

Full project title:

Evaluating the ten year impact of the Productive Ward at the clinical microsystem level in English acute trusts

Summary of Research

Our overall research question is whether the ‘Productive Ward: Releasing Time to Care’ programme (PW) has had a sustained impact at the clinical microsystem level in English NHS acute trusts since its introduction in 2007.

As the research call notes, clinical microsystems can be a team, practice, ward or clinical unit; this proposal focuses on a quality improvement intervention specifically designed to improve the efficiency of hospital wards. The PW programme aims to: (1) increase the proportion of time nurses spend in direct patient care, (2) improve experience for staff and patients, and (3) make structural changes to the use of ward spaces to improve efficiency in terms of time, effort and money. Consequently the PW has the potential to meet health needs (by improving the efficiency of care) and is directly concerned with the organisation and delivery of health care. The NHS Institute for Innovation & Improvement (NHSI) developed PW in 2005 and 2006 and first implemented it in England in 2007. It is a self-directed quality improvement (QI) toolkit consisting of three foundational or ‘core’ modules and eight process modules (see figure 1 below). In subsequent years, the PW has been adopted and implemented internationally.

Our study will identify and evaluate any sustained impacts and wider legacies of the PW in Trusts in England which have adopted the programme. We will explore how varying times of adoption (‘early’, ‘late’) and differing local approaches to implementation (e.g. whole hospital roll out, pilot wards) have shaped such impacts and/or wider legacies over the previous decade.

We will address our aim through three complementary research approaches:

- A national survey of all NHS acute Trusts in England to . explore the timing, scale, nature and perceived impact of PW adoption, implementation and assimilation into routine nursing practice in England.
- Organizational case studies in 6 PW-adopting NHS acute Trusts that adopted PW at different stages of its history and representing a variety of implementation approaches. The case studies will comprise:

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- semi-structured interviews and (where practicable) focus groups to explore approaches to implementation (including PPI involvement), perceived impacts and potential wider legacies of the PW with a range of staff at different organisational levels (including 2 wards that implemented the PW within each Trust)
 - documentary analyses to (a) further explore local approaches to implementation over time, and (b) inform a critical review and evaluation of the local use of metrics to monitor and report on the impact of the PW (including, for example, any productivity, patient experience and staff wellbeing indicators)
 - semi-structured interviews with PPI leads and any patients involved with implementation or evaluation of the PW in order to assess the extent - and how - patient and public engagement has shaped the impact of the PW .
- Telephone interviews with staff known to have been leading PW in its early days (in post in 2010) to investigate the wider legacies of PW in terms of professional development.

There is little evidence relating to the sustainability of the impact of interventions like the PW in clinical microsystems. The proposed study will draw on a unique and detailed dataset compiled in 2009 by the research team enabling the lasting effects (10 years post-adoption by the end of the proposed study) of the PW to be evaluated. We will generate evidence relating both to any lasting impact of the PW (and the nature of that impact) but also as to how different approaches to local implementation shaped the sustained impact at the clinical microsystem level of a national QI programme.

Background and Rationale

In May 2008, the government invested £50 million to support the dissemination and implementation of the Productive Ward (PW) in England. This investment was provided on the basis of evidence from early test sites (2006-08), widespread commitment from nursing leaders and the promise of what PW might help to achieve across the NHS (Dept of Health, 2008). The NHSI had developed the PW programme in order to empower ward teams to identify areas for improvement by giving staff the information, skills and time they need to regain control of their ward and the care they provide. Modules and toolkits to guide implementation were made freely available via the NHSI website; trusts could also purchase 'standard' or 'accelerated' support packages. Figure 1 illustrates the 3 'core' modules (well organized ward; knowing how we are

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doing; patient status at a glance) and 8 ‘process’ modules (patient hygiene, nursing procedures, ward round, patient observations, admissions and planned discharge, shift handovers, meals and medicines) that together comprised the PW programme. Local implementation was supported by ward and project leader guides and an extensive ‘toolkit’.

FIGURE 1 The structure of the PW programme



Table 1 summarises the three aims of the PW and provides examples of the modules that might be expected to have contributed to each of these 3 aims:

TABLE 1 Summary of PW aims, modules and data collection methods

PW aims	Examples of PW modules likely to have influenced this
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(1) increase the proportion of time nurses spend in direct patient care,	Core modules (well organized ward; knowing how we are doing; patient status at a glance); medicines; patient hygiene; meals; nursing procedures
(2) improve experience for staff and patients	All modules
(3) make structural changes to the use of ward spaces to improve efficiency in terms of time, effort and money	Core modules (well organized ward; knowing how we are doing; patient status at a glance); shift handovers; admissions and planned discharges; nursing procedures

In collaboration with the NHSI we undertook research in the period 2009-10 exploring the development, early adoption, implementation and spread of the PW in England (NNRU & NHSI, 2009; Robert et al, 2011). The study comprised analysis of indicators of the timing of 'decisions to adopt' the PW, an online 32-item survey of PW leads in English trusts and interviews in five organisational case studies to explore the process of assimilation in different local contexts. This earlier research established that 36% (140) of all NHS trusts (acute and non-acute) had adopted the programme (i.e. purchased either an accelerated (n=109) or standard (n=31) support package) by March 2009 with large variation between geographical regions (Robert et al, 2011) (see table 2).

TABLE 2 Total number of NHS trusts in England purchasing accelerated or standard PW support packages by March 2009 [by Strategic Health Authorities (SHA)]

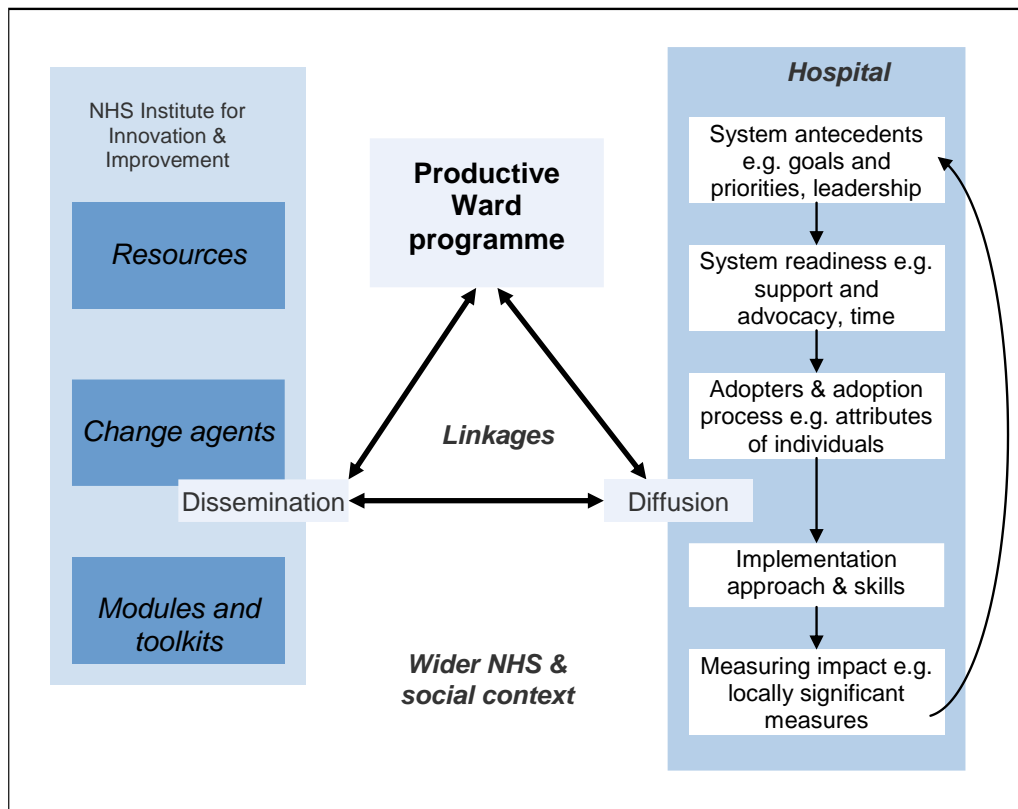
SHA	Total number of Purchased package: accelerated/standard Adoption
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	NHS trusts	(no. of trusts)	(%)
East Midlands	23	2/0	9
South Central	23	19/2	91
South West	39	13/13	67
West Midlands	38	2/3	13
South East Coast	28	19/0	68
East of England	40	27/0	68
Yorkshire & the Humber	37	2/10	32
North West	63	8/3	17
London	75	17/0	23
North East	23	0/0	0
TOTAL	389	109/31	36

In this national study we also explored the local components and key interactions that helped to explain the rate and scale of the adoption, implementation and assimilation of the PW into routine nursing practice in NHS trusts in England. The PI for this current proposal (Glenn Robert) also contributed to an NIHR-funded systematic review of the extensive literature on the diffusion of service innovations which had produced a model for understanding the complexities of the adoption, implementation and assimilation of innovations into day-to-day healthcare services (Greenhalgh et al. 2005). This review found that few empirical studies acknowledged the complexities of spreading and sustaining innovation in service organisations. Most concentrated on specific components of the model (for example, certain features of innovations or specific characteristics of individual adopters) and failed to take account of their interactions and contextual and contingent features. The model was originally developed to help make sense of the multiple components and interactions that influence adoption, implementation and assimilation in complex settings such as acute trusts. In our study of the adoption of the PW we adapted the model as shown in figure 2 below.

FIGURE 2 Framework for examining diffusion of the Productive Ward programme
(adapted from Greenhalgh et al, 2005)



We found that interactions between several factors had contributed to the rapid adoption of the PW programme in England:

- the innovation itself was adaptable and well framed for different groups of staff
- the linkages between the external change agency and potential adopters were generally strong
- the readiness for change was heightened by the priority accorded to local QI agendas and the pre-existence of service improvement teams and expertise
- the wider NHS/societal context emphasised the need for efficiency and to meet national targets, to build leadership capacity and to demonstrate commitment to QI.

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We also reported that the key organisational factors that were perceived to have influenced the successful local implementation of the programme were:

- staff having a 'felt need' for change and seeing the PW as a simple practical solution to real problems
- engaging with the NHSI and drawing on the PW modules and resources
- selecting initial wards on the basis of their desire to work on PW
- emphasising local ownership of the programme and empowerment of ward staff, rather than using a directive approach
- providing sufficient resources and support, in particular allocated budgets for backfill of staff time.

With regard to this final factor, by far, the most commonly reported facilitating factor in the survey for local PW implementation was having dedicated project leadership. In particular, having a realistic and flexible plan, support from a steering group, clinical facilitation and communication about PW helped to maintain the momentum of the work itself. (We have recently published a further paper exploring the role of leadership in implementing the Productive Ward based on secondary analysis of our original data (Morrow et al, 2014)).

However, it should be noted that despite widespread perception of significant benefits, we found that frontline nursing staff reported that more needed to be done to ensure that impact could be demonstrated in quantifiable terms. Our overall conclusion was that the PW programme had been rapidly adopted by NHS trusts in England (albeit with significant regional variation) but that a variety of implementation approaches were being employed which were likely to have implications for the successful assimilation of the programme into routine nursing practice and, therefore, the impact of the programme as a whole. The proposed organisational case study component of our research will build on this earlier work and our findings by using the diffusion of innovations framework as a preliminary model to explore (a) how the PW has been assimilated into routine practice in 3 earlier adopting Trusts (for example, focusing particularly on issues such as 'implementation approach and skills' and 'measuring impact') and (b) how the PW has been adopted and implemented in 3 later adopting Trusts (issues such as 'system antecedents', 'system readiness', 'adopters and adoption process'). Further details are provided on page 12ff.

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A follow up study we also conducted in 2010 sought to (a) inform efforts to maintain momentum of the PW programme, (b) support NHS staff going forward, and (c) discuss mechanisms and arguments for continued commitment and investment (NNRU & NHSI, 2011). Through fieldwork in 8 case study trusts, we found that the programme has been successfully framed and communicated in a way that connects with frontline NHS staffs' need and will for change, and that it thrives where local leadership and ownership are strong. Our report forwarded 16 key lessons from the programme to date that would assist hospitals in local implementation in the future. We also concluded that the programme 'has a huge perceived value and local impact including improvements in staff skills (in particular ward-level leadership), more time for better care, improved patient experiences, cost savings, and higher staff satisfaction and retention [and that] the programme itself facilitates dialogue 'ward' to 'board' by giving a shared language and focal point where the interests and values of these different staff groups can converge.'

However, beyond such 'perceptions' - and a decade after the initial development of the PW - there remains little robust evidence of the impact of the PW on the efficiency and productivity of clinical microsystems despite its widespread and continuing adoption (both in the NHS and internationally) (White et al, 2014). Two of the members of the advisory group for this proposal (Mark White and John Wells) have recently examined the literature relating to the PW through a bibliometric analysis (ibid). They found 64 grey literature publications, 13 evaluations & reports and 21 peer reviewed papers during the period 2006-13. However, of the peer reviewed papers only 7 presented the results of original research or outlined any methodology and the authors concluded that 'whilst the literature serves as a guide for interest, demand and reports of implementation it provides no empirical offering to the paucity of evidence required to gauge success and impact.'

Whilst anecdotal evidence has suggested that for every £1 spent implementing the programme, £8.07 has been returned - and an assessment by the NHSI in 2011 suggested that by March 2014 a £270 million benefit would be achieved from implementing PW across acute trusts in England (NHSI, 2011)¹ - to date there is no robust, independent evaluation to support or challenge this type of claim which relies upon the scaling up of the innovation and embedding over time, of which there is no robust evidence. However, it should be noted that these figures

¹As the authors of the report themselves noted 'the sample of nine trusts included in this study is not a statistically significant sample and the attribution of changes to The Productive Ward were obtained from the judgements and opinions of managers involved in the implementation of the programme who have been interviewed, and do not necessarily reflect the views of the Trust Board ... (t)he data reported here from the trusts interviewed represents a snap shot in time. Since the implementation of The Productive Ward is ongoing, we should expect there to be a dynamic element to the numbers.'

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were based on assumptions that changes will be sustained and a recent systematic review of the PW suggested that whilst 'organisations were keen to report the significant improvements experienced following the initial implementation ... it is unclear whether or for how long these changes were sustained.' (Wright & McSherry, 2013).

Our earlier work suggested that failure to sustain changes brought about by the PW may be a common occurrence (NNRU & NHSI, 2009); the proposed research study will robustly explore the evidence that implementing the PW has led to such sustained impacts thereby generating new knowledge. Attention to staff outcomes may also be important. Significantly, a reduction in staff absence rates and improvements in staff morale seem to be key indicators justifying the adoption of the PW according to a recent systematic review of the PW literature (Wright & McSherry, 2013). The links between staff wellbeing and patient experience have recently been established in an NIHR funded study undertaken by two of the applicants (Glenn Robert, Jill Maben) in the current proposal (Maben et al, 2012). Reviewing the local evidence for improved staff morale and wellbeing at the ward-level will consequently be one focus of our fieldwork.

Evidence explaining why this research is needed now

This research proposal is a direct response to a commissioned call which specifically identified the PW as a widespread quality improvement intervention at the clinical microsystem level which warrants evaluation. The 'spread of this initiative in the NHS and lack of evidence to date on its effect on productivity and efficiency' was recognised by the NIHR HSDR panel which reviewed our outline proposal.

A recent systematic review on the effectiveness of the PW found only 18 articles (including 6 'anecdotal' pieces in the professional press). The evidence base largely comprises single site, descriptive studies characterised by poor outcomes data and a distinct positive bias (Wright & McSherry, 2013). The review concluded that 'at present there is a lack of high quality empirical research ... the notion of attribution means it is difficult to assess the impact of PW'. More broadly, a systematic review of reviews of Lean thinking in trusts (upon which the PW is based) concluded that the 'immaturity of the research field makes it hard to find substantial evidence for effective lean interventions in healthcare' (Andersen et al, 2014).

In our earlier research we assessed locally available data in 5 case study sites (NNRU & NHSI, 2009). Issues about frequency and consistency of reporting made it difficult to analyse findings and assess impacts across whole organisations; recent Canadian and Irish evaluations of PW

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found similar limitations, both echoing the findings of the systematic review cited above. We did identify routine clinical or administrative measures as potentially available across all trusts but found these were not deployed in support of implementation of PW. Potential comparable data included falls incidence, MRSA rates, pressure sore incidence, staff satisfaction surveys, and staff sickness/absence. However these had not been compiled in order to properly demonstrate change over time; we proposed it might be possible to obtain data on these metrics from Trust's administrative systems or other routine returns. As PW was then a relatively new initiative we argued it would take time to show impact in clinical indicators and staff outcomes. We concluded that there was good rationale and some data available for undertaking in-depth cross-case analysis of impact (ibid).

The broader context for this proposal is one of the rapid and widespread adoption of a (still) largely unproven intervention to improve efficiency and productivity (and performance) at ward level, both nationally and internationally. Reviews of studies of sustained change in healthcare organisations suggest that the evidence base to help guide both national and local strategies is insufficient (Buchanan et al, 2007). Most studies lack rigour (i.e. they are atheoretical and anecdotal) and are not designed to test, empirically, hypotheses about the process of achieving sustained change (Greenhalgh et al, 2005). A recent longitudinal case study of the adoption and implementation of the PW in a Dutch hospital is an exception, in this case using an institutional logics perspective to explore the different ways in which the PW has been framed for both the nursing profession and health care managers (van der Broek, 2014). Other studies have explored the adaptation of Lean techniques - on which the PW is based to a large extent - into healthcare organisations (Radnor & Walley, 2008; Radnor et al, 2012; Waring & Bishop, 2010) but despite significant claims from advocates there is little empirical evidence of the sustained benefits of adopting such approaches.

Our proposed study will provide much needed insights into the assimilation of such quality improvement interventions in day-to-day healthcare practice. Significant resources (financial and staff time) have been devoted to implementing the PW and policy makers and managers, as well as frontline staff, need to know whether this investment has been justified and should continue (and, if so, what approach should they take to local implementation). The proposed research will therefore answer the question of 'does the PW work' as well producing generalisable lessons for achieving sustained change and improvement in the organisation and delivery of health care services.

Aims and objectives

Our overall research question is whether the 'Productive Ward: Releasing Time to Care' programme (PW) has had a sustained impact at the clinical microsystem level in English NHS acute trusts since its introduction in 2007.

Our study will identify and evaluate any sustained impacts and wider legacies of the PW in Trusts in England which have adopted the PW. We will explore how varying times of adoption (using Rogers' 5-fold categories of adoption – innovators, early adopters, early majority, late majority, laggards) and differing local approaches to implementation (e.g. whole hospital roll out, pilot wards) have shaped such impacts and/or wider legacies over the previous decade.

Our 5 related objectives are:

1. Through an online survey of acute NHS Trusts in England: to identify non-adopters and cohorts of adopters; and explore the timing, scale, nature and perceived impact of PW adoption, implementation and assimilation into routine nursing practice.
2. To explore through organizational case studies in 6 Trusts (which adopted the PW at different stages of its history according to Rogers' categorisation) how local implementation and assimilation processes relating to the PW - including patient engagement - have shaped sustained impact and any wider legacies (including, for example, quality improvement (QI) capabilities, nursing leadership development) of the PW.
3. To investigate, through telephone interviews with early PW leads, any wider legacies in terms of professional development.
4. To draw conclusions as to the nature and extent of the sustained impact of the PW on clinical microsystems in English trusts over a 10 year period and make recommendations to managers and clinicians as to how to maximize and sustain the benefits from QI interventions at the microsystem level.
5. To add to the theoretical knowledge relating to the assimilation of QI interventions into routine day-to-day practice and their sustained impact.

Research Plan / Methods

Review strategy and strategy for reviewing literature:

As outlined in the 'Background and rationale' section above, a systematic review of the impact of the PW and a bibliometric analysis of the literature relating to the PW have both been published very recently (Wright & McSherry, 2013; White et al, 2014). Both report a paucity of high quality empirical evidence relating to the PW and emphasise the anecdotal nature of much of the 'evidence base'. Given these recent reviews we do not propose undertaking a further formal systematic or scoping review but will routinely conduct citation analysis to monitor whether any further empirical studies are published during the course of our proposed 30 month study.

Design and theoretical/conceptual framework:

Our research design will use a mixed methods approach (O'Cathain et al, 2010). The adapted Greenhalgh et al (2005) model - which we applied previously in our study of the early adoption, and implementation of the PW (Robert et al, 2011) - will provide the preliminary conceptual framework for our surveys and organizational case studies (i.e. guiding our initial qualitative fieldwork and documentary analyses).

As described on page 5 and in figure 2 above, we previously used the diffusion of innovations model to help analyse the local components - and key interactions between them - that helped to explain the rate and scale of the early adoption and implementation of the PW into routine nursing practice in NHS hospitals in England (Robert et al, 2011). In this proposed study we will again draw on the model to supplement these previous findings with a study of the later stages of the diffusion of innovations process: namely how the PW has been assimilated into routine nursing practice and sustained, and its impact measured. Key contextual factors identified by the model as influential at these later stages of the process (and which will therefore be explored in our surveys and be the focus of our initial fieldwork) include:

- human resources (i.e. staff training)
- staff engagement
- decision-making autonomy
- internal and external collaboration
- local adaptation, re-invention and ongoing development of the PW programme.

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Similarly, our exploration of the impact of the PW will attend to the following potential 'consequences' of adopting and implementing the programme as guided by the same model:

- recognised and intended (i.e. the 3 stated aims of the PW programme)
- unanticipated, desirable (e.g. nursing leadership development, QI capabilities)
- unanticipated, undesirable (e.g. staff disengagement)
- knock-on for other systems (e.g. patient transfers between wards, services and organizations) .

Sampling:

National surveys

To update and extend our 2008 survey (NNU & NHI, 2009) we will conduct a further national survey to all acute NHS Trusts in England (n=157)².

Organizational case studies:

From the survey results we will categorise all responses as being from one of 5 types of trust³:

- 'early adopters' (Rogers' 'innovators', early adopters' or 'early majority') that:
 - implemented PW on all their wards (either through whole hospital implementation or planned roll-out)
 - implemented PW on some of their wards
- 'late adopters' (Rogers' 'late majority' or 'laggards') that:
 - implemented PW on all their wards (either through whole hospital implementation or planned roll-out)
 - implemented PW on all their wards
- 'non-adopters' that have never implemented PW on any wards.

We will conduct organizational case studies in 6 adopting trusts (Yin, 2009),³ 3 early and 3 late adopters. Our sampling criteria to identify (a) our 6 case study sites and (b) the 2 embedded

² Based on the most recent data available from the Health and Social Care Information Centre. *Data Files - Hospital Estates and Facilities statistics*. 2014/15. URL: <http://hefs.hscic.gov.uk/DataFiles.asp> (Accessed 17/03/16).

³ Throughout all stages of the study, 'implementation' will be defined as having implemented the 3 'core' PW modules and at least one 'process' module.

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wards within each of these sites will be as follows. Primarily for (a) we will sample Trusts distributed across Roger's adoption categories. In selecting the 3 'early' adopting Trusts we would ideally like to be able to recruit 3 of the 5 Trusts in which we have previously conducted in-depth case studies as this will enable us to draw on both the national picture of early adopters from our earlier survey study in 2008 and an existing qualitative dataset (comprising 58 transcribed qualitative interviews and documentary materials from 2009-2010). These existing data sources provide significant contemporaneous insights into the local approaches to early implementation of the PW in these 5 Trusts. Additionally, amongst the 3 'early' adopting Trusts we would seek to recruit one that implemented the PW on a whole hospital basis (the 'big bang' approach), one which initially implemented the PW in selected pilot wards and one which planned for a whole hospital 'roll out' from the start. This will enable us to compare and contrast different local approaches to early implementation. Should we be unable to recruit any or all of the 3 case study sites from the 5 Trusts in which we previously conducted research we would nonetheless seek to recruit Trusts which represented each of the three implementation approaches outlined above. Similar 'implementation approach' criteria would be applied to the selection of the 3 'late' adopting (post-March 2009) Trusts. As a secondary consideration we would also consider the following selection characteristics: geographical (for example urban/rural); size of Trust/number of wards; CQC rating; and age of hospital estate.

With regard to (b) (the 2 embedded wards within each of the 6 sites) we know from our earlier research that over 59% of implementing wards were Medical (24%), Surgical (21%) or Care of the Elderly (14%). We therefore propose sampling 3 medical, 2 surgical and 1 care of the elderly wards from the 3 'early' adopting Trusts, with a similar sample in the 3 'late' adopting Trusts. Our sample will be determined by randomly selecting relevant ward types from amongst those that are known to have formally implemented the PW in each site (defined as having implemented the 3 core modules and at least one process module).

Telephone interviews with early PW leads

Early PW leads are identified on an existing database of contacts compiled as part of a previous study of the Productive Ward carried out by the current research team in 2010.

Setting/context:

National surveys:

All 157 acute trusts in England.

Organizational case studies:

6 acute trusts in England.

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Telephone surveys with early PW leads

Existing (2010) database of names and contact details of PW leads in 55 NHS Trusts in England.

Data collection:

National surveys:

The online survey will elicit the current state (timing, scale and nature to date, future plans) of PW implementation in each acute trust in England. We will use two complementary survey questionnaires per Trust. The first is a short (10-item) survey sent to Directors of Nursing, which asks strategic-level questions about the use of PW and asks them to identify the PW lead at the Trust. The second survey is sent to the PW lead, and asks for more detailed information. We will draw on the online survey design and 32 questionnaire items we previously used; this combined open and closed questions to explore perceptions of the PW programme in terms of the identified key components of the diffusion of innovation model (see figure 2), as well as assessing the local adoption and implementation of particular modules and the availability and accessibility of local impact data (Robert et al, 2011). Exemplar questions from our earlier survey include⁴:

- when did you first become involved with the PW?
- what type of ward(s) is PW being implemented on in your organization?
- how many wards is the PW currently running on in your organization?
- are there plans to run the PW on more wards in the future?
- the PW includes modules covering different aspects of the work of a ward. Which modules have you been involved with?
- which of the modules you have been involved with have had most impact?
- the PW includes a number of tools to help wards identify priorities and plan implementation. Which parts of the toolkit have you used?
- which parts of the toolkit have been most effective?
- in your view, in which areas does the PW have the most impact?
- please give an example that best illustrates the positive aspects of the PW?
- have there been any measurable improvements as a direct result of Productive Ward?

⁴ For reasons of space we have not included the range of options respondents were asked to select from in relation to these exemplar questions.

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- do you think there are any drawbacks of implementing the PW?

Two reminders e-mails will be sent at fortnightly intervals to non-responders with final follow-up telephone calls where necessary.

Organizational case studies:

The organizational case studies will allow the findings from the surveys (see above) to be situated within a broader local context, essentially retracing the 'story' of the PW in each case study site. We will conduct the following in each of our 6 case study trusts:

- semi-structured interviews and focus groups to explore approaches to implementation, perceived impacts and potential wider legacies of the PW with a range of staff at different organisational levels (including 2 wards that implemented the PW within each Trust)
- documentary analyses to (a) further explore local approaches to implementation over time, and (b) inform a critical review and evaluation of the local use of metrics to monitor and report on the impact of the PW (including, for example, any productivity, patient experience and staff wellbeing indicators)
- semi-structured interviews with PPI leads and any patients involved with implementation of the PW in order to assess the extent - and how - patient and public engagement has shaped the impact of the PW.

Local PW leaders and champions of the programme and their perceptions of the wider legacies of the PW will be a particular focus of our investigation. From our 2009 dataset we have the names and contact details of those who were leading PW implementation in 102 trusts at the time; clearly a significant proportion of these staff will have moved on to other posts/organizations but where possible we will trace these individuals and include them as interviewees in our organizational case studies regardless of their current post. Our two national surveys will also request details of named individuals in each responding Trust who would then be key informants regarding local implementation of the PW in our case studies.

In total we will conduct a maximum of 70 interviews and 12 focus groups across our 6 case studies and our approach to the fieldwork in each of the case studies will be as follows:

- initial site visit and 1-2 face-to-face semi-structured interviews with key informants to determine broader organisational processes (for example, structures and processes for QI work) and specific aspects of current PW working (composition of any existing PW teams, processes, measures)

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- collation of local contextual data including documentary (including electronic) materials relating to PW implementation and monitoring of impact since 2008 including evidence of (a) which modules had been implemented and evidence of any local adaptation, and (b) metrics chosen to monitor progress⁵
- 5-8 face-to-face semi-structured interviews with key staff identified through purposive sampling (Miles & Huberman, 1994) but likely to include Director of Nursing, PW project leads (current and former), Director of Quality, central QI team members and PPI leads. The interviews will explore:
 - their experiences of adopting, implementing and assimilating the PW into routine practice including (a) retracing the various phases of the Trust engagement with the PW programme (for example, purchase and value of an ‘accelerated’ or ‘standard’ PW support package; any discontinuations, re-engagement or major local adaptations of the approach) and (b) reflecting upon the relative significance of the components of our underlying framework in shaping the impact of the PW (see figure 2)
 - the level and extent of sustained investment in formal PW roles/teams
 - the level and extent of sustained use of the specific PW modules and techniques in the Trust, and how these have been adapted over time (recognizing that discontinuation and replacement of obsolete innovation must be a part of continuous improvement)
 - the use of specific PW modules and techniques on our two selected wards and the local evidence of impact of each of these (supplemented with collation of documentary evidence)
 - evidence of impact of the PW both in terms of its three stated aims and other ‘consequences’ (see page 9 above)
 - (PPI leads) whether there has been any direct PPI with the PW and, if so, the nature and extent of this involvement and the perceived impact.

⁵ Our earlier research found that - of the 3 ‘core’ and 8 ‘process’ modules that together comprise the PW - the 3 ‘core’ modules (‘Knowing how we are doing’, ‘Well organized ward’, ‘Patient status at a glance’) were (not surprisingly) most commonly implemented. Of the 8 ‘process’ modules, ‘shift handovers’, ‘patient observations’ and ‘meals’ were most commonly implemented. In terms of perceived impact the ‘Well organized ward’ module was rated much higher than any other module (‘Knowing how we are doing’ and ‘shift handovers’ were also rated somewhat highly). These previous findings give some indication as to where we are most likely to have to focus our fieldwork in terms of the impact of specific modules but we will be guided in this regard by what we find in practice in our case study sites.

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- Individual, paired, small group or focus groups (depending on availability) with nursing and health care assistant staff from each of our two selected wards exploring their experience of the PW and perceptions as to its sustained impact.

Telephone surveys with early PW leads

- Some of the impacts of the Productive Ward are likely to inhere in individuals involved in it. In order to capture these impacts we will carry out telephone interviews with up to 55 people who led the PW at an early stage. Topics covered are: their past involvement with the Productive Ward; their views on the programme; any impacts their involvement had on them personally or professionally.

Data analysis:

National surveys:

The survey data and analysis will comprise descriptive statistics consisting of single variables and include frequency and percentage response distributions, measures of central tendency, and dispersion measures such as the range and standard deviation. All open comment responses will be analysed using open coding and constant comparison. Similar codes will then be grouped to identify key concepts emerging from the data to inform conclusions as to the national findings relating to the adoption, implementation and assimilation of the PW in England. The results from the survey of 'late' and non-adopters of the PW in this project will be combined with our previous (2009) survey of 'early' adopters to provide a comprehensive overview of the timing and nature of the adoption of the PW programme nationally over a 10 year period.

Organizational case studies:

Analysis of the interview and documentary data will use the Framework method (Ritchie & Spencer, 1994) and we will use a preliminary theoretical framework rather than a purely grounded theory approach so that data analysis will be a combination of induction (data-driven generalisation) and deduction (theory-driven exploration); the latter informed by our adaptation of the Greenhalgh et al model (see Figure 2) which will provide the preliminary framework for our data collection tools and within and between-site analysis of the case study data.

The key topics and issues emerging from interviews will be identified through familiarisation with the interview transcripts. A series of thematic charts will be developed and data from each transcript summarized under each theme, enabling examination of similarities and differences of views within and between transcripts. Ongoing discussions amongst the core research team and the advisory group will provide opportunities for reflexivity and the development of insights into the effect of different local approaches to implementation and assimilation of the impact in

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terms of the three stated aims of the PW and any wider legacies of the PW (e.g. leadership development, QI capabilities).

We will also conduct two related analyses to inform our overall assessment of the impact of the PW programme nationally:

- we will examine the impact of the specific 'core' and/or 'process' modules (see figure 1 on page 2) that were implemented on each of the 12 wards included in our 6 case studies through the collation and analysis of locally available documentation and our qualitative fieldwork
- we will critically review how metrics have been used locally to determine the impact of the PW (based on secondary analysis of documentary sources and our earlier review – see page 8).

These analyses will therefore include collating all local PW-related data for the 2 selected wards in each site, assessing whether they are showing improvements over time on the relevant PW modules (and related measures) and judging the rigor and robustness of these data for (a) quality improvement and (b) evaluation purposes. Our assessment will be partly informed by our earlier work which included empirically-based recommendations relating to the measurement of impact of the PW (NNRU & NHSi, 2009; Robert et al, 2011). Based on our findings we will present revised recommendations for future data collection.

Telephone surveys with early PW leads

Analysis of the transcribed telephone interview data will use a grounded theory approach. The key topics and issues emerging from interviews will be identified through familiarisation with the interview transcripts, and ongoing discussions amongst the core research team and the advisory group.

Dissemination and projected outputs

Dissemination

A range of dissemination approaches will be used to target different audiences for the research. We will produce a final research report for the NIHR journals library detailing all the work undertaken and including supporting technical appendices, an abstract and an executive summary focused on results/findings and suitable for use separately from the report as a briefing for NHS managers. We will also prepare for the NIHR a set of 10 PowerPoint slides which present the main findings from the research and will be designed for use by the research

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team or others in disseminating the research findings to the NHS. The slides will be made available alongside the report on the HS&DR programme website. We will prepare at least two high impact academic papers (one focusing on implications for quality improvement practitioners and one at academics interested in quality improvement evaluation methods). We will submit abstracts for oral presentation at two national conferences and one international conference related to quality improvement in healthcare, as well as preparing short articles for the health care professional and NHS management press.

Our advisory group includes a Director of Nursing at a large acute NHS Trust with experience of implementing the PW, leaders of the national implementation programme in Ireland and the PW evaluation team in Saskatchewan, Canada. Through the established networks of these members we will share our findings - as listed above - with those leading national and local implementation of the PW both nationally and internationally. An important dissemination route will be through NHS Improving Quality which hosts the PW programme following the closure of the NHS Institute for Innovation & Improvement.

Outputs

A key output from this research will be robust evidence as to the sustained impact of the PW on clinical microsystems in English trusts, and lessons for 'holding the gains' over time. There is very little good quality evidence relating even to the short-term impacts of the PW and whilst there is a sizeable amount of anecdotal evidence of the benefits of implementing the PW, health care managers lack evidence upon which to base decisions to adopt the PW and, importantly, the local approaches - including patient engagement strategies - that they should take to ensuring any improvements are sustained over time. Our findings will provide important lessons for those who have already implemented the PW and those who are planning to do so in the future. In addition, the study will explore any wider, unanticipated benefits of implementing the PW that have been unstudied to date. In collaboration with the NHS Institute for Innovation & Improvement we have previously produced a 'top tips' guidance document for managers in relation to the spread of the PW; the findings of the proposed study would enable the production of a similar guidance document relating to the sustainability of the PW and lessons for how to 'hold the gains'. Finally, a concise briefing paper will be distributed through the National Nursing Research Unit's established networks. The main theoretical contribution of this proposed study will be an exploration - over a 10 year time frame - of the nature and extent of the assimilation processes by which innovations in service and delivery can make clinical microsystems more efficient and productive.

Plan of investigation and timetable

Months -2 to 4: recruit 1 researcher; prepare ethics and R&D submissions including refinement of survey designs & fieldwork tools. {milestone 1 (month 4): ethics and R&D approval granted}

Months 5-9: online survey of 157 trusts) {milestone 2 (month 9): minimum 60% response rate }

Months 10-11: analyse survey results and construct sampling framework; recruit 6 case study sites {milestone 3 (month 11): successful recruitment of 6 case study sites}

Months 12-24: conduct 6-10 face-to-face semi-structured interviews in each of 6 organisational case studies and a focus group in each selected ward (n=12, 2 per Trust); documentary analysis (milestone 5 (month 24): completion of 6 organisational case studies); conduct up to 55 telephone interviews with early PW Leads; analyse telephone interviews (milestone 6 (month 24) completion of telephone interviews and their analysis)

Months 24-27: analyse organizational case studies (interviews and documentary analysis) {milestone 7 (month 27): analysis and synthesis of data completed}

Months 28-30: formulate and test findings and recommendations; report writing and begin dissemination. {milestone 8 (month 30): submission of final report to NIHR}

Project management

The study will be led by Professor Glenn Robert (GR) who will have overall responsibility for meeting project milestones as agreed with NIHR, and supported by the core senior project group. This group will comprise co-applicants Professor Jill Maben (JM), Professor Peter Griffiths (PG), and Rosemary Chable (RC) and other research staff as required and will be chaired by Professor Robert; it will meet monthly via Skype or teleconferencing.

Our project advisory group will meet four times during the study and comprises:

- Judy Gillow, Director of Nursing, Southampton University NHS Trusts Trust
- Professor John Wells, Head of the School of Health Sciences, Waterford Institute of Technology, Ireland (led evaluation of PW in Ireland)
- Mark White, National Lead for Productive Ward, Director, NMPDU HSE-South (SE), Ireland
- Gary Teare, Executive Director, Measurement & Analysis, Health Quality Council (Saskatchewan), Canada (led Canadian evaluation of PW)

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- Tanya Verrall, Director, Health System Integration and Networking. Health Quality Council (Saskatchewan), Canada (led Canadian evaluation of PW)
- Dr Elizabeth Morrow, independent consultant & formerly research fellow studying the Productive Ward in England
- Dr Claire Taylor (RGN, PhD), Nurse Consultant in Colorectal Cancer, London Northwest Healthcare NHS Trust (invited)
- Lallita Carballo, Clinical Lead for Supportive Cancer Care, University College Hospitals Cancer Centre (invited)
- Christine Chapman, PPI member
- Sally Brearley, PPI member

The individual components of the project and the research staff will be managed at King's College London by Professor Robert.

Approval by ethics committees

We believe this proposal will require full ethical approval as it involves staff recruited through the NHS. The research will also require R&D approval in our 6 organizational case studies. Ethics and R&D applications will commence as soon as we hear if we are successful and before the study commences. Issues of anonymity, confidentiality and informed consent will be addressed in the recruitment of all participants; Glenn Robert, Jill Maben and Peter Griffiths have experience of leading research projects which have required similar ethics approval. Participant information sheets and consent processes will be produced. We do not foresee any major ethical issues or anticipate any adverse events from this study. All participants would be made aware prior to giving consent of the ways in which researchers would carry out their observations. We have allowed 4 months in total at the start of the project to gain ethical and R&D approval an adequate time frame based on our previous experience. We will gain feedback on our information sheets and other documentation from the advisory group before our application is submitted. We have registered our proposed study with IRAS; the Project ID is 182798.

Patient and Public Involvement

The aims of active involvement in this project

It should be noted that one of the starkest findings from our earlier research was the very limited nature of the patient and carer involvement in the implementation of the PW. A recent systematic review of the PW reported that a limitation was the 'lack of public involvement in the development, rollout and evaluation of the programme ... there is currently a lack of evidence from the patient perspective that examines how an increase in direct care time is associated with patient outcomes and feeling cared for' (Wright & McSherry, 2013). Based on this and comments from PPI members, we have explicitly highlighted the impact of the PW on patient experience as one of the key foci of our field work; the 2 PPI members of our project advisory group will be actively involved in this aspect of the study (see below) which will include offering insights about PPI in programme implementation and continuous quality improvement work.

A description of the patients, carers or members of the public to be involved

Two PPI representatives have agreed to join the advisory group for the project. Christine Chapman is a patient and former NHS manager. Christine was a Patient Governor at an NHS Foundation Trust until September 2014, is a patient and public reviewer for the NIHR, and a Public Member of the EME Prioritisation Group of NETSCC until October 2014. She is a Patient and Public Advisor to a number of NNRU projects. Sally Brearley (Visiting Senior Research Fellow in Patient and Public Involvement, National Nursing Research Unit, King's College London) is Lay Member (Quality and PPI), Sutton CCG and Patient and Public Voice Member, NHS England Clinical Priorities Advisory Group.

A description of the methods of involvement

Christine and Sally will contribute to the design of the research (in particular our exploration of the impact of the PW on patient experience in our acute wards), the management & reporting of the research, and the dissemination of the research findings. Both Christine and Sally will provide 4 days support to the project at NIHR/INVOLVE rates including attendance at all the planned advisory group meetings and ongoing advice via email as necessary.

Expertise and justification of support required

The research question in this proposal was prioritised by the applicants on the basis of their previous research specifically related to the PW and their knowledge of the contemporary literature and ongoing national evaluations of the PW in other countries. Together, we have extensive knowledge not only of the origins, development, wider literature and current evidence

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base relating to the PW in acute Trusts but also methodological issues of evaluating the programme (i.e. limitations of relying on locally collected improvement data and potential availability and value of routine data sources). Our 'learning and impact review' (NNRU & NHSI, 2009) was cited in the research call; there remain few peer-reviewed published papers on PW other than our own (Robert et al, 2011; Morrow et al, 2012; Morrow et al, 2014). Collectively we have strong links with teams in 2 other countries (Canada and Ireland) that are conducting national evaluations of the PW and members of both of these teams will be members of our advisory group.

Professors Robert and Maben will support design and administration of the two surveys and oversee qualitative data collection and analysis, and PPI. An experienced researcher will be recruited for the duration of the study, based in London and this post-doctoral research associate will have responsibility for managing and undertaking day-to-day fieldwork and data collection across the study as a whole, supervised by Professor Robert. Individually, our expertise is as follows. Professor Griffiths will lead the critical review of how metrics have been used locally to determine the impact of the PW. Glenn Robert's (GR) research draws on organisational studies and organisational sociology and focuses on quality improvement and studying innovations in the organisation and delivery of health care services. He has been a PI or CI on 11 NIHR funded studies; his research has also been funded by the European Union, the Department of Health, the Economic & Social Research Council and the Health Foundation. Jill Maben (JM) is a nurse and social scientist and has an international reputation in the research and policy development of nursing. She is a leader in current debates around compassionate care in nursing. Her principle research interests lie in the nursing workforce and in creating positive practice environments for staff and supporting staff in the work they do. She has been a PI on 3 NIHR HS&DR studies. Peter Griffiths (PG) explores issues of workforce effectiveness using routinely collected data and the development and use of nurse sensitive outcomes and quality measures. Peter was part of the RN4CAST consortium (www.rn4cast.eu), a major EU funded study on the impact of nurse deployment on patient safety. Rosemary Chable (RC) is an associate director of nursing with responsibility for and experience in developing education, professional practice and standards and training and development. She is lead for the implementation of the PW in her Trust.