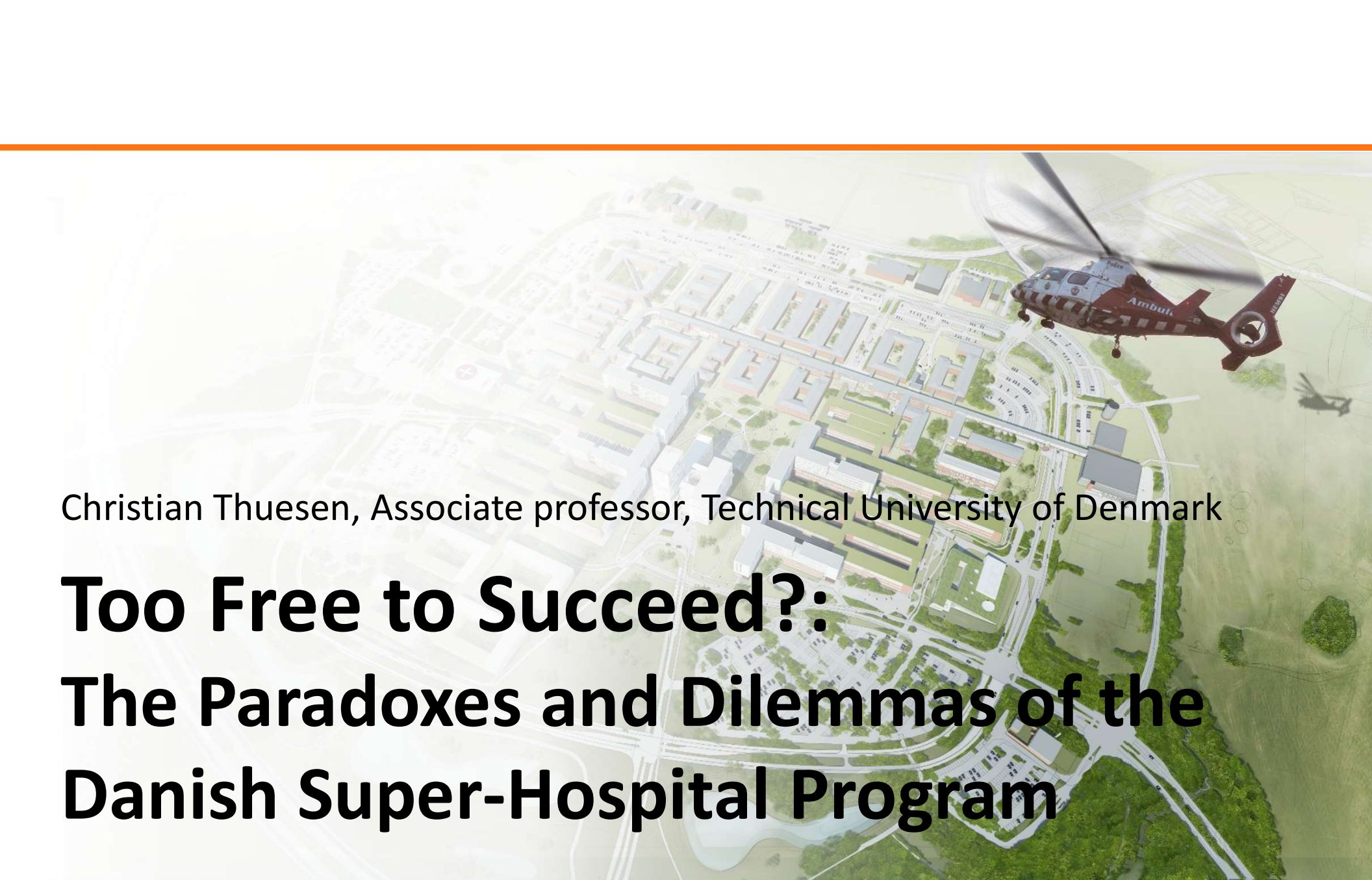


An aerial architectural rendering of a large, modern hospital complex. The complex consists of numerous interconnected buildings with flat roofs, surrounded by green spaces and parking areas. In the upper right foreground, a red ambulance helicopter with "Ambul" written on its side is shown in flight. The background shows a mix of green fields and some distant structures.

Christian Thuesen, Associate professor, Technical University of Denmark

Too Free to Succeed?: The Paradoxes and Dilemmas of the Danish Super-Hospital Program

Core Governance Dilemmas and Tensions

Project governance is characterized by persistent contradictions across operational, structural, and institutional boundaries (DeFillippi et al. 2016).

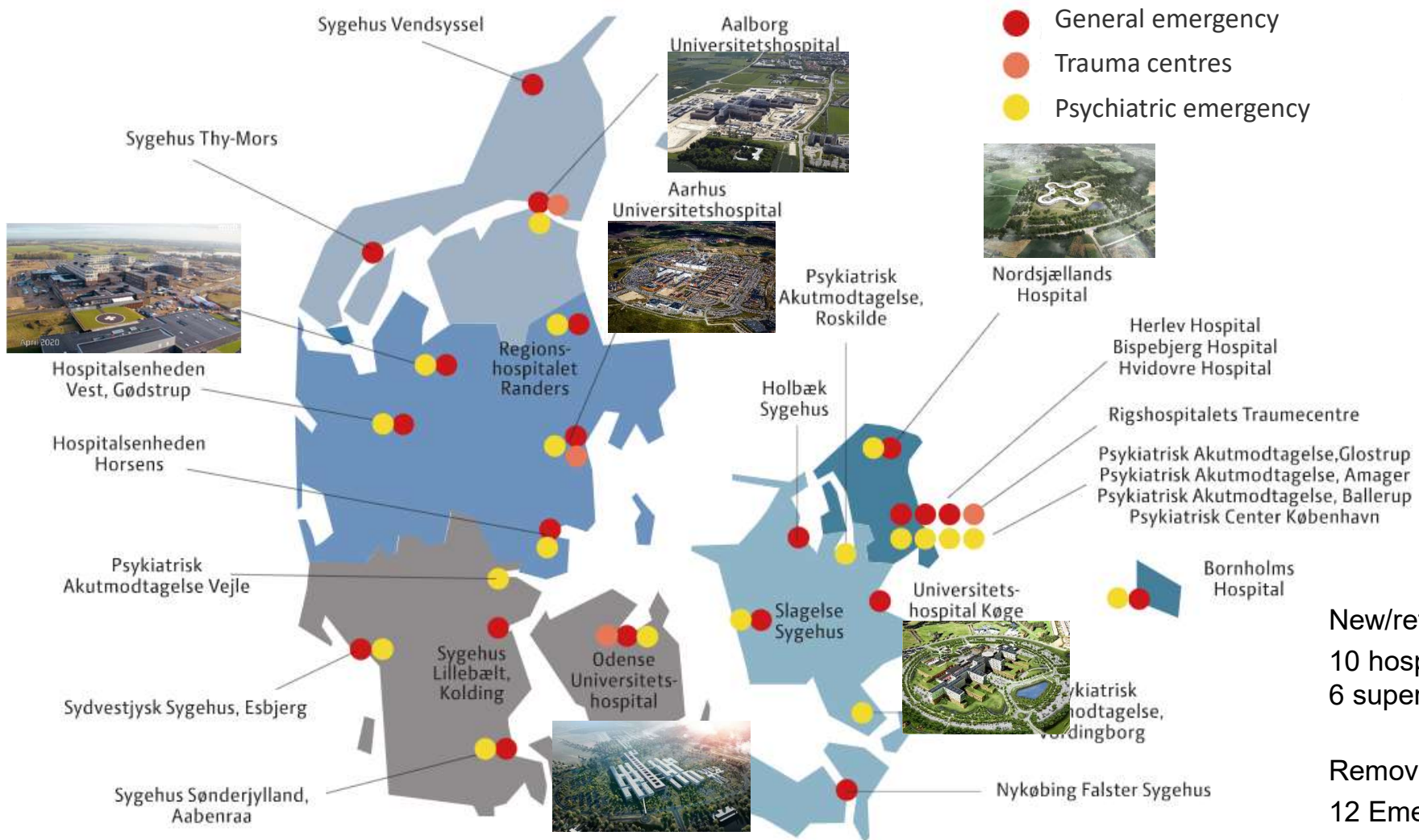
- **Control vs. Flexibility:** Enforcing rigid milestones risks failure during uncertainty, while excessive flexibility compromises accountability (Bakhshi et al 2025, Miller et al 2005, & Vestola et al 2025).
- **Temporary vs. Permanent:** Projects prioritize short-term delivery budgets over long-term strategic benefits realization (Sabini et al 2021, Riis et al 2019, & Sun et al 2024)
- **Front-End Commitment:** Major investment decisions occur when uncertainty is highest, often anchoring flawed concepts (Samset et al 2016, Aubry et al 2025).
- **Public Multi-Role Dilemma:** Sponsoring bodies face conflicting responsibilities between project championing and rigorous oversight (Miller et al 2005).
- **Network Relational Drift:** Informal relational "wiggle room" builds operational trust but clashes with parent accountability rules (Waardenburg et al 2020, & Vestola et al 2025).

Ambulance in Ans (1920-25)



Kellerup Hospital (1913)





New/refurbished projects

10 hospitals

6 super hospitals

Removed capacity:

12 Emergency functions

7 Hospitals

The complexity of healthcare

Key Figures of the Danish Healthcare System

- Costs: €23,180 billion. Approx. 15,6% of GDP (OECD [2019](#))
- Operations per year 2018: 2.119.997 (Esundhed [2019](#))
- Diagnoses per year 2018: 1.373.414 (Esundhed [2019](#))
- Employees (FTE) in hospitals: 90.212 in 2001 and 106.676 in 2018 (OECD [2019](#))
- Patients (percent of the population): 38,2 (2002) to 40,3 (2009)
- Healthcare facilities (small and big): 56 facilities, 3,8 million m²
- Beds: 22.927 in 2001 and 14.429 in 2018 (OECD [2019](#))
- Equipment: 370 scanners and 60 linear accelerators

Complication (goals)	An inefficient healthcare system focusing on hospitalization rather than treatment. Enforced by old, outdated buildings and practices Goals: Improved healthcare services
Solution	Centralisation of treatments and specialization by the construction of super hospitals and closing of regional Hospitals
Implications	Radically transformed healthcare system realizing an increasing output (treatment) – local resistance and challenging organizational change processes

Status

# of projects	16
projects ongoing	5
# of projects completed	11
# of projects with delays	13
Total delay	52 years
Average delay	3,25 years
# of projects with cost overrun	12
Average cost overrun	17, 41%
# projects with disputes	8

Tabel 1
Kvalitetsfundsprojekter: Totalramme/nyt styrende budget, status for Indenrigs- og Sundhedsministeriets tilsyn samt forventet projektafslutning

Projekt * = Delvist ibrugtaget ^ = Fuldt ibrugtaget (FAM) = Akuthospital med fælles akutmodtagelse	Budget ¹		Økonomisk prognose, pct. ²	Status for ministeriets tilsyn	Afslutning af projekt	
	Totalramme ved tilsagn (mio. kr., 2009-pl)	Gældende budget (mio. kr., 2025-pl)			Aktuel status (forventet/ realiseret) ³	Ved endeligt tilsagn
Region Hovedstaden	13.092	21.811				
Nyt Hospital Bispebjerg* (FAM)	3.004	5.026	61	Skærpet tilsyn	2032	2024
Nyt Hospital Herlev^ (FAM)	2.290	3.258	15	Anlægsregnskab afsluttet, verserende tvister	2022	2018
Nyt Hospital Nordsjælland (FAM)	3.907	7.992	72	Skærpet tilsyn	2027	2020
Nyt Hospital Hvidovre^ (FAM)	1.470	2.091	33	Byggeri afsluttet, anlægsregnskab udestår	2024	2021
Det Nye Rigshospital^	1.855	2.639	14-17	Anlægsregnskab afsluttet, verserende tvister	2020	2018
Ny Retspsykiatri Sct. Hans^	566	805	4	Byggeri afsluttet, anlægsregnskab udestår	2021	2018
Region Midtjylland	10.837	15.416				
Det Nye Universitetshospital i Aarhus (DNU)^ (FAM)	6.451	9.177	0	Anlægsregnskab og evt. tvister afsluttet	2019	2019
Det Nye Hospital i Vest, Gødstrup (DNV)^ (FAM)	3.222	4.583	0	Anlægsregnskab afsluttet, verserende tvister	2022	2020
Regionshospitalet Viborg (RHV)^ (FAM)	1.164	1.656	0	Årlig rapportering ⁴	2020	2018
Region Nordjylland	4.191	7.491				
Nyt Aalborg Universitetshospital (NAU)* (FAM)	4.191	7.491	31	Skærpet tilsyn	2026	2020
Region Sjælland	5.493	8.103				
Universitetshospital Køge (USK)* (FAM)	4.083	6.097	6	Skærpet tilsyn	2027	2021
Psykiatri i Slagelse^	1.110	1.579	19	Anlægsregnskab og evt. tvister afsluttet	2015	2014
Akutmodtagelse i Slagelse^ (FAM)	300	427	0	Anlægsregnskab og evt. tvister afsluttet	2013	2013
Region Syddanmark	8.621	12.725				
Kolding Sygehus^ (FAM)	912	1.298	3	Anlægsregnskab og evt. tvister afsluttet	2017	2016
Nyt Odense Universitetshospital (Nyt OUH) (FAM)	6.444	9.629	18	Skærpet tilsyn	2027	2020
Aabenraa Sygehus^ (FAM)	1.264	1.798	1	Anlægsregnskab og evt. tvister afsluttet	2020	2020
I alt	42.234	65.546				

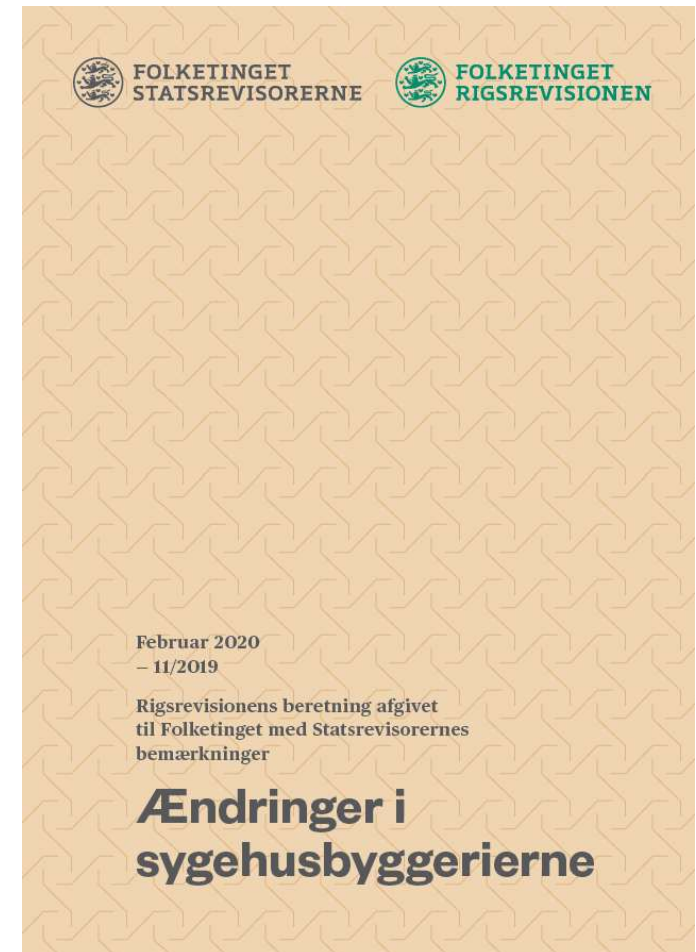
Evaluation of the framework conditions for the Quality Fund projects



“The Public Accounts Committee recommends that the Ministry of Health and Elderly Affairs conduct an overall assessment of the appropriateness of the framework conditions once the hospital construction projects are completed.” (National Audit Office, 2020)

The purpose of the evaluation is:

- to assess whether the framework conditions, given the premises at the time, have been appropriate;
- to establish a basis for improved planning and implementation of future large-scale public infrastructure projects, particularly in the healthcare sector.



Methodology

Analytical Framework:

The evaluation covers central framework conditions (defined by the Ministry) and exogenous conditions (market and industry) assessed through four perspectives:

- Public Administration: Appropriateness of roles and responsibilities.
- Project Management: Organizational competence and execution.
- Construction Expertise: Buildability and technical realism.
- Benefits Realization: The ability to deliver the intended clinical and operational efficiencies.

Data Collection

The research approach utilizes a mixed-methods design to ensure triangulation of data and perspectives:

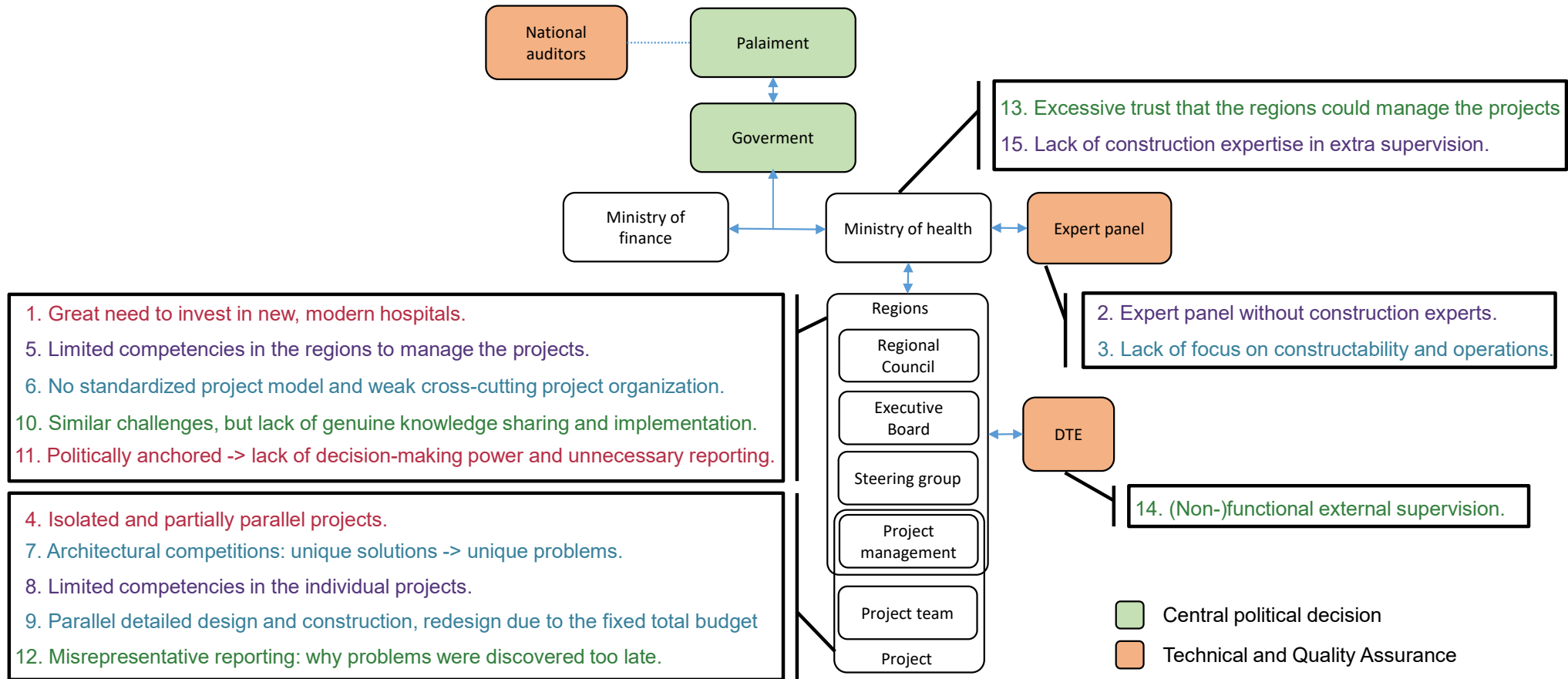
- Document Analysis: Expert Panel's screening reports (2008–2010), regional applications, accounting instructions, and external audit reports from.
- Stakeholder Workshops: A facilitated workshop involving current and former key figures from the construction projects.
- Qualitative Interviews: Anonymous dialogues with key personnel across projects to uncover "off-the-record" realities



Evaluering af rammevilkår for kvalitetsfondsprojekterne

Bestiller: Indenrigs- og Sundhedsministeriet
Dato: juni 2024
Udarbejdet af: Martin Kjær & Christian Thuesen
Revision: Endelig version

What happened ?



1 Wrong from the start

Several projects did not simply go wrong – they started wrong.

- **Unrealistic foundation:**

- Projects were initiated without sufficient documentation that they could be delivered within the allocated time and budget.
- Several projects were overly ambitious relative to their budgets in terms of architecture, floor area, and technical solutions.

- **No real assessment of feasibility:**

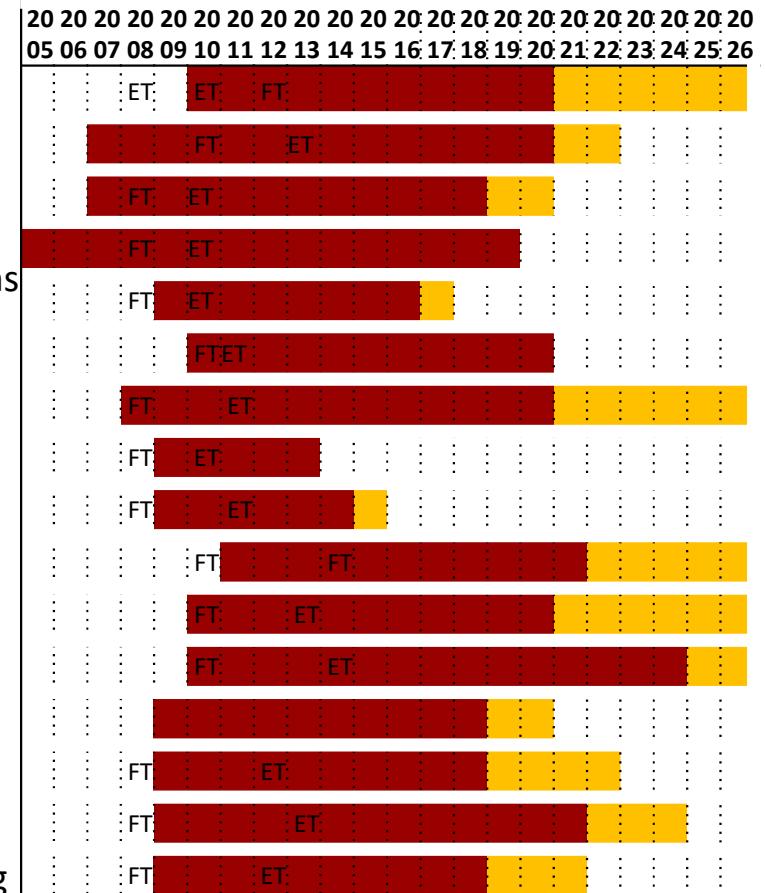
- The Expert Panel lacked competencies in construction and FM.
- As a result, architecture was in several cases prioritized over hospital operations, functionality, and life-cycle cost efficiency.

- **Optimistic schedules under political pressure:**

- For several projects, completion dates were politically defined.
- The original schedules were superficial and underestimated or ignored complex phases such as commissioning and move-in.

- **Launched simultaneously:**

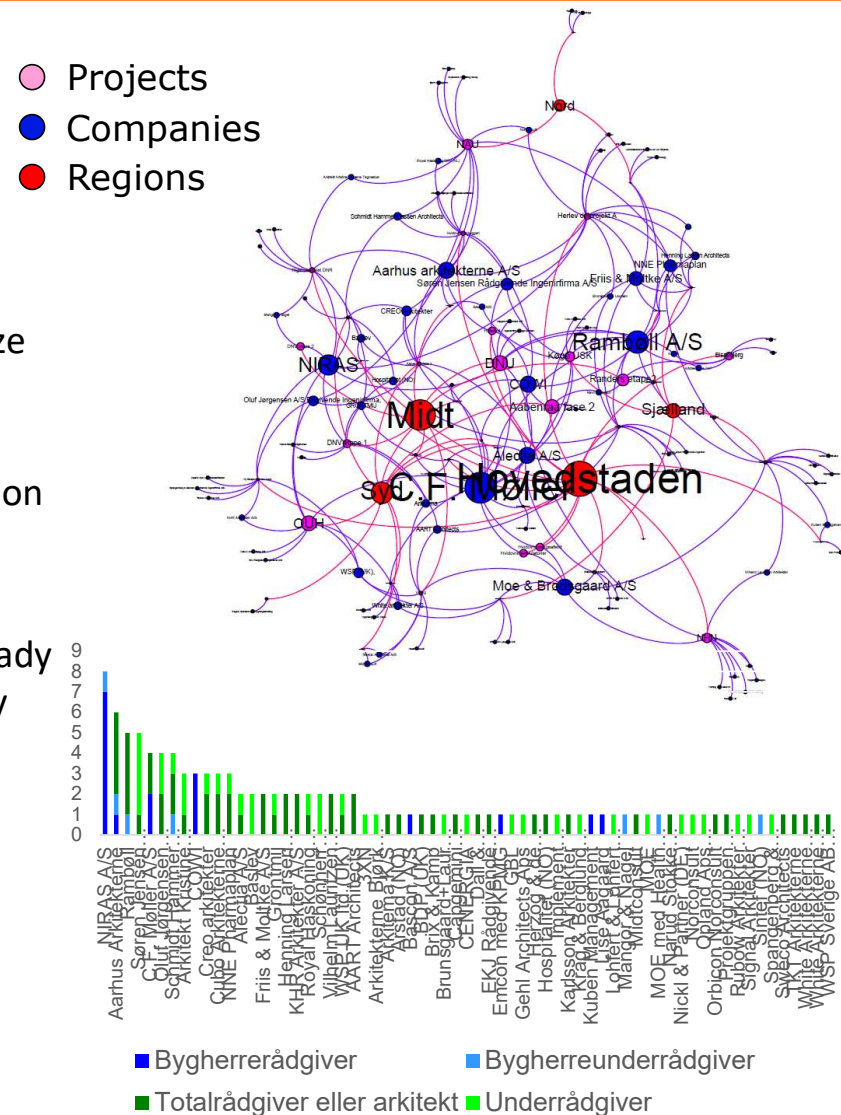
- It was inappropriate to initiate so projects within a short period, placing pressure on limited market competencies.



2: Competencies and learning

Clients and the industry were on a “very steep learning curve.”

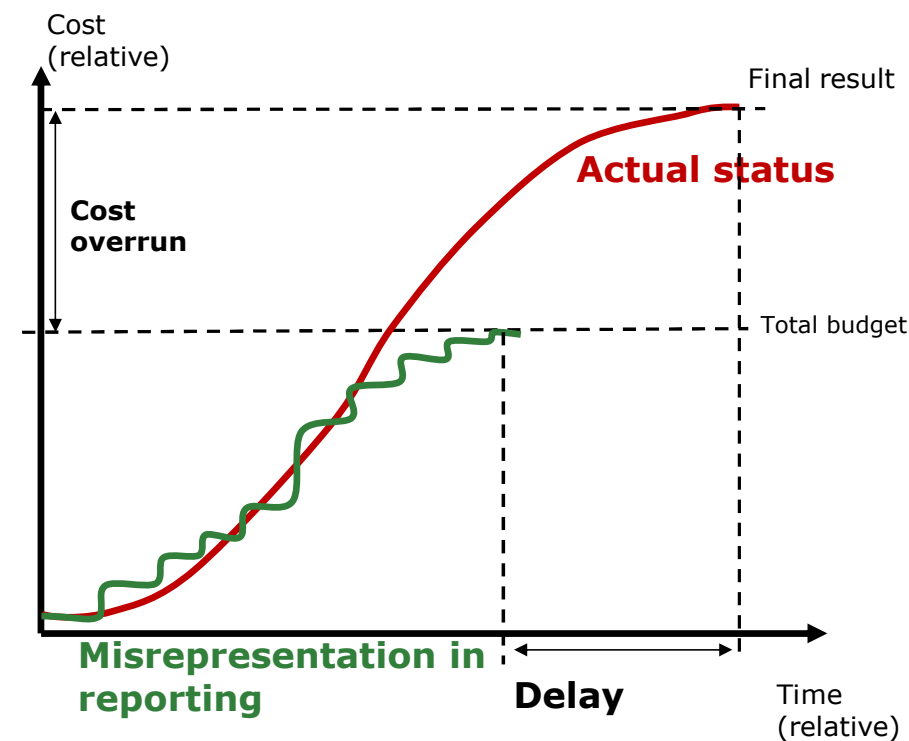
- **Inexperienced clients and consultants:**
 - The regions generally had no experience delivering projects of this size and complexity. Their construction organizations often evolved from smaller operational units.
 - Many consultants and contractors also lacked real hospital construction experience when the projects began.
- **Scarce competencies spread thin:**
 - Because all major projects were initiated almost simultaneously, already limited resources with the necessary competencies became “severely insufficient.”
 - Both clients and the construction industry faced intense pressure to recruit qualified personnel.
- **Superficial learning, lack of specialization:**
 - The simultaneous launch of projects “diluted” specialization in the industry, as many firms were involved in only a few projects.
 - “Many have practiced a little, but practice makes perfect.”



3: Strategic misrepresentation in reporting

Control mechanisms were ineffective.

- **Reporting without (the full) truth:**
 - Reporting on several projects was marked by “strategic misrepresentation,” presenting a “sanitized” picture of status.
- **External oversight (“The Third Eye”) was not effective:**
 - Not truly independent: DTØ is paid by the regions themselves.
 - Lack of competencies: It lacked the necessary deep construction expertise to properly assess projects.
 - Influenceable reporting: In several cases, project management succeeded in revising or toning down critical findings.
- **Ineffective “enhanced supervision” from the Ministry:**
 - The oversight “lacked the necessary construction expertise” to assess projects in depth.
 - It relied primarily on dialogue and the projects’ own (potentially misleading) reporting rather than professional auditing.
- **Consequence: Problems were allowed to grow and escalate**



Identified paradoxes and dilemmas in the case



Governance Dimension

1. Front-End Commitment
2. Financial vs. Clinical Control
3. Temporal Governance Structure
4. Public Oversight & Auditing
5. Program Scheduling
6. Design & Scope Prioritization

Core Empirical Tension

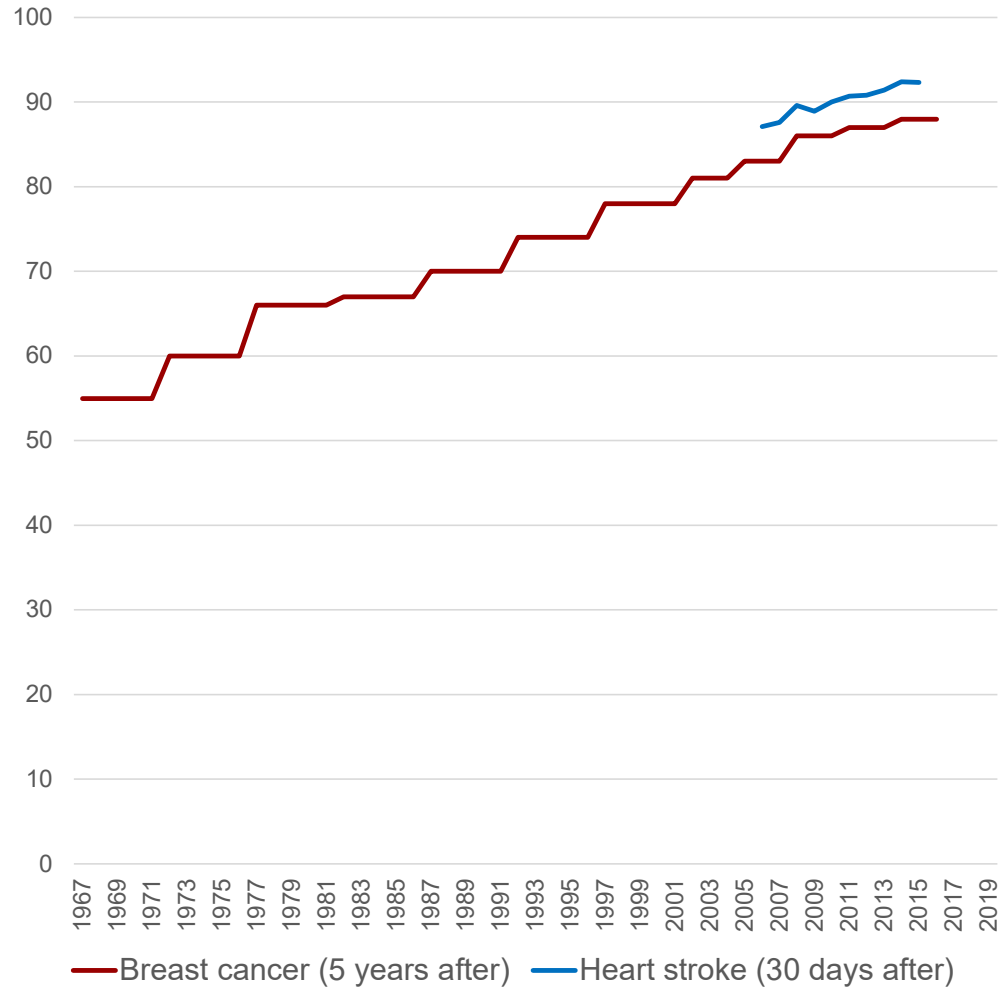
Early Financial Lock-In vs. High Initial Uncertainty
Fixed Capital Caps vs. Long-Term Clinical Adaptability
Temporary Ad-Hoc Setup vs. Permanent Institutional Capacity
Arm's-Length Distance vs. Independent Quality Assurance
Parallel Launch vs. Market Capacity & Serial Learning
Architectural Vision vs. Constructability & Total Economy

Policy implications

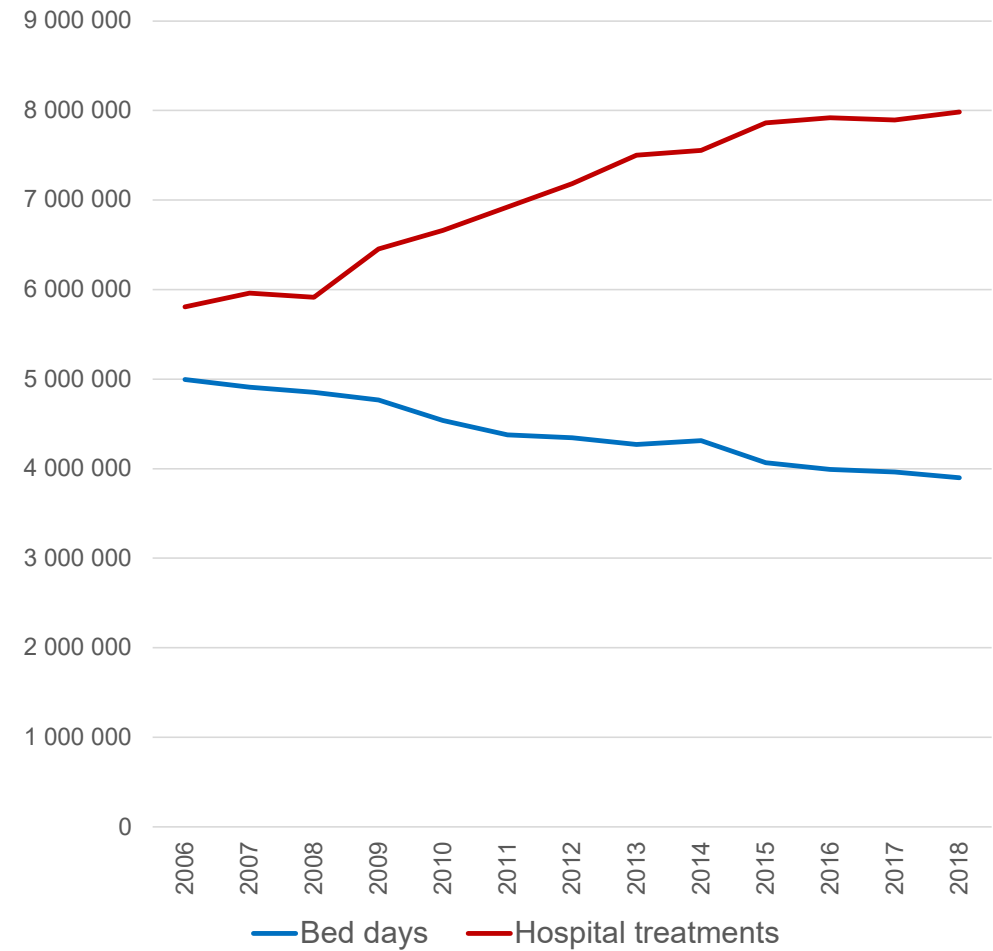
Navigating governance paradoxes requires moving away from binary either-or choices toward a **both-and cognitive mindset** that balances structural discipline with operational flexibility. The failures of the Quality Fund model highlight the necessity of transitioning toward **permanent governance frameworks**—such as the Danish Transport Ministry's *Ny Anlægsbudgettering* (NAB) or the Norwegian State Project Model:

- **Portfolio Sequencing:** Shifting from isolated, parallel projects to a strategically sequenced portfolio mitigates market overheating and enables serial institutional learning.
- **Centralized Independent External Quality Assurance:** Anchoring QA functions (QA1 for concept selection; QA2 for execution readiness) within a central ministry ensures technical expertise and insulates oversight from local political pressures.
- **Standardized Project Models:** Mandating a unified project model with standardized technical solutions (e.g., operating rooms, sterilization facilities) prevents the continuous "reinvention of the hospital".
- **Balancing Financial Discipline with Clinical Adaptability:** Structuring governance to evaluate total cost of ownership allows reasonable capital adjustments when long-term operational efficiencies and clinical functionalities can be proven.

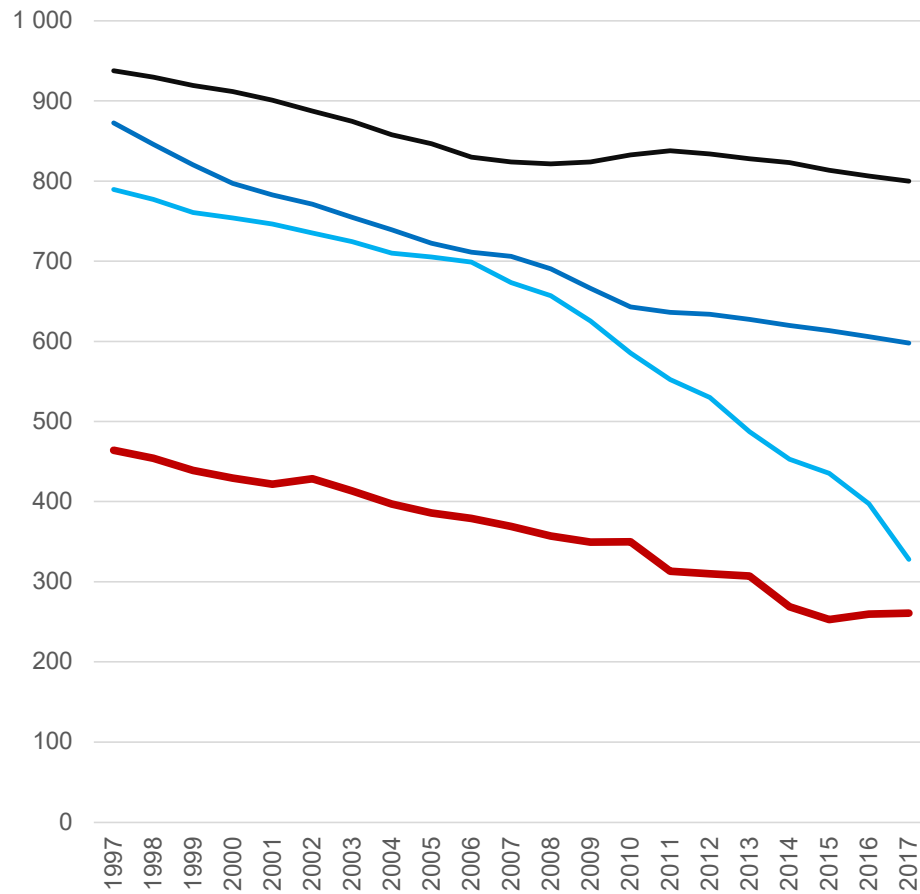
Survival rate %



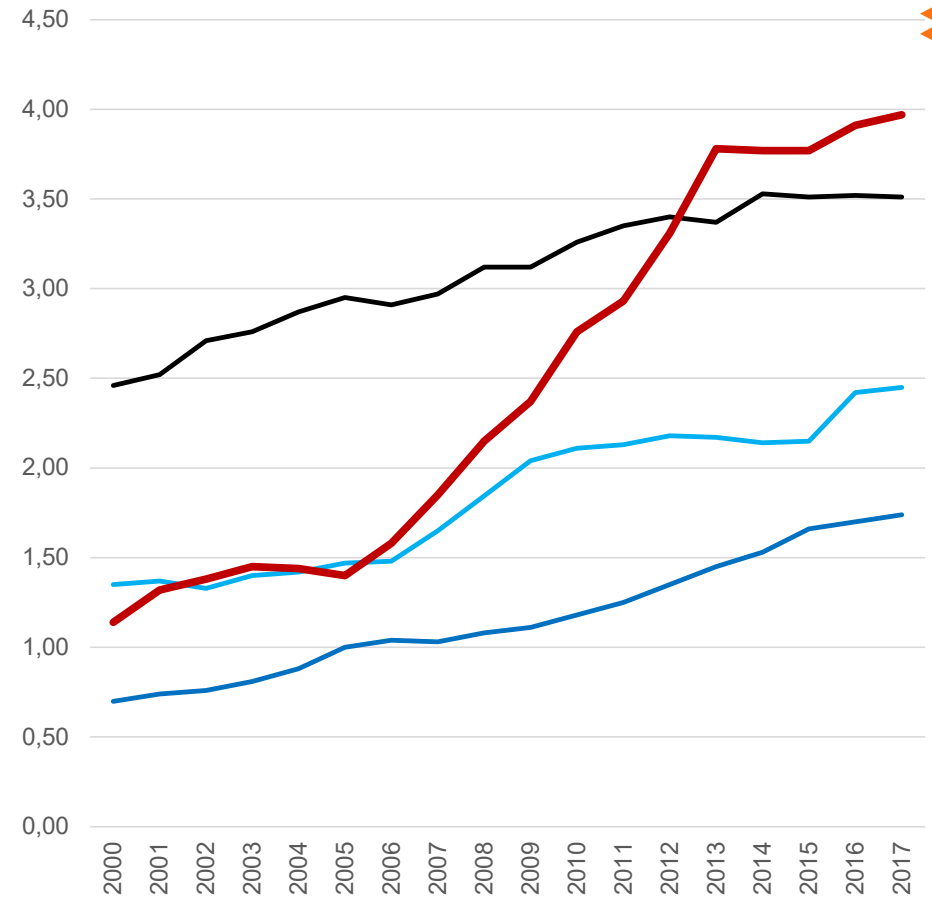
Indicators of healthcare effectiveness and efficiency



Number of beds / 100.000 inhabitants



Number of CT scanners / 100.000 inhabitants



Denmark Finland Germany France

Can it still be a success?



Pictures: Tonny Fogmar, copyright Aarhus Universitetshospital left) and Marianne Brink, copyright jysk fynske medier (right))

Resources



Working Paper Proceedings

Engineering Project Organization Conference
Cie Elum, Washington, USA
June 28-30, 2016

Reinventing the Hospital – A Study of Lost Synergies in Danish Healthcare

Baris Bekdik, Technical University of Denmark, Denmark
Christian Thuesen, Technical University of Denmark, Denmark

Proceedings Editors

Jessica Kaminsky, University of Washington and Vedran Zerjav, University College London



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Case 1: Transforming National Healthcare by the Construction of Super Hospitals

A Case on the Centralisation of the Danish Healthcare System – Engineering Healthcare

See Fig. 3.

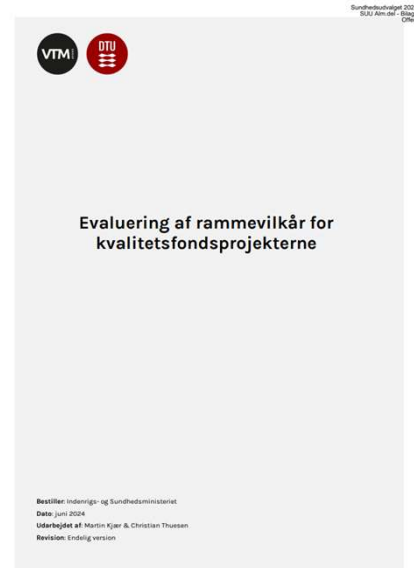


Fig. 3 The transformation of the Danish healthcare system by the construction of 16 super hospitals. (Picture: Rådgivergruppen DNU, used with permission)



Thuesen, C., Kozine, I., Maier, A., & Oehmen, J. (2022). [Engineering Systems Interventions in Practice: Cases from Healthcare and Transport](#). In A. Maier, J. Oehmen, & P. E. Vermaas (Eds.), *Handbook of Engineering Systems Design* Springer.

Podcast:
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[Kjær & Thuesen \(2024\), Evaluering af rammevilkår for kvalitetsfundsprojekterne](#)