Centralising Acute Services: what does the evidence say?

Seminar organised by the Nuffield Trust and SiRM

28 June 2023

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1. Goal of the seminar

Goal of the seminar

EDITORIAL

Reconfiguring emergency and acute services: time to pause and reflect

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A dominant trend over the past few decades has been the reconfiguration of acute hospital services to provide more centralised and specialised care, particularly for complex conditions, resulting in fewer hospitals each serving a higher volume of patients. Centralisation is usually framed as a response to concerns about the safety of care in smaller hospitals. In this issue of the journal, Flojstrup and colleagues report on the impact of a hospital reconfiguration programme for emergency and acute care in Denmark.[1] The ongoing programme, which began in 2008, involves closure of most small, rural hospitals and halving the number of acute hospitals. The quality of Danish registry data allows for the survival outcomes (adjusted in-hospital and 30-day mortality rates) of a large cohort (1 367 655 unplanned non-psychiatric episodes) to be described throughout the centralisation programme and across different diagnoses and arrival times. The use of a unique patient identifier across datasets enables a comprehensive analysis of case-mix changes over time.

The results are disappointing for proponents of centralisation. Although there were some possible benefits for small groups of patients (myocardial infarction, stroke, aortic aneurysm, major trauma), there was no overall improvement in the in-hospital mortality trend and a slight worsening of the 30-day mortality trend.

The study has some limitations. Like many major system evaluations, the authors were unable to unpick the effect of individual components of the programme, such as increased exposure to senior specialists. Specific implementation dates for each hospital could not be pinpointed, making it difficult to identify when effects might appear. Further, they could not account for effects on patient decision-making, such as disincentivising rural patients to attend an emergency department (ED).

RECONFIGURATION: WHAT DOES THE EVIDENCE SAY?

There are long-standing concerns about the effectiveness of reconfiguration. Although reconfiguration is framed as 'evidence based', it is often presented without a comprehensive analysis of how each of the assumptions underlying any programme theory is supported by research. In the sections below, we provide such an analysis.

ASSUMPTION 1: THERE IS A PROBLEM WITH THE QUALITY OF EMERGENCY CARE THAT NEEDS TO BE FIXED

Emergency care has been seemingly on the brink of crisis for at least the last two decades. Yet, while the increasing numbers of patients attending EDs have been well documented, there is no evidence that this has translated into increased patient mortality at the aggregated level. Instead, the trend has been for improvements in mortality coupled with a decrease in hospital length of stay.[2] Crucially, mortality improvement trends were faster before the onset of centralisation in both the Flojstrup and colleagues study and a similar study conducted in Ireland.[1 3] This suggests major ongoing improvements in the delivery of care over the past two to three decades that are independent of reconfiguration. Some of this is undoubtedly due to innovation in the treatment of critically unwell patients, such as percutaneous coronary intervention for myocardial infarction. However, there have been mortality improvements for diseases without similar breakthroughs in treatment, such as severe asthma.[4] This suggests a broader trend towards higher-quality care.

So, why then is emergency care presented as constantly in need of radical

Linked

► http://dx.doi.org/10.1136/bmjqs-2021-013881

Check for updates

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- There is now substantial evidence on the impact of centralising acute services.
- Some of the conventional assumptions about the benefits of centralisation do not follow the evidence.
- Given the recent proposals to change acute hospital services in the Netherlands, it is helpful to take a more critical view of this issue, including the impact on ambulance services and the wider community.

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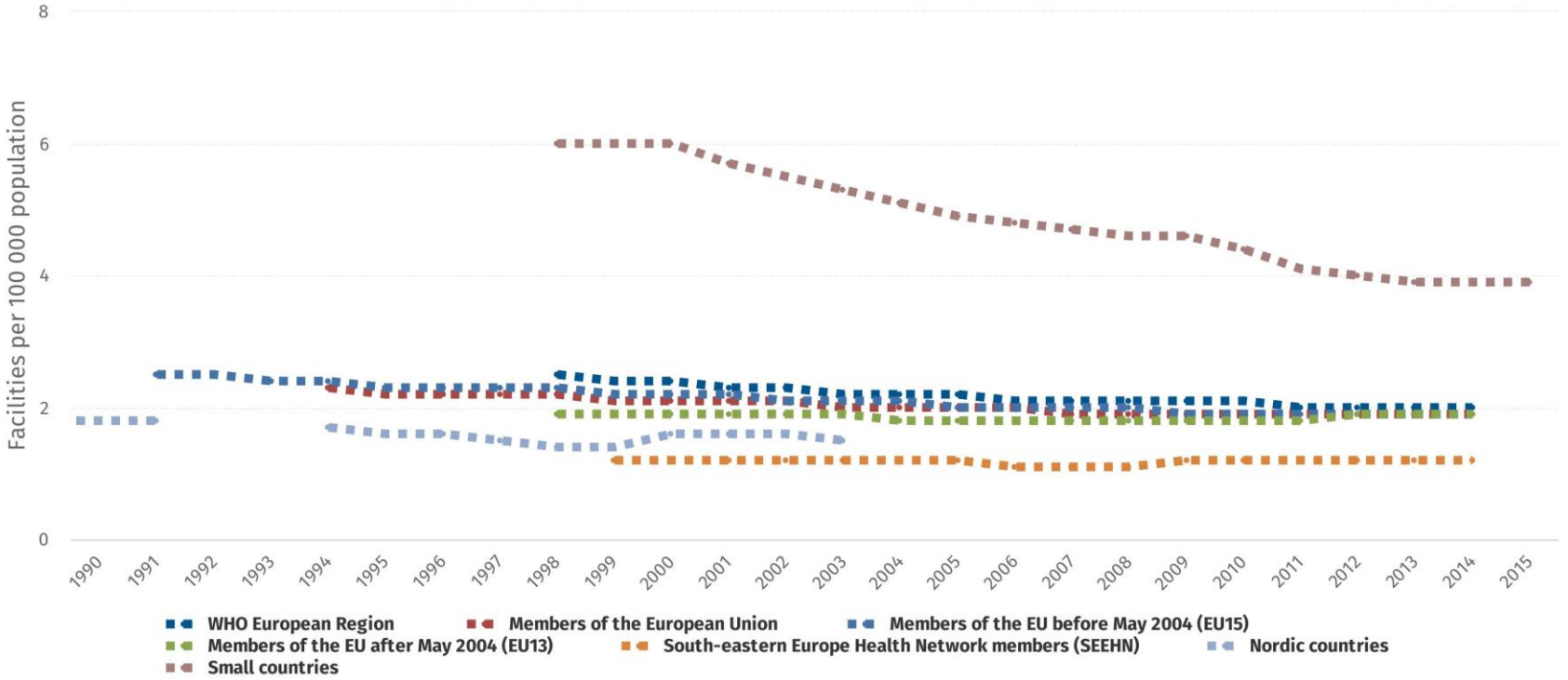
2. Overview of proposed changes in European countries

Acute (short-stay) hospitals per 100 000



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A lot of activity

- Norway – centralisation and networks from 2016
- Poland – centralisation and networks in discussion
- Germany – defining levels of hospitals and new payment mechanisms
- Romania – rationalisation and new building
- Denmark – centralisation and reconstruction – largely completed
- Estonia – revisiting its master plan
- Finland – regionalisation of services
- Slovenia and Slovakia – planning in progress
- Austria – funding pressure to reduce hospital use

Lessons

- Market based mechanisms are of limited effectiveness in optimising the shape of the system;
- Planning based approaches are more effective at this – as long as we are sure we know what optimal is
- Capital investment is often an essential ingredient
- Politicians and their communities are sceptical of many of the arguments they hear
- Many plans fail to be implemented

3. Review of the evidence about centralisation and alternative approaches to it

Emergency Care Reconfiguration: Evidence from 'Whole-Population' Evaluations in Ireland and Denmark

Professor John Browne

School of Public Health, University College Cork

and

Senior Editor, BMJ Quality & Safety

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Structure of talk

1. Review of evidence on whole population mortality impact of urgent/emergency care centralisation (ie not just single conditions or specialties)
   - Why? Because centralisation impacts the whole patient population.
2. Danish study by Flojstrup et al, BMJ Quality & Safety, 2022
3. Irish study by Lynch et al, BMC Health Services Research, 2018
4. Two smaller regional evaluations in UK
5. Discussion of causal pathways that could lead to harms for centralisation

NB slides for the Danish study are taken from a presentation given by Dr Marianne Flojstrup that can be found below:

https://www.sphereprogramme.ie/resources/recordings-listen-back-to-events/

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ORIGINAL RESEARCH

OPEN ACCESS

Mortality before and after reconfiguration of the Danish hospital-based emergency healthcare system: a nationwide interrupted time series analysis

Marianne Flojstrup ,[1,2] Søren Bie Bie Bogh ,[3,4] Mickael Bech,[5] Daniel Pilsgaard Henriksen,[6,7] Søren Paaske Johnsen,[8] Mikkel Brabrand [2,9]

► Additional supplemental material is published online only. To view, please visit the journal online (http://dx.doi.org/10.1136/bmjqs-2021-013881).

For numbered affiliations see end of article.

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ABSTRACT

Objectives The study aimed to investigate how the 'natural experiment' of reconfiguring the emergency healthcare system in Denmark affected in-hospital and 30-day mortality on a national level. The reconfiguration included the centralisation of hospitals and the establishment of emergency departments with specialists present around the clock.

Design Hospital-based cohort study.

Setting All public hospitals in Denmark.

Participants Patients with an unplanned contact from 1 January 2007 until 31 December 2016.

Interventions Stepped-wedge reconfiguration of the Danish emergency healthcare system.

Main outcome measures We determined the adjusted ORs for in-hospital mortality and HRs for 30-day mortality using logistic and Cox regression analysis adjusted for sex, age, Charlson Comorbidity Index, income, education, mandatory referral and the changes in the out of hours system in the Capital Region. The main outcomes were stratified by the time of arrival. We performed subgroup analyses on selected diagnoses: myocardial infarction, stroke, pneumonia, aortic aneurysm, bowel perforation, hip fracture and major trauma.

Results We included 11 367 655 unplanned hospital contacts. The adjusted OR for overall in-hospital mortality after reconfiguration of the emergency healthcare system was 0.998 (95% CI 0.968 to 1.010; p=0.285), and the adjusted OR for 30-day mortality was 1.004 (95% CI 1.000 to 1.008; p=0.045)). Subgroup analyses showed some possible benefits of the reconfiguration such as a reduction in-hospital and 30-day mortality for myocardial infarction, stroke, aortic aneurysm and major trauma.

Conclusions The Danish emergency care reconfiguration programme was not associated with an improvement in overall in-hospital mortality trends and was associated with a slight slowing of prior improvements in 30-day mortality

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ There are conflicting results on short-term mortality after reconfiguration of emergency healthcare systems.
⇒ Research on the consequences of major emergency healthcare reforms is scarce.
⇒ Additional knowledge is imperative, as major healthcare reforms are massive investments in physical and human capital and entail complex organisational changes.

WHAT THIS STUDY ADDS

⇒ The Danish emergency healthcare reconfiguration from 2007 to 2016 had no change on in-hospital mortality but slightly increased 30-day mortality.
⇒ Subgroup analyses showed a decrease in in-hospital or 30-day mortality for myocardial infarction, stroke, aortic aneurysm and major trauma, all conditions that require urgent management.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE AND/OR POLICY

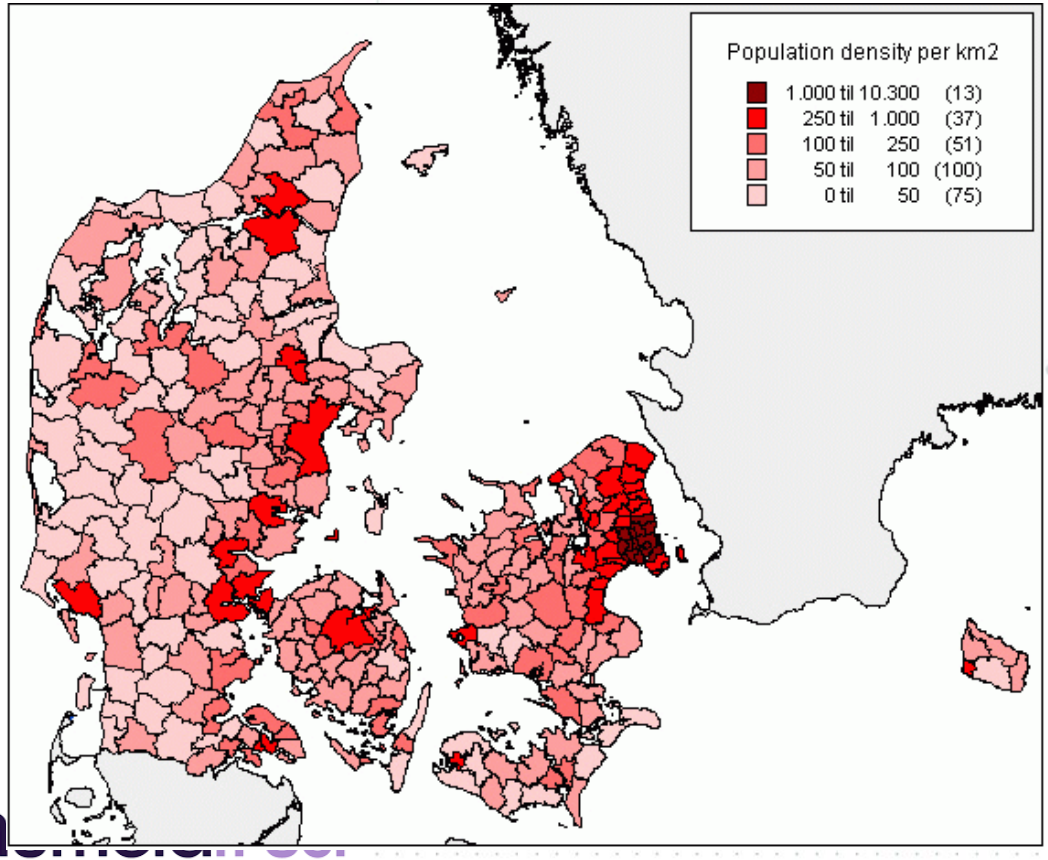
⇒ Reconfiguration of a nationwide emergency healthcare system is a complex and massive investment.
⇒ As such, all mechanisms can never be described; however, the results of this study do not support any association between mortality and reconfiguration.

Linked

► http://dx.doi.org/10.1136/bmjqs-2022-015141

Check for updates

Danish population distribution



2007 reconfiguration plan for Danish acute hospitals

- Fewer emergency hospitals through mergers
- Closing of smaller hospitals
- Some new hospitals
- Centralisation of specialised treatment
- Relevant medical specialists present 24/7
- Mandatory referral to the ED from GP or dispatch centre
- Number of acute hospitals will go from 44 (in 2007) to 21 (in 2025).
- Longer travel distances for rural patients

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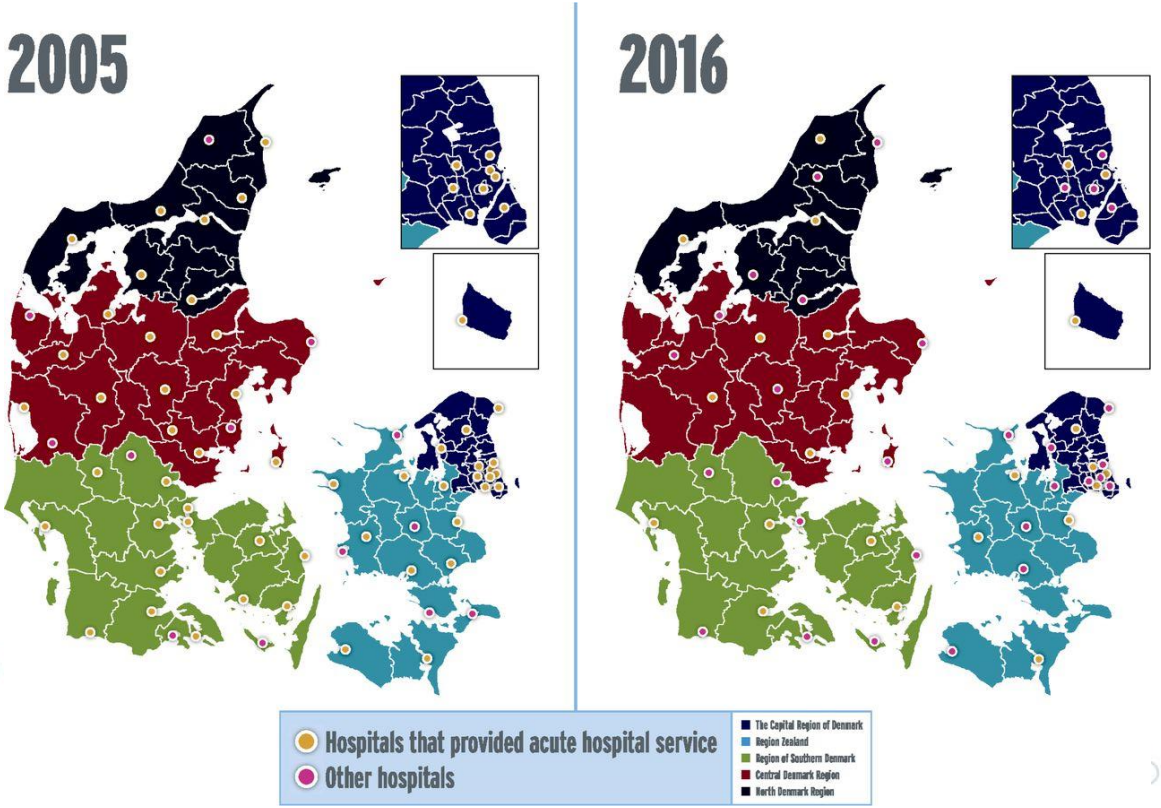
Danish hospital reconfiguration



Fløjstrup et al. BMJ Open 2020;10:e031409

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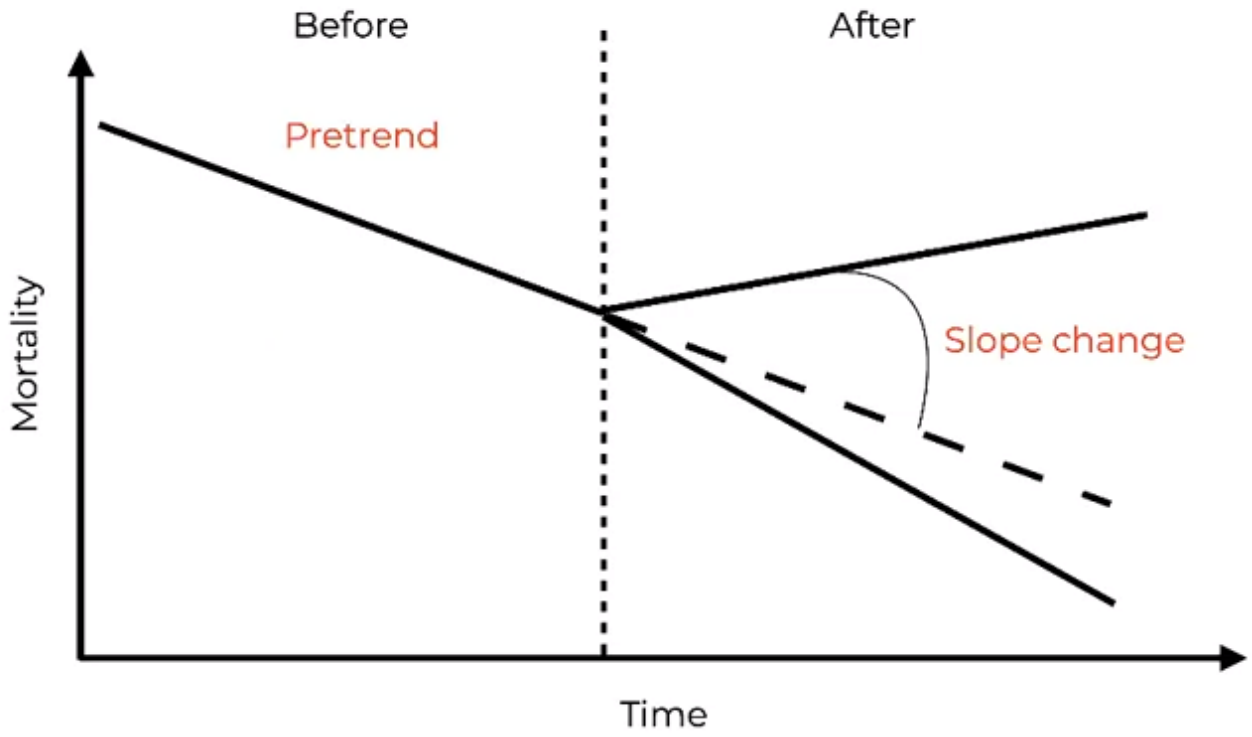
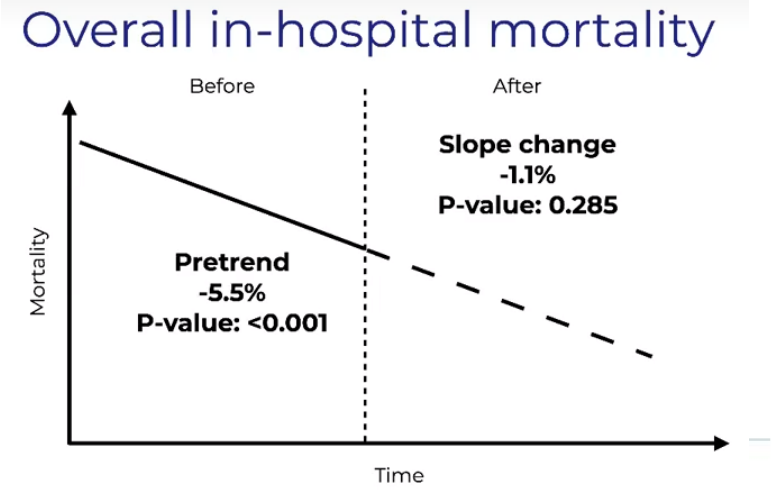
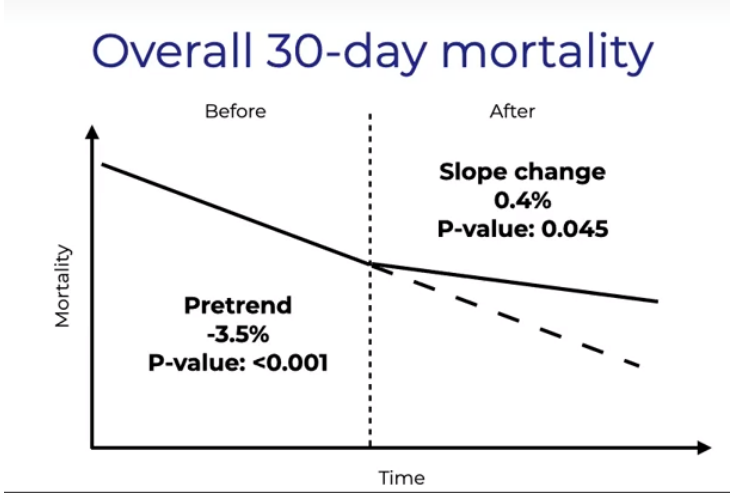
BMJ Open

Interrupted time series



Danish results as found by Flojstrup et al 2022





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Lynch et al. BMC Health Services Research (2018) 18:474
https://doi.org/10.1186/s12913-018-3260-1

BMC Health Services Research

RESEARCH ARTICLE Open Access

Case fatality ratios for serious emergency conditions in the Republic of Ireland: a longitudinal investigation of trends over the period 2002–2014 using joinpoint analysis

Brenda Lynch[1*], Anthony P. Fitzgerald[1], Paul Corcoran[1], Orla Healy[2], Claire Buckley[1,2], Conor Foley[1] and John Browne[1]

Abstract

Background: In the past decade, the Republic of Ireland has undertaken significant reconfiguration programmes to improve emergency services. During this time the public healthcare system experienced a large real decrease in resources. This study assesses national and regional population outcomes over the period 2002–2014, and whether changes coincide with system reconfiguration and the financial restrictions imposed by the 2008 recession.

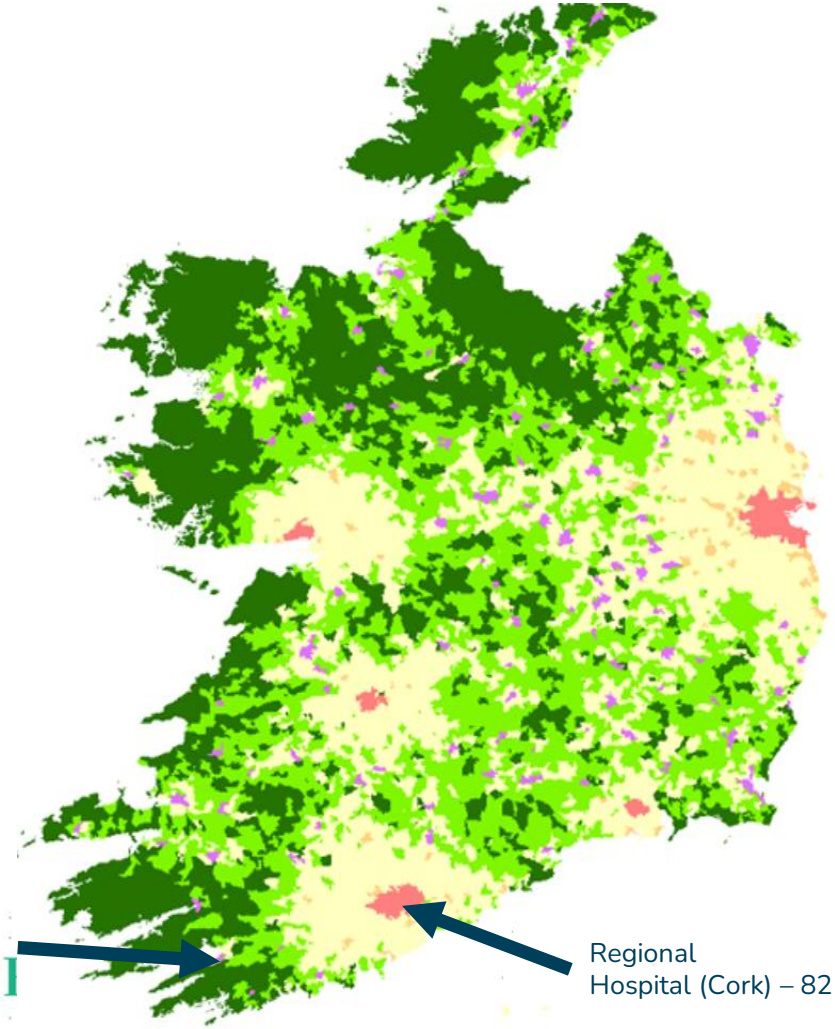
Methods: Case fatality ratios (CFRs) were constructed for emergency conditions for 2002–2014. Total emergency conditions and individual condition trends were analysed nationally using joinpoint analysis. National results informed the investigation of trends at a regional and county level using an inverse standard error weighted generalised linear model with a log link to construct funnel plots. County-level CFRs were compared for the first and last 3 years of the period to further investigate the changes to county results over the 13 year period, specifically in comparison to the national-level CFR.

Results: Nationally, there was an annual fall in CFRs (2.1%). The decline was faster from 2002 to 2007 (annual percentage change = − 3.4; 95% CI-4.4, − 2.4), compared to 2007–2014 (annual percentage change = − 1.2; 95% CI -1.9, − 0.5). The South-East had a lower rate of decrease and the West had a higher rate. Cross sectional analysis of two periods (2002–2004 and 2012–2014) showed high consistency in the counties performance relative to the national CFR in both periods.

Conclusion: Change in the national trend coincided with the onset of economic stress on the public health system. Attributing the decline in CFR improvement to economic factors is weakened by the uneven nature of the trend change. No distinct pattern of change was identified among regions which underwent substantial reconfiguration of emergency services.

Keywords: Reconfiguration, Emergency care, Health systems, Regional variations

Republic of Ireland: distribution of 5 million people



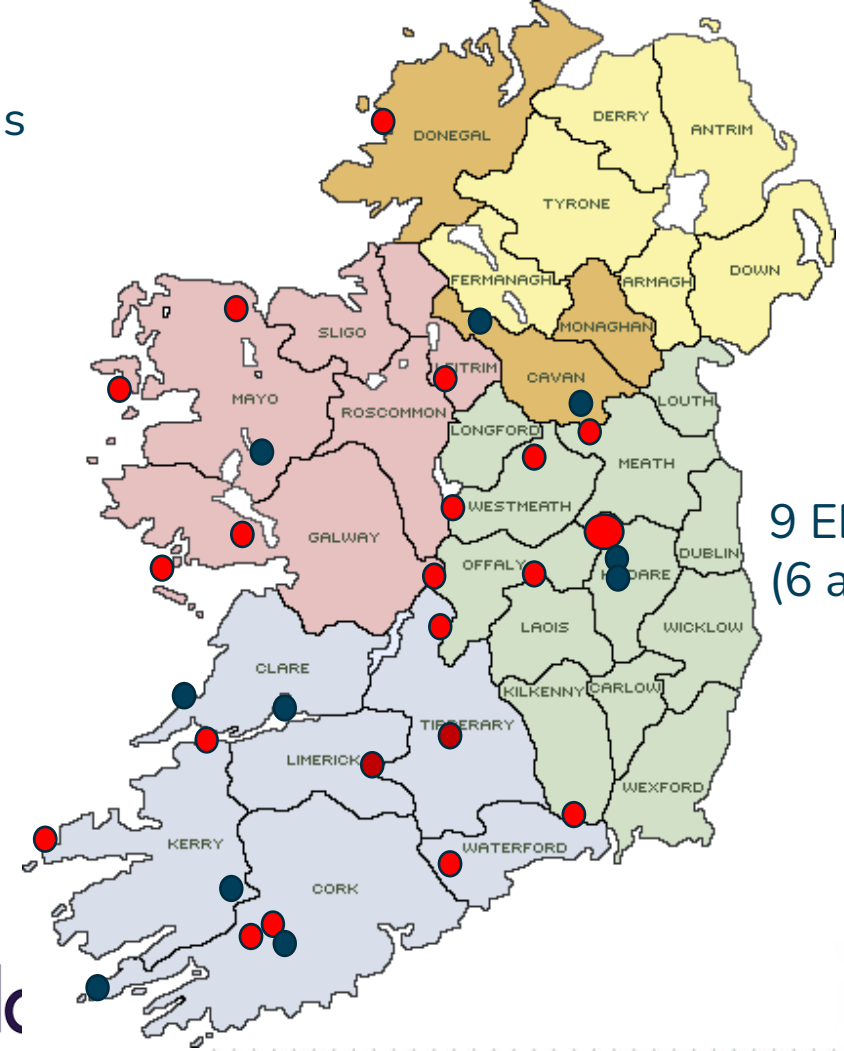
- 1. Cities
- 2. Satellite urban towns
- 3. Independent urban towns
- 4. Rural areas with high urban influence
- 5. Rural areas with moderate urban influence
- 6. Highly rural/remote areas

Source: CSO Ireland

Local Hospital Bantry

Regional Hospital (Cork) – 82 kms from Bantry, 90 mins driving time.

- Current ED locations
- Downgraded EDs



9 EDs in Dublin
(6 adult and 3 paediatric)

- Emergency departments were reconfigured to varying degrees in Ireland over period 2002-14
- Focus was on Southern and Mid-Western regions of the country which are also the most rural.

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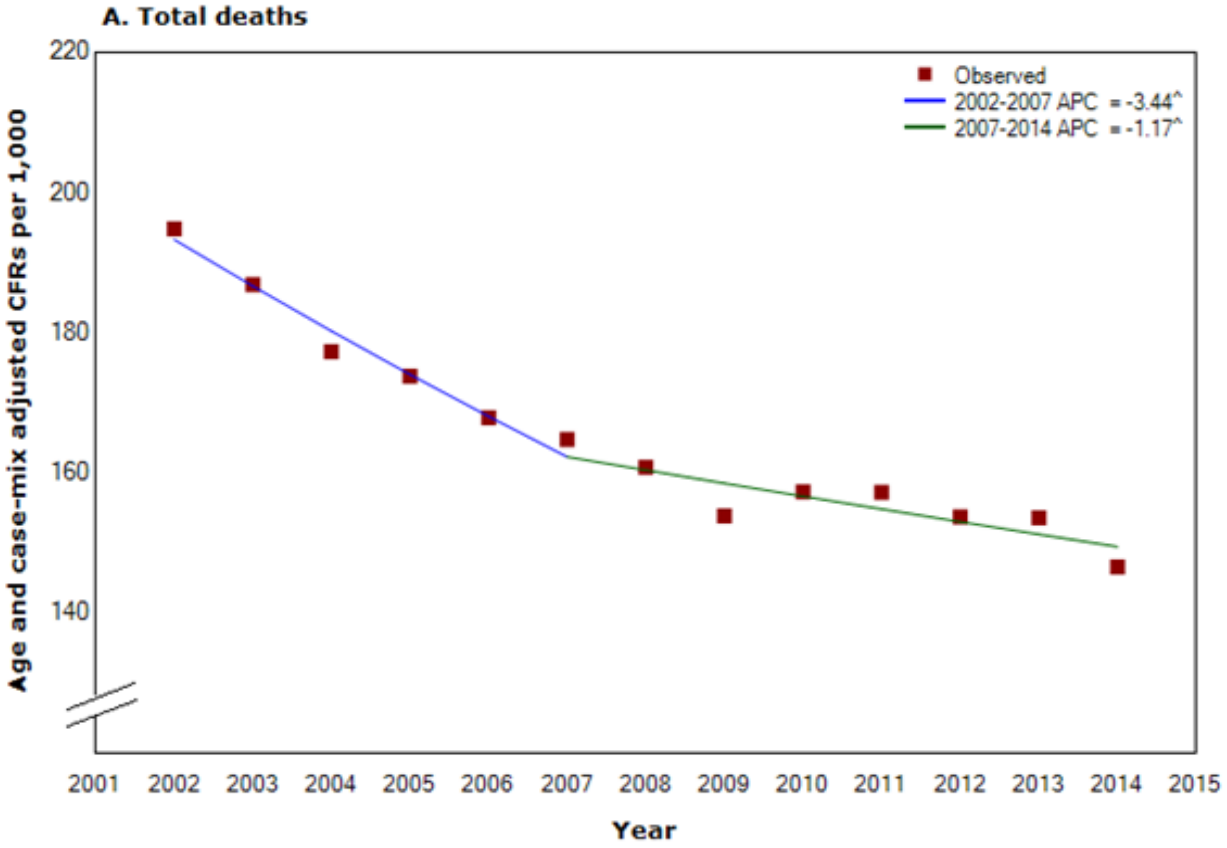
Was reconfiguration associated with a slope improvement in case-fatality for serious emergency conditions in Ireland?



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Two smaller studies from the UK

The impact of closing emergency departments on mortality in emergencies: an observational study

Emma Knowles, Neil Shephard, Tony Stone, Suzanne M Mason, Jon Nicholl

ABSTRACT

Background In England the demand for emergency care is increasing, while there is also a staffing shortage. This has implications for quality of care and patient safety. One solution may be to concentrate resources on fewer sites by closing or downgrading emergency departments (EDs). Our aim was to quantify the impact of such reorganisation on population mortality.

Methods We undertook a controlled interrupted time series analysis to detect the impact of closing or downgrading five EDs, which occurred due to concerns regarding sustainability. We obtained mortality data from 2007 to 2014 using national databases. To establish ED resident catchment populations, estimated journey times by road were supplied by the Department for Transport. Other major changes in the emergency and urgent care system were determined by analysis of annual NHS Trust reports in each geographical area studied. Our main outcome measures were mortality and case fatality for a set of 16 serious emergency conditions.

Results For residents in the areas affected by closure, journey time to the nearest ED increased (median change 9 min, range 0–25 min). We found no statistically reliable evidence of a change in overall mortality following reorganisation of ED care in any of the five areas or overall (+2.5% more deaths per month on average; 95% CI −5.2% to +10.2%; p=0.52). There was some evidence to suggest that, on average across the five areas, there was a small increase in case fatality, an indicator of the 'risk of death' (+2.3%, 95% CI +0.9% to+3.6%; p<0.001), but this may have arisen due to changes in hospital admissions.

Conclusions We found no evidence that reorganisation of emergency care was associated with a change in population mortality in the five areas studied. Further research should establish the economic consequences and impact on patient experience and neighbouring hospitals.

What this paper adds

What is already known on this topic

- A small number of EDs in England have been closed due to issues around safety and sustainability, with further ED closures expected in other areas.
- The impact of closure or downgrade of an ED in England on population mortality was unknown.
- Existing evidence indicated that longer journey times to ED and the delayed onset of emergency treatments are detrimental to patient mortality.

What this study adds

- We found no statistically reliable, consistent evidence of an increase in deaths among the population from serious emergency conditions in the period following the reorganisation of emergency care in the five geographical areas studied.
- It may be possible to close further carefully selected EDs without negative impact on population mortality. However, selection of these EDs would require careful consideration.

on fewer sites by closing some of these EDs or suspending services overnight. In recent years a small number of EDs have been closed or downgraded to a less acute facility, reportedly due to reasons of inadequate staffing and safety implications. However, there is little research evidence to inform decision-making about closing EDs.

Those opposed to such reorganisation claim that ED closures impact on the quality and safety of care

Impact of emergency care centralisation on mortality and efficiency: a retrospective service evaluation

Christopher Price,[1] Stephen McCarthy,[2] Angela Bate,[2] Peter McMeekin[2]

ABSTRACT

Objective Evidence favours centralisation of emergency care for specific conditions, but it remains unclear whether broader implementation improves outcomes and efficiency. Routine healthcare data examined consolidation of three district general hospitals with mixed medical admission units (MAU) into a single high-volume site directing patients from the ED to specialty wards with consultant presence from 08:00 to 20:00.

Methods Consecutive unscheduled adult index admissions from matching postcode areas were identified retrospectively in Hospital Episode Statistics over a 3-year period: precentralisation baseline (from 16 June 2014 to 15 June 2015; n=18 586), year 1 postcentralisation (from 16 June 2015 to 15 June 2016; n=16 126) and year 2 postcentralisation (from 16 June 2016 to 15 June 2017; n=17 727). Logistic regression including key demographic covariates compared baseline with year 1 and year 2 probabilities of mortality and daily discharge until day 60 after admission and readmission within 60 days of discharge.

Results Relative to baseline, admission postcentralisation was associated with favourable OR (95% CI) for day 60 mortality (year 1: 0.95 (0.88 to 1.02), p=0.18; year 2: 0.94 (0.91 to 0.97), p<0.01), mainly among patients aged 80+ years (year 1: 0.88 (0.79 to 0.97); year 2: 0.91 (0.87 to 0.96)). The probability of being discharged alive on any day since admission increased (year 1: 1.07 (1.04 to 1.10), p<0.01; year 2: 1.04 (1.02 to 1.05), p<0.01) and the risk of readmission decreased (year 1: 0.90 (0.87 to 0.94), p<0.01; year 2: 0.92 (0.90 to 0.94), p<0.01).

Conclusion A centralised site providing early specialist care was associated with improved short-term outcomes and efficiency relative to lower volume ED admitting to MAU, particularly for older patients.

Key messages

What is already known on this subject

- Current national policy favours centralisation of emergency medical care based on evidence of improved outcomes and efficiency for specific conditions.
- The number, age and complexity of emergency admissions are increasing in real terms.
- It is unclear whether centralisation is justified for unselected emergency admissions reflecting older, frailer patients with a broad range of conditions.

What this study adds

- Unscheduled adult index admissions were identified in Hospital Episode Statistics from a single large NHS Trust to examine the impact of emergency care centralisation over a 3-year period: precentralisation baseline (from 16 June 2014 to 15 June 2015; n=18 586), year 1 postcentralisation (16 June 2015 to 15 June 2016; n=16 126) and year 2 postcentralisation (from 16 June 2016 to 15 June 2017; n=17 727).
- The probability of day 60 mortality was reduced when three district general hospital EDs were centralised at a new high-volume emergency care hospital with earlier specialist contact.
- The greatest mortality reduction was observed among the oldest patients (aged 80+ years) with potentially treatable conditions such as pneumonia and heart failure.
- Although length of stay increased during the first year postcentralisation, the average probability of discharge per day was higher with a reduced risk of readmission.

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Why might centralisation be harmful?

- It stresses the system as a whole (overspill crowding in hub hospitals)
- It hits condition groups where centralised care is not superior, especially ‘difficult’ presentations in older, poorer patients and those with complex mental, physical and social needs.
  - Frail 80 year old woman falls because of anti-depressant associated hyponatremia.
  - Husband observes convulsion (possible head injury?). Possible broken leg (actual knee fracture not operable).
  - Ambulance transport to local hospital 20km away or tertiary hospital 100km away?
  - What is the tertiary hospital going to do that local hospital can’t?
  - If the local hospital can’t perform CT/X-ray, review/change meds, stabilise knee and transfer to community rehab hospital… why is that?
- What are possible harms associated with transfer in this case?
  - Overcrowded ED and wards in tertiary hospital
  - Less knowledge of the patients themselves who may have been treated locally many times
  - Disrupted relationships with community care (eg GP, local community geriatrics/psychiatry, rehab facilities)
  - Extra economic/travel burden on 80 year old husband who now has to drive to see her

Beyond Volume Indicators and Centralization: Toward a Broad Perspective on Policy for Improving Quality of Emergency Care

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Table. Repertoires of emergency care.

Repertoire	Patients' Conditions	Quality of Care	Professional Skills	Organization of Care
Acute and complex care	Acute danger of death or major health damage	Defined in clinical terms, eg, mortality	Expert knowledge and routines aimed at achieving optimal clinical outcomes	Standardized teamwork in high-tech facilities
Uncertain diagnostics	Symptoms that are hard to classify or relapses in a chronic disease, often leading to hospital admission	Speed of diagnosis, treatment, and admission and clear communication with patients in uncertain situations	Excellent diagnostic and communicative skills and knowledge of the background and medical history of patients	Presence of a wide range of diagnostic tools and good collaboration between the ED and other hospital departments
Basic care	Minor health issues	Short waiting times and patient-friendly communication	Routine medical skills, good planning and communicative skills	Collaboration between the ED and primary care facilities
Physical, mental, and social care	Multiproblems (medical, psychological, social)	Good diagnosis, clear communication with patients, and well-organized (long-term) care	Good organizing skills, empathy, good diagnostic and communicative skills, knowledge of other (long-term) social and medical services	Collaboration between the ED and home care, nursing homes, mental care, and primary care facilities

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Why are we removing services from communities that need them the most?

Demographic Research: Volume 39, Article 33
Descriptive Finding

Persistence of death in the United States: The remarkably different mortality patterns between America's Heartland and Dixieland

Wesley James[1]
Jeralynn Cossman[2]
Julia Kay Wolf[2]

Abstract

BACKGROUND
Geographic disparities in mortality have been analyzed by place in myriad ways. Although the people who live in a place continuously change, the health characteristics of those places tend to stay the same; they are persistent. Our work analyzes persistence of mortality across various geographic designations and uncovers the wide-ranging disparities in death across the United States.

METHODS
Using 48 years of county-level mortality data, we analyze trends over time and disparities across places using rural–urban distinctions and census-based region and division classifications. Trends in death rates, excess deaths, and rates of mortality improvement are provided.

RESULTS
Findings support the hypothesis that persistently high mortality places are disproportionately concentrated in the rural South, particularly the East South Central division of Kentucky, Tennessee, Mississippi, and Alabama. The disparity between this division and urban America is wide and getting wider, and the disparity between this area of the South and the Midwest is alarming.

CONTRIBUTION
Our research moves forward the literature on place-based mortality disparities in two important areas by testing the notion of persistence of poor health in place, and by identifying geographic disparities based on classifications not previously tested.

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[2] West Virginia University, Morgantown, USA.

Holmager *et al. BMC Public Health* (2021) 21:90
https://doi.org/10.1186/s12889-020-10108-6

BMC Public Health

RESEARCH ARTICLE Open Access

Emergence of a mortality disparity between a marginal rural area and the rest of Denmark, 1968-2017

Therese L. F. Holmager[1*], Lars Thygesen[2], Lene T. Buur[3] and Elsebeth Lynge[1]

Abstract

Background: Lolland-Falster is a rural area of Denmark, where the life expectancy is presently almost six years lower than in the rich capital suburbs. To determine the origin of this disparity, we analysed changes in mortality during 50 years in Lolland-Falster.

Methods: Annual population number and number of deaths at municipality level were retrieved from StatBank Denmark and from Statistics Denmark publications, 1968–2017. For 1974–2017, life expectancy at birth by sex and 5-year calendar period was calculated. From 1968 to 2017, standardised mortality ratio (SMR) for all-cause mortality was calculated by sex, 5-year calendar period and municipality, with Denmark as standard and including 95% confidence intervals (CI).

Results: In 1968–2017, life expectancy in Lolland-Falster increased, but less so than in the rest of Denmark. Fifty years ago, Lolland-Falster had a mortality similar to the rest of Denmark. The increasing mortality disparity developed gradually starting in the late 1980s, earlier in Lolland municipality (western part) than in Guldborgsund municipality (eastern part), and earlier for men than for women. By 2013–2017, the SMR had reached 1.25 (95% CI 1.19–1.31) for men in the western part, and 1.11 (95% CI 1.08–1.16) for women in the eastern part. Increasing mortality disparity was particularly seen in people aged 20–69 years.

Conclusions: This study is the first to report on increasing geographical segregation in all-cause mortality in a Nordic welfare state. Development of the mortality disparity between Lolland-Falster and the rest of Denmark followed changes in agriculture, industrial company closure, a shipyard close-down, administrative centralisation, and a decreasing population size.

Keywords: Denmark, Vital statistics, Health status disparities, Population dynamics, Rural population

Summary

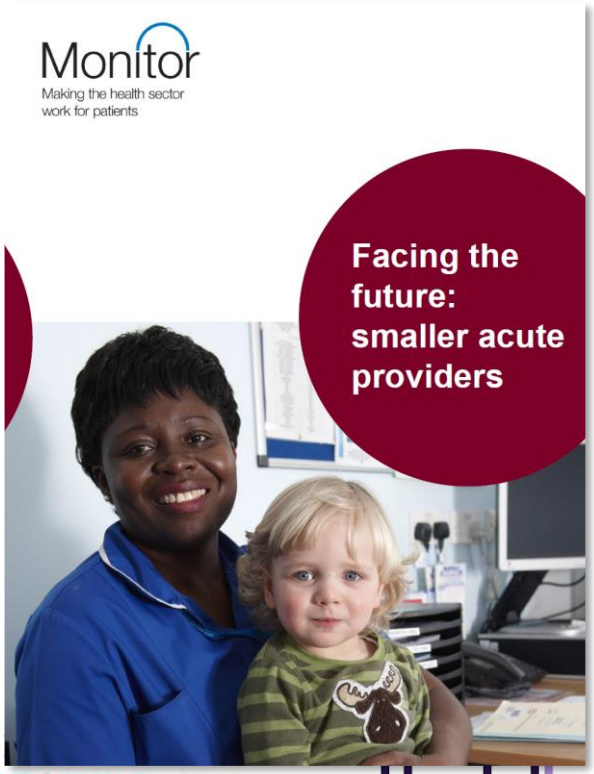
- No evidence from whole country evaluations that reconfiguration has improved mortality outcomes.
- The limited mortality evidence we have is not supportive of emergency care centralisation.
- Evidence base is weak – few studies, mostly weak designs (other than Danish study).
- Very hard to map from context to context:
  - Ireland 72 people per Km^2
  - Denmark 137 per Km^2
  - Netherlands 508 per Km^2
- Remarkably little evidence about 'balancing' impacts:
  - equity (income/age/geography)
  - timeliness of care
  - environment (extra cars on the road)
  - staffing (stress and retention)
  - overcrowding at hub hospitals
  - efficiency of mitigation measures (eg converting smaller EDs to minor injury or acute assessment units)
  - patient/carer experience
  - disrupted relationships with local providers
- Consistent concerns about 'procedural injustice':
  - poor public engagement – focus on informing by 'experts' rather than listening
  - diminishing the role of public representatives and campaigners as 'populism'
  - cherry-picking studies so that policies can be sold as evidence-based
  - inferring whole population benefits from a small group of complex care conditions
  - ambiguous definitions of success: eg changes from 'saves lives' (as a sales pitch) to 'doesn't kill anyone' (to defend policy)
  - lack of candour about historical decisions that led to impetus for centralisation (eg benign neglect of smaller units)
  - lack of transparency about role of vested interests eg medical schools, professional bodies
  - lack of accountability and a plan B in the case of failure

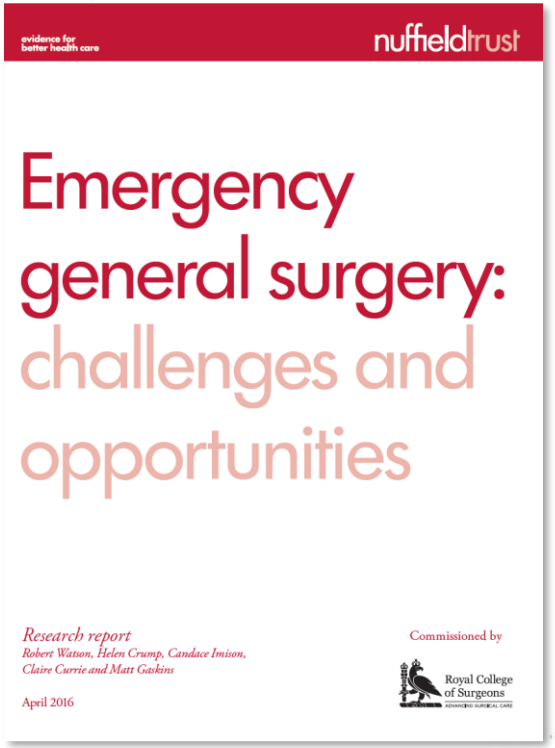
Specialist Services: Can Reconfiguration Improve Acute Outcomes?

Louella Vaughan
Senior Clinical Fellow
Nuffield Trust

Surgery

NO strong evidence that surgical outcomes are necessarily worse for smaller hospitals





Association of Hospital Critical Access Status With Surgical Outcomes and Expenditures Among Medicare Beneficiaries

Andrew M. Ibrahim, MD[1]; Tyler G. Hughes, MD[2]; Jyothi R. Thumma, MPH[1]; et al

» Author Affiliations | Article Information

JAMA. 2016;315(19):2095-2103. doi:10.1001/jama.2016.5618

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Some evidence that increasing volumes of urgent specialist surgery improves outcomes

Hospital Volume Association With Abdominal Aortic Aneurysm Repair Mortality

Analysis of the International Consortium of Vascular Registries

Salvatore T. Scali, MD, Adam W. Beck, MD, Art Sedrakyan, MD, PhD, Jialin Mao, MD, MS, Maarit Venermo, MD, PhD, Rumi Faizer, MD, Marc Schermerhorn, MD, Barry Beiles, MB BCh, FRACS, Zoltán Szeberin, MD, PhD, Nikolaj Eldrup, MD, PhD, Ian Thomson, MBChB, FRACS, Kevin Cassar, MD, FRCS(Ed), M Alexander Behrendt, MD, Sebastian Debus, MD, FRCS, Amundeep Johal, PhD, Martin Bjorck, MD Mani, MD, PhD

JAMA Surg. 2014 February ; 149(2): 119–123. doi:10.1001/jamasurg.2013.3649.

Volume 140, Issue 15, 8 October 2019; Pages 1285-1287
https://doi.org/10.1161/CIRCULATIONAHA.119.042504

"Understanding the Volume-Outcome Effect in Cardiovascular Surgery: the Role of Failure to Rescue"

Andrew A. Gonzalez, MD, JD, MPH, Justin B. Dimick, MD, MPH, John D. Birkmeyer, MD, and **Amir A. Ghaferi, MD**
Center for Healthcare Outcomes and Policy (CHOP) Department of Surgery, University of Michigan, Ann Arbor, Michigan

No real evidence for centralisation of emergency general surgery

BMJ Open

Volume and in-hospital mortality after emergency abdominal surgery: a national population-based study

Deirdre M Nally ,[1] Jan Sørensen,[2] Gintare Valentelyte ,[2] Laura Hammond,[2,3] Deborah McNamara,[3] Dara O Kavanagh,[1] Ken Mealy[3]

Original Investigation

FREE

July 2013

Utilization and Outcomes of Inpatient Surgical Care at Critical Access Hospitals in the United States

Adam J. Gadzinski, MD, MS[1]; Justin B. Dimick, MD, MPH[2]; Zaojun Ye, MS[1]; et al

» Author Affiliations | Article Information

JAMA Surg. 2013;148(7):589-596. doi:10.1001/jamasurg.2013.1224

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Volumes required for benefit surprisingly low

BMJ Open

Hospital volume and mortality for 25 types of inpatient treatment in German hospitals: observational study using complete national data from 2009 to 2014

Ulrike Nimptsch, Thomas Mansky

8.7) in very low volume hospitals. The minimum volume above which risk of death would fall below the average mortality was estimated as 18 cases per year. If all hospitals providing this service would perform at least 18 cases per year, one death among 104 (76 to 166) patients could potentially be prevented.

To cite: Nimptsch U, Mansky T. Hospital volume and mortality for 25 types of inpatient treatment in German hospitals: observational study using complete national data from 2009 to 2014. *BMJ Open* 2017;**7**:e016184. doi:10.1136/bmjopen-2017-016184

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Conclusion: Centralisation may not improve outcomes

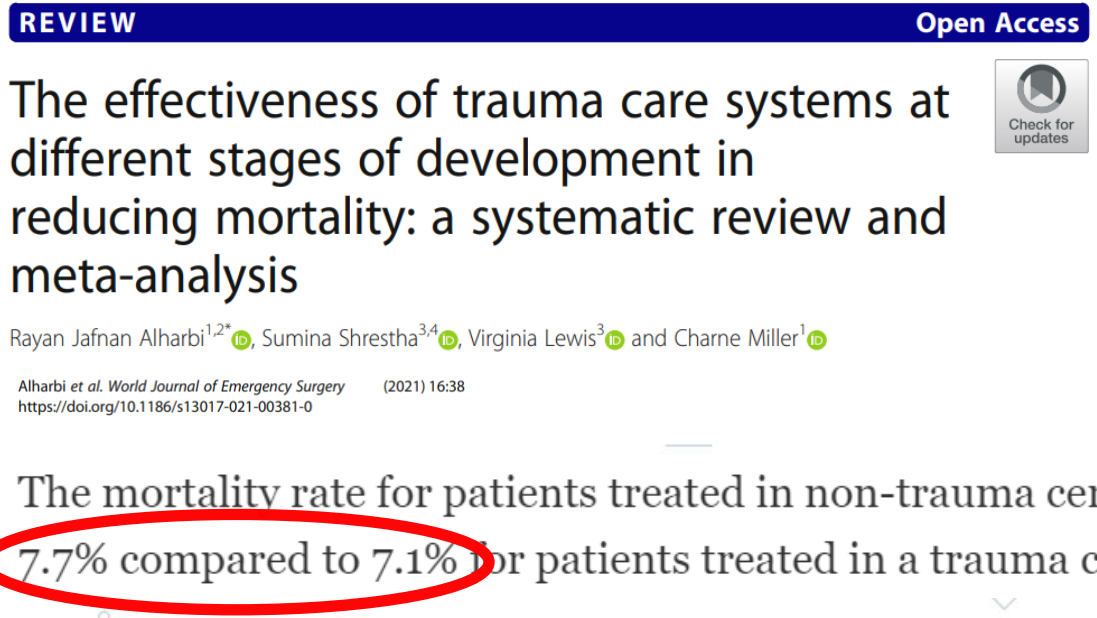
Assessing the hospital volume-outcome relationship in surgery: a scoping review

Mathieu Levaillant[1,2*], Romaric Marcilly[1,3], Lucie Levaillant[4], Philippe Michel[5], Jean-François Hamel-Broza[2], Benoît Vallet[1] and Antoine Lamer[1]

Even though the great majority of studies (in almost all surgical fields and all countries) found a volume-outcome relationship, those that explored centralization showed that having only high-volume centre had adverse effects and might not improve patient outcomes. Stitzenberg et al. reported that a marked increase in travelling distance observed after the centralization of pancreatic surgery posed a significant obstacle to accessing quality care [55] and increased inequalities in care access for specific populations - mainly in rural states [56]. Dimick et al. even suggested that given the size of the USA and the numbers of some types of surgery, nationwide local access to a high-volume facility is impossible [57].

Trauma

Trauma services show only marginal benefit



REVIEW Open Access

The effectiveness of trauma care systems at different stages of development in reducing mortality: a systematic review and meta-analysis

Check for updates

Rayan Jafnan Alharbi[1,2*], Sumina Shrestha[3,4], Virginia Lewis[3] and Charne Miller[1]

Alharbi *et al. World Journal of Emergency Surgery* (2021) 16:38
https://doi.org/10.1186/s13017-021-00381-0

The mortality rate for patients treated in non-trauma centres or non-trauma systems was 7.7% compared to 7.1% for patients treated in a trauma centre or trauma system. With the

Centralisation may not produce benefits

Changing the System - Major Trauma Patients and Their Outcomes in the NHS (England) 2008–17

Christopher G. Moran [a], Fiona Lecky [b], Omar Bouamra [c], Tom Lawrence [c], Antoinette Edwards [c], Maralyn Woodford [c], Keith Willett [d], Timothy J. Coats [e,*]

ORIGINAL RESEARCH Open Access

The volume-outcome relationship among severely injured patients admitted to English major trauma centres: a registry study

Charlie A. Sewalt[1*], Eveline J. A. Wiegers[1], Fiona E. Lecky[2,3], Dennis den Hartog[4], Stephanie C. E. Schuit[5,6], Esmee Venema[1,7] and Hester F. Lingsma[1]

Closing trauma services makes outcomes worse across system

Effects of closure of an urban level I trauma centre on adjacent hospitals and local injury mortality: a retrospective, observational study

Marie Crandall,[1] Douglas Sharp,[2] Xiong Wei,[3]

Comparative Study > Am Surg. 2008 Oct;74(10):930-4.

Impact on patient outcomes after closure of an adjacent trauma center

Arezou Yaghoubian [1], Roger J Lewis, Brant A Putnam, Christian De Virgilio

Affiliations + expand

PMID: 18942616

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Geographical studies show higher mortality in ‘holes’

Original article

Distance to trauma centres among gunshot wound victims: identifying trauma ‘deserts’ and ‘oases’ in Detroit

Circo GM. Distance to trauma centres among gunshot wound victims: identifying trauma ‘deserts’ and ‘oases’ in Detroit. *Injury Prevention* 2019;**25**:i39-i43.

Geographic Coverage and Verification of Trauma Centers in a Rural State: Highlighting the Utility of Location Allocation for Trauma System Planning

Amato, Stas S. MD, MS[a,*]; Benson, Jamie S. BA[c]; Murphy, Serena MD[a]; Osler, Turner M. MD, MS, FACS[a]; Hosmer, David PhD[d]; Cook, Alan D. MD, MS, FACS[e,f]; Wolfson, Daniel L. MD, FACEP[b]; Erb, Andrew MD[a]; Malhotra, Ajai MD, FACS[a]; An, Gary MD, FACS[a]

Author Information

Journal of the American College of Surgeons 232(1):p 1-7, January 2021. | ***DOI:*** 10.1016/j.jamcollsurg.2020.08.765

Centralised trauma services have range of negative impacts

- Overcrowding at trauma centres
- Loss of skills + staff at non-trauma centres
- Patients further away from home (discharge/FU)
- Families may have difficulty visiting

Other Urgent Specialist Services

Stroke: Unit quality likely more important than centralisation

Fulop *et al. Implementation Science* 2013, **8**:5
http://www.implementationscience.com/content/8/1/5

IMPLEMENTATION SCIENCE

STUDY PROTOCOL **Open Access**

Innovations in major system reconfiguration in England: a study of the effectiveness, acceptability and processes of implementation of two models of stroke care

Naomi Fulop[1*], Ruth Boaden[2], Rachael Hunter[3], Christopher McKevitt[4], Steve Morris[1], Nanik Angus IG Ramsay[1], Anthony G Rudd[6], Pippa J Tyrrell[7] and Charles DA Wolfe[4]

Pross *et al. BMC Health Services Research* (2018) 18:880
https://doi.org/10.1186/s12913-018-3664-y

BMC Health Services Research

RESEARCH ARTICLE **Open Access**

Stroke units, certification, and outcomes in German hospitals: a longitudinal study of patient-based 30-day mortality for 2006–2014

Christoph Pross[1], Elke Berger[1], Martin Siegel[2], Alexander Geissler[1*] and Reinhard Busse[1,3]

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Maternity: High quality smaller units safer than long distances

Grzybowski *et al. BMC Health Services Research* (2015) 15:410
DOI 10.1186/s12913-015-1034-6

BMC
Health Services Research

RESEARCH ARTICLE Open Access

The safety of Canadian rural maternity services: a multi-jurisdictional cohort analysis

Stefan Grzybowski[1*], John Fahey[2], Barbara Lai[1], Sharon Zhang[3], Nancy Aelicks[3] Kathrin Stoll[4] and Rebecca Attenborough[2]

Conclusion

Composite analysis of data from three Canadian provincial jurisdictions provides the strongest evidence to date demonstrating that we need to sustain small community maternity services with and without caesarean section capability. Rural caesarean section services staffed by GPs with enhanced surgical skills provide safe care and should be supported.

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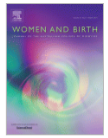
Maternity: Closures = risk shifting

ELSEVIER

Women and Birth

Volume 27, Issue 1, March 2014, Pages 9-14



Women's access needs in maternity care in rural Tasmania, Australia: A mixed methods study

Ha Hoang, Quynh Le, Daniel Terry

The study supports the claim that the closure of rural maternity units shifts cost and risk from the health care system to rural women and their families.

MI: Undoubted winner

- Some evidence for key conditions (stroke, trauma, MI)
- BUT less account for <1% of all ED presentations
- + Acute surgery still <5% of all ED presentations

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Reconfiguration and Staff

When services close, staff leave the area AND the system

GAO Highlights

Highlights of GAO-21-93, a report to the Ranking Member, Committee on Homeland Security and Governmental Affairs, United States Senate

December 2020

RURAL HOSPITAL CLOSURES

Affected Residents Had Reduced Access to Health Care Services

Table 1: Median Number of Health Care Professionals per 100,000 Residents in Counties with and without Rural Hospital Closures, 2012 and 2017

Type of health care professional	Counties with closures			Counties without closures		
	2012	2017	Percentage change (percent)	2012	2017	Percentage change (percent)
All physicians	71.2	59.7	-16.2	87.5	86.3	-1.3
General surgery	4.8	3.1	-36.4	5.1	4.8	-5.0
Obstetrics	4.8	3.9	-19.2	3.5	3.1	-9.7
Primary care	42.7	36.0	-15.8	50.3	48.3	-4.1
Internal medicine	14.0	11.9	-14.8	11.3	11.2	-0.5
Pediatrics	5.3	4.7	-10.7	4.9	4.9	-0.1
Emergency medicine	0.0	1.8	—	2.5	3.1	23.6
Physician assistant	10.8	14.3	31.5	16.4	21.9	33.8
Advanced practice registered nurse	68.7	110.8	61.3	77.9	121.8	56.3

Legend: — = not applicable because median value in 2012 was zero.

Source: GAO analysis of data from the Department of Health and Human Services and North Carolina Rural Health Research Program (NC RHRP). | GAO-21-93

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Staff that move are unhappy, stressed, sick and unproductive (for years)

Coping with Downsizing and Job Loss: Lessons from the Shaughnessy Hospital Closure

Stephen J. Havlovic, France Bouthillette, Rena van der Wal

First published: 08 April 2009 | https://doi.org/10.1111/j.1936-4490.1998.tb00174.x | Citations: 29

Aust N Z J Psychiatry. 2001 Apr;35(2):150-4. doi: 10.1046/j.1440-1614.2001.00874.x.

The human costs to staff from closure of a general hospital: an example of the effects of the threat of unemployment and fragmentation of a valued work structure

P Valent [1]

Optimum Staffing Models: A Perfect Storm

- Generational Shifts – feminisation, fewer average hours for FT, increased LTFT
- Inflexible regulations
- Failure to understand evidence around context in work
- Solution to problems wrt safety = MORE staff
- Fortressing and flight as responses to work stress
- The Great Leaving

Might be an impossible circle to square

Reconfiguration: Other Impacts

Ambulance Services

- Increased time on road
- Increased number of incidents
- ? Increase mortality
- Longer waiting times at remaining units
- Less efficient
- More expensive

Creation of ‘Deserts of Care’

Economic Impact on Towns

Abandonment, Inequity, Injustice

Original Research

Big Med's Spread

LAWTON ROBERT BURNS and MARK V. PAULY

The Wharton School, University of Pennsylvania

Conclusions: Cross-market hospital mergers may yield no benefits to the hospitals involved or the communities in which they operate. The boards of hospital systems that engage in these cross-market mergers need to exercise greater diligence over the actions of their CEOs.

The Milbank Quarterly, Vol. 0, No. 0, 2023 (pp. 1-38)