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**Benchmarking the prevalence of care problems in UK care homes using the  
LPZ-i: a feasibility study**

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East Midlands Research into Ageing Network (EMRAN) is a research collaboration across the East Midlands to facilitate collaborative applied clinical research into ageing and the care of older people. EMRAN was set up with support from NIHR CLAHRC East Midlands.

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## Abstract

**Background:** UK care homes have no mechanism for counting, collating or analyzing prevalence of care problems to benchmark quality of care. This study investigated the feasibility of the International Prevalence Measurement of Quality of Care (LPZ-i) for benchmarking in UK care homes and described facilitators and challenges to implementation.

**Method:** The pressure care and incontinence modules of the LPZ-i were implemented in a purposive sample of UK care homes. Interviews and focus groups with regional co-ordinators, NHS and care home staff who had been involved in implementation. Data were analysed using a framework approach.

**Results:** 26 care homes and 489 residents implemented the LPZ-I modules. 60 pressure ulcers were reported in 41 (8.4%) of residents. 325 (66%) of residents were incontinent of urine, faeces or both. It was demonstrated that it was possible to use prevalence data to benchmark care between UK care homes and against homes overseas. 38 participants took part in focus groups and interviews which revealed the importance of existing relational working with care homes as a basis for implementation. Care homes reported improved identification and management of pressure ulcers and incontinence in response to the audit. However, care home staff could not interpret or analyse data from the audit or use it to drive quality improvement.

**Conclusion:** Implementing the LPZ-i was possible, delivered data appropriate for benchmarking, was well received by care home and NHS staff, and appeared to lead to changes in practice. More widespread implementation of the LPZ-i is feasible, subject to improving the data and quality improvement competencies amongst care home staff.

## Background

450,000 people in the UK live in care homes, which provide accommodation together with personal care, with or without specialist nursing input[1]. They include residential and nursing homes. Care home residents are vulnerable, highly care dependent and at risk of adverse events[2]. The UK care home sector is a complex mixed economy, with care commissioned and provided by a mixture of health and social care, and public and private organisations[3]. Despite central inspection and regulation, there is no consistent approach to quality assurance or improvement and no statutory mechanism for systematically collecting or collating data on basic care problems or how health and social care providers respond to these. This contrasts with other countries where systematic reporting of such issues is routine[4,5].

One tool used to benchmark prevalence and management of care problems in long-term care is the Landelijke Prevalentiemeting Zorgkwaliteit (LPZ) or Prevalence Measurement of Quality of Care. This was originally used in the Netherlands but now, as the LPZ-international (LPZ-i), has also been implemented in Austria, Switzerland and New Zealand[5]. Amongst other achievements, it has described the prevalence of malnutrition in Dutch long-term care and was used alongside quality improvement initiatives to tackle the issue[6]. It has allowed detailed cross-national comparisons of the prevalence of pressure ulcers and how this associated with differing care practices – enabling discussions around training and practice[7][8].

We set out to consider the feasibility of LPZ-i in UK care homes and whether using a standardised benchmarking tool could trigger conversations and actions to improve quality of care in this setting. We proposed that the LPZ-i would be suitable for more widespread implementation if: the LPZ-i could be put into practice; if it was well received by care home and NHS staff; if data from it could be collated sufficiently for benchmarking purposes; and if there was evidence that changes in practice were likely to emerge from the process.

## Methods

This was a feasibility study designed to test whether it was possible to implement LPZ-i and to describe the facilitators and challenges to effective implementation in a sample of UK care homes based within two counties of the East Midlands.

LPZ-i is a single cross-sectional audit undertaken annually to measure prevalence of care problems and the management strategies, policies and preventative or treatment measures in place for these within participating institutions. All institutions audit prevalence on the same day using a standardized protocol. The audit is modular with a central component covering institutional variables and optional modules covering pressure ulceration, continence, nutrition, falls, physical restraint and intertrigo. Pressure ulcers are identified by top-to toe-examination, with other data extracted from care records. Audit is undertaken by two staff, one from the patient care team and one external visitor from a paired institution. All data are entered into a secure online portal and analysed at Maastricht University. Care homes receive their own collated data and comparator data showing national average prevalences using an online dashboard.

The audit was launched in the UK through a series of presentations to local care home forums focusing on issues from research in care homes through to commissioning, service provision and regulation. Following these we worked with local commissioners and providers to recruit a purposive sample of homes with/without nursing care, with/without dementia registration and with/without on-site rehabilitation services, with the rationale that these features could influence resident dependency, how staff were organized to provide care and, as a consequence, how feasible LPZ-i implementation was.

The pressure ulceration and incontinence modules were chosen as the focus for the study to facilitate an understanding of implementation issues around the hands-on aspects top-to-toe pressure ulcer inspection[9] alongside the paper-based audit of incontinence prevalence and practices (which is similar in structure and layout to all remaining LPZ-i modules).

Following a training day, all participating homes undertook the audit on a single day in November 2015. External assessors were National Health Service (NHS) tissue viability or community nurses with specific training and expertise in pressure ulcer identification and management. Routine clinical audit within the NHS does not require specific consent, however discussion at the training day led to several homes saying that they would feel more comfortable explicitly documenting resident consent, given the intimate nature of a top-to-toe inspection in vulnerable adults and the fact that the audit was a new addition to routine practice which could be subject to challenge. Local authority safeguarding advisors at the event were supportive of such an approach. The final decision about whether or not to adopt formal consent procedures was left to individual homes – a template document, based upon standard NHS consent documentation – was made available to homes should they want to use it.

Audit data were collated, analysed and compiled into dashboards for individual care homes, as per standard LPZ-i protocol, at Maastricht University.

To contextualise and understand the implementation work, and to identify how data generated from audit might drive quality improvement, a series of focus groups were conducted with care home and NHS staff and residents. One-to-one interviews were used where participants were unable to attend focus groups for logistical reasons. Four groups with direct influence over audit implementation were recruited: the project team organising the LPZ-i at a regional level (these were employees of East Midlands Academic Health Sciences Network Patient Safety Collaborative [PSC], an NHS organisation set up to improve patient safety); NHS nurses acting as external assessors; care home managers, nurses and care assistants; and care home residents and their relatives. To ensure that interviews identified a broad range of structural and process factors related to implementation, a purposive sampling framework was designed to recruit a subsample of participant homes comprising those: in urban/rural locations; different in size; registered for care with/without nursing; and representative of the full range of quality ratings awarded by the UK statutory inspector of care homes.

Data were analysed by two of the researchers (JD, JH) using framework analysis[10]. This provides a systematic and methodological approach to thematic analysis and seeks out patterns and differences in the data, focusing upon themes which explain these. Data were organised in NVivo version 11 (QSR International). Researchers initially reviewed transcripts individually and then met to review and discuss emerging themes. Overlapping themes were merged and then matrices produced for each theme with quotations organised into columns as either supporting or refuting the theme, with each row representing a separate interview or focus group. A final meeting between JD and JH reviewed the thematic codes in light of these matrices to determine an agreed structure of themes and sub-themes which were felt to be sufficiently evidenced by the transcripts.

## Results

28 homes were recruited and trained. From these, 26 participated in the audit. Of the two non-participating homes, one closed on audit day due to viral gastroenteritis and another had an unannounced regulatory inspection. 489 out of a possible 914 residents participated in the audit, 204 and 285 from residential and nursing homes respectively. The mean (SD) age of participants was 84.6 (9) years, 60% of participants were female and the median (interquartile range) duration of residency was 508 (153-1098) days.

60 pressure ulcers were reported in 41 (8.4%) residents, 80% of which had started in the care home. 325 (66%) residents were incontinent of urine, faeces or both. 21 (4%) had an indwelling catheter for urinary incontinence. 80% and 74% of those with urinary and faecal incontinence respectively had this prior to admission. Comparison of UK audit findings with those taken from the established national audits of other countries in 2015 is shown in table 1 as an exemplar of how such data might be used for international benchmarking.

Table 1 - Point prevalence of care problems and preventative methods across three countries

Point Prevalence (%)	UK care homes	Netherlands nursing homes	Austrian nursing homes
Pressure ulcer (grades 2-4)	3.4	3.3	3.9
Pressure ulcer (grades 2-4 amongst high risk residents)*	4.2	8.6	5.1
Urinary incontinence	64.8	48.2	66.1
Faecal incontinence	48.6	25.8	45.8
Urinary and faecal incontinence	47.0	22.6	38.7
<b>Pressure ulcer preventative measures</b>			
Pressure-relieving mattress	78.9	69.6	81.0
Repositioning in bed	39.3	11.2	49.8
Prevention of dehydration and/or malnutrition	47.6	36.9	52.7
Providing client with information and instruction	54.3	18.6	46.3
Floating heels	3.8	19.4	42.0
Heel protectors	4.9	2.9	17.8

Moisturiser/barrier cream to protect the skin	59.3	50.3	87.6
Sheepskin	0.06	0.3	0.7
<b>Interventions in residents with urinary or faecal incontinence</b>			
Environmental adjustments	37.5	2.3	63.1
Clothing adjustments	49.5	9.7	76.5
Bladder training/pelvic floor muscle training	17.7	0.7	9.6
Fixed time bathroom visits at resident level	44.8	35.6	39.4
Fixed time bathroom visits at institutional level	7.3	8.4	6.2
Disposable materials	81.7	68.8	14.7
Medication	3.8	2.0	0
None	5.4	6.7	

\*Residents were categorized as high risk on the basis of a Braden score <20.

Thirty-eight participants took part in focus groups or interviews. Four were Patient Safety Collaborative (PSC) staff, eight tissue viability nurses (TVN), five care home managers (CHM), sixteen other care home staff (CHS), and five care home residents (CHR). 98 codes were generated which, through iterative review using the framework method as described above, were merged into four themes and ten sub-themes outlined in table 2.



Table 2 - Themes and subthemes emerging from focus groups and interviews after LPZ-i implementation

Themes	Sub-themes
Strategic organization	Pre-planning
	Barriers to audit
	Maintaining routine care alongside audit
The role of the PSC in brokering communication	Communication with homes
	Communication between homes
	Communication with residents and their families
Interpreting the data	Concerns about bias in the sample
	Competencies in data interpretation and using this to drive change
Impact of the audit	Changes in practice in response to audit
	Future intentions

### Theme 1: Strategic organisation

This covered sub-themes of pre-planning, barriers to audit and maintaining routine care alongside audit.

Pre-planning was required to ensure that care home documentation recorded the correct variables and these could be collated to populate the audit, but also to establish how top-to-toe examinations would be managed between care home and NHS staff:

“We’d planned the day out...knowing...who got up first and what have you, so we’d done the list to work with that, and it all went really well and naturally as we’d checked someone, the carers would then go to that resident to get them, you know, assist them to get washed and dressed.” (CHM Interview 6).

In homes where existing patterns of shared working between NHS and care home staff had been established – a relational working pattern – preparation for the audit was more straightforward and it was easier to establish shared priorities:

“We co-opted a nurse who works for county healthcare who worked very closely with the care home teams, again she was very influential and instrumental in getting staff to come and train and, you know, they gave their time freely, no one wanted paying for it...you know they are just so passionate about it” (PSC Interview 3).

Relational working was necessary, but not sufficient, to implement the audit. The importance of co-ordination by central PSC staff was emphasised, particularly by providing regular prompts to busy care home staff to keep them focused on preparations:

“In the run up to the audit day, I was working with the matrix of all of the homes, the number of contacts they’d had, the topics that were discussed, and the areas that we knew needed to be in place on the day itself, but just working through that checklist with each home, is really intensive but really seems to have borne fruit.” (PSC Interview 2).

Barriers to audit included time and staffing constraints, extra workload, disruption to care home routines, difficulty coordinating external auditors and challenging trenchant processes to make the audit work. Amongst these, workforce implications of conducting a structured audit within a defined time window, with involvement of both NHS and care home staff, loomed large. Both sectors reported already feeling overstretched and having to make sacrifices to accommodate the work, including paying for extra staff, or staff coming in from leave. Both sectors voluntarily incurred expense to support the project and identified the need to protect and pay for staff time as an important resource issue for future roll-out of the initiative at scale:

“We increased our staffing by two. Because we wouldn’t have been able to achieve what we achieved otherwise, because, you’ve got nurse call bells going and people don’t want to wait because you’re doing something, it’s their morning routine, they’d like assistance and they’d like it now, please. If we didn’t have extra staffing on the day, we’d have struggled” (CHM. Focus Group 8).

Even though homes were self-selecting, the potential for external scrutiny to be threatening and the need to use an appreciative approach to facilitate collaboration was mentioned by several participants:

“I went in with the attitude of I’m here to help you, I’m not here to spy on you. Because there was an element of some of the homes I went in, that, it was like, ‘Oh, not someone else coming to inspect us,’ and so, the build up to it was very clear, we’re here to see how we can help.” (PSC. Interview 4).

Maintenance of routine care alongside audit recognised a tension between the requirements of a large systematic audit and the day-to-day need to deliver person-centred care:

“..tissue viability nurse was very good because, although she had to travel to us, she took into consideration that the residents like to get up early, so she actually came in at about seven in the morning, so that it didn’t disrupt the day too much for the residents, but she could still complete the audit within the timeframe.” (CHM. Focus Group 3).

## Theme 2: The role of the PSC in brokering communication

This covered sub-themes of communication with care home staff, communication between care homes and communication with residents and their families.

Bidirectional and frequent conversations between PSC and care home staff were required to individualize explanations, reminders and contact with homes depending upon individual policies, procedures and the core competencies of management and staff. Another important role for the PSC team was networking and disseminating progress across a complex mix of stakeholders active in care homes, without any clear overarching infrastructure to do so. There was a sense that, without this co-ordination, support from both NHS and care home partners would have lessened:

“My Clinical Commissioning Group contacts, I could contact people I knew well who I knew had an interest in care homes and were likely to support this, which they did. So it was using my name to contacts really, to set up the pilot...” (PSC. Interview 3).

There was also an issue of communication between care homes, which can become isolated and some of which are in business competition. There was a recognized role for an external agency, in this case the PSC, in brokering effective networking:

“If we only get one positive thing out of this, it’s that the care homes are talking, that they’re in contact with each other and they’ve learned something about pressure ulcers and, they learned that there is a PSC that, you know, you’re not on your own.” (PSC. Interview 1).

Where the PSC did not directly broker communication, for example between care homes, residents and their families, considerable variability in practice emerged. It was reported that, where care homes chose to adopt a formal consent process, contrary to the initial perception that it would reassure residents and families, this could be perceived by some as intimidating:

“To me one of the most interesting things was the reaction of relatives gaining consent. Given that we provide their loved ones with really intimate personal care, it was interesting that several of them were quite resistant to the idea” (CHS. Focus Group 2).

Such formalized consent processes were felt to be at odds with an audit process which was straightforward and had overarching aims that all interested in good care should have been able to support:

“I had a couple of residents that didn’t have the capacity. So we had to discuss with the families, which was fine. They felt it was very good that we were taking part. I think its reassurance, isn’t it, for families, that you’re open and transparent, and are wanting to do something like that. So families were all behind it anyway. And the residents were all yes, because if it’s going to improve things for the future, they were quite happy to take part” (CHM. Interview 6).

“Interviewer: And what was your reasoning behind participating? Did you think it was important?

Respondent: I do, yes, because they want to know what they’re dealing with when they, when they come in, if there’s anything wrong with us or what we have feelings about, so they need to know that..”(Resident 2. Focus Group 7).

Indeed, residents participating in focus groups who had been subject to audit had not noticed a break from routine practice:

“I don’t remember much about it. It was more or less what I expected, really” (Resident 1. Focus Group 7).

“I can’t really remember anything about that day in November” (Resident 2. Focus Group 7).

An additional risk of formal consent processes was that they could lead to residents being exempted, with risk of biasing the audit. There was a shared view that if the audit became accepted as a routine part of practice, without need for consent, then this could be avoided:

“I think it was perhaps about fifty percent [of residents that provided consent]. And they only picked the ones that were easy. The ones that were unwell, we didn’t get to see. So I didn’t think that was a fair picture really” (TVN. Focus Group 4).

### Theme 3: Interpreting the data

This included sub-themes about bias in the sample and competencies in data interpretation and quality improvement amongst care home staff.

Bias in the sample came up amidst discussions about high levels of enthusiasm, openness and transparency amongst the care homes. This was frequently caveated by reservations about the voluntary nature of recruitment to the project and concerns that this might generate observations which were overly optimistic both about the feasibility of audit and the quality of care in care homes more generally. Both care home and NHS respondents suggested that, because homes were volunteers, they were more likely to be highly performing homes which could engage constructively with the audit and also might be homes in which better practices were manifest:

“So, there’s some homes out there that I’d like to have gone into to see how their practice is but they’re not the ones that volunteered” (TVN. Focus Group 9).

Under the heading of data interpretation, a significant challenge was reported around getting care homes to engage with audit data after it was collated, analysed and made available on dashboards – with most homes reporting that they didn’t do so:

“I haven’t actually been back to the LPZ-i website to have a look. I thought perhaps the information might be collated and the information sent back to our manager, and he would be telling us what information he’d got back, but, I think day to day work has overtaken it.” (CHS. Focus Group 5)

Where data were accessed, homes faced issues with data literacy and how they should change practice in response to findings. It became clear that most homes had no quality improvement training or infrastructure and that they anticipated help would come from outside their organization:

“Actually, if we had something with the data that said. ‘This is what it is saying, it may be useful for you to do A, B, C and D’ that would be a lot better than giving us reams of paper that are like, yeah, right, what’s it saying?” (CHM. Focus Group 2).

#### Theme 4: Impact of audit

This incorporated themes about changes in practice in response to audit and also future intentions regarding LPZ-i.

Respondents reported recognizing, through preparation for the audit, deficiencies in training and responding to these in the run up to the audit. An example was changes to how they approached and documented specific care problems:

“I think one of the things that came out of the experience was how the homes were going to make improvements on their own. I know one of them certainly started to make changes from day one. It was very much a case of, ‘this is going to become our normal weekly practice’” (PSC Interview 4).

Even after these preparations, the audit day allowed further structured opportunity for care homes to review current practices in line with gold-standard care:

“..as we went round, I kept my notes as to what people needed equipment-wise and looking at [creams or dressings] required....I followed that up, and ordered what we needed to order” (CHS. Focus Group 8).

Under future intentions, respondents spoke about working to sustain changes in practice leading on from audit day:

“I don’t think they quite appreciated what it would entail but they, themselves, at the end, did say that they would be looking to do something similar themselves. That meant the skin inspections on a regular basis” (TVN. Focus group 9).

Most respondents spoke about the future need to establish quality improvement expertise in care homes. All participants stated an ambition to repeat the audit on an annual basis and to do so at greater scale and pace:

“I’m almost of the opinion that, if we’re going to focus that heavily on two areas, why don’t we do a few other issues as well?...So if we’re focusing on gaining information, can we do it on more than the two areas?” (CHM. Focus Group 7)

## Discussion

This paper reports the first feasibility study exploring implementation of an international benchmarking measurement (LPZ-i) in UK care homes. Implementation was feasible and delivered data which could be used for benchmarking. The tool was well received by care home and NHS staff but implementation was contingent upon established patterns of relational working, effective central co-ordination and supporting organisations undertaking specific measures to free-up staff resource. Preparation for audit was reported to be a driver for change and improvement of care practices. However uncertainty amongst care home staff about how to interpret data meant that it was not used as a basis for quality improvement within the homes.

The strengths of this study included using a standardized international measure, enabling progression to consider implementation questions without a prolonged period of development and validation of the benchmarking tool. Framework analysis enabled a critical approach to focus group and interview data within limited time and financial constraints. Purposive sampling and the inclusion of relevant perspectives from NHS, care home and administrative staff allowed triangulation of findings taking account of multiple perspectives. The limitations were that findings come from an initial wave of implementation and so insights about sustainability over multiple audit cycles are limited. Comparisons of prevalence data with those from other countries must be taken as indicative and are influenced by the caveat that volunteer homes participating may possibly have self-selected for lower incidence of the care problems under study. Issues of cost and affordability were not raised in this study, which was funded by the East Midlands Academic Health Sciences Network and Patient Safety Collaborative.

The low levels of data literacy amongst care home staff is an important finding, which needs to be addressed if the LPZ-i or similar audit tools are to be applied in UK care homes. Deficiencies in computer literacy have previously been identified in the sector[11] and care was taken to ensure that staff could access data using available technology. The issue here, though, was less about accessing data and more how interpret it. Care home staff lacked the competencies to use data to inform, drive and measure quality improvement. Given that NHS organisations, which employ dedicated quality improvement staff, are still developing skills and infrastructure for quality improvement[12], it is unsurprising that care homes, with more limited resources, are currently under-prepared. Building such skills in tandem with audit is important if a quality improvement culture is to be established within the sector. Care home staff were open about these deficiencies and keen to find a way to build

capacity in quality improvement. Strategic investment and support will be required to make this happen.

The observation that pre-cultivated links with care homes enabled audit implementation is compatible with existing literature about situating care home interventions in patterns of relational working[13]. This does not mean that improvement teams need to wait months or years for such relational patterns to develop but rather that effort must be devoted, when working with the sector, to identify existing patterns of relational working and how these can be accessed and used. An important additional finding was the role of an external agency, in this case the PSC, in brokering collaboration across the care home sector by overcoming communication barriers between homes.

Tools other than the LPZ-i could be used to benchmark care in this sector. The NHS patient safety thermometer has been available to homes for several years and could enable comparison between acute and long-term care settings[14]. It has not, to date, been widely employed by care homes despite the opportunity to do so. More detailed data collection instruments, such as the international Resident Assessment Instrument (InterRAI) [15] have been used for quality improvement in long-term care in other countries. These are, however, more complex than LPZ-i and further work is needed to consider how the complexity of measures influences their implementation in UK long-term care. Regardless of the benchmarking tool adopted, the findings reported here about the need to develop relational working, data literacy and QI infrastructure, would still apply.

This article adds to a growing literature on quality improvement and assurance in long-term care internationally[16-18]. The findings here demonstrate that benchmarking in UK care homes using the LPZ-i is feasible, subject to relational working, supporting infrastructure, building competencies and capacity when developing sustainable quality improvement in long-term care, and a sustainable financial model for delivery.

### Ethical approval

The project was funded and co-ordinated by the East Midlands Academic Health Science Network Patient Safety Collaborative (PSC), an NHS body focussed upon innovation to improve patient safety. The implementation of LPZ-i was classified as service development using the UK Health Research Authority/Medical Research Council online toolkit. Focus group and interview work was granted favourable opinion from Research Ethics Committee 3, West of Scotland, REC 15/WS/009.



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