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## **Developing scaled tools for residential and nursing home inspection: feasibility study**

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## **Abstract**

### *Purpose*

This study explored the feasibility of developing scaled inspection tools for use during external inspection of health and social care facilities to give improved accuracy in identifying facilities 'at risk', a tool for risk-adjusted frequency of inspection, and greater consistency of judgements.

### *Design*

This paper summarises the development through working groups and workshops involving 20 experienced inspectors (nurses and social workers) of the Regulation and Quality Improvement Authority who inspect the 206 nursing and 182 residential care homes in Northern Ireland. A brief evaluation survey, including response to a case vignette, gathered inspectors' views after using the tools for six months.

### *Findings*

Eight two-dimensional Scaled Inspection Tools were created, each embodying a scale of performance (seriousness of risk issue) and a scale of the ability of the facility to manage that issue, each axis comprising four points. The Scaled Inspection Tools were used for on-site

inspections during 2017-18. Evaluative comments were generally positive. The case vignette seemed to highlight greater risk aversion amongst newer inspectors.

#### *Originality*

Scaled inspection tools, with two orthogonal axes corresponding to seriousness of risk and ability to manage the risk (inverse of likelihood of harm), proved acceptable and intuitive in use. The study gives credibility to the possibility of developing screening and surveillance approaches to risk-based governance in service regulation.

#### *Practice Implications*

Prompts for each domain were found essential to guide inspectors. Despite the challenge of change, inspectors became enthusiastic about use for evaluating risks, and managers about improvements in consistency of inspection.

#### *Research Implications*

The creation of scaled inspection tools adds credibility to the potential for developing risk-based governance in service regulation. Further testing of domains and their scope is required.

#### *Social Implications*

Knowledge derived from statistical approaches needs to be incorporated into inspection and regulation, just as in other aspects of professional practice.

### **Plain language summary**

As the complexity of health and social care services increases, increasingly sophisticated approaches to regulating and ensuring standards of services is required. This feasibility study developed scales to assist in appraising quality and risk during inspections of nursing and residential homes.

### **Keywords**

Benchmarking; community care; governance; government regulation; health and care quality; inspection standards; licensure; Northern Ireland; nursing homes; quality assurance; quality improvement; regulation of health and social care; residential care; risk management; social care services.

### **Introduction**

The development of effective and efficient ways to ensure the provision of safe and compassionate care is a priority for policy makers and managers in health and care services (MacVane Phipps, 2019). The knowledge and skills of professionals in making decisions about complex needs, risks and contexts need to be matched by organisational systems that support this essentially human endeavour. It is no longer regarded as sufficient for professions to regulate themselves (Dixon-Woods, *et al.*, 2011), and external regulatory systems are developing to promote quality. External regulatory systems are now viewed generally as an essential aspect of health and social care systems to complement staff training and internal management systems of provider organisations (MacVane Phipps, 2019). In relation to the long-term care of older people, the World Health Organisation highlights that: "Ensuring the quality and effectiveness of ... care requires appropriate guidelines, protocols and standards. It ... [needs] mechanisms to accredit care providers (both institutional and professional)..." (World Health Organisation, 2017, p20; para 87).

#### *Regulation and inspection of services*

External regulation of health and care services is designed to ensure quality and create public confidence in services (Flodgren *et al.*, 2016). As the number, diversity and complexity of health and social care services grows, increasingly sophisticated processes are required by regulators to monitor standards, improve quality and manage risks (Sparrow, 2000). Despite some agreement on principles such as accountability, transparency and proportionality in the design of regulatory systems (Scheweppenstedde *et al.*, 2014), operationalising these presents challenges such as in defining good care, creating useful standards and designing effective regulatory processes (Braithwaite *et al.*, 2019). In particular, there are demands to streamline regulatory approaches (Hampton, 2005) and to 'predict harm' so as to prevent the occurrence of adverse events, requiring the development of statistical approaches to support professional judgements (Søbjerg *et al.*, 2020). These developments fit within broader initiatives towards *risk-based governance* in public services (Rothstein *et al.*, 2012). The time is ripe for broader governance approaches in health and social care (Arah *et al.*, 2003; Donabedian, 2006; Taylor and Campbell, 2011) to be applied more systematically to regulatory systems. In relation to the long-term care of older people, regulation is an important dimension in the development of robust risk management and quality assurance systems (Davies *et al.*, 2020; Frost *et al.*, 2020; Taylor & Donnelly, 2006).

#### *Risk detection in regulation*

Three overarching approaches to statistical methods in health and social care regulation have been outlined by David Spiegelhalter and colleagues (Spiegelhalter *et al.*, 2012):

1. *Rating*: creating a composite score or ranking from risk factors, facilitating comparison between services in terms of an overall quality measure, although general measures may mask specific risk issues and the approach may prove contentious to private providers who do not score well (Griffiths *et al.*, 2017).
2. *Screening*: identifying data outliers that indicate risk and quality issues, although identifying these requires a 'norm' of similar services against which to measure variation (Bardsley *et al.*, 2009; Proudlove *et al.*, 2018).
3. *Surveillance*: monitoring service data 'continuously' to enable risk factor analysis and methods such as statistical process control from other industries to be applied, although this will inevitably give some false positive errors (Bardsley and Sherlaw-Johnson, 2016; Swets, 1986).

#### *Scaled inspection tools*

All of the above statistical approaches require reliable scaled (interval) data for optimum effectiveness. This presents challenges, particularly in community health and social care services (Smithson *et al.*, 2018, p35). One promising approach is to build on the expertise of inspectors by creating scaled inspection tools to supplement or give structure to the conventional narrative record of inspection findings as reported in a recent literature review which has been used to inform this project (Cunningham *et al.*, 2020). That review by Cunningham *et al.*, using robust search methods, identified the limitations of the existing knowledge base on the topic. Despite the robust search methodology, no papers were retrieved in that review on the use of scales during external inspection processes of community health and social care facilities. The development of inspection scales should improve transparency of inspection, as well as providing quantitative data to support governance informed by statistical methods.

#### *Northern Ireland context*

This paper reports on a feasibility study (as part of a wider organisational transformation process) to develop scaled inspection tools for inspectors of residential and nursing homes who work at the *Regulation and Quality Improvement Authority* (RQIA) for Northern Ireland. The RQIA is an 'arms-length' body accountable to government, with statutory duties and powers to review and regulate public, not-for-profit and private sector health and social care services. The services that are inspected include hospitals; mental health and learning disability services; health care services in justice settings; and – in community settings –

nursing homes; residential homes (including those for children and people with mental ill-health or disability); day and domiciliary support schemes; nursing agencies; voluntary adoption agencies; and adult placement agencies. RQIA carries out inspections of services that are required to be registered based on minimum care standards, and also reviews public health and social care services. No scaled inspection tools were in use at the start of the project, and the concept was novel within the organisation.

#### *Developing risk-based governance*

At the start of the project it was determined that the data held by the regulatory body was predominantly nominal data (such as location and categories of establishment) and narrative inspection reports. There was a limited amount of interval data such as occupancy levels and counts of notifiable incidents such as accidents. Additional interval-scale data was required to inform the development of statistical approaches to regulation. Developing the *Scaled Inspection Tools* (SIT) described here is a part of RQIA's developing *Risk-Adjusted, Dynamic and Responsive* (RADaR) approach to regulation, which aims not only to be responsive to signals of concerns, but also (over time) to develop risk-adjusted frequency of planned inspections based on wider risk measures. This paper focuses on a project to create scales for inspection factors that might indicate concern about harm occurring, as required for a *screening or surveillance* approach, rather than quality in general as would be required for a *rating* approach (Allan and Forder, 2015).

#### *Aim*

The aim of the feasibility study described in this paper was to develop tools for gathering scaled data during inspection of residential and nursing homes to: (1) enable inspection data to be incorporated within a dynamic *surveillance* approach to identify facilities *at risk*; (2) improve the consistency of inspection; and (3) inform the development of risk-adjusted frequency of inspection.

#### **Method**

An organisation development approach was used, embodying change management activities such as: external facilitation of the process; establishing a vision and sense of urgency; generating short-term wins; and linking this project to the broader organisation strategy which in this case included an anticipated change in statutory regulatory requirements (Crawford & Nahmais, 2010; Pollack & Algeo, 2014). Given the central role of human inspectors in the process, particular attention was paid to the interplay between change leadership and organisational change processes (Griffiths-Cooper & King, 2007). Project stages were devised using learning from well-established models of change management (Mento *et al.*, 2002).

#### *Stage 1: Identifying risk domains*

Seven experienced inspectors, including two senior inspectors and two more senior managers, were facilitated in a series of Working Group sessions to give their views on which inspected factors they perceived as most likely to have undesirable outcomes, and how these domains were best conceptualised in terms of risk of harm. The inspectors were selected as having substantial experience in the inspection of nursing and residential care homes, as well as availability and being perceived by managers as able to articulate their experiences. The outcomes from these Working Group sessions were taken to Workshops comprising all of the 20 nurses and social workers of the *Care Homes Team* (whose role is the inspection of residential and nursing homes), as well as appropriate managers. These sessions were informed by published literature (Chen and Grabowski, 2015; Cunningham *et al.*, 2020; Kim *et al.*, 2009) and by quantitative information on risk factors from an audit of the organisation's administrative data.

#### *Stage 2: Development of two-dimensional scales*

As the Workshop series progressed, a view gained ground that to judge the regulatory significance of a risk, it was important to consider not only the severity of possible impact on service users, but also the capacity of the facility to manage or improve the situation. This was developed initially for one domain and then extended to others. It was confirmed to the group by the external facilitator that this two-dimensional structure for risk factors was equivalent to the standard 'risk matrix' used for risk management purposes. In this regulatory situation, the concept of 'likelihood of the problem occurring' translates into an inverse measure: appraisal of the robustness of measures in place in the establishment to manage or prevent dangerous situations where harm may occur.

#### *Stage 3: Development of guidance prompts*

During later Workshops a need was identified for prompts on the completion of scales to aid clarity. Guidance prompts were developed by a subgroup of senior inspectors, and refined when implementation was reviewed.

#### *Stage 4: Measures of outcomes*

Data on formal 'undesirable outcomes' as defined by regulations made under statute (i.e. *Serious Concern Meetings* with home managers or owners, and *Enforcement Notices*) is limited, so a proxy measure was used for developmental purposes. Inspectors were asked at the end of the inspection how long a time interval there should be before the next inspection: 3, 6, 9 or 12 months (the current regulations provide for a minimum of two inspections per year).

#### *Stage 5: Implementation of scaled assessment tools*

From April to September 2017 (six months), the Scaled Inspection Tools were completed in respect of 206 of 248 (83%) Nursing Homes and 182 of 227 (80%) Residential Care Homes in Northern Ireland, in addition to completion of the standard inspection documentation.

#### *Stage 6: Consistency of inspection standards*

The interim findings were appraised in October 2018. A summary was presented to a group of 19 inspectors who attended a facilitated Workshop which gathered feedback on use of the scales. The Workshop sought to learn also from outlier inspections where the indicated proposed time to next inspection was more than two standard deviations from the mean as predicted by the aggregate of the eight risk scales (multiplying the scores on the orthogonal axes to give the score for that domain).

#### *Stage 7: Evaluation of use of scaled inspection tools*

A brief evaluation questionnaire was sent to the 20 inspectors of residential and nursing homes after the first year of use. This included an anonymised inspection report (vignette), on the basis of which inspectors were asked to complete SIT scores.

#### *Ethical approval*

Ethical and operational approval was granted by the senior management of RQIA.

#### *Method of analysis*

The findings of the earlier stages were analysed by the change facilitator in discussion with senior managers and information staff of the organisation at suitable time intervals. Simple counts were used for survey analysis as this involved a small number of respondents.

## **Findings**

#### *Organisational context*

Despite the usual challenges of organisation change processes within a busy working environment, the inspectors became enthusiastic about the use of scales for key inspection domains. In general they found that the use of the scales supported rather than undermined

professional judgement. The iterative development process involving managers and front-line inspectors was generally viewed as a successful approach.

#### *Identification of risk areas*

In order to create interval-scale inspection data on the most important risks, the Working Group considered first domains that are clearly regulated such as: care risks, fire risks, individualised care, medicines management, notifiable events; record keeping, and provision of a safe environment. The discussion then focused on factors that might indicate residents coming to harm such as falls, choking or hospital admission. The discussion was broadened to identify additional domains that might correlate with serious concerns, based on participants' experiences of conducting inspection processes, such as: end-of-life care; infection control and wound management; nutrition and food management; pain management; staffing; leadership; change of manager or owner; a new service; repeated inspection recommendations; whistleblowing; and issue of an *Enforcement Notice*.

For this feasibility study, these domains were then narrowed to factors that could be operationalised in an inspection tool with clear indicators of levels of concern. This happened in tandem with re-considering the conceptualisation of factors. For example, should nutrition and hydration be treated as one domain or as two? With an emphasis on risk rather than on quality in general, this process led to the identification of eight factors:

- *Care Documentation*
- *Falls*
- *Infection Prevention and Control*
- *Management Arrangements*
- *Nutrition*
- *Restrictive Practices*
- *Staffing Arrangements*
- *Wound Management*.

In terms of scaling, it was agreed long scales would give limited standardisation due to issues in defining the points, and that a three-point scale would be only marginally better than the normal two-point dichotomisation into 'good enough' or 'not good enough'. A four-point scale for levels of seriousness of possible harm was decided upon, and was developed for each of the eight domains. The language for scale points was harmonised across domains as the project progressed rather than being imposed on the domain working groups at the start.

#### *Two-dimensional scales*

As the inspectors considered more closely how the scales would be used in practice, two-dimensional scales were suggested. These were created, the y-axis relating to seriousness of concerns and the x-axis relating to the capacity to manage or improve the situation. The result was eight two-dimensional inspection scales, each axis having four points. An example is shown in Figure 1.

**Interval scale for: Restrictive Practice**

<b>Potential for harm/ Outcome for service users</b>	<b>4</b> High risk - Restrictions in place may cause death/have a serious impact on safety, independence, freedom of movement, liberty and quality of life	4	8	12	16
	<b>3</b> Significant risk - Restrictions in place may cause harm and have a significant impact on safety, independence, freedom of movement, liberty and quality of life	3	6	9	12
	<b>2</b> Potential risk - Restrictions in place may have an impact on safety, independence, freedom of movement, liberty and quality of life	2	4	6	8
	<b>1</b> Low risk – Restrictions in place maintain safety, independence, freedom of movement, liberty and quality of life	1	2	3	4
		<b>1</b> Evidence of proactive management and implementation of restrictive practices	<b>2</b> Inconsistent evidence of management and implementation of restrictive practices	<b>3</b> Limited evidence of management and implementation of restrictive practices	<b>4</b> Absence of adequate management and implementation of restrictive practices

**Capacity to reduce risk**

Figure 1: Example of two-dimensional scale for *Restrictive Practice*

**Guidance**

It became apparent during the project that guidance prompts would help to standardise interpretation of the scales. These were developed by the working groups, and an example of the prompts in relation to restrictive practice is illustrated in Figure 2. These were found to be a key component in supporting consistent use of the scales.

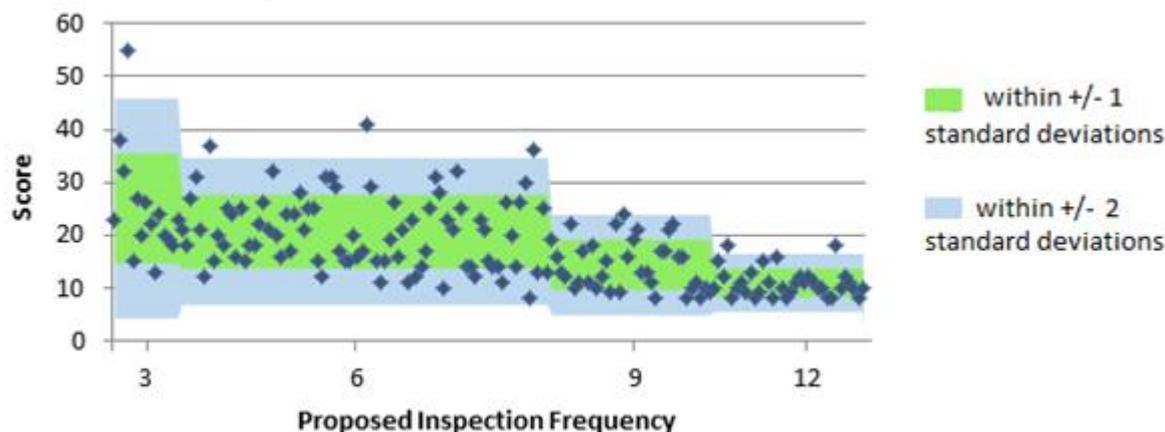
<b>Restrictive Practice</b>	
<b>Evidence sources</b>	<b>Best Practice Guidance</b>
<ul style="list-style-type: none"> <li>✓ Misapplication, misuse, lack of training, environment institutional restrictions, attitudes, approach</li> <li>✓ Multidisciplinary input to decision making quality of life</li> <li>✓ Risk assessments/ care plans are in place</li> <li>✓ There is evidence of continued review of the need for restrictions</li> </ul>	<ul style="list-style-type: none"> <li>• Adult Safeguarding – Prevention and Protection in Partnership</li> <li>• NIASP Guidelines</li> <li>• DOH Guidance – Deprivation of Liberty</li> <li>• RCN – Principles of consent guidance for nursing staff</li> <li>• RCN – Restrictive Practice</li> </ul>

Figure 2: Example of prompts for *Restrictive Practice* domain

*Improving consistency of inspection*

At the interim review in November 2018 the 123 inspections carried out to that time were reviewed by the team responsible for information and statistics. Individual inspection scores were plotted against the proposed time to next inspection. Ten inspections (8%) by five inspectors were identified where the indicated proposed time to next inspection was more than two standard deviations from the mean as predicted by the aggregate of the eight risk scales (see Figure 3).

*Distribution of Nursing Home Risk Scores*



*Distribution of Residential Home Risk Scores*

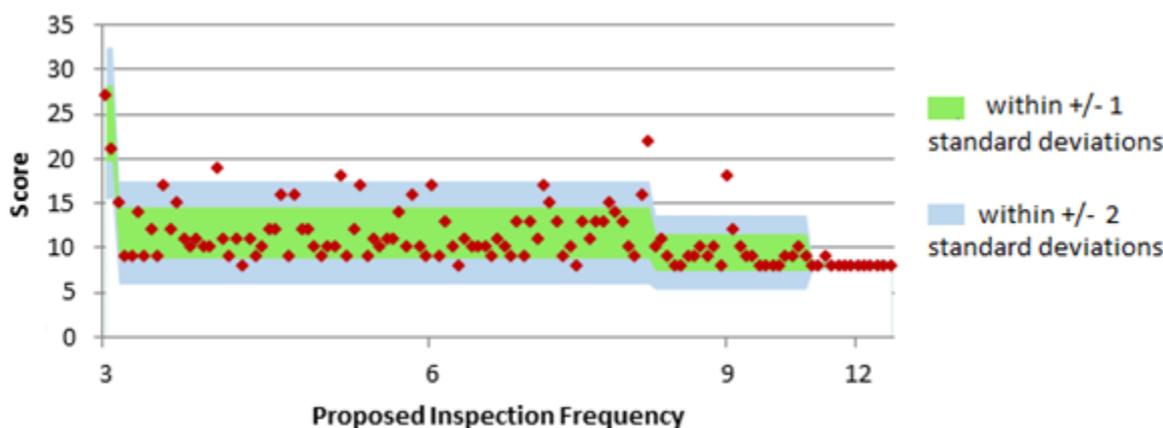


Figure 3: Distribution of Scaled Inspection Tool scores against the proposed inspection frequency for (a) nursing homes; and (b) residential care homes

These outlier inspections were discussed by the responsible inspectors, each with a small group of colleagues at the interim review Workshop. Issues identified were the level of imminent risk to residents; the level of confidence in the ability of the service to effect the required change; and the ability of the inspector to validate the service’s response to the required improvement without having to visit the service. This process led to refinement of the language of some scales and guidance prompts. These Workshops were a valuable learning process and helped the team of inspectors to move towards greater consistency of knowledge and inspection practice.

*Usability*

Eight (six nursing home, two residential home) inspectors completed the usability questionnaire. Respondents reported that the time taken to complete the Scaled Inspection Tools (having completed their normal inspection) were (in intervals of 5 minutes) 20, 15, 10

(three respondents) and 5 minutes (three respondents). Comments by inspectors were predominantly positive, highlighting such aspects as:

- more easily identifying substantial risks and areas of concern;
- identifying aspects of the facility that are well managed;
- helping to inform the conduct of the next inspection and scheduling of inspections;
- identifying areas for improvement to review at next inspection; and
- the value of an evidence base to support regulatory activities.

About two-thirds of respondents thought that the Scaled Inspection Tools would enable inspectors to predict undesirable outcomes more accurately. Suggested improvements included making provision for qualitative statements to contextualise the SIT scores; amending wording where scaling was difficult; and highlighting the anticipated benefits when the data were incorporated into the computer system on which other inspection data are managed. Through the development process, it was recommended that the proxy outcome measures (3, 6, 9 and 12 months to next inspection) might be better amended in future to three categories: *low, medium and high*, similar to more intuitive understandings of ‘risk’ in other health and care contexts (Taylor and Moorhead, 2020).

A vignette was completed (anonymously) as part of the evaluative survey by six inspectors who had used the Scaled Inspection Tools completed. Findings are illustrated in Table 1. The number of respondents was too small for meaningful statistical analysis, but on a number of domains the scores of recently-appointed inspectors seemed to rate the risks more seriously than did inspectors with longer experience.

Inspector:	1	2	3	4	5	6
Years Experience	<1	<1	<1	<1	14	3
Completed risk assessments	1	2	2	2	10	39
Falls - Capacity	1	1	1	1	1	1
Falls - Outcome	1	1	1	1	1	1
IPC - Capacity	1	1	1	1	1	1
IPC - Outcome	1	1	1	1	1	1
Nutrition - Capacity	2	3	3	3	2	2
Nutrition - Outcome	3	3	2	3	1	2
Restrictive Practice - Capacity	1	1	1	1	1	1
Restrictive Practice - Outcome	1	1	1	1	1	1
Staffing Arrangements - Capacity	1	1	1	1	1	1
Staffing Arrangements - Outcome	1	1	1	1	1	1
Care Documentation - Capacity	3	4	3	3	2	2
Care Documentation - Outcome	4	3	3	3	1	2
Wound Management - Capacity	2	3	2	3	2	2
Wound Management - Outcome	3	3	2	3	1	3
Management Arrangements - Capacity	1	1	1	1	1	1
Management Arrangements - Outcome	1	1	1	1	1	1
Falls Score	1	1	1	1	1	1
IPC Score	1	1	1	1	1	1
Nutrition Score	6	9	6	9	2	4
Restrictive Practice Score	1	1	1	1	1	1
Staffing Arrangements Score	1	1	1	1	1	1

Care Documentation Score	12	12	9	9	2	4
Wound Management Score	6	9	4	9	2	6
Management Arrangements Score	1	1	1	1	1	1
Total Score	29	35	24	32	11	19
Average RADaR Score	30				15	

## Discussion

The development of structured inspection tools for regulatory bodies parallels the development of structured assessment tools to support decision making in other domains of health and social care (Taylor, 2012a,b). Although human (professional) judgement has to be recognised for its ability to conceptualise situations and manage complexity, approaches are required to address variance in professional judgement in governance contexts (Taylor, 2017b). Despite the challenges in seeking to quantify risks relating to human behaviour (Schrödter *et al.*, 2020), greater structure should lead to increased consistency by the inspectors as well as facilitating communication with service providers and within supervisory and governance processes. The identification of the domains of risk confirmed findings in the literature that management and governance processes were a key aspect of quality care (Furnival *et al.*, 2018), good management correlating with fewer problems in other domains.

It was delightful that the Working Groups, based primarily on their experience of inspection work, developed the idea of two-dimensional scales for each risk domain. This parallels the now standard approach of considering risk in terms of orthogonal axes incorporating both consequences (seriousness) and likelihood of (re-)occurrence (Huihui *et al.*, 2010; Taylor, 2017a). In this case the *likelihood* scale was expressed as its inverse: the capacity to manage the risk effectively, ie reduce the likelihood of occurrence. The identification of the capacity to manage risks as a key feature of assessing each risk domain confirmed the current interest in self-regulatory mechanisms and improvement capability within provider organisations. For statistical modelling, the two dimensions of each scale might be added or multiplied.

The Scaled Inspection Tools have been used by inspectors for two years at the time of writing and were found usable in practice beyond the initial period on which this paper focuses. The scales typically took about 10 minutes to complete, following a 'normal' narrative inspection report. The team of inspectors found the scales valuable to assist in consistent judgement of levels of risk. There remains, of course, the need for professional judgement (based on the training and expertise of inspectors) and supervisory processes to contextualise and make effective use of the scores.

In terms of limitations, the scales were developed to cover both residential and nursing homes. This promoted common understanding between inspectors from nursing and social work professions, and was beneficial for team building and developing consistency of approach. However separate scales might give greater precision. The iterative process suited the organisational environment. Facilitating use of the expertise of these experienced professionals proved an effective development process. The challenge in the process was to keep the wider team informed whilst doing focused work in the smaller Working Groups. The eight factors included six factors focusing primarily on safety and two factors focusing primarily on services being well-led, omitting factors focusing on effectiveness or compassionate services. This reflected the conscious focus on risk rather than overall quality, but may also reflect the statutory regulatory context in which the study was conducted. Arguably, the focus on the possibility of harm might bias inspectors towards risk-aversion when their overall task is to improve the quality of services, although the orthogonal scale gave recognition to 'capacity to improve'. The scope might usefully be extended to include domains relating to medicines management and admission processes.

To date the scales have been used following the usual narrative report, but a next step will be to integrate these. Their use for statistical purposes will depend, of course, on whether they are considered as interval or as ordinal scales. There was no weighting of domains; their use was to inform the inspectors' judgements. Weighting is an area for future development, although this is not a limitation if the only purpose is to highlight outliers on individual risk factors. Generalisability may be limited by the extent to which other jurisdictions have defined care standards, although the risk factors considered went beyond these to include domains common to the care of older people.

As professionals and managers seek evidence to inform health and social care decisions, the potential of statistical data within regulation needs to be recognised. However there are challenges as well as potential benefits in statistical approaches to predicting harm through risk factor statistics, both increased through the use of 'big data' and machine learning approaches. This feasibility study demonstrated the potential for including statistical data from scaled inspection tools as part of screening and surveillance approaches to regulation, giving a clear connection between the data and the observed realities reported by inspectors in their daily work.

The Working Group sessions and Workshops were a very worthwhile process for helping the inspectors to move towards greater consistency of inspection by providing a focus and tools to facilitate discussion. In particular the discussion of outlier inspections (with a supervisor or colleagues) was facilitated in a more objective manner than could occur with purely narrative inspection reports. The active engagement created ownership, and the approach seemed more effective than trying to create standardisation through ever-tighter procedural rules (Munro, 2010). The need for training of inspectors was perhaps highlighted by differences in scoring between novice and experienced inspectors, although the results on this are tentative. This result, however, confirms findings elsewhere in health and social care that workers with less experience tend to be more risk averse than those with more experience (Hennessy, 1993).

This initiative provides some evidence for the viability and usefulness of developing screening and surveillance approaches to the use of statistical methods in health and social care regulation (Spiegelhalter *et al.*, 2012). In particular the project indicates a way forward for strengthening the potential of risk-adjusted frequency of inspection as an aspect of risk-based governance. The study highlighted the scope for developmental research in areas such as: confirmation of domains that best indicate *risk*, and the differing conceptualisations of this term; the use by inspectors of more structured assessment tools; the use of risk statistics by care professionals; the effect on risk communication of the development and use of scaled inspection tools; and the use of such tools within supervisory processes. Further testing of domains and their scope is required.

As with all structuring of assessment using tools, attention needs to be paid to the potential de-skilling effect on inspectors (Taylor, 2020), although that did not present as a problem in this study. The scaled inspection tools seemed to facilitate rather than undermine professional judgement. This perhaps reflected the level of experience of the professional inspectors using the tools. It may be that newly-qualified workers are more inclined to let their judgement be dominated by the structure of an assessment tool, having less confidence to make use of the tool appropriately (Devaney *et al.*, 2017). The tools also provided a useful platform to facilitate discussion of key issues in supervision and with colleagues (such as in learning sets), paralleling encouraging aspects of use of assessment tools with patients and clients (Taylor & McKeown, 2013). Such developments might usefully be linked to the Dreyfus model of skill acquisition (Benner, 2004) to generalise our understanding of the use of inspection tools.

In principle, society should welcome the application of 'science' (knowledge) to a field of human endeavour such as care home inspection. More sophisticated methods are required to address the increasing complexity of our society. However there are challenges to the use of risk factors, particularly when statistical approaches develop towards predictive analytics using 'big data' and machine learning. The implementation of regulatory methods requires a consideration of the perspectives of various stakeholders, although the scientific rigour of the methods must remain the key issue.

## Conclusion

Scaled inspection tools, with seriousness of possible harm and potential to manage the risk as two orthogonal axes, proved acceptable and intuitive in use in relation to regulation of nursing and residential homes. Prompts for each domain were found essential to guide inspectors. These two aspects will be useful for future scale development initiatives. The developmental process illustrated the potential for engaging inspectors in scale development through an iterative process. Despite the usual challenges of organisation change processes, inspectors became enthusiastic about their use for evaluating risks, and managers about the potential for improving consistency of inspection. The feasibility study demonstrated the possibility of attaining scaled data relating to inspection visits as one data source to inform screening or surveillance approaches to regulation, thus starting to address one key challenge to such developments. On this project, the scaled inspection tools seemed to facilitate rather than undermine professional judgement, giving encouragement to the use of assessment tools with experienced professionals. Overall this initiative provided positive evidence to support the development of risk-based governance in inspection and regulation of residential and nursing homes for the benefit of older people and society in general.

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