigate difficulties in the postmerger integration process, little evidence exists on repeated merger performance in the health care sector, and we were unable to model this effect quantitatively.

The second observation from juxtaposing the qualitative and quantitative results is that the institutional perspective appears to be more capable of explaining continued hospital merger behavior than the other perspectives when it comes to quality of care. The scale effects and supply-oriented quality arguments put forth by the stakeholders in our study corroborate the work of Comtois et al. (2004), which suggests that the professional logic adopts arguments that are traditionally associated with a business logic as quality arguments to justify hospital mergers. In other words, our findings provide further proof that organizational structures are (re)produced by institutionalized behavior of actors (cf. Scott,

2008). That is, our results suggest that hospital staff members reinforce a narrative in which mergers have a cause–effect relation to quality of care (over time), despite evidence to the contrary. In doing so, they reinforce the institutionalized belief that mergers improve quality of care. Given the lack of empirical evidence of these claims (Gaynor et al., 2015), these perceptions could constitute the basis for health care’s “bigger is better myth” (Lega, 2005). Future research could assess the quality effects of hospital mergers over prolonged periods. In the absence of these effects, however, the main quality-related reason for hospitals to merge is that hospital staff says (and beliefs) so.

## Limitations

Our study is subject to a few caveats. First, DID approaches are prone to endogeneity problems (Gaynor & Town, 2012). We mitigated this issue by constructing a control group with hospitals similar to the merging hospitals (i.e., excluding academic and specialized hospitals). Our results are robust with different compositions of the control group. Second, we model the effects of hospital mergers based on the date they were approved by the antitrust authority. In practice, they could have been consummated at a later date, which would render our quantitative estimates underestimations of their effects. As far as our data allowed, we use various postmerger time periods in our analyses to mitigate these effects. Third, several positive effects of mergers that surfaced in the qualitative stage constituted explicit ex ante merger goals, which could have induced confirmation bias. However, the fact that these effects emerged in all cases makes it unlikely that they are solely the result of confirmation bias. Lastly, although Dutch hospitals have been studied in the health care management and hospital merger field (e.g., Postma & Roos, 2016; Roos & Postma, 2016), the specifics of the Dutch health care system limits the generalizability of our (quantitative) results to other settings. However, our quantitative results are consistent with findings from other settings.

## Practice Implications

Our results form a cautionary signal to hospital managers contemplating mergers in order to improve quality of care. In deciding to pursue hospital mergers, executives, managers, and professionals should be wary of the “mythical” status of hospital mergers. That is, our results suggest that it is advisable to articulate which outcomes they seek to improve by merging, through which mechanisms they expect the merger to influence these quality dimensions, and to substantiate these expectations with scientific evidence. In case hospital managers do decide to merge in pursuit of quality improvements, they can furthermore expect cultural clashes, political power plays, and insecurities among staff members during the postmerger integration process, which can influence the way in which the merger affects quality of care in their hospital. Hospital managers are therefore encouraged to actively address these issues and seek to mitigate any negative influence on the quality improvement mechanisms of the merger. They should

furthermore be aware of the fact that this can be a lengthy, political, and complicated process.

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