The effectiveness of methods of inspection in health and social care on quality of healthcare: a systematic review


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THE EFFECTIVENESS OF METHODS OF INSPECTION IN
HEALTH AND SOCIAL CARE ON QUALITY OF
HEALTHCARE:
A SYSTEMATIC REVIEW

Charlene Treanor¹, Martin Dempster², Michael Donnelly¹, Jacqui Murphy³, Hall
Graham³, Olive Macleod³, Lourda Geoghegan³ and Noleen K McCorry¹

¹Centre of Excellence for Public Health Northern Ireland, Centre for Public
Health, School of Medicine, Dentistry and Biomedical Sciences, Queen’s
University Belfast

²School of Psychology, Queen’s University Belfast

³The Regulation and Quality Improvement Authority (RQIA)

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Executive Summary

Inspection systems are used in healthcare to promote quality improvements, and are based on the assumption that externally promoted adherence to evidence based standards (through inspection / assessment) will result in higher quality of healthcare.

The Regulation and Quality Improvement Authority (RQIA) in Northern Ireland has initiated a project which aims to consider the introduction of a new inspection assessment framework based on best available evidence, and it is in response to this strategic work that the current review has been conducted.

The current review is preceded by two other related work packages [24,25]. Results of these previous work packages have identified:

1) that there is no published research which has examined the effectiveness of using any specific rating scale on any health or care outcome while systematically controlling for other attributes of the inspection system. Rating scales do vary, but they are generally used as part of a complex and multicomponent inspection system, which may include variation in the format and content of many other components of the system

2) the range of components included in inspection systems for health and social care internationally. These components have been organised under the three core categories proposed in Boyne’s [26] framework, namely:
   a) Director - the standards, targets or goals to which the inspected organisation is expected to adhere
   b) Detector - the methods by which an organisation is assessed with respect to the Director elements
   c) Effector – the ways by which an inspected organisation might be influenced to initiate improvements within their organisation.

The resulting ‘External Inspection Component Map’ is provided in appendix 1.

The review reported here follows on from these work packages to identify and critically appraise the existing published evidence on the effectiveness of methods of external inspection, as a means of identifying the optimal design of inspection systems for improving healthcare quality.
Rigorous systematic review methods were utilised. Papers meeting the eligibility criteria published since 2006 (the date of a previous Health Foundation review [27]) were identified, and subsequently synthesised. A total of 10,507 titles were identified from the database search. Nine thousand, seven hundred and ninety-four studies were excluded following title and abstract screen, thus, 229 full texts were examined for eligibility in the review. Twenty-three papers were included in the review.

Analysis of these papers resulted in the following findings in relation to the effectiveness of methods of external inspection:

1) Financial incentives – there was a trend for improvement over time on some care outcomes for incentivised compared to non-incentivised healthcare facilities

2) Performance feedback and benchmarking – there were inconsistent findings regarding the impact of performance feedback on care outcomes of inspected organisations

3) Action planning – there was a pattern of modest improvements in a range of care outcomes for organisations receiving action planning or goal setting interventions (in addition to performance feedback), but these interventions were also resource intensive and costly

4) Short versus long term impact of inspection visits - studies of accreditation in the USA reported improved outcomes during inspection weeks versus non-inspection weeks followed by a post-accreditation slump

5) Public report cards - there was evidence that publication of report cards (in Canada and USA) resulted in quality improvement activities and some improved healthcare processes and quality outcomes.

In general, there has been limited investigation, using rigorous methods, of the impact of external inspection methods on care quality outcomes. There is no published research which has systematically investigated any ‘Director’ component of inspection systems. There is however, some evidence of the impact of inspection visits (a ‘Detector’ component’) and a limited number of ‘Effector’ components, including financial incentives, report cards, performance feedback, and action planning. Further research is needed to identify the specific content of effective action planning interventions, guided by established frameworks. Stakeholders should work collaboratively to agree a consensus-based research priority agenda aimed at identifying the components of an effective inspection system.
The effectiveness of methods of inspection in health and social care on quality of healthcare: a systematic review

1. Background

Inspection systems are used in healthcare to promote quality improvements, and are based on the assumption that externally promoted adherence to evidence based standards (through inspection / assessment) will result in higher quality of healthcare. However, as established by a recent Cochrane review [28], it is uncertain whether external inspection programmes lead to improved compliance with accreditation standards. In addition, a report commissioned by the Health Foundation [27] found that there was, generally, a lack of evidence available about the effect of inspection systems on the quality of health care provision, or which inspection processes are most successful in improving the quality of healthcare.

The Regulation and Quality Improvement Authority (RQIA) in Northern Ireland has initiated a project which aims to consider the introduction of a new inspection assessment framework based on best available evidence, and it is in response to this strategic work that the current review has been conducted.

The current review is preceded by two other related work packages. Results of these work packages have been reported previously [24,25], and are summarised below:

1. Initially the project team conducted a scoping exercise to identify and appraise empirical studies regarding the use of rating scales (within the context of healthcare inspection) in terms of the degree to which they improved health and social care outcomes. Results of the scoping exercise demonstrated that there is no published research which has examined the effectiveness of using any specific rating scale on any health or care outcome while systematically controlling for other attributes of the inspection system. Rating scales do vary, but they are generally used as part of a complex and multicomponent inspection system, which may include variation in the format and content of many other components including feedback, incentives / penalties, and other processes.

2. A comprehensive mapping exercise was then conducted to identify and describe the various components that constitute an external inspection system. Components were extracted from descriptions of twenty five health and social care inspection systems. The components were organised under three core categories described previously by
Boyne et al. [26], namely Director components (the standards, targets or goals to which the inspected organisation is expected to adhere), Detector components (the methods by which an organisation is assessed with respect to the Director elements), and Effector components (the ways by which an inspected organisation might be influenced to initiate improvements within their organisation). The resulting ‘External Inspection Component Map’ is provided in appendix i.

The review reported here follows on from these work packages to identify and review relevant published literature which addresses the effectiveness of inspection methods on quality of care, including the components identified by the mapping exercise. A critical appraisal of the existing evidence provides a means of identifying the optimal design of inspection systems for improving healthcare quality.

As recommended by the recent Cochrane review [28], and in line with the approach adopted by a previous Health Foundation review [27], we investigated a range of relevant health and social care settings and contexts, and included studies reporting a range of outcomes associated with quality of care. In this review, we use the term inspection system to capture both accreditation and inspection processes.

2. Review question

What is the effectiveness of inspection methods on quality of care within health and social care?

3. Methods

3.1. Criteria for including studies in the review

3.1.1. Types of participants (health and social care setting)

Only inspection systems applied to health and social care settings were eligible, including, but not limited to hospitals, nursing homes, clinics, primary care practices and day services. There were no geographical limitations applied to the review, however, the context in which health care is delivered was taken into account and findings from studies conducted within non-socialised healthcare systems were treated with caution and the scope of application to the UK National Health System was considered.
3.1.2. *Types of interventions (inspection systems)*

Studies were eligible for the review if they included inspections which fit the following criteria defined by a recent Cochrane Collaboration review [28]. Inspections were: i) conducted independently by an organisation external to the health and social care setting and, ii) against an externally derived set of standards or quality indicators.

3.1.3. *Types of outcomes*

Papers reporting on any indicators of healthcare quality, including those related to structure, process and outcomes of care [29] were included. *Structure* refers to factors that affect the context in which healthcare is delivered. This includes, but is not limited to the physical environment of the healthcare setting, equipment used, and human resources. Organisational characteristics such as staff structure, training and methods of payment are also included. *Process* outcomes refer to the interface between patients and providers throughout the delivery of healthcare, including what occurs during diagnosis, treatment or any aspect of how care is delivered. *Outcomes of care* include any direct effects of healthcare on patients or populations, including changes to health status (including morbidity and mortality), behaviour, or knowledge as well as patient satisfaction.

Papers addressing adverse consequences relating to structure, process and outcomes of care, or other adverse consequences were also included. Cost-outcomes were also included in the review.

3.1.4. *Study designs*

Studies of any design were eligible for the review if they included a comparator group which were not subject to inspection. Alternatively, studies without a comparator group were included if an interrupted time series analysis was undertaken including multiple assessment points before and after implementation of an inspection.

3.2. *Criteria for excluding studies not covered in the inclusion criteria*

Non-English language papers are excluded.
3.3. Methods of the review

3.3.1. Sources

A search strategy (see Appendix ii) was applied to the following electronic databases: Medline, EMBASE, Cumulative Index for Nursing and Allied Health Literature (CINAHL) and the Healthcare Management Information Consortium (HMIC) from July 2006 (the date of a previous Health Foundation [27] search) to 11th August 2017.

3.3.2. Decisions around inclusion

Identified titles were exported to Refworks and all duplicate publications were removed. Individual reviewers assessed each title, abstract and full text against the eligibility criteria. Due to the large number of identified titles, 10% of the titles were screened independently to ensure validity for inclusion in the review. Inter-reviewer reliability was high, >98%.

3.3.3. Data extraction and synthesis

Data pertaining to the aims, methods, findings and conclusions from each study were extracted by one reviewer (CT) into tables. Given the range of study designs included in the review, data could not be pooled statistically therefore data was narratively synthesised by CT and NMcC.
4. Results

Figure i is a flowchart of the review process, showing the number of articles excluded at each stage of the review.

Figure i: Flowchart of study eligibility

10,507 titles identified from search

10,027 titles remain following removal of duplicates

229 full-text papers examined

Reasons for exclusion:
- No comparison group (n=89)
- No inspection/external inspection (n=78)
- Inappropriate study design (n=31)
- Relevant outcomes not captured (n=5)
- Study protocol (n=3)

23 papers included
4.1. Study characteristics

A total of 10,507 titles were identified from the database search and 10,028 titles remained following removal of duplicates. A total of 9794 studies were excluded following title and abstract screen, thus, 229 full texts were examined for eligibility in the review (see Figure i for flowchart of study selection). Twenty-three papers were included in the review.

Included studies were conducted in the USA (n=8), Canada (n=4), The Netherlands (n=4), United Arab Emirates (n=2), England (n=2), multiple European countries (n=1), Singapore (n=1) and Malawi (n=1). In terms of type of inspection systems some studies addressed the impact of accreditation on various outcomes; specific accreditation bodies include: The Joint Commission International (n=5), National Hip Fracture Database Initiative (n=1), Accreditation Canada (n=1), Dutch College for General Practitioners accreditation (n=1), and Centres for Medicare and Medicaid Services (CMS) (n=1). Individual quality improvement initiatives within the context of a wider inspection or accreditation system (n=14) formed the remaining types of intervention. These included: supervision programs (n=2) or Cardiovascular Risk Management (including benchmarking and option for collaborative improvement planning) (n=1) as part of the Dutch College for General Practitioners accreditation (n=2), pay for performance (n=2), reciprocal peer review (n=1), benchmarking and feedback (n=1), benchmarking, feedback, academic detailing and support for change (n=1), benchmarking and audit and feedback (n=1), early versus delayed feedback (n=1), benchmarking and goal-setting/feedback (n=1), action-planning (n=1) and collaborative improvement planning (n=1).

Studies varied by healthcare setting of interest: hospital (n=9), primary care (n=8), nursing homes (n=3), intensive care units (n=1), midwifery practices (n=1) and hospitals trusts (n=1). A number of different study designs were implemented across the studies including: RCTs (n=9), quasi-experimental methods (n=5), time series analysis (n=4) and observational studies with comparison group (n=5).
4.2. Narrative synthesis of results

Table 1 provides a summary of the key characteristics and findings from the titles (N=23) included in the review. The findings from the included titles are synthesised below, and organised in relation to the inspection ‘method(s)’ investigated in the original studies.

4.2.1. Financial incentives

Two studies [4,8], both conducted in the USA, systematically examined the impact of a ‘pay for performance’ intervention on multiple care outcomes. These papers reported a trend for (faster) improvement over time for incentivised compared to non-incentivised healthcare facilities on outcomes. These outcomes include cervical cancer screening rates and mammography rates, [4] and other quality measures covering acute myocardial infarction, heart failure and pneumonia. However no significant effect over time was found for paediatric immunisations [5]. One study [8] involved the Hospital Quality Alliance and 613 acute care hospitals across the USA.

4.2.2. Performance feedback

Several studies have investigated the impact of providing performance feedback, sometimes incorporating benchmarking, on a range of care quality outcomes. The largest of these studies was an evaluation of the OPTIMISE intervention [5] which randomly allocated 477 primary care centres in six European countries to either the intervention group which received feedback and benchmarking on type 2 diabetes outcomes, or a control group. Better outcomes across a range of measures were reported by the intervention centres. Another study [11] examined the impact of a multi-component intervention comprising web-based feedback, telephone helpline and meetings, and reported improvements for the intervention group on care outcomes including early surgery and mortality. Mold et al. [9] reported that a multi-component intervention that included performance feedback with benchmarking, academic detailing, practice facilitation, and IT support was more effective than performance feedback with benchmarking alone on the implementation of care processes, but that the cost per practice was high. Two studies [17,23] reported no significant differences on care outcomes between intervention groups (which received performance and benchmarking feedback) and control groups (no performance feedback or benchmarking).
4.2.3. Action planning

Action planning or goal setting was incorporated alongside performance feedback using a variety of methods. For example, community health centres participating in the Health Disparities Collaborative in the USA [7] which were allocated to an intervention group - where improvement plans were discussed and generated collaboratively - significantly improved on measures of quality for care of patients with diabetes and asthma (but not for patients with hypertension) compared to controls who were not part of the Collaborative. A program in the Netherlands [12] which attempted to support more focused improvement plans (relative to a control group) improved some aspects of professional performance, but not the primary care outcomes. A resource intensive intervention among lung cancer teams in England [16] used reciprocal peer review and support from an independent quality improvement facilitator to identify quality improvement plans following performance feedback, which had a modest impact on care process and outcome measures. A less costly action planning intervention (the GAP intervention), which paired performance feedback with a goal-setting worksheet provided to Canadian primary care clinics, had no impact on patient outcomes compared to the control group which received performance feedback only [6]. In two separate papers, Oude et al [13,14] reported the results of the Dutch Healthcare Inspectorate’s supervision programme on midwives, and on care groups providing integrated diabetes care. Using a cluster RCT design the authors were able to isolate the effect of two components of the inspectorate’s supervision programme on midwives’ practice. They concluded that there were improvements on care outcomes (provision of smoking cessation interventions) resulting from personal feedback and improvement recommendations, and further improvements resulting from a site visit combined with feedback and improvement recommendations. In contrast, however, the authors could not demonstrate improvements in quality of integrated diabetes care resulting from a similar supervision programme provided to care groups providing integrated diabetes care.

4.2.4. Short versus long term impact of accreditation

Several studies [1,2,3,19,22] have investigated the association of The Joint Commission accreditation survey and a variety of outcomes including patient safety, hospital and nursing home quality measures. These studies have described improved outcomes during inspection weeks versus non-inspection weeks [1], followed by a post-accreditation slump and a long period where outcome performance plateaus, but at levels higher than pre-accreditation [2].
One study found no significant positive change in the level of 25/27 measures post-accreditation [3], and another [22] reported improvements in nursing home quality measures that were not sustained over the long term.

4.2.5. Publication of report cards

Two studies [10,20] tested the hypothesis that care providers would be stimulated to undertake quality improvement activities resulting in improved healthcare processes and quality outcomes, following the public release of quality data. Publication of report cards was associated with improvements in two out of five outcomes in American nursing homes, and with improved mortality data in Canadian hospitals, compared to care facilities where the publication of the report cards was systematically delayed.
### Table 1: Study characteristics and summary of findings

<table>
<thead>
<tr>
<th>Study ID</th>
<th>Aim</th>
<th>Characteristics of Inspectorate/Intervention</th>
<th>Design</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Barnett (2017)(1) | To examine the association of The Joint Commission survey with patient safety outcomes | The Joint Commission Country: USA Components:  
- Onsite visit to institution (announced and unannounced visits)  
- Institution-led survey pre-inspection  
- Trial run of survey/inspection  
- Three-year accreditation cycle  
- Verbal feedback and formal report  
- Identifies areas for improvement | Comparison: Within-institution comparison of outcomes in each week (three weeks) preceding inspection to each week (three weeks) following inspection between 2008-2012  
Setting: Hospitals  
Outcomes: Primary: 30-day mortality. Secondary: Rates of Clostridium difficile (C-diff) infections, in-hospital cardiac arrest mortality and 2 composite measures of patient safety indicators | Primary outcome: 30-day mortality significant lower during inspection weeks compared to non-inspection weeks  
Secondary outcomes: No significant differences between survey and non-survey weeks on any of the secondary outcomes (rates of C-diff, in-hospital cardiac arrest mortality and composite patient safety measures)  
See paper for sub-group analyses  
**There was lower 30-day mortality during inspection weeks versus non-inspection weeks. There was no association with any other outcome.** |
| Devkaran (2014)(2) | To evaluate whether The Joint Commission International accredited hospitals maintain | The Joint Commission Country: United Arab Emirates | Comparison: Within-institution comparison of outcomes during 48-months (monthly measurements) to | The Life Cycle Model explains 87% of the variation in quality compliance measures. |
quality and safety standards during the accreditation cycle (testing the Life Cycle Model during year preceding and four-year accreditation cycle: four phases of the life cycle are as follows: the initiation phase, the pre-survey/inspection phase, the post-accreditation slump phase and the stagnation phase)

**Components:**
- Onsite visit to institution (announced and unannounced visits)
- Institution-led survey pre-inspection
- Trial run of survey/inspection
- Three-year accreditation cycle
- Verbal feedback and formal report
- Identifies areas for improvement

**capture pre-inspection and post-inspection period during 2009-2012**

**Setting:** Hospital

**Outcomes:** Composite score comprising of 23 quality measures

Pattern of compliance to quality measures followed as hypothesised. An Initiation phase characterised by a period of steep increases in compliance followed by sporadic declines. A decrease immediately post-accreditation. The post-accreditation slump followed by a long period of stagnation (plateaued levels of compliance) at levels higher than pre-accreditation.

**Higher scores on quality measures post-accreditation compared to before accreditation following initial increases in scores leading to accreditation period.**

<table>
<thead>
<tr>
<th>Devkaran (2015)(3)</th>
<th>To examine the impact of accreditation on hospital quality measures</th>
<th>The Joint Commission</th>
<th>Comparison: Within-institution comparison of outcomes during 48-months (monthly measurements) to capture pre-inspection and post-inspection period during 2009-2012</th>
</tr>
</thead>
</table>
| **Country:** United Arab Emirates | **Components:**
- Onsite visit to institution (announced and unannounced visits)
- Institution-led survey pre-inspection | **Setting:** Hospital | **Outcomes:** 27 quality measures

Twenty out of 27 measures indicated improvements (13 of which were significant) pre-inspection.

Accreditation had no significant impact (either positive or negative) on 11/27 measures.

The accreditation survey resulted in a significant
- Trial run of survey/inspection
- Three-year accreditation cycle
- Verbal feedback and formal report
- Identifies areas for improvement

positive change in level for medication errors and hand hygiene compliance.

A significant negative change in level was observed in seven of the measures.

Only one measure (Troponin turn-around time) resulted in a significant positive change in the post-accreditation slope.

There was no significant positive change in the level of 25/27 measures post-accreditation.

There was no significant positive change in the slope of 26 measures post-accreditation.

**Accreditation had no significant impact (either positive or negative) on 11/27 measures.**

<p>| Gavagan (2010)(4) | To evaluate the effect of a physician pay-for-performance programme in community health centres | Harris County Hospital Distract Quality Assurance Country: USA Components: | Comparison: Facilities (n=6) staffed by staff from one medical school formed the financial incentive intervention group and facilities staffed by staff from Non-incentivised group had significantly higher percentage of meeting cervical cancer screening during 3rd and 4th quarters of 2003. Incentivised group had a significantly |</p>
<table>
<thead>
<tr>
<th>Methods of Inspection review (October 2017)</th>
</tr>
</thead>
</table>
| • Audit  
• Feedback  
• Recommendations for improvement  
Additional intervention component  
• Three additional performance indicators  
• Financial incentives at twice the level of Center for Medicare and Medicaid Services (CMS))  |
| second medical school formed the control group (n=5) (detailed information not given, assumed no financial incentive or financial incentives at the level of CMS) from 2001-2007  
Setting: Community-based health centres  
Outcomes: Screening for cervical cancer and breast cancer and receipt of paediatric immunisations.  |
| higher percentage of meeting cervical cancer screening during some late time periods: 2nd, 3rd, and 4th quarters of 2005.  
Incentivised group had a significantly higher percentage of meeting mammography during: 2nd, 3rd, and 4th quarters of 2005 and 1st, 2nd and 3rd quarters of 2006.  
Incentivised group had a significantly higher percentage of meeting paediatric immunisations during: 3rd quarter of 2001, 1st, 2nd and 4th quarters of 2002 and 2nd, 3rd and 4th quarters of 2004.  
Trend for improvement over time for incentivised compared to non-incentivised (decrease over time) for cervical cancer screening.  
Trend for faster improvement over time for incentivised compared to non-incentivised for mammography.  |
Financial incentives had no significant effect over time regarding paediatric immunisations.

**Financial incentives led to improvements in breast and cervical cancer screening, but not paediatric immunisations.**

<p>| Hermans (2013)(5) | To assess prospectively evaluate the effect of benchmarking on quality of primary care for patients with type 2 diabetes | OPTIMISE intervention: Feedback benchmarked against other centres in each country. Country: Six European countries. Description of intervention: Benchmarking procedure comprised feedback given to each investigator regarding the level of control of the pre-set targets of their patients. This information was provided every four months at the study visits and was anonymously compared with anonymised results from colleagues in the same country. | Comparison: 293 centres randomly allocated to intervention (standard care and benchmarking) group and 184 centres to the (standard care) control group from December 2008 for 12-month follow-up. Setting: Primary care centres. Outcomes: HbA1c, LDL cholesterol and systolic blood pressure (SBP). | HbA1c: percentage of patients achieving HbA1c target significantly increased from baseline to 12 months in both benchmarking and control groups, with a greater increase in the benchmarking group, but not significant. SBP: significantly higher percentage of patients had reached the SBP target in the benchmarking compared to controls at 12-months follow-up. LDL cholesterol: significantly higher percentage of patients in the benchmarking group than in the control group had reached the LDL cholesterol |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Intervention Details</th>
<th>Comparison</th>
<th>Outcome Measures</th>
</tr>
</thead>
</table>
| Ivers (2013)(6) | To examine the effect of a worksheet to facilitate goal-setting and action planning, appended to feedback reports versus no feedback sheets only. | Feedback GAP intervention  
Country: Canada  
Description of intervention: Each physician received a package by courier every six months for two years featuring feedback reports describing meeting quality targets. For each disease condition, the report fit on one page and for every quality target, the aggregate performance achieved by the participating physician was compared to the score achieved by the top 10% of participating physician performers- limited to twice yearly for two years. The worksheet facilitated goal-setting and implementation intention-based action-plans, | Comparison: Fourteen institutions randomly allocated to intervention (feedback and worksheet) (n=7) or control (feedback alone) (n=7) for two-year follow-up  
Setting: Primary care clinics  
Outcomes: Primary: LDL cholesterol and systolic blood pressure and composite score of care in adherence to guidelines. Secondary: Composite process score to include glycemic control, proportion meeting guideline targets for LDL and BP and prescription rates for insulin and beta-blockers | No between-group differences in any outcomes except HbA1c levels (significantly lower levels in the intervention versus control group)  
The feedback GAP intervention led to better outcomes for HbA1C outcomes only. |
| Landon (2007)(7) | To evaluate the effect of the Health Disparities Collaboratives on the quality of care in three conditions (diabetes, cardiovascular disease and asthma) | Health Disparities Collaboratives improvement intervention  
Country: USA  
Components:  
- Pre-work period  
- Target areas for intervention identified  
- Improvement plans discussed and generated collaboratively  
- Improvement plans implemented by institutions | Comparison: 44 intervention centres participating in an eligible collaborative centre and 20 control centres not participating in a collaborative centre from 1999-2003  
Setting: Community health centres  
Outcomes: Range of quality of care measures including preventive care and screening, disease monitoring and treatment and outcomes (e.g. blood pressure, glycated haemoglobin levels and LDL cholesterol and ≤2 urgent care visits per year and 0 hospital/emergency visits per year for asthma | Asthma: anti-inflammatory medication for persistent asthma and asthma care plans significantly higher in intervention versus control centres.  
Diabetes: increased number of patients receiving more than or equal to two glycated haemoglobin level assessments per year significantly in intervention versus control.  
Hypertension: no differences between intervention and controls.  
Overall effect: intervention centres significantly improved care compared to controls.  
Interventions had significant improvement in the composite indicators for prevention and screening versus controls.  
Composite indicators for disease monitoring and treatment also improved |
Involvement in the Health Disparities Collaboratives improvement intervention led to improvements on a range of care outcomes.

<table>
<thead>
<tr>
<th>Lindenauer (2007)(8)</th>
<th>To determine the incremental effect of pay for performance as a result of quality improvements.</th>
<th>Hospital Quality Alliance</th>
<th>Comparison: Intervention institutions receiving pay for performance (n=207) and control institutions without pay for performance (n=406)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country: USA</td>
<td>Components:</td>
<td>Setting: Acute care hospitals</td>
<td>Setting: Acute care hospitals</td>
</tr>
<tr>
<td></td>
<td>• Specific components not reported in paper</td>
<td>Outcomes: 10 quality measures covering acute myocardial infarction, heart failure and pneumonia</td>
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<tr>
<td></td>
<td>• Concerned with public reporting of hospital quality</td>
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<tr>
<td></td>
<td>• 10 quality measures collected and reported on Hospital Compare website</td>
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<tr>
<td></td>
<td>Additional intervention component:</td>
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<tr>
<td></td>
<td>• Hospital Quality Incentive Demonstration</td>
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<tr>
<td></td>
<td>• Financial incentives collected on 33 measures (including the 10 measures on</td>
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<td></td>
<td>Pay-for-performance led to improvements on a number of care outcomes in three conditions.</td>
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</tbody>
</table>
Hospitals performing in the top decile on a composite measure of quality for a given year received a 2% bonus payment in addition to the usual Medicare reimbursement rate.

- Hospitals in the second decile received a 1% bonus.
- Financial penalties ranging from 1 to 2% of Medicare payments for hospitals that by the end of the third year of the program had failed to exceed the performance of hospitals in the lowest two deciles, as established during the program’s first year.

| Mold (2008) (9) | To examine the effectiveness of a multi-component intervention on nurse standing orders, reminder/recall systems and wellness visits. | Multi-component intervention  
Country: USA  
Description of intervention:  
- Feedback with benchmarking | Comparison: Primary care practices were randomly allocated to multicomponent intervention (n=24) or to a feedback and benchmarking only control group (n=24)  
Higher proportion of intervention practices implemented total improvements/opportunities and in children and adults compared to control practices. |
| Academic detailing (review and discussion of both published information and the discussion of methods used by local high-performing facilities). | Setting: Primary care practices |
| Support and facilitation to implement changes |
| IT support |
| Outcomes: Adoption of evidence-based strategies, use of nurse standing orders, use of reminders and delivery of prevention/immunisation ‘wellness’ clinics for children and adults |
| Higher proportion of use of standing orders in total and for adults only and for clinician improvements/opportunities for children only, but none for reminders. |
| Delivery of prevention/immunisation care was higher in interventions than controls (except colorectal cancer screening), but was only significant for mammography. |
| Group assignment only (not clinician, practice characteristics or readiness to change predicted implementation of evidence-based approaches. |
| There was no significant correlation between the number of facilitator visits or contact time and the number of processes implemented |
| **Intervention practices implemented more of the processes than control practices overall for adults,** |
| Mukamel (2008) (10) | To examine the association between nursing home quality and publication of Nursing Home Compare report card testing the hypothesis that nursing homes will undertake quality improvement measures following report publication | Centre’s for Medicare and Medicaid Services (CMS) certification for Nursing Homes Country: USA Components:  - Unannounced onsite visit on consecutive days  - Formal report disseminated  - Follow-up inspection  - Publicly reporting of scores on Nursing Home Compare website via report cards | Comparison: Within-institution comparison of multiple time-points before first report card publication to multiple time-points post-publication during 2001-2003 Setting: Nursing homes Outcomes: short-stay residents- the number of residents with moderate pain daily or excruciating pain at any time; long-stay residents- the percentage of residents whose activities of daily living (ADLs) changed in last quarter, percentage of residents with new infections, pressure ulcers or who are physically restrained daily

Demonstration nursing homes (who had reports published earlier in April 2002) demonstrated significant change from pre-post publication indicating improvements in use of physical restraints and short-term pain. Non-demonstration nursing homes (who had reports published in November 2002) had significant improvements in physical restraints and short-term pain, but significant increase in the number of residents with pressure ulcers.

Several specific actions taken by nursing homes following report publication was associated with improvements in quality measures. | and for children. They were also more likely to implement at least one of the processes for children and to implement standing orders for either children or adults. |
- Audit  
- Continuous web-based feedback on case mix, care and outcomes and compliance to national clinical standards.  
- Telephone helpline, an informative website, and regional multidisciplinary meetings. | Comparison: Within-institution comparison of multiple time-points pre-implementation (2003-2007) of the NHFDI in 2007 to multiple time-points post-implementation (2007-2011). Setting: Hospitals Outcomes: Process of care: number of patients who underwent early surgery (defined as surgery either on the day of or the day after admission to hospital) and 30, 90 and 365-day mortality | Rates of early surgery were slowly decreasing before the NHFDI; trends significantly increased annually during the post-NHFDI period. Rates of mortality significantly decreased at a higher rate during the post-NHFDI period compared smaller decrease during the pre-NHFDI period. The NHFDI appeared to lead to improvements in the number of patients receiving early surgery and survival. |
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<tbody>
<tr>
<td>Nouwens (2014) (12)</td>
<td>To determine the effectiveness of improvement plans in accreditation of primary care practices in terms of cardiovascular risk management (CVRM) CVRM targeted improvement plans (during Dutch College of General Practitioners accreditation process) Country: The Netherlands Components:</td>
<td>Comparison: Facilities randomly allocated to intervention (n=22) (improvement plans focused on CVRM) or control group (n=23) during September 2008-April 2010.</td>
<td>No significant improvements on any of the primary outcomes in either intervention or control practices. 6/17 secondary outcomes showed significant improvements as a result of the</td>
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<tr>
<td>Methods of Inspection review (October 2017)</td>
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<tr>
<td><strong>Oude Wesselink (2015a) (13)</strong></td>
<td>To evaluate the effect of a supervision program on the quality of integrated diabetes care</td>
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<tr>
<td>Supervision program of the Dutch Healthcare inspectorate</td>
<td>Country: The Netherlands</td>
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<tr>
<td>Components:</td>
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<tr>
<td>• Announced onsite visit</td>
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<tr>
<td>• Written report</td>
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<tr>
<td>• Recommendations for improvement</td>
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<tr>
<td>Setting: Primary care practices</td>
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<tr>
<td>Outcomes: Primary: systolic blood pressure (140 mmHg), LDL cholesterol (2.5mmol/l) and prescription of anti-platelet drugs. Secondary: 17 indicators of CVRM and physician’s perceived goal attainment for the chosen improvement project</td>
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<td>intervention, including patients with known smoking status, registration of physical exercise, diet control and alcohol intake, measurement of waist circumference and fasting blood glucose.</td>
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<tr>
<td><strong>The intervention had no effect on systolic blood pressure, cholesterol or anti-platelet drug prescriptions, however, the intervention had a positive effect on 6/17 outcomes.</strong></td>
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<td>Comparison: Facilities randomly allocated to supervision intervention or to no supervision during June 2011- July 2012.</td>
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<td>Setting: General practices who are part of a care group providing multidisciplinary care</td>
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<tr>
<td>Outcomes: Structures of care, processes of care and health outcomes</td>
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<td>Over time-period of the study, use of care plans, regulation of access to patients’ files and organised care for multi-morbidity patients</td>
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<tr>
<td>There were no differences of the intervention (compared to control) on structures of care, processes of care and health outcomes.</td>
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<tr>
<td><strong>The supervisory program did not have any effect on any outcome. Some outcomes were improving over time</strong></td>
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</tbody>
</table>
| Oude Wesselink (2015b) (14) | To evaluate the effects of an Inspectorate’s supervision programme on the provision of smoking-cessation counselling by midwifery practices | Supervision program of the Dutch Healthcare inspectorate  
Country: The Netherlands  
Components of supervision program:  
- Three components  
- A) A deadline was announced by which all practices should comply with professional norms on counselling (2011)  
- B) Questionnaire about perceptions and personal feedback report including recommendations for improvement (2010)  
- C) Site visit and a personal feedback report including recommendations for improvement (2012). | Comparison: Only Components B and C were assessed via comparisons of facilities allocated to receive the intervention or no intervention (B- n=113 versus 100; C- n=14 versus 38).  
Setting: Midwifery practices  
Outcomes: Quality and quantity of smoking cessation brief intervention and use of steps included in intervention  
A greater number of practices receiving component B or C interventions reported using smoking cessation brief intervention compared to controls.  
There were significant between-group differences in some steps (including enhancing motivation to quit, reducing barriers to quit and setting a quit date) for the intervention B versus control, but not intervention C versus control.  
There were small improvements following questionnaire and feedback and site visit interventions on provision of smoking cessation by midwives. |}

| Rawlins (2013)(15) | To evaluate the impact of a quality improvement initiative in Malawi on reproductive health | Performance and Quality Improvement initiative  
Country: Malawi | Study design: Intervention institutions (n=8) and comparison hospital (n=8) who did not receive intervention. Intervention  
After controlling for region, the intervention group had significantly higher clinical observation scores in two service areas, FP and PNC. |
<table>
<thead>
<tr>
<th>Method</th>
<th>Components</th>
<th>Setting</th>
<th>Outcomes</th>
<th>Results</th>
</tr>
</thead>
</table>
| Methods of Inspection review (October 2017) | service quality and delivery | Components:  
- Onsite visit  
- Identify performance gaps  
- Action-planning  
- Action plan implementation  
- Quarterly internal assessments  
- External assessment to assess validity  
- Benchmarking against baseline and other centres | Setting: District hospitals  
Outcomes: Client-provider interactions in antenatal care (ANC), family planning (FP), labour and delivery (L&D) and postnatal care (PNC). Service statistics in form of number of Caesarean sections, partograph use and active management of third stage of labour. | Results for ANC and L&D were not statistically significantly different between the intervention and comparison hospitals. The number of Caesarean sections increased in both study groups, but more dramatically in the intervention group than in the comparison group.  
There was no evidence that the intervention had an impact on partograph use and active management of third stage of labour.  
**The performance and quality improvement initiative led to improvements on some care outcomes.** |
| Russell (2014)(16) | To determine whether a programme of reciprocal peer-to-peer review visits with supported quality improvement and collaborative working can significantly improve lung cancer | Reciprocal peer review  
Country: England  
Description of intervention: Facilitated reciprocal site visits consisting of observation of the host team’s multidisciplinary team meeting, three discussion | Comparison: Facilities randomised to intervention (n=31) or control (n=48) who did not receive reciprocal peer review. Two additional pilot sites were not included in the final analysis  
Setting: English NHS Trusts | There was a trend for a greater increase in the proportion of patients receiving active anticancer treatment in the intervention group compared to the controls.  
The remaining NLCA indicators improved similarly |
### Methods of Inspection review (October 2017)

<table>
<thead>
<tr>
<th>Scales (2011) (17)</th>
<th>To determine the effectiveness of a multi-centre quality improvement program to increase delivery of 6 evidence-based Intensive Care Unit (ICU) practices</th>
<th>Audit and feedback intervention</th>
<th>Study design: Fifteen facilities randomly allocated to 1 of 6 interventions targeted a different care practice (prevention of ventilator-associated pneumonia, prophylaxis against deep vein thrombosis, daily spontaneous breathing trial, prevention of catheter-related bloodstream infections, early enteral feeding and decubitus ulcer prevention) so a comparison facility who did not receive a</th>
<th>Patients in ICUs receiving active intervention were more likely to receive the targeted care practice than those in contemporaneous control ICUs receiving an active intervention for a different practice. Compared to control ICUs, intervention ICUs improved significantly in catheter-related bloodstream infections.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>process and outcome measures</td>
<td>sessions, the host team’s National Lung Cancer Audit data and patient experience questionnaire results. Further aims to identify the focus of improvement work to be undertaken by the host team. Over the next 12 months the quality improvement facilitator provided support via email, telephone and follow-up visits, where required. Teams within the intervention group supported each other via mini collaboratives in the form of web-based teleconferences and two face-to-face workshops.</td>
<td>Outcomes: Proportion of patients discussed at MDT meetings, histological confirmation rate, active treatment rate, surgical resection rate, proportion of patients seen by a lung cancer nurse specialist, proportion of patients with non-small cell lung cancer treated with chemotherapy and radiotherapy.</td>
<td>both in the intervention and control groups. Reciprocal peer review led to improvements in the number of patients receiving active anticancer treatment, but no other indicators.</td>
</tr>
</tbody>
</table>
| Stall (2015) (18) | To analyse the effect of a national medical reconciliation accreditation (Accreditation Canada) requirement for nursing homes on rates of unintentional medication discontinuation after hospital discharge. | Accreditation Canada  
Country: Canada  
Components:  
- Onsite visit  
- Organisation completes initial assessment prior to onsite visit  
- Supported to implement improvements | Comparison: Accredited versus non-accredited facilities  
Setting: Nursing homes  
Time-period: 2003-2012  
Outcomes: Primary: Proportion of patients who were dispensed statins, thyroxine or proton pump inhibitors within 7-days (to capture residual medication from hospital). Secondary: proportion of patients who were dispensed statins, thyroxine or proton pump inhibitors within 30-days to  
No further differences between the groups in all other care practices were found.  
Audit and feedback led to improvements in catheter-related bloodstream infections, but no other outcomes.  
Nursing home accreditation did not have a significant impact on medication discontinuation rates in nursing home residents after hospital discharge for any of the three medication groups.  
There was no impact of nursing home accreditation on outcomes. |
<table>
<thead>
<tr>
<th>Study</th>
<th>Objective</th>
<th>Methodology</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Towers (2014)(19) | To examine hospital risk-adjusted mortality in relation to site visits as part of The Joint Commission’s accreditation process | The Joint Commission Components:  
- Onsite visit to institution (announced and unannounced visits)  
- Institution-led survey pre-inspection  
- Trial run of survey/inspection  
- Three-year accreditation cycle  
- Verbal feedback and formal report  
- Identifies areas for improvement | Comparison: Within-institution comparison of outcomes in each month (three weeks) preceding inspection to each week (three weeks) following inspection during  
Setting: Hospitals  
Outcomes: Mortality  
Mortality rates drop significantly in the first month post-site visit and return to pre-inspection levels, no other time-points are significant.  
Undertaking unannounced versus announced visits did not differ.  
*Site visits lead to a short-term decrease in mortality rates which do not appear to be as a result of anticipation of a site visit.* |
| Tu (2009)(20) | To evaluate whether the public release of data on cardiac quality indicators effectively stimulates hospitals to undertake quality improvement activities that improve health care | Enhanced Feedback for Effective Cardiac Treatment (EFFECT) intervention Components:  
- Participating centres received early or delayed (control group) | Comparison: Facilities randomly allocated to early intervention (n=44) and delayed intervention (n=42). Baseline (between April 1999-March 2001), early intervention (January 2004) and delayed intervention  
Early feedback hospital report card did not result in a significant system-wide improvement in the early feedback group in either the composite AMI process-of-care indicator or the composite CHF process-of-care indicator. |
<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
<th>Setting</th>
<th>Outcomes</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methods of Inspection review (October 2017)</strong></td>
<td>Feedback of a publicly released report card on their baseline performance for a set of national process-of-care quality indicators for myocardial infarction (AMI) and congestive heart failure (CHF) care.</td>
<td>(between April 2004-March 2005) Setting: Acute care hospitals Outcomes: Primary outcomes were composite AMI and CHF indicators based on 12 AMI and 6 CHF process-of-care indicators. Secondary outcomes were the individual process-of-care indicators, a hospital report card impact survey and all-cause AMI and CHF mortality</td>
<td>The mean 30-day AMI mortality rates were significantly lower in the early feedback group compared with the delayed feedback group. Better outcomes in terms of mortality, but not process of care indicators results from an early feedback intervention.</td>
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<p>| Van Doorn (2014)(21) | To examine the effect of accreditation on quality of care regarding diabetes, chronic obstructive pulmonary disease and cardiovascular disease | Dutch College of General Practitioners accreditation Country: The Netherlands Components: - Audit conducted by external team - No other information reported in the paper | Comparison: Two cohorts compared: one cohort follow-up data from post-accreditation compared to second cohort where data from pre-accreditation used during 2006-2011. Outcomes: Percentage levels of patients below target level were calculated. A number of performance indicators were captured (e.g. patients with a target HbA1c level of (&lt;53 mmol/mol)) Cholesterol target values were significantly less often reached in the second cohort (pre-accreditation) compared to the first cohort (post-accreditation). There were no between-cohort differences in COPD performance indicators. CVD performance indicators were significantly much higher in the second cohort compared to the first cohort (target level blood pressure, recorded |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Objective</th>
<th>Methods</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Wagner (2012)(22) | To determine if quality measures improve following accreditation | The Joint Commission  
Country: USA  
Components:  
- Onsite visit to institution (announced and unannounced visits)  
- Institution-led survey pre-inspection  
- Trial run of survey/inspection  
- Three-year accreditation cycle  
- Verbal feedback and formal report  
- Identifies areas for improvement | Comparison: Within-institution comparison of pre-inspection and multiple post-inspection assessments  
Setting: Nursing homes  
Outcomes: Physical restraint use, catheter use, inadequate pain management, two measures for pressure sores and two overall quality scores.  
Comparisons of one-year pre-accreditation to one-year post-accreditation was associated with improvements across all seven measures.  
Comparisons of post-accreditation to one-year post-accreditation was associated with improvements across all measures (except one of the pressure ulcer measures)  
Comparisons across all measured time-points was associated with improvements in three measures only (pain, one pressure ulcer measure and catheter use)  
The Joint Commission-accredited nursing homes improve a number of quality measures over time, but do not sustain changes in the long term. |
<table>
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<tr>
<th><strong>Yeo (2012)</strong> (23)</th>
<th><strong>Methods of Inspection review (October 2017)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>To evaluate the impact of a prospective audit and feedback antimicrobial stewardship program (ASP) on antimicrobial prescription and resistance trends in a haematology and oncology unit</td>
<td>Antimicrobial Stewardship Program</td>
</tr>
<tr>
<td>Country: Singapore</td>
<td>Study design: Series of assessments conducted before intervention (1st August 2008-30th June 2009) and after the intervention (implemented in July 2009) over a 23-month period (1st August 2009-30th June 2009)</td>
</tr>
<tr>
<td>Description of intervention: Prospective audit of antibiotic prescription with direct feedback to the prescriber(s) in the event of inappropriate use via a written form placed in the respective case notes on the same day. Prescribers were not obliged to comply with ASP recommendations, retaining autonomy of clinical decision-making. The analyzed results in terms of compliance with recommendations and outcomes were reported back to the hospital clinicians quarterly.</td>
<td>Setting: Hospital</td>
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<tr>
<td></td>
<td>Outcomes: Primary outcome: Defined Daily Dose (DDD) per 100 inpatient-days for audited antibiotics. Secondary outcomes: DDD/100 inpatient-days of all antibiotics and incidence-density of 5 most commonly cultured antibiotic-resistant microorganisms in Singaporean hospitals</td>
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<tr>
<td></td>
<td>The mean amounts of prescribed vancomycin, piperacillin/tazobactam and all evaluated antibiotic DDD/100 inpatient-days increased significantly between pre-intervention and intervention evaluation period.</td>
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<td></td>
<td>Audited antibiotics cephalosporins and vancomycin DDD/100 inpatient-days and all evaluated antibiotics there were trends for reduction during the post-intervention evaluation phase. Paradoxical vancomycin results (decreasing prescription trend but increased mean volume of prescription) occurred as a result of a large Bacillus cereus at the start of the intervention evaluation period.</td>
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<td>Removing vancomycin from analysis did not result in a change in prescription trends of all evaluated and audited antibiotics for the NCIS, although the increase in the</td>
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mean amount of all evaluated antibiotics during the evaluation period lost statistical significance.

There was no statistically significant change in the incidence-density of Gramnegative antibiotic-resistant microorganisms observed before and during the intervention period.

The average MRSA incidence-density decreased during the intervention evaluation period, but there was no change in the incidence-density trend of MRSA over the same period.
5. Conclusions

5.1. Summary of findings

In general, there is a paucity of high-quality controlled evaluations of the effectiveness or cost-effectiveness of external inspection systems, or their components, particularly in the context of mandatory inspection systems. There is no published research which has systematically investigated any ‘Director’ component of inspection systems. There is however, some evidence of the impact of inspection visits (a ‘Detector’ component) and a limited number of ‘Effector’ components, including financial incentives, report cards, performance feedback, and action planning, specifically:

- Studies in the USA demonstrated a short-term impact of inspection visits, followed by a ‘post-accreditation slump’.
- Two studies in the USA have demonstrated that financial incentives may lead to improved care for some outcomes.
- Studies in the USA and Canada have demonstrated that the publication of report cards may lead to improved care for some outcomes.
- There is inconsistent evidence that performance feedback (with benchmarking) is associated with better care quality measures.
- The addition of action-planning alongside performance feedback has been shown to result in modest improvements in outcomes, although these interventions are relatively costly.

These findings are consistent with the findings of a previous Health Foundation review [27] which reported that accredited organisations in the USA provided higher quality care compared to non-accredited organisations. However, many review systems such as those in the USA are voluntary, and organisations will already have made some commitment to improvement of care when they volunteer themselves for the accreditation process. Hence, although there is evidence of associations between quality of care and accreditation status, there is no evidence of causality. That is, accreditation status may largely be a result of prior improvement activities, which in turn lead high performing organisations to choose to participate in accreditation, rather than accreditation processes leading to better performance or higher quality healthcare. As such, the findings of research conducted in the context of voluntary accreditation schemes should be interpreted with caution.
The Health Foundation report also identified 3 studies where inspection, or the prospect of formal inspection, was a catalyst for improvement on the part of regulated organisations. The present review contributes further to this knowledge base by identifying a limited number of inspection (‘Effector’) components which are associated with improvements in some care outcomes, specifically financial incentives, publication of report cards, action planning, and to a lesser extent, the impact of providing performance feedback. Among those studies reviewed, the approaches used for performance feedback and action planning varied considerably, which may contribute, in part, to the lack of consistency in their impact on quality outcomes. Indeed, a Cochrane review [31] of audit and feedback found that feedback is more effective when sent more than once, delivered by a supervisor or senior colleague in both verbal and written formats, and when it includes both explicit targets and an action plan. The Cochrane review found that audit and feedback had a median effect of 4% improvement on aspects of professional performance, and an 11% effect when combined with target setting and action planning.

The studies categorised under ‘action planning’ included lower cost worksheet based guidance, peer-to-peer supported planning, and various levels of collaboration in the activities of identifying and specifying goals and supporting improvement. There was also very limited information on the nature or content of ‘goals’. For action plans to be most effective, they must very specifically relate to behavioural goals, rather than outcome goals [30]. It is unclear to what extent the ‘action planning’ interventions used were informed by relevant theory.

5.2. Research quality

When attempting to evaluate an external inspection system (or its methods), several methodological challenges arise. A control group may not be available, particularly where inspection is mandatory – although stepped wedge designs may be possible. Conversely where inspection is voluntary is it difficult to identify whether accreditation caused quality improvements, rather than successful accreditation arising as a result of existing or previous quality improvement activities. In addition, many of the studies included in the current review reported quality improvements in both the intervention and comparison/ control groups, perhaps attributable to the Hawthorne effect – a phenomenon which describes how people may change their behaviour as a result of being observed. In the context of inspection, the process of measuring quality for the purposes of research, even in the control groups, may
produce changes in professional behaviour and performance. Other research challenges include unwillingness of some providers to participate in research, non-adherence to intervention components, attrition, and poor data quality, particularly when data is provided via self-assessment or using existing databases.

5.3. Implications

Rigorous research evidence is limited, but there is evidence to suggest that some specific external inspection interventions may be effective for improving care outcomes. Of particular interest is the impact of performance feedback and action planning on some care outcomes. Further research is needed to identify the specific content of effective action planning interventions, guided by established frameworks.

Further investigation is necessary to identify the components of an effective external inspection system. Given the considerable investments in inspection activity, and the relatively sparse evidence of its effectiveness, the research base should be strengthened. The ACCREDIT project [32], which incorporates twelve inter-related studies to evaluate the effect of Australian accreditation in achieving its goals is a useful exemplar. Stakeholders should work collaboratively to agree a consensus-based research priority agenda in this area.
References (of articles included in the review)


22. Wagner LM, McDonald SM, & Castle NG. Relationship between nursing home safety culture and Joint Commission accreditation. The Joint Commission Journal on Quality
Other references


Appendix i: External Inspection Component Map

Director Components

- Accreditation
- Regulation
- Ranking
- Audit
Detector Components

- **On site Visit**
  - Yes
  - scope of the visit
    - meeting with management
    - orientation tour
    - inspection of physical environment
    - trial run
    - announced
    - unannounced
  - warning
    - regular
    - selected
  - frequency
    - consecutive days
    - samples different shifts
  - duration
    - included
    - not included
  - self-assessment
    - included
    - not included

- No
Data considered

Routine data
  - yes
  - no

Source of data
  - internal
  - external
  - collected by the inspectorate

Inspectors

Background
  - experts by experience
  - healthcare professional
  - matched to organisation

Training
  - provided by inspection body
  - accredited by external organisation
**Effector Components**

- **Rating Scale**
  - Graded: 3 points
  - Ranked: 5 points
  - Dichotomised: 6 points
  - % score

- **Dissemination of outcome**
  - Public: online
  - Displayed by inspected organisation: verbal
  - Feedback to organisation: written report
Follow-up

- Action plan required
  - Self-directed
  - Formulated by the inspectorate
- Support for change provided by inspectorate
  - Follow-up onsite visit
- Monitoring
  - Evaluation of documentation
  - Publicly published list of concern
- negative consequences
  - cessation of activity
  - legal action
- mechanism for appeal
  - increased frequency of visits
Appendix ii: Medline search strategy

Due to the variation across the databases the search strategy was adapted accordingly.

1. exp health facilities/st
2. (hospital or hospitals or clinic or clinics or (primary adj2 care) or (health adj2 care)).tw.
3. or/1-2
4. peer review, health care/
5. benchmarking/
6. exp accreditation/
7. exp management audit/
8. exp clinical audit/
9. (organi?ation* adj raid*).tw.
10. (external* adj5 (accreditation or accredited or peer review or inspection or inspected or regulation or regulated or certified or certification or benchmark* or measured or measurement or evaluation or evaluated or audit or audits or auditing or assessment or assessed or monitored or visitation or surveillance or review or oversight or (control adj program*))).tw.
11. or/4-10
12. intervention?.ti.
13. (pre-intervention? or preintervention? or “pre intervention?” or post-intervention? or postintervention? or “post intervention?”).ti,ab.
14. demonstration project?.ti,ab.
15. (pre-post or “pre test*” or pretest* or posttest* or “post test*” or (pre adj5 post)).ti,ab.
16. (pre-workshop or post-workshop or (before adj3 workshop) or (after adj3 workshop)).ti,ab.
17. trial.ti. or ((study adj3 aim?) or “our study”).ab.
18. (before adj10 (after or during)).ti,ab.
19. (“quasi-experiment*” or quasixperiment* or “quasi random*” or quasirandom* or “quasi control*” or quasicontrol* or ((quasi* or experimental) adj3 (method* or study or trial or design*)).ti,ab.
20. non-randomized controlled trials as topic/
21. pilot projects/
22. pilot.ti. or (pilot adj (project? or study or trial)).ab.
23. (time points adj3 (over or multiple or three or four or five or six or seven or eight or nine or ten or eleven or twelve or month* or hour? or day? or “more than”)).ab.

24. (“time series” adj2 interrupt*).ti,ab.

25. interrupted time series analysis/

26. controlled before-after studies/

27. historically controlled study/

28. (multicentre or multicenter or multi-centre or multi-center).ti.

29. (control adj3 (area or cohort? or compare? or condition or design or group? or intervention? or participant? or study)).ab.

30. random*.ti,ab. or controlled.ti.

31. (control year? or experimental year? or (control period? or experimental period??)).ti,ab.

32. (utili?ation or programme or programmes).ti.

33. (during adj5 period).ti,ab.

34. ((strategy or strategies) adj2 (improv* or education*)).ti,ab.

35. (clinical trial or multicenter study).pt.

36. evaluation studies as topic/ or prospective studies/ or retrospective studies/

37. ((evaluation or prospective or retrospective) adj study).ti,ab.

38. or/11-37

39. “comment on”.cm. or review.pt. or (review not “peer review*”).ti. or randomized controlled trial.pt.

40. (rat or rats or cow or cows or chicken? or horse or horses or mice or mouse or bovine or animal?).ti,hw. or veterinar*.ti,ab,hw.

41. exp animals/ not humans.sh.

42. or/39-41

43. 38 not 42

44. exp randomized controlled trial/

45. controlled clinical trial.pt.

46. randomi#ed.ti,ab.

47. placebo.ab.

48. drug therapy.fs.

49. randomly.ti,ab.
50. trial.ab.
51. groups.ab.
52. or/44-51
53. Clinical Trials as topic.sh.
54. trial.ti.
55. or/44-47,49,53-54
56. exp animals/ not humans/
57. 53 not 54
58. 43 or 57
59. 11 and 58