

# The incidence and costs of inpatient falls in hospitals

July 2017

Delivering better healthcare by inspiring and supporting everyone we work with, and challenging ourselves and others to help improve outcomes for all.

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For more background information and details of working assumptions see the annexes in the accompanying resource.

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# Foreword

A fall in hospital can be devastating. The human cost of falling includes distress, pain, injury, loss of confidence, loss of independence and increased morbidity and mortality. Falling also affects the family members and carers of people who fall, and has an impact on quality of life, health and social care costs.

Falls represent significant cost to trusts and the wider healthcare system, with annual total costs to the NHS alone from falls among older people estimated by the National Institute for Health and Care Excellence (NICE) in 2015 at £2.3 billion.

We know that work is well underway across hospitals to prevent serious harm to those who fall. We want to ensure they have the information, tools and understanding to improve reporting and care. In 2016, as part of our work to support providers to deliver the safest and best quality care to patients, we reviewed the national and international evidence on falls prevention. We went on to invite acute, community and mental health trusts to join a [falls improvement collaborative](#). Some trusts were performing well but wanted to continue that: others were at the beginning of their journey to achieve best practice.

Nineteen trusts took part in this collaborative which aimed to achieve a 5% reduction in falls rates, calculated by reported falls adjusted for under-reporting, comparing whole-year 2017/18 data with a baseline of 2016/17. In keeping with research evidence we are also encouraging the falls work away from a mainly nursing or patient safety issue towards a multiprofessional focus. Our aim is to support participants representing all professional groups to achieve best practice by focusing on practice areas that would potentially have greatest impact to improve care for this vulnerable group of patients.

Before the launch of the collaborative in January 2017, we commissioned an economic review to describe the scale of the problem in financial terms and provide a model to scope potential financial savings if, by implementing best practice (Fallsafe Royal College of Physicians<sup>1</sup>), reductions in falls incidence and associated harms could be realised. The review aimed to help answer the following questions:

<sup>1</sup> [www.health.org.uk/programmes/closing-gap-through-clinical-communities/projects/fallsafe-project](http://www.health.org.uk/programmes/closing-gap-through-clinical-communities/projects/fallsafe-project)

- What is the incidence of inpatient falls in hospital in England?
- What are the estimated costs hospitals incur as a result of inpatient falls?
- What are the potential cost savings from reducing falls by implementing well-evidenced multidisciplinary interventions?
- What are the potential savings to hospitals from taking these actions?

We understand from the *National audit of inpatient falls 2015*<sup>2</sup> that there is variance in the way that falls prevention is delivered across providers. Our work sets out to:

- improve assessment, interventions and care
- improve the quality of reporting
- bring together and share exemplar initiatives and innovations to inspire collaborative improvement.

Ruth May  
Executive Director of Nursing

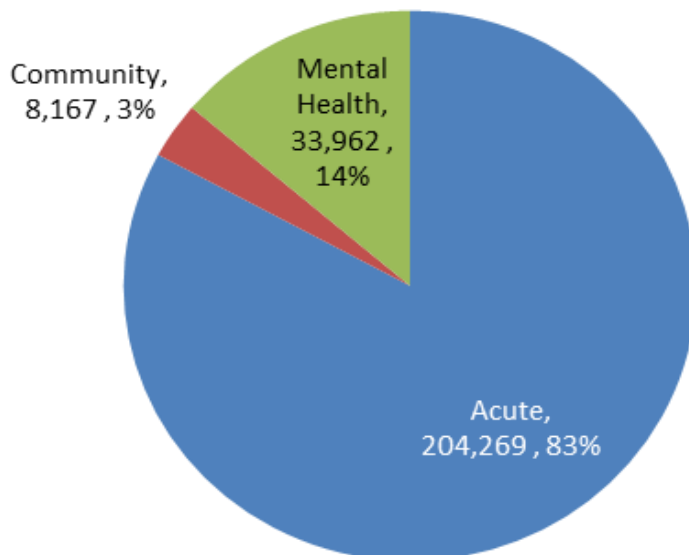
<sup>2</sup> *National audit of inpatient falls 2015*, Royal College of Physicians. Available at: [www.rcplondon.ac.uk/projects/outputs/naif-audit-report-2015](http://www.rcplondon.ac.uk/projects/outputs/naif-audit-report-2015)

# 1. The incidence of inpatient falls

In 2015/16, as in previous years, falls were the most commonly reported type of incident in acute and community hospitals and the third most commonly reported type of incident in mental health hospitals (see Annex 2 Falls breakdown in 2015/16), in the patient safety incidents reported to the National Reporting and Learning System (NRLS).<sup>3</sup>

Based on data submitted to the NRLS, around 250,000 falls were reported in 2015/16 across these three hospital settings (see Figure 1 below).<sup>4</sup>

**Figure 1: Breakdown of total reported inpatient falls 2015/16**



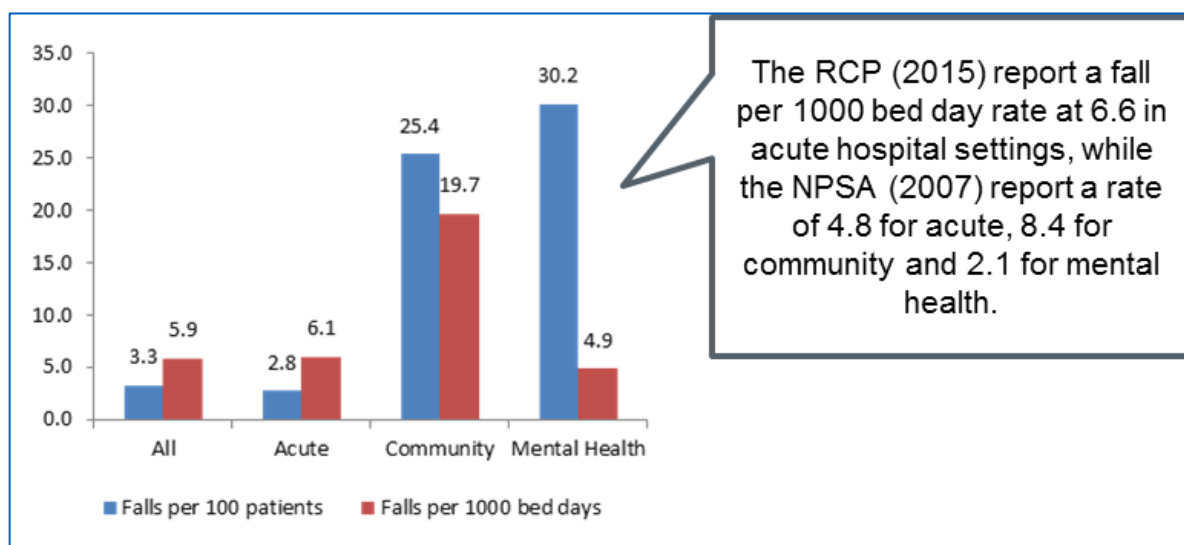
Source: National Reporting and Learning System 2015/16

<sup>3</sup> The NRLS) is a national reporting system that enables providers to report patient safety incident reports to a national database. Its main purpose is to enable learning from patient safety incidents in the NHS. It was established as a voluntary scheme and therefore does not provide a definitive number of patient safety incidents in the NHS. This report uses safety thermometer data where there is no NRLS data.

<sup>4</sup> The volume of inpatients (admission without day cases) in acute is 7.4 million compared with 110,000 in mental health and 32,000 in community hospitals in 2015/16. (HES)

Differences in case mix, to some extent, drive a large proportion of the variation in reported falls rates by setting (see Figure 2). A much greater proportion of inpatients in community hospitals is older (ie over 65) than in acute and therefore more likely to fall (see Annex 3: Falls by severity, age and hospital setting).<sup>5</sup>

**Figure 2: Estimated reported fall rates per 100 patients and 1000 bed days 2015/16<sup>6 7</sup>**



Older inpatients also tend to stay longer in these settings than in acute hospitals (particularly in mental health) and this increases the likelihood of each patient falling several times.<sup>8</sup> Further, patients with mental health problems are typically more vulnerable to increased risks of falling due to treatments and/or medications in addition to multiple medical co-morbidities.

This analysis does not present variations in reported falls rates at the trust level as this could be misleading because of:

<sup>5</sup> The percentage of inpatients over 65 in 2015/16 is 42% in an acute setting, 33% in a mental health setting and 60% in a community setting. (HES)

<sup>6</sup> The number of falls is from the NRLS, the number of patients is from Hospital Episode Statistics (HES) and the number of occupied bed days is from NHS England Unify2 data.

$$\text{Falls per 100 patient} = \frac{\text{Number of Falls} * 100}{\text{Patients (Admissions)}} \quad \text{Falls per 1000 bed day fall} = \frac{\text{Number of Falls} * 1000}{\text{Occupied Bed Days}}$$

<sup>7</sup> Both the RCP and NPSA rates are estimates – they might not be comparable to our calculations due to differences in the datasets as not every trust is involved in their calculation. The rates are also based only on ‘reported falls’. Differences in the level of reporting practices mean comparing rates over different time periods may not be consistent.

<sup>8</sup> The average length of stay among the over-65 age group in an acute setting is 3.8 days, 20 in a community setting and 56 in a mental health setting (HES).

- potential under-reporting in trusts – the degree of which will vary by trust and potentially across time
- differences in patient case mix which means that patients’ risk of falling may vary significantly.

The NRLS requires reporters to assign one of five degrees of severity of harm: no, low, moderate, severe and death. A report by the National Patient Safety Agency (NPSA) in 2007 applied falls definitions to these categories (see Table 1):

- no harm: where no harm came to the patient, eg no visible bruising
- low harm: required first aid, minor treatment, extra observation or medication, eg graze on right hand
- moderate harm: likely to require outpatient treatment, admission to hospital, surgery or a longer stay in hospital, eg fractured pubic rami
- severe harm: where permanent harm, such as brain damage or disability, was likely to result from the fall, eg fractured neck of femur
- death: where death was the direct result of the fall.<sup>9</sup>

**Table 1: Breakdown of reported falls within age groups by severity 2015/16 (all hospital settings in England)**

Age group	Total falls (15/16)	Breakdown by severity (%)				
		No harm	Low harm	Moderate harm	Severe harm	Death
Under 65	57,000	73.4	24.9	1.5	0.2	0.0
Over 65	190,000	71.1	26.0	2.2	0.6	0.1
Total	247,000	71.9	25.5	2.0	0.5	0.1

**Note:** Unclassified values when splitting the number of falls by age account for around 12% of all reported falls. We have allocated the missing values into age groups based on the current observed split for age classified falls.

Looking at the rate of reported falls by severity across two broad age groups (patients over and under 65 years old), 77% of all reported inpatient falls happen to patients over 65 and they are more likely to be harmed. Interestingly, the over-65

<sup>9</sup> Death as a reported outcome of a fall is likely to be underestimated in incident reports because it is rarely reported at the time of a fall. However, injuries resulting in severe harm such as hip fracture or subdural haematoma may result in increased mortality. Not all reports will be updated to reflect this outcome (partly because there may be other contributing factors). As with the total number of reported falls, the number of deaths as a result of a fall is likely to represent an ‘at least state’.



age group represents only 40% of total admissions according to Hospital Episode Statistics.

Not only are reported falls among older patients more likely to result in some degree of harm, where harm does result, it is three times more likely to be severe.

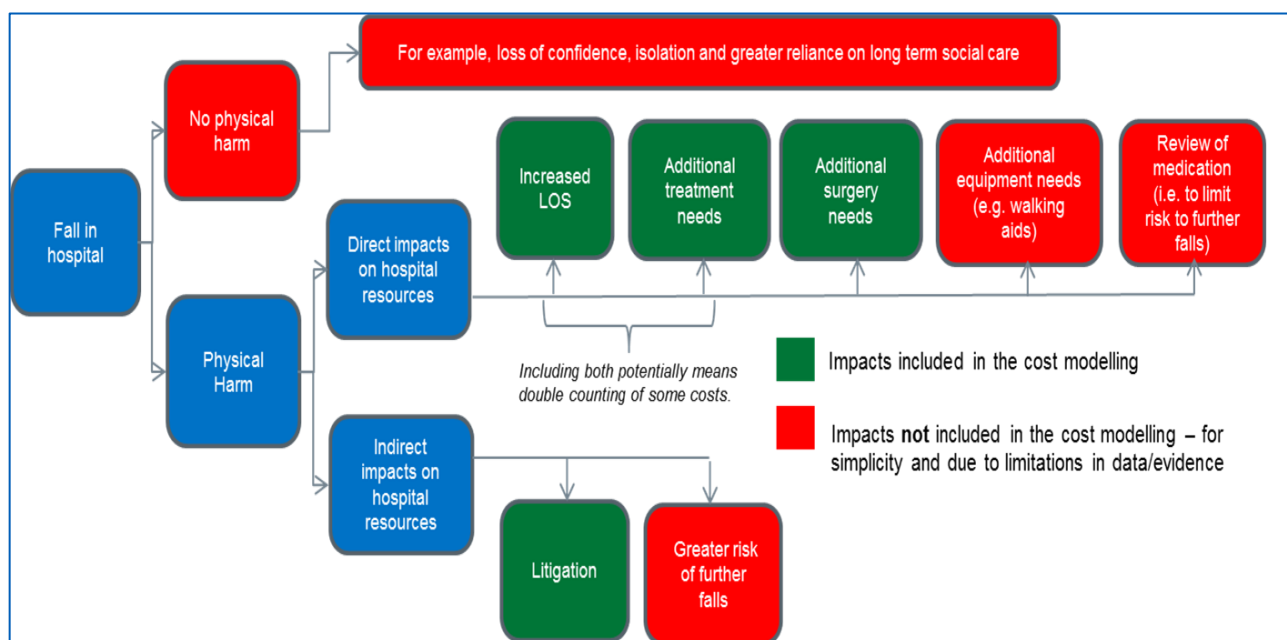
Older patients are also likely to be relatively frailer before the fall and therefore more likely to sustain more serious harm as a direct result of the fall.

Reported falls among older patients in acute settings were more likely to result in either moderate or severe harm than falls in either mental health or community hospitals (see Annex 3: Falls by severity, age and hospital setting).

## 2. The estimated costs of inpatient falls

Falls have a number of direct and indirect impacts on patients and hospitals (see Figure 3 below).

**Figure 3: Direct and indirect impacts of inpatient falls**



Both the likelihood and scale of these impacts will vary according to the age of the patient and the severity of the fall.

There may be non-physical impacts – particularly if people are older – irrespective of whether or not the falls resulted in a physical injury. These may include loss of confidence, isolation, and greater reliance on long-term social care.

In some cases, the impact of inpatient falls may also extend beyond hospital settings (ie after discharge needs for rehabilitation in the community) and result in costs to the wider health and social care system.

## Quantifying impacts

We drew on publicly available evidence to inform our working assumptions on the impact of falls on hospital resources (see Table 2).

**Table 2: Key assumptions in our qualification of costs**

Impact	No Harm		Low Harm		Moderate Harm		Severe Harm		Death		Sources
	Over 65	Under 65	Over 65	Under 65	Over 65	Under 65	Over 65	Under 65	Over 65	Under 65	
Length of stay: no surgery (days)	8.2	4.1	9	4.5	12	6	15	7.5	0	0	Includes NICE, Bates and Morello
Length of stay: surgery (days)	23	11.5	23	11.5	23	11.5	23	11.5	23	11.5	Includes HES, NAO, RCP
Cost per day	A: £303 MH: £366 Com: £298		A: £303 MH: £366 Com: £298		A: £303 MH: £366 Com: £298		A: £303 MH: £366 Com: £298		A: £303 MH: £366 Com: £298		Reference costs, NICE, PSSRU, DH
Treatment Costs (excluding surgery)	£54		£86		£424		£424		£0		NPSA report
Surgery rate	0%		0%		50%		80%		0%		RCP hip fracture report
Surgery cost	£4,329		£4,329		£4,329		£4,329		£4,329		NPSA report
Litigation rate (£13,500 aver pay-out)	0%		0.3%		3%		24%		45%		NHS Litigation Authority

We have limited evidence for length of stay for no harm and low harm. We have looked at two studies – one by Vass et al which is based on a small sample size in one single trust from 2009-11 and one by Morello which is based in Australia.

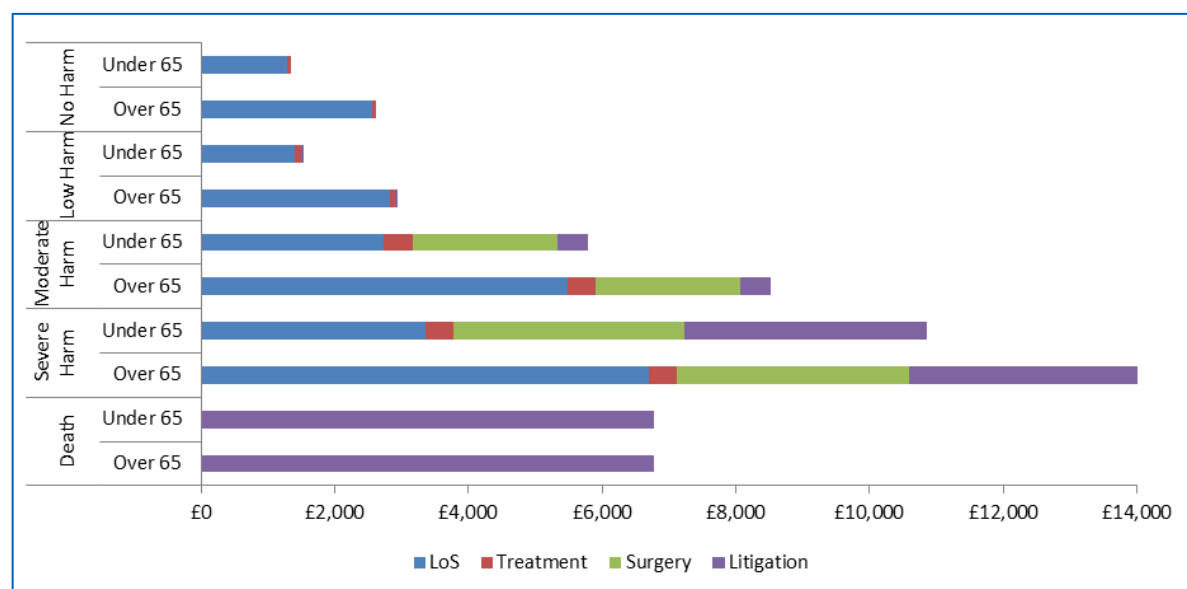
See Annexes 4-7 for further details on these working assumptions.

Based on these assumptions, we calculated the average cost of a fall at £2,600 (see Table 3 and Figure 4 for average costs of falls by age group and reported severity of harm).

**Table 3: Average estimates of the cost per fall by age**

Severity of harm	Average cost per fall (£): Direct impacts only		Average cost per fall (£): Direct + indirect impacts	
	Over 65	Under 65	Over 65	Under 65
No harm	2,621	1,337	2,621	1,337
Low harm	2,903	1,495	2,949	1,540
Moderate harm	8,068	5,328	8,519	5,779
Severe harm	10,587	7,237	14,197	10,847
Death	0	0	6,769	6,769

**Figure 4: Breakdown of all costs per fall by reported severity and age**



This implies a total yearly combined cost to hospitals of reported inpatient falls of around £630 million (see Table 4 below for a breakdown by hospital sector).

**Table 4: Total estimated costs of reported inpatient falls by hospital setting<sup>10</sup>**

Hospital setting	Total falls 15/16 (000's)	Total costs: Based on the max LoS assumptions	Breakdown of cost by age group (%)	
			<65	>65
Acute	204	£506m	13	87
Mental health	34	£105m	14	86
Community	8	£24m	6	94
<b>Total</b>	<b>246</b>	<b>£634m</b>	<b>13</b>	<b>87</b>

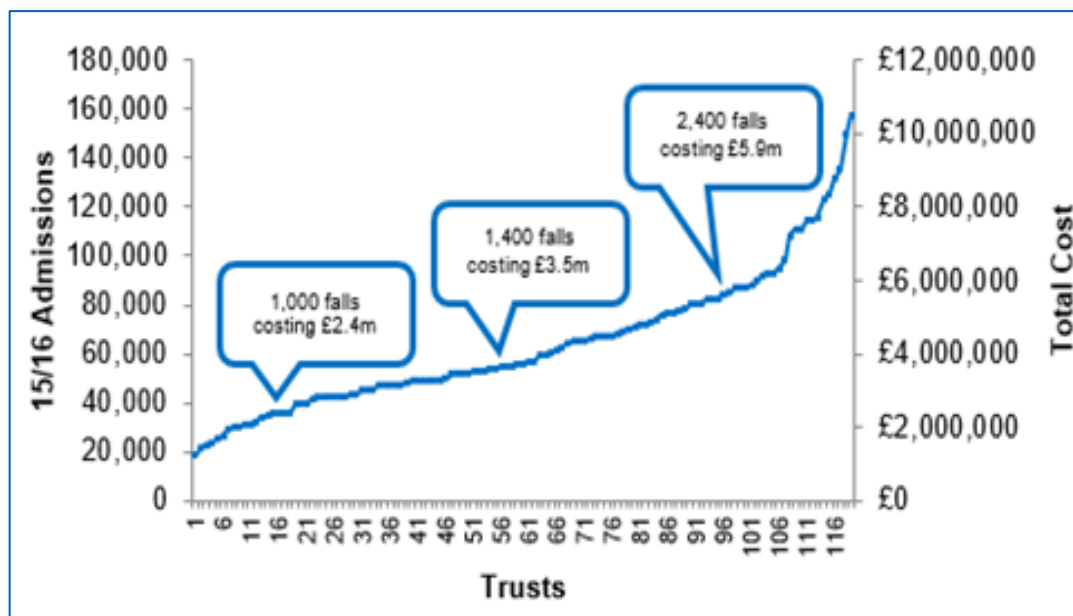
Falls among older groups account for approximately 77% of total reported falls but around 87% of total costs.

This represents around 25% of the estimated £2.3 billion total system cost of falls (both inside and outside hospitals) by NICE (2015). These costs are indicative. They should not be used for local decision-making without taking into account the local length of stay impacts of falls that will drive the estimated cost.

However, using these estimates, we estimated the indicative cost at acute hospitals, mental health hospitals and community hospitals, based on the annual volume of admissions. See Figures 5, 6 and 7 below.

<sup>10</sup> The NHS Litigation Authority (NHSLA) commented: 'The figures for clinical claims and non-clinical falls are highly likely to be unreliable due to the way these claims are recorded.' This means that they may include staff as well as patient litigation costs.

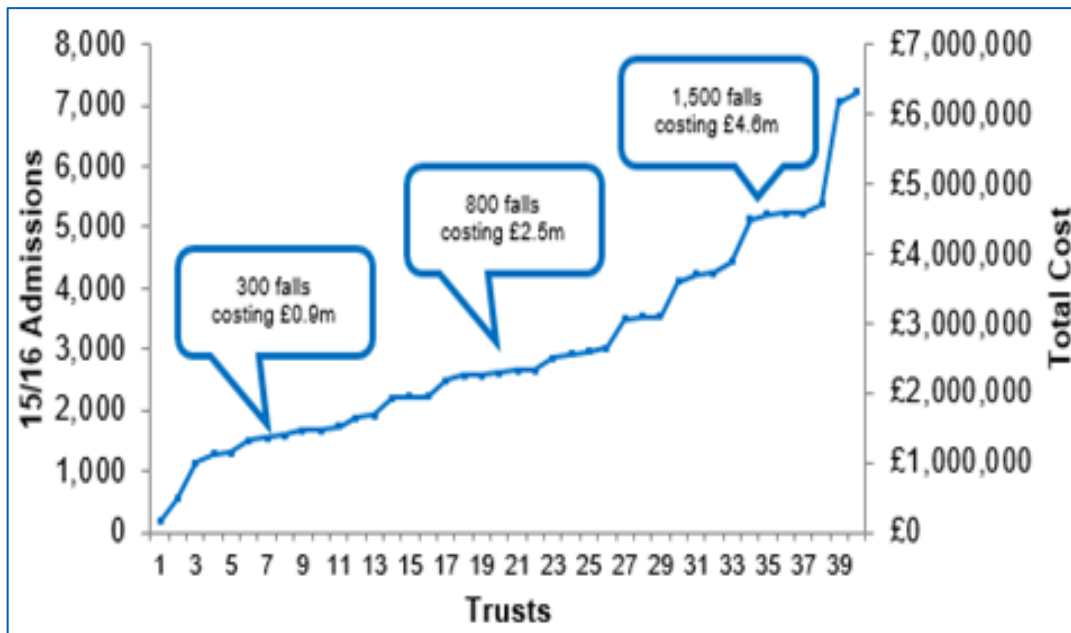
**Figure 5: Indicative cost estimates per acute trust by volume of inpatient admissions<sup>11</sup>**



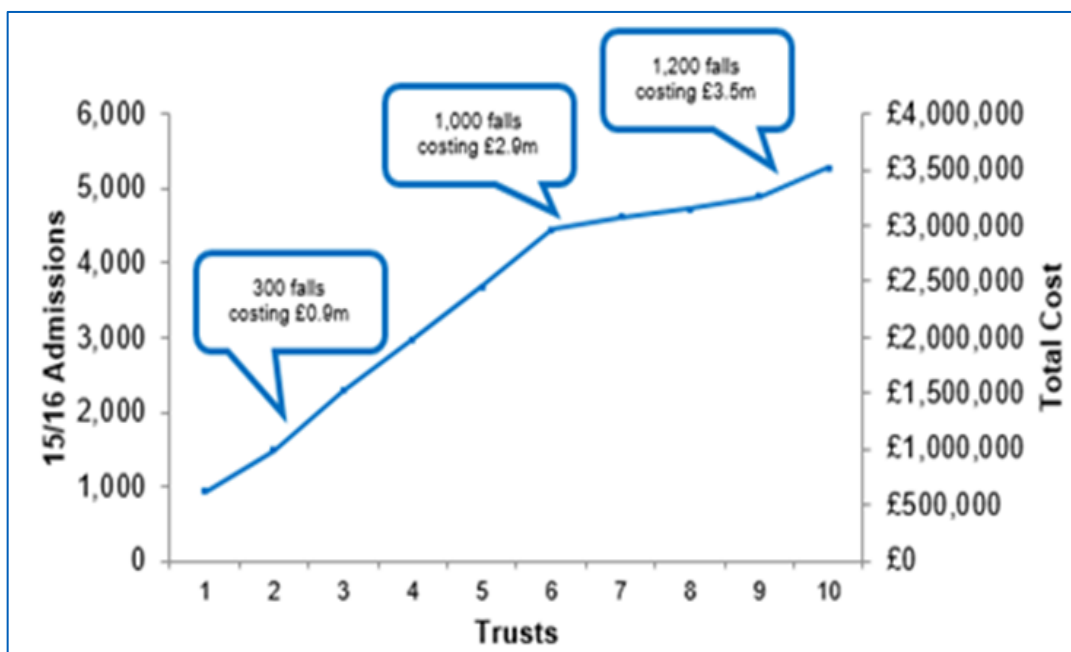
Note: Using the estimated falls rate per 1,000 bed days, a provider with 800 beds will have approximately 1,500 falls at a cost of £3.9 million. This is different from the £92,000 NPSA estimate in 2007 because of impacts costed, inflation and differences in assumptions about the fall rate.

<sup>11</sup> Number of trusts based on HES admissions for 2015/16 – this excludes specialist trusts and trusts with a null admission value.

**Figure 6: Indicative cost estimates per mental health trust by volume of inpatient admissions**



**Figure 7: Indicative cost estimates per community trust by volume of inpatient admissions**



These estimates do not account for the impact on the wider health system and social costs of reported inpatient falls.

These will include impacts on, for example:

- out-of-hospital rehabilitation services:
  - some patients need to access rehabilitation services in the community (for example physiotherapy) once discharged from hospital to fully recover from the fall
  - for working-age patients, the rehabilitation process may result in loss of productivity and/or earnings which may put pressure on services that are already facing significant increases in demand
- the need for care/nursing home:
  - older patients who fall in hospital are more likely to need care and be discharged into social/nursing care homes
  - in some cases, family and friends will provide ongoing care needs, which may represent productivity losses and/or loss in earnings for them
- the risk of further falls in the community:
  - the loss of confidence, particularly among older patients, that falls may result in, may place some patients at a much greater risk of further falls both inside and outside hospital. This may increase the risk of readmission to hospital and/or the demand on other services to deal/treat repeat falls in the community, eg the impact on GPs, emergency services, emergency and minor injury departments and other falls/fracture/frailty liaison services
- mental health:
  - the loss of confidence and increased isolation for some patients after an inpatient fall (regardless of how severe), as well as other psychological impacts which may increase the demand for GP services, as well as mental health services, and in the medium to longer term increase the demand for social care services.

There has been little work to estimate these wider costs of inpatient falls – probably because of data limitations and challenges in distinguishing which ongoing care needs are directly attributable to a hospital fall. However, given the likely scale of these costs further research in this area would be valuable.



## Length of stay sensitivity analysis

Our assumptions about extra days in hospital as a result of reported falls with no or low harm are the most uncertain and this affects our estimates as these falls account for a large majority of total falls and 88% of our total costs.

We based our figure on the average of two studies: Vass and Morello. Vass is based on a small sample in a single UK trust from 2009-11 and Morello is based on a sample of six hospitals in Australia from 2011-13 (which might not be comparable). This gives us 8.2 days for no harm and 9 days for low harm.

To reflect this uncertainty we looked at two scenarios (see Table 5) based on 50% and 25% reductions in the current length of stay assumptions. Based on these assumptions, the estimate of total cost is reduced to between £354 million (44% lower than our central estimate) and £494 million (22% lower than our central estimate). Table 6 provides a breakdown of these estimates by hospital setting.

**Table 5: Sensitivity of no and low harm cost per fall to length of stay assumptions**

Severity of harm	Adjustment 1: Assume LOS is 50% lower than base estimate		Adjustment 2: Assume LOS is 25% lower than base estimate	
	Adjusted cost per fall (£)	% change compared with base estimate	Adjusted cost per fall (£)	% change compared with base estimate
No harm	1,190	-49	1,758	-24
Low harm	1,378	-47	2,001	-24

**Table 6: Sensitivity of no and low harm overall cost to length of stay assumptions**

Hospital setting	Assume LOS is 50% lower than base estimate		Assume LOS is 25% lower than base estimate	
	Total Cost	% change compared to base case	Total Cost	% change compared to base case
Acute	£281m	-44	£393m	-22
Mental health	£60m	-43	£83m	-21
Community	£13m	-46	£18m	-24
<b>Total</b>	<b>£354m</b>	<b>-44</b>	<b>£494m</b>	<b>-22</b>

Given the limited evidence on the impact of falls with little or no harm on increasing the length of stay in hospital, future research should focus on building this evidence base.

# 3. The potential savings from reducing falls

There is evidence (for example the FallSafe project) that assessments and interventions that take into account a range of factors to identify and treat underlying reasons for falls in hospitals could reduce the incidence by 25-30%. Based on our estimates of the costs of falls, reduction on this scale could mean around 57,000 fewer falls per year and reduce the annual cost of falls by up to 25% (see Table 7 for a breakdown of these potential savings across settings).

In practice, trusts vary a great deal in how they report falls, which means that some will have more scope than others to reduce the number of falls (even if the conditions set out in Figure 8 are met). Some trusts, for example, will already have successful processes and policies for reducing falls and low reported rates of falls as a result (given their patient and length of stay profile). For these trusts, the scope for further reductions may be much lower than for trusts that currently perform poorly on this measure and have a lot of scope for reducing falls.

Other points to take into account:

- the evidence on falls reduction is largely focused in older patient groups so we have limited reductions to falls across the >65 age group
- we have applied the same 25-30% reduction across all levels of reported severity and assumed that all trusts can reduce falls by this rate. We recognize that this is a simplifying assumption and that in practice (as we have highlighted above), we know that trusts will have very different starting points and so the potential scale of reduction would vary a lot across individual trusts.
- if trusts target efforts at reducing the most severe types of falls (rather than all falls), this saving could be significantly higher.

Despite the evidence of potential for significant reduction in falls, these practices are not being applied systematically across hospital trusts.

Designing and implementing practices of the kind covered by the FallSafe project across individual providers is not, however, without challenge and ensuring that reductions are sustained in the longer term intensifies this challenge.

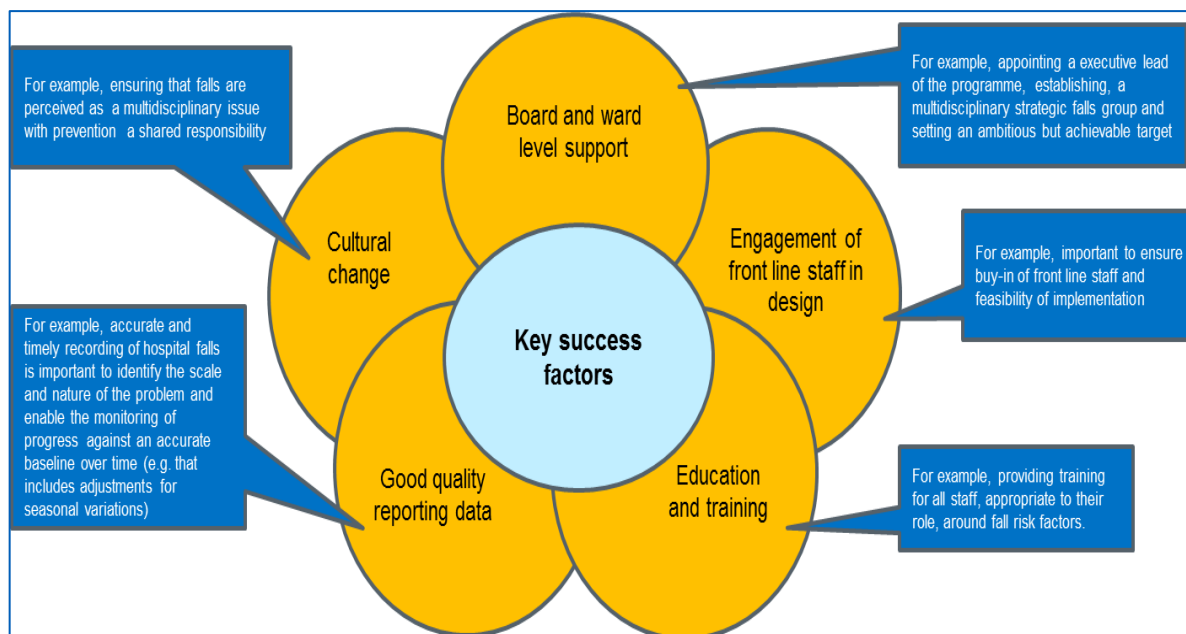
The evidence from successful and sustainable falls prevention programmes suggests there are broadly five key factors in reducing the number of falls in hospital (see Figure 8):

- board and ward level support: for example, appointing an executive lead of the programme, establishing a multidisciplinary strategic falls group and setting an ambitious but achievable target
- engaging frontline staff in design: to encourage their buy-in and also ensure that implementation is feasible
- education and training: to ensure that all staff are appropriately aware of fall risk factors
- good quality reporting data: for example, accurate and timely reporting of hospital falls to identify the scale and nature of the problem and enable accurate monitoring of progress, including adjustment for seasonal variations
- culture change: ensuring that falls are perceived as a multidisciplinary issue and prevention is shared responsibility.

Although trusts should be ambitious in setting targets to reducing avoidable falls, reducing falls to zero will not be a realistic target for any hospital because:

- trusts will always have to make a challenging trade-off between encouraging patient mobility/independence and minimising the risks of patient falls
- in some cases, falls will be a necessary part of a patients' rehabilitation process
- the costs of trying to eliminate all risk is likely to be prohibitively high.

**Figure 8: Key success factors for successful implementation and sustainable results**



**Table 7: Summary of potential savings from reducing the number of falls**

Hospital setting	Total falls >65 (000s)	Total cost of falls (£m) >65	25-30% reduction in total falls >65 (000s)	Total cost saving from 25-30% reduction (£m)	Savings as % of total costs (total falls across all ages)
Acute	156	439	39-47	110-132m	22%-26%
Mental health	26	90	7-8	23-27m	22%-26%
Community	7	23	2-2	6-7m	23%-28%
<b>All</b>	<b>190</b>	<b>552</b>	<b>47-57</b>	<b>128-166m</b>	<b>22%-26%</b>

**Note:** The savings are based on the total cost of falls of £634 million. The cost savings here are the gross savings and do not include implementation and/or running costs.

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