Final stage impact assessment

Title:	Sprinklers in Care Homes – Government Response Impact Assessment
Type of measure:	Statutory guidance
Department or agency:	Ministry of Housing, Communities and Local Government
IA number:	N/A
RPC reference number:	N/A
Contact for enquiries:	buildingassurance@communities.gov.uk
Date:	01/08/2024

Contents

Contents: Tables

1. Summary of proposal

1. There is currently no blanket recommendation for sprinklers in care homes within Approved Document B. It is proposed to amend Approved Document B to call for sprinklers in all new care homes of any number of beds. We propose that this provision should be in line with code of practice BS 9251:2021 for residential care premises. The 2021 update to this code of practice extends the provision of sprinklers into some bathrooms, shower rooms, toilets and some stairs.

2. The preferred policy option is to: install sprinklers in all new care homes and extensions regardless of height; remove the allowance for excluding self-closing doors and set an upper limit on beds per compartment to 10. The proposed policy is estimated to have a total present cost of £91.5 million to businesses, with around £19.7 million in total present benefits to society. The additional net present cost to society is approximately £71.8 million over 10 years, and the benefit cost ratio (BCR) is 0.21. The equivalent annual net direct cost to business (EANDCB) is estimated to be £10.6 million.

2. Strategic case for proposed regulation

3. A 2018 call for evidence revealed that the provision of sprinklers in care homes was perceived to offer numerous benefits. In response to this, the government committed to reevaluate the evidence supporting the use of sprinklers in care homes. Care homes serve as vital community resources, and fires in these settings necessitate the relocation of residents, causing distress to both the residents and their families.

4. There is currently no blanket recommendation for sprinklers in all care homes within Approved Document B, however, the benefits of sprinklers are recognised in the guidance. Care homes rely on various measures to resist fire spread in the building, aiming to limit the number of people who need to be evacuated initially and protecting residents elsewhere in the building. The provision of sprinklers in all new care homes will complement this. There is evidence in the 'Sprinkler effectiveness in care homes: final research report: BD 2546'[1] that in most situations where a sprinkler operates, other occupants within the room that are not in intimate contact with the fire should survive.

5. The current policy framework for care homes includes several allowances regarding the provision of sprinkler systems. These allowances permit protected areas to house more than 10 beds and do not require fire doors to have self-closing devices, where sprinkler systems are provided. However, previous research suggests that the inclusion of sprinkler systems could provide overall benefits by limiting the spread of fire and fire damage.

6. Government intervention to modify the existing framework could therefore enhance the safety and welfare of care home residents, who are some of the most vulnerable in society. Additionally, this could potentially save millions in property damage costs.

3. SMART objectives for intervention

7. The proposed intervention focuses on installing sprinkler systems in new care homes. The primary objective is to reduce the risk of fire-related incidents and minimise property damage.

[1] BRE (2006), Sprinkler effectiveness in care homes: final research report: BD 2546
Sprinkler Effectiveness in Care Homes.doc (bregroup.com)

8. Fires in care homes can cause distress for residents and their families, often leading to rehoming. By implementing sprinklers, the aim is to prevent such situations. Beyond safety, the intervention aims to enhance residents' well-being. The presence of sprinkler systems provides peace of mind and reduces distress caused by fire incidents. Vulnerable residents and their families will be assured that robust safety measures are in place.

9. Implementing sprinkler systems enhances societal well-being and growth by aligning with government priorities of safety and economic prosperity.

4. Description of proposed intervention options and explanation of the logical change process whereby this achieves SMART objectives

10. The preferred policy option is to install sprinkler systems in all new care homes, regardless of their height. This provision aligns with the code of practice BS 9251:2021 for residential care premises. The primary goal is to enhance fire safety and mitigate the risk of harm to residents and property damage.

11. Sprinkler systems have a proven track record in preventing and controlling fires. By installing them, it will significantly reduce the risk of fire-related incidents in care homes. A uniform approach across all new care homes ensures equitable safety standards.

12. The government will enact changes to Approved Document B with all new care homes to install sprinkler systems during construction. Guidance will be provided to care home operators, architects, and builders regarding sprinkler system design, installation, and maintenance through Approved Document B. Regular fire risk inspections will assess compliance and system effectiveness.

5. Summary of long-list and alternatives

13. Several options were considered to address the risks which arise in care homes, these included:

14. **Counterfactual / Do Nothing:** This option was considered as a baseline scenario where no changes are made to the current practices. While this approach would involve no additional costs or disruptions, it also means that existing safety concerns, such as the lack of sprinklers, the issue with self-closing doors, and the absence of bed limits per compartment, would remain unaddressed. This could potentially lead to increased risks in the event of a fire, making this option less desirable in terms of improving overall safety in care homes.

15. **Policy Option 1 - Sprinklers in Care Homes with allowances unchanged.** This option was considered for its simplicity. However, this option does not deliver the evolution of safety improvements sought as part of the building safety regime.

16. **Policy Option 2 - Sprinklers in Care Homes with removal of self-closing doors allowance.** This option was considered due to its potential to enhance fire safety by recommending sprinklers while removing the allowance for not including self-closing doors when providing sprinkler systems. The removal of the self-closing doors allowance will reduce

the spread of smoke from its origin. However, this option does not address the issue of bed limits per compartment, which could impact evacuation efficiency.

17. **Policy Option 3 - Sprinklers in Care Homes with upper limit of 10 beds on compartment sizes.** This option was considered due to its potential to enhance fire safety through ensuring manageable evacuation scenarios in addition to the provision of sprinklers in care homes. However, this option does not address the issue of providing self-closing doors, which would limit the spread of smoke.

18. **Policy Option 4 - Sprinklers in Care Homes with the removal of self-closing doors allowance, and the upper limit on beds per compartment set to 10.** This option is preferred for its comprehensive approach to safety. It provides sprinkler systems in new care homes, removes the allowance for self-closing doors, and imposes an upper limit of 10 beds on compartment sizes. This combination of measures was seen as a robust solution to enhance fire safety, prevent potential fire and smoke spread, and ensure manageable evacuation scenarios.

19. Policy Options 2 and 3 were dropped at long list as these allowances together will enable new build care homes to have improved fire safety through the prevention of fire spread and ensuring manageable evacuation scenarios, whilst the additional cost of introducing these allowances together is expected to be low.

6. Description of shortlisted policy options carried forward

20. Long-list Policy Options 1 and 4 above have been taken from the long list and have been shortlisted as Policy Options 1 and 2 respectively below. These options are assessed within this impact assessment.

21. **Policy Option 1 - Sprinklers in Care Homes with allowances unchanged.** This option was considered for its simplicity. However, this option does not deliver the evolution of safety improvements sought as part of the building safety regime.

22. **Policy Option 2 – Preferred: Sprinklers in Care Homes with the removal of self-closing doors allowance, and the upper limit on beds per compartment set to 10.** This option is preferred for its comprehensive approach to safety. It provides sprinkler systems in new care homes, removes the allowance for self-closing doors, and imposes an upper limit of 10 beds on compartment sizes. This combination of measures was seen as a robust solution to enhance fire safety, prevent potential fire and smoke spread, and ensure manageable evacuation scenarios.

23. **Small and Micro Business Assessment (SaMBA) and Medium-Sized Business Impact:** The preferred policy option could have an impact on small and micro businesses, as well as medium-sized businesses, due to the costs associated with installing sprinkler systems and modifying existing structures to remove self-closing doors and limit beds per compartment.

24. **Small and Micro Business Assessment (SaMBA) and Medium-Sized Business Mitigations**: To mitigate these impacts, a transitional period is proposed, and technical guidance will be provided to help businesses understand and comply with the new provisions.

7. Regulatory scorecard for preferred option

Quantitative estimates and qualitative descriptions of impacts are provided under each heading in the following sections.

The right-hand column includes directional ratings based on the description of impact and the sign of the suggested indicator (NPV, NPSV, all impacts):

Green – positive impact, **red** – negative impact, **amber** – neutral or negligible impact, **blue** – uncertain impact.

Part A: Overall and stakeholder impacts

(1) Overall impacts on total welfare		**Directional rating** **Note: Below are examples only**
Description of overall expected impact	This policy is expected to have an uncertain overall impact on society. It will provide improved fire safety benefits for care home residents, preventing fatalities and injuries, as well as the spread of property damage in the event of a fire, as well as improve the wellbeing of residents/family or staff who may be concerned about fire safety. The monetised costs outweigh the monetised benefits and are expected to solely fall to care home providers. There are several non-monetised benefits that are expected to provide significant wellbeing benefits, but these could not be confidently monetised to determine whether or not these benefits would switch the net policy impact to being positive, and hence the directional rating is uncertain. Switching analysis has been performed on the wellbeing benefits which suggests a life satisfaction improvement equivalent to £231/year would be needed before the policy is cost neutral.	**Uncertain** **Based on all impacts (incl. non-monetised)**
Monetised impacts	**The total net present social value is estimated at -£71.8m under the central scenario. Under the high and low net present value scenarios, these are -£43.0m and -£100.7m respectively.** **Additional monetised costs total to £91.5m. The most significant of which are:** - Installation costs: £109.7m, - Maintenance costs: £12.4m. - Avoided Retrofitted costs: -£33.6m - Provision of self-closing doors: £2.4m. - 10 bed limit on compartment sizes: £0.6m.	**Negative** **Based on likely £NPSV**

	Additional monetised benefits total to £19.7m, made up of: - Avoided average property damage: £12.9m. - Avoided major property damage or building loss: £4.7m. - Avoided fatalities: £0.8m - Avoided injuries: £0.7m - Avoided relocation of residents: £0.6m.	
Non-monetised impacts	No non-monetised costs have been identified. Non-monetised benefits are: - Reduced stress for residents/staff/family from concern over fire safety of a care home. - Avoided mental health impacts from fires. - Avoided business disruption in the event of a fire. - Loss of items with a sentimental value to the resident beyond their replacement value is avoided	**Positive**
Any significant or adverse distributional impacts?	Yes, there may be additional cost pressures on local authorities to fund care for low income residents.	**Uncertain**

(2) Expected impacts on businesses		
Description of overall business impact	Businesses are expected to incur all of the costs of sprinklers in care homes and additional allowances. Businesses will indirectly benefit through property damage avoidance, but will not see direct benefits as a result of this policy.	**Negative**
Monetised impacts	The Business Net Present Value (NPV) is estimated at -£73.3m. The Equivalent Annual Net Direct Cost to Business (EANDCB) is estimated at £10.6m, of which administrative costs are expected to be £0.01m in familiarisation. No pass through of costs on to households is assumed, therefore all costs will fall on to care home providers.	**Negative** **Based on likely business £NPV**
Non-monetised impacts	No non-monetised costs have been identified. Non-monetised impacts benefitting businesses are that care home providers will avoid disruption to business in the event of a fire.	**Positive**
Any significant or adverse	This policy will apply to all new care homes and care home extensions in England. There are no regional differences expected to comply with this policy.	**Neutral**

distributional impacts?		

(3) Expected impacts on households		
Description of overall household impact	Care home residents are not estimated to experience any costs as a result of this policy. There is a risk of cost passthrough from businesses, but this has not been costed due to limited information. Overall, residents should experience a net benefit, due to a reduction in fatalities, injuries and relocations in the event of a fire. Concerns over the fire safety of their home should reduce with the addition of a sprinkler system as well.	**Positive**
Monetised impacts	No costs are assumed to fall to care home residents from care home providers. There will be some risk of this, due to regional monopolies and availability of care home residency making it difficult for residents to choose a cheaper alternative. However the extent of this risk is unknown. The Household NPV (HNPV) is therefore estimated at £1.5m. The benefits are not expected to be direct to households, and so the equivalent annual net direct cost to households is estimated at zero.	**Positive** **Based on likely household £NPV**
Non-monetised impacts	Households will receive non-monetised benefits of: - Reduced stress for residents/staff/family from concern over fire safety of a care home. - Avoided mental health impacts from fires. - Avoided loss of sentimentally valuable items.	**Positive**
Any significant or adverse distributional impacts?	There are some potential impacts to low income residents. In the event of cost-passthrough, low income care home residents may find it more difficult to afford the cost of care. Local authority schemes currently exist to aid affordability of care for low-income residents, but these schemes may become more restrictive if funding is not increased. No other impacted groups or regional differences were identified.	**Neutral**

Part B: Impacts on wider government priorities

Category	Description of impact	Directional rating

Business environment: **Does the measure impact on the ease of doing business in the UK?**	The higher costs associated with constructing and maintaining care homes negatively impact the profitability of such investments. This strain affects Local Authority funding of care homes and residents and may disincentivise private investment. It is expected that a large proportion of new builds are already implementing sprinklers. The addition of sprinkler systems and allowances will only have a cost impact of 5.5% of the capital cost, and additional maintenance cost of 1.5% for a new build care home. Therefore, the change will only impact a minority of care homes by a low amount, hence the minor negative impact to private business. Smaller and more rural care homes may feel the negative impact more acutely, as the costs of implementing sprinklers will be slightly larger compared to large care homes and care homes in urban or suburban areas.	**Neutral**
International Considerations: **Does the measure support international trade and investment?**	No trade implications are expected.	**Neutral**
Natural capital and Decarbonisation: **Does the measure support commitments to improve the environment and decarbonise?**	No significant natural capital or decarbonisation impacts are expected.	**Neutral**

8. Monitoring and evaluation of preferred option

25. The Building Safety Regulator has a duty to keep the safety and standards of buildings under review.

26. The Department and the Building Safety Regulator will continue to liaise with each other on any reports of unreasonable consequences of this policy.

9. Minimising administrative and compliance costs for preferred option

27. The burden on business will be minimised by allowing an appropriate transition period. This will allow smaller organisations the time and opportunity to adjust to providing sprinklers in new care homes and reduce the life risks to residents and building damage

Declaration

Department or Agency:

…

Contact details for enquiries:

…

Minister responsible:

…

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed: Sign here

Date: Date

Summary: Analysis and evidence

For Final Stage Impact Assessment, please finalise these sections including the full evidence base.

Price base year: 2023

PV base year: 2025

This table may be reformatted provided the side-by-side comparison of options is retained	**Do Nothing**	**Policy Option 1: Sprinklers in Care Homes with allowances unchanged.**	**Policy Option 2 – Preferred: Sprinklers in Care Homes with the removal of self-closing doors allowance, and the upper limit on beds per compartment set to 10.**
Net present social value (with brief description, including ranges, of individual costs and benefits)	N/A	Central NPV scenario -£68.8m High NPV scenario – -£38.7m Low NPV scenario – -£97.7m	Central NPV scenario -£71.8m High NPV scenario – -£40.8m Low NPV scenario – -£101.6m
Public sector financial costs (with brief description, including ranges)	N/A	There is a possibility that care homes owned by local authorities will face additional costs from implementing and maintaining sprinklers. External research suggests that around 3% of existing care homes are owned by the public sector. However, the extent of local authority ownership of new build care homes and extensions, as well as the current rate that these care homes will include sprinklers is unknown, and so this has not been monetised.	Same as Policy Option 1

Significant un-quantified benefits and costs (description, with scale where possible)	N/A	Unquantified benefits include: - Reduced stress for residents/staff/family from concern over fire safety of a care home. - Avoided mental health impacts from fires. - Avoided business disruption in the event of a fire. - Avoided mental health impact of loss of sentimentally valuable items	Same as Policy Option 1
Key risks (and risk costs, and optimism bias, where relevant)	N/A	Key Risks: - It is difficult to know the proportion of care homes that are assumed to fit sprinklers in the counterfactual, and this can impact the size of the overall NPSV. This carries a medium risk, as the assumption is based on industry expertise. The impact of this assumption can be large, however it would not effect the outcome of a net cost to society. - It was assumed that sprinklers would last 60 years as opposed to the 50 years quoted by most sprinkler companies. This assumption carries a low risk as it will only impact benefits 50 years in the future which is insignificant once discounted.	Key Risks: - Same as Policy Option 1 - It was assumed that only large care homes would be affected by removing the compartment size allowance. This was based on assumptions around an average care home size and layout for each size. Different layouts could mean that a proportion of larger medium or small care homes, but the cost impact of this upper limit is expected to be marginal.
Results of sensitivity analysis	N/A	No impact on overall outcome, policy option remains a net cost to society (based only on monetised impacts) and to business but a benefit to households. Sensitivity was performed on the effectiveness of a sprinkler and avoided costs of	No impact on overall outcome, policy option remains a net cost to society (based only on monetised impacts) and to business but a benefit to households. Sensitivity was performed on the effectiveness of a sprinkler and avoided costs of relocation, as well as the installation and

		relocation, as well as the installation and maintenance costs of a sprinkler system. Switching analysis based on the improvement in wellbeing a sprinkler system would need to cover the cost of providing a sprinkler system. Life satisfaction is rated on a 0 to 10 scale, where a 1 point improvement is valued at £13,000 per year. It is estimated that residents must experience a 0.017 point improvement in life satisfaction to cover the cost of providing a sprinkler system. This is equivalent to around £212 per year per resident, or £4.08 per week per resident.	maintenance costs of a sprinkler system and allowances. Switching analysis based on the improvement in wellbeing a sprinkler system would need to cover the cost of providing a sprinkler system. Life satisfaction is rated on a 0 to 10 scale, where a 1 point improvement is valued at £13,000 per year. It is estimated that residents must experience a 0.017 point improvement in life satisfaction to cover the cost of providing a sprinkler system. This is equivalent to around £231 per year per resident, or £4.45 per week per resident.

Evidence base

Problem under consideration, with business as usual, and rationale for intervention

28. The primary issue being addressed is the potential risk of fire in care homes. The government aims to enhance fire protection in these residential building types where residents are vulnerable and reliant on others for evacuation. The proposal aims to meet the objective of ensuring safety and protection of these vulnerable groups.

29. The current harm being tackled is the short and long-term effects of fire in care homes. Future harms could include increased fire incidents due to lack of adequate fire safety measures, leading to potential loss of life and property. There is currently no blanket recommendation for sprinklers in all care homes within Approved Document B, however, the benefits of sprinklers are recognised in the guidance. Care homes rely on various measures to resist fire spread in the building, aiming to limit the number of people who need to be evacuated initially and protecting residents elsewhere in the building. The provision of sprinklers in care homes will compliment this.

30. The sectors affected would primarily be the health and social care sector, specifically care homes facilities. Stakeholders include care homeowners, residents, their families, and the wider community. Government intervention means these facilities may need to install sprinkler systems, which could involve initial installation costs and ongoing maintenance.

31. The government is best placed to ensure a standardized, regulated approach that is applicable to all care homes. This ensures that all residents, regardless of the facility they reside in, have access to the same level of fire protection.

Policy objective

32. Continue the Department's post-Grenfell building safety measures programme in a considered and gradual evolution of building safety protocols. When combined with other measures introduced, this policy aims to ensure high levels of safety. The new policy will focus on implementing sprinkler systems in care homes as an improved safety measure, simplifying the safety measures within the Approved Document B.

33. Strive to deliver a balance of safety improvements when considered against the potential impact of the proposed change on industry. There is a transition period of 6 months which should allow businesses to adapt.

Description of options considered

34. The options considered in the impact assessment document are as follows:

35. **Counterfactual / Do Nothing:** This option was considered as a baseline scenario where no changes are made to the current practices. While this approach would involve no additional costs or disruptions, it also means that existing safety concerns, such as the lack of sprinklers, the issue with self-closing doors, and the absence of bed limits per compartment, would remain unaddressed. This could potentially lead to increased risks in the event of a fire, making this option less desirable in terms of improving overall safety in care homes.

36. **Policy Option 1: Sprinklers in Care Homes with allowances unchanged.** This option was considered for its simplicity and minimal disruption to existing practices. However, it was found to lack the comprehensive safety improvements sought, as it did not address the issue of self-closing doors and bed limits per compartment.

37. **Policy Option 2 – Preferred: Sprinklers in Care Homes with the removal of self-closing doors allowance, and the upper limit on beds per compartment set to 10.** This option was ultimately preferred due to its more holistic approach to safety. The removal of self-closing doors allowance was seen as a necessary step to prevent potential fire spread, and the limit on beds per compartment was viewed as a crucial measure to ensure manageable evacuation scenarios.

Summary and preferred option with description of implementation plan

38. The preferred option is to make provision for sprinklers in new care homes with the removal of self-closing doors allowance, and the upper limit on beds per compartment set to 10.

39. This option will be implemented by updating guidance in Approved Document B. Approved Document B offers practical guidance on how compliance with the fire safety functional requirements of Building Regulations can be met in common building situations. Industry tends to adopt Approved Documents guidance as a default minimum standard. Government anticipates that when Approved Document B is updated, provision of sprinklers will become the industry norm.

40. Developers/care home owners will be given a 6-month transitional period followed by 6 months to comply after the changes have been made.

Analytical Approach

Rationale and evidence to justify the level of analysis used in the IA (proportionality approach)

41. The analysis below aims to identify the additional cost of a sprinkler system, and the potential benefits of sprinklers for society. It reflects industry estimates on the cost to install sprinklers within new care homes and care home extensions and the impact of removing allowances from new care homes for installing sprinklers. Estimates on the safety benefit of sprinklers are based on literature reviews commissioned by MHCLG[2]. Uncertainty around the costs of sprinkler installation and maintenance and the effectiveness of sprinklers to prevent fatalities, injuries and property damage has been reflected within sensitivity analysis below.

Main analytical assumptions

42. The analysis within this impact assessment is based on estimates prepared by the Adroit Consortium, which comprises economics expertise from Adroit Economics, combined with industry expertise from PRP Architects and MGAC cost consultants with input from MHCLG and the Building Safety Regulator. All figures are based on England only.

[2] https://www.gov.uk/government/publications/compartment-size-resistance-to-fire-and-fire-safety-research

43. The figures assume a 10-year appraisal period of 2025 – 2034, with ongoing costs and benefits costed across the full 60-year lifetime of the installed sprinklers up until 2094. There will be a 6-month transition period meaning the policy will only come into force from 2025. Undiscounted costs and benefits have been presented where stated. Net costs and benefits have been presented in 2023 prices and discounted to present value terms based on the HMT Green Book.
    - Non-health impacts – 3.5% for the first 30 years and 3.0% for the subsequent years;
    - Health impacts – 1.5% for the first 30 years and 1.286% for the subsequent years.

44. All estimates are assumed to stay constant in real terms, assuming costs and benefits will increase in line with the GDP deflator throughout the appraisal period.

45. The average number of beds per new care home are based on analysis of new care home registrations across 2018-2021[3].
    - The average number of beds in new small care homes (less than 10 beds) is estimated at 5.
    - The average number of beds in new medium-sized care homes (from 10 to 50 beds) is estimated at 29.
    - The average number of beds in new large care homes with more than 50 beds is estimated at 73.

46. It is also assumed that there will only be one bed per bedroom in these care homes.

    Costs and benefits have been calculated based on the expected number of sprinklers installed under the counterfactual, and the expected number of sprinklers installed under both policy options. The additional policy cost of Policy Option 1 and 2 have been netted off against the counterfactual. Note that allowances have only been calculated as an additional cost.

47. The number of care homes affected is based on published development industry reports about the care home market, and analysis of Glenigan planning data[4]. These reports also provide an estimate of the number of care homes undergoing extensions. Based on this, it is estimated that around 150 new care homes will be built and there will be 225 care home extensions per year[5]. Amongst new builds, around 16% are considered small care homes, 32% are considered medium-sized care homes and 52% are large care homes[6]. For care home extensions, half are expected to small extensions adding fewer than 10 beds, and the other half are expected to be for medium size extensions, adding between 10 and 50 beds to the existing home.

48. **Table 1** below shows the number of new care homes and extensions split by care home size.

Table 1: Number of new care homes and extensions per year

[3] Based on analysis of new care home registrations over 2018-2021. https://www.cqc.org.uk/about-us/transparency/using-cqc-data

[4] Note that the number of care home extensions based on 450 care homes in process of extending in 2019 Knight Frank report.

Source: Savills (2023), Spotlight: UK Care Home Development, https://www.savills.co.uk/research_articles/229130/351928-0 Source: Knight Frank (2019), UK Healthcare development opportunities 2019 https://content.knightfrank.com/research/336/documents/en/healthcare-development-opportunities-2019-6452.pdf.

[6] Assumption based on Adroit Consortium experience, analysis of new care home registrations across 2021 to 2023 from the HSCA, and in line with market reports.

	Number of buildings
New Care Homes – Small (<10 beds)	24
New Care Homes – Medium (10-50 beds)	48
New Care Homes – Large (>50 beds)	78
Care Home Extensions – Small (<10 beds)	112.5
Care Home Extensions – Medium (10-50 beds)	112.5

New care home estimates based on Glenigan Data and Savills Report on new care homes being built, number of care home extensions based on 450 care homes in process of extending in 2019 Knight Frank report. It is assumed that extending a care home will take two years.

Source: Savills (2023), Spotlight: UK Care Home Development, https://www.savills.co.uk/research_articles/229130/351928-0

Source: Knight Frank (2019), UK Healthcare development opportunities 2019 https://content.knightfrank.com/research/336/documents/en/healthcare-development-opportunities-2019-6452.pdf.

Counterfactual

49. Under the counterfactual, a large proportion of new build care homes and care home extensions are already expected to install sprinklers. This is based on a review of 31 new build care home projects by PRP and judgement of PRP from recent experience of designing new care homes. Around 50% of small care homes, 75% of medium-sized care homes, and 90% of large care homes will install sprinklers. This is assumed for both new build and care home extensions.

50. Under the counterfactual and the 6-month transition period for Policy Options 1 & 2, new build care homes and extensions which did not initially installed sprinklers when they were built but will subsequently be instructed to retrofit sprinklers to meet the requirements of insurers and the Fire and Rescue Service. The analysis assumes that 1% of medium care homes and 2% of large care homes without sprinklers will be instructed to install them each year. Therefore, the number of new build care homes without sprinklers will continue to fall year on year under the counterfactual. Small new build care homes and extensions are not expected to be instructed by insurers or the Fire and Rescue Service to retrofit a sprinkler system.

51. Across the 60-year lifetime of a care home building, this is on average around 2 medium or new build large care homes per year under the counterfactual.

52. Under Policy Options 1 and 2, a very small number of new care homes are expected to be built during the 6 month transition period without a sprinkler system installed. This means that the number of retrofits occurring under that group is likely to be small.

53. Under Policy Options 1 and 2, an additional 29 new care homes and 78 extensions to care homes will install sprinklers per annum for a total of around 107 additional sprinkler systems per year. This is broken down in **Table 2** below.

Table 2: Number of sprinkler systems installed per year by Counterfactual, Transition Period and Post-Transition for Policy Options 1 & 2.

	Counterfactual / Do Nothing			Policy Option 1 / 2 (6-month transition period)			Policy Option 1 / 2 (post-transition)	Policy Option 1 / 2 (entire appraisal period)
	Care Homes without sprinkler system when care home is built	*Of which, FRS request retrofit a sprinkler system in future*	Sprinklers installed when care home is built	Care Homes without sprinkler system when care home is built, during 6-month transition period	*Of which, FRS request retrofit a sprinkler system in future*	Sprinklers installed when care home is built (transition period)	Sprinklers installed when care home is built (post-transition period)	Total number of additional sprinklered care homes per year across entire appraisal period
New Care Homes – Small (<10 beds)	12.0	-	12.0	0.6	-	0.6	22.8	11.4
New Care Homes – Medium (10-50 beds)	12.0	0.9	36.0	0.6	0.05	1.8	45.6	10.6
New Care Homes – Large (>50 beds)	7.8	0.9	70.2	0.4	0.05	3.5	74.1	6.6
Care Home Extensions – Small (<10 beds)	56.3	-	56.3	2.8	-	2.8	106.9	53.4
Care Home Extensions – Medium (10-50 beds)	28.1	2.0	84.4	1.4	0.1	4.2	106.9	24.8
Total	116.2	3.7	258.8	5.8	0.2	12.9	356.3	106.8

Note that there is a mix of 2014 and 2021 standard sprinklers under the counterfactual and transition periods, Sprinklers are expected to be installed to the 2021 standard under both policy options.
Retrofits are assumed to occur over a 60 year rate. This is at a rate 0%/1%/2% per year of unsprinklered small/medium/large care homes respectively
The total additional sprinklered care homes across the appraisal period is calculated through the sum of sprinklers installed under Policy Option 1 & 2 (either retrofitted or installed when acare home is built), minus the sum of sprinklers installed under the Counterfactual / Do Nothing (either retrofitted or installed when a care home is built).

54. **Table 3** shows the total number of sprinklers being installed and the additional sprinklered care homes across the appraisal period under both the counterfactual and each of the policy options.

55. Under each policy option, it is expected that the number of additional sprinklered care homes is around 894, split between 205 new builds and 689 extensions. Larger care homes are most likely to install a sprinkler under our counterfactual and as such should be impacted the least severely. Policy Option 1 and 2 will also reduce the number of retrofits, meaning these care homes will have a sprinkler system when they are built, as opposed to later in the building's lifetime, thus improving the safety of the building over a longer period.

Table 3: Total new sprinklers installed across appraisal period (2025-2034)

	Counterfactual / Do Nothing			Policy Option 1 / 2 (6-month transition period)			Policy Option 1 / 2 (post-transition)	Policy Option 1 / 2 (entire appraisal period)
	Care Homes without sprinkler system when care home is built	*Of which, FRS request retrofit a sprinkler system in future*	Sprinklers installed when care home is built	Care Homes without sprinkler system when care home is built, during 6-month transition period	*Of which, FRS request retrofit a sprinkler system in future*	Sprinklers installed when care home is built (transition period)	Sprinklers installed when care home is built (post-transition period)	Total number of additional sprinklered care homes per year across entire appraisal period
New Care Homes – Small (<10 beds)	120.0	-	120.0	6.0	-	6.0	228	114
New Care Homes – Medium (10-50 beds)	120.0	50.6	360.0	6.0	2.7	18.0	456	66
New Care Homes – Large (>50 beds)	78.0	52.0	702.0	3.9	2.7	35.1	741	25
Care Home Extensions – Small (<10 beds)	562.5	-	562.5	28.1	-	28.1	1,069	534
Care Home Extensions – Medium (10-50 beds)	281.3	118.5	843.8	14.1	6.3	42.2	1,069	155
Total	1,162	221	2,588	58	12	129	3,563	894

Note that there is a mix of 2014 and 2021 standard sprinklers under the counterfactual and transition periods, Sprinklers are expected to be installed to the 2021 standard under both policy options.
Retrofits are assumed to occur over a 60 year rate. This is at a rate 0%/1%/2% per year of unsprinklered small/medium/large care homes respectively
The total additional sprinklered care homes across the appraisal period is calculated through the sum of sprinklers installed under Policy Option 1 & 2 (either retrofitted or installed when acare home is built), minus the sum of sprinklers installed under the Counterfactual / Do Nothing (either retrofitted or installed when a care home is built).

NPSV: monetised and non-monetised costs and benefits of each shortlist option (including administrative burden)

Monetised Costs

56. Implementing sprinklers in care homes involves more than material costs, there are design costs, ongoing maintenance and administrative costs that need to be factored in.

57. It is assumed that some new build care homes built under the counterfactual will be asked to retrofit a sprinkler system by insurers or the Fire and Rescue Service. This is also assumed for some new build care homes during the 6-month transition period (See **Table 2**). Due to the increased difficulty of designing retrofitted systems, the cost of retrofitting is higher than implementation in newly built care homes. Once the transition period is over, the difference in number between those new care homes that are built with sprinklers as opposed to those that would have been built without sprinklers without the policy can be calculated. Using this figure and the costs of new implementation as well as the costs of retrofitting the existing number of care homes without sprinklers a total implementation cost can be calculated.

58. After the implementation costs, there are costs of maintaining a sprinkler system. Water costs, regular maintenance checks from engineers and costs to repair or replace parts damaged through wear and tear are all expenses that stem from a care home having sprinklers. The difference in number of care homes equipped with sprinklers with and without the policy can then be used year on year to calculate total maintenance costs.

59. Costs are estimated for both the counterfactual scenario, and each of the policy option scenarios. The difference in cost between the two scenarios represents the additional impact of the policy options.

Delay costs

60. For new builds, architects and engineers must factor in sprinklers during design, incurring familiarisation costs and additional professional fees to adjust blueprints to meet health, safety, and structural requirements. This cost is captured within the cost of installation. The design process for new builds and extensions is assumed to occur within a 6-month transition period and therefore no delay costs for care homes are expected.

Transition Costs

61. Transition costs are calculated using an estimate that 750 architects or engineers must become familiar with the policy over the course of 0.25 hours at the blended hourly rate of £67.49, resulting in a **transition cost for the preferred policy option of around £12,650**.

62. The estimate of 750 stems from an assumption that there will be 2 people (for example an architect and an engineer) working on each new scheme per year. Therefore, with an assumed 150 new builds and 225 extensions, the total number of new schemes is 375. With 2 people being hired to create or alter the designs for the care home this brings the total labour cost to 750 people who take 0.25 hours to make the transition at the blended average rate.

63. The blended hourly rate is a 50/50 split between industry charge out rates and employment costs. This is based on the understanding that the construction industry typically uses a mix

of inhouse staff (time valued using employment costs) and outsourced consultancy services (time valued using charge out rates). The charge out rates were collected from a small survey by the Adroit consortium of different professions in the industry. The employment costs were derived from ASHE (salaries) and oncosts (ONS)[7].

Maintenance Costs

64. The annual cost of maintaining a sprinkler system was calculated to be £170, £990 and £2,500 for a small, mid-sized and large care home respectively based on a per-bed maintenance cost calculation and multiplying up to the average size of a small to large care home. These figures were derived by taking the annual costs for an 82-bed care home with sprinklers in 2022 prices (£31.98), obtaining a per bed figure and then adjusting to 2023 prices using the GDP deflator to £34.25. Maintenance for a sprinkler system would consist of an annual servicing and routine checks throughout the year.

65. As the lifetime of a care home is assumed at 60 years, the maintenance cost is therefore expected to be around £10,300 / £59,600 / £150,000 for a small, mid-sized and large care home respectively without discounting.

Table 4: Average number of beds and annual sprinkler maintenance by care home size

Care home size	Average beds per care home	Adjusted maintenance cost per bed	Total annual sprinkler maintenance cost per home	Total undiscounted sprinkler maintenance cost across appraisal period per home
Small	5	£34.25	**£170**	**£10,300**
Mid-sized	29	£34.25	**£990**	**£59,600**
Large	73	£34.25	**£2,500**	**£150,000**

66. Under the counterfactual, it is estimated that the present value of maintenance costs total around **£72.6m**. Under the policy options, it is expected that the present value of maintenance costs will total **£85.0m.** Therefore, the additional present value maintenance cost under both policy options is expected to be **£12.4m[8].**

Implementation Costs

67. The total cost to implement sprinklers is calculated using a similar process. Rural and suburban care homes have greater difficulty accessing key infrastructure for a sprinkler system such as water mains or separate water tanks. Install sprinkler systems in rural and suburban care homes is therefore estimated to be more expensive than in urban ones:

[7] Earnings and hours worked, occupation by four-digit SOC: ASHE Table 14 - Office for National Statistics (ons.gov.uk)
SOC codes used for analysis were;
Architects - 2451
Engineers (mechanical and electrical) - 2122/2123

[8] Estimates may not sum due to rounding.

Table 5: Costs to install or retrofit 2014/2021 sprinkler systems in new builds or extensions by location – based on an 82-bed care home. (2022 prices)

Area	Installation cost in new build / extensions (BS 9251_2014)	Installation cost in new build / extensions (BS 9251_2021)	Retrofit cost (BS 9251_2021)
Urban	£400,000	£400,000	£659,000
Suburban/Rural	£461,000	£459,000	£753,000
Blended average	**£443,000**	**£441,000**	**£725,000**
Retrofit costs are assumed to be identical regardless of 2021/2014 standard. Estimates based on an 82 bed care home. Estimates are in 2022 prices.			

68. It is also estimated that retrofitting sprinklers would be more expensive due to complications with fitting sprinkler system equipment in and around an existing structure that was not designed with sprinklers in mind. Retrofitting as discussed earlier will only impact care homes under the counterfactual and during the transition period.

69. Based on estimates for an 82-bed care home, a per-bed care home sprinkler installation cost for medium and large homes is calculated which is then used to estimate the installation and retrofit costs for a range of care home sizes. The average number of beds in each care home size bracket (see **Main analytical assumptions** section) is used to calculate the installation costs by multiplying the blended average per-bed cost and the average number of beds in each care home.

70. Small care home estimates were calculated using the same method but with a 10 bed care home design as a baseline.

71. After adjusting for 2023 prices, the expected costs for implementing and retrofitting sprinklers in various care home sizes come to:

Table 6: Costs to install or retrofit a 2014/2021 sprinkler system by care home size (2023 prices)

Adjusted costs for different care homes sizes - 2023 prices	Installation cost in new build / extensions (BS 9251_2014)	Installation cost in new build / extensions (BS 9251_2021)	Installation cost in extensions (BS 9251_2021)	Retrofit cost (BS 9251_2021)
Small Care Homes (<10 beds)	£32,000	£32,000	£55,000	N/A
Mid Sized Care Homes (10-50 beds)	£168,000	£168,000	£168,000	£274,000
Large Care Homes (>50 beds)	£421,000	£422,000	£422,000	£691,000
Number of beds per care home was assumed to be the average for each size band those being:				

Small – 5 beds Medium – 23 beds Large – 79 beds Note that retrofitting is assumed not to occur for small extensions.

72. For new build / extension installation costs, under the counterfactual it is estimated that the present value of installation costs total is around £458.0m. Under the policy options, it is estimated that the present value of installation costs total is around £567.7m, **Therefore, the additional present value installation cost for the preferred policy option is estimated at £109.7m.**

73. For retrofits, under the counterfactual, the present value of retrofitting is estimated at around £35.7m. Under the policy option this is estimated at £2.1m. **Therefore, the additional present value retrofitting cost is -£33.6m, representing a cost saving.** It is not expected for small care homes to have to retrofit sprinklers during the design process though small new builds and extensions are still expected to implement sprinklers.

Allowances

74. As part of the preferred policy option, not only will sprinklers be provided in new care homes of all sizes, but additionally the existing allowances for care homes that have sprinklers installed are to be removed. This prompts all care homes with sprinklers to also implement self-closing devices on their bedroom doors and to ensure only 10 beds are present in each compartment of the care home. Bedrooms will also no longer be able to be shared and must have only one bed per bedroom.

Removal of self-closing door allowance costs

75. Costs for the removal of the fire door allowance were estimated by first taking the proportion of buildings with sprinklers that do not have self-closing bedroom doors from a PRP survey done on existing care homes. This figure then indicated the number of care homes impacted by the change in allowance, around 9%. From the 9% figure, it can be derived that 2 small care homes, 4 medium care homes and 7 large care homes per year would be affected by the guidance change.

76. The cost of a single self-closing device was estimated by MGAC and PRP as roughly £440. By multiplying this figure by the average number of bedrooms per care home, a total cost per home size was estimated:

Table 7: Number of additional self-closing devices and costs to install self-closing bedroom fire doors per building by care home size

Care Home Size	Additional self closing devices per building	Total gross cost per building
Small Care Homes (<10 beds)	5	£2,200
Mid Sized Care Homes (10-50 beds)	29	£12,800
Large Care Homes (>50 beds)	73	£32,100

77. Using these figures, total cost of installing self-closing devices can be calculated by multiplying each expected per-home cost by the number of care homes of each size that would be affected (9%). The resulting costs after being discounted over time are broken down by size of the care home indicated in the table below:

Table 8: Total costs of installing self closing fire doors across the observed period

Care home size	PV Costs
Small Care Homes (<10 beds)	£37,000
Mid Sized Care Homes (10-50 beds)	£430,000
Large Care Homes (>50 beds)	£1,800,000
Total	£2,200,000
Estimates may not sum up due to rounding	

78. On top of the cost to implement self-closing devices, there is a cost to maintain them each year. By multiplying the cumulative number of care homes without self-closing fire-doors in bedrooms and the annual cost to check and maintain devices and discounting over time, the total cumulative cost of self-closing device maintenance can be calculated.

79. The annual cost to maintain self-closing devices in a care home of a given size was taken from the same PRP designs as the figures for costs when implementing them. Scaling this yearly maintenance cost per device to the number of beds per care home gave an annual cost of around £7.50, £44 and £110 for each small, medium and large are home respectively. The table below gives the present value of cumulative maintenance costs by care home size:

Table 9: Total maintenance cost of self closing devices across observed period by care home size

Care home size	PV Costs
Small Care Homes (<10 beds)	£3,400
Mid Sized Care Homes (10-50 beds)	£39,000
Large Care Homes (>50 beds)	£160,000
Total	£200,000
Estimates may not sum up due to rounding	

80. When combined, the total present value of the cost of removing the self-closing door allowance from the guidance comes to roughly **£2.4m.**

Costs of removing the allowance on compartment size, through setting a 10 bed upper limit

81. By limiting the number of beds allowed in each compartment, care homes that are making use of the allowance will have to install additional cross-corridor fire doors. From the PRP survey, it was estimated that 47% of large buildings with sprinklers have compartments with more than 10 beds. Of these, the average compartment held 15 beds.

82. Based on designs from PRP, it is assumed small care homes would only need 1 compartment regardless of the guidance as they have fewer than 10 beds by definition. Medium care homes were also assumed to not be impacted as they had fewer than 30 beds per floor so a minimum of 3 compartments would be unchanged by a removal of the allowances. Therefore, only large care homes are assumed to be affected by requiring an additional 4 cross-corridor fire-doors per building.

83. MGAC cost consultants estimated the cost of a fire door at around £460. Using this estimate, the total cost of implementing fire doors was calculated by multiplying it by 4 and the number of large care homes that would be affected by the policy (47%).

84. The number of large care homes built per annum is estimated to be 78. Therefore, the number of sprinkler-fitted homes with compartment sizes over 10 beds under the counterfactual is roughly 37 built per annum. With a cost of roughly £1,850 per care home from the assumption of 4 fire doors being needed at around £460 each, the total cost per year therefore is £68,500. Due to the 6-month transition period, half of this number of annually affected care homes will be impacted in year 1, resulting in roughly 18 care homes reducing compartment sizes with no difference in cost. After discounting over time across a 10 year period, the present value of the policy cost is calculated to be £555,000 as indicated in the table below:

Table 10: Total cost across appraisal period of removing compartment size allowances

Number of additional fire doors provided per care home	Total cost per care home	Affected care homes per annum	Total cost per year of reduced compartment sizes	PV of policy cost over 10 year period
4	£1,854	18 in Year 1, 37 in steady state	£34,300 in Y1, £68,500 in steady state	£555,000

85. Cross-corridor fire-doors are assumed not to have an annual maintenance cost impact associated with them outside of maintenance which is typically performed on a care home that already has fire doors.

Removing the allowance for more than one bed per bedroom

86. This allowance removal has been estimated at a zero cost. Based off stakeholder engagement and discussions with industry, it is expected that no new build care homes would be expected to have shared rooms with more than one bed in a bedroom.

Total Costs

87. Totalling all the present value costs together gives a present value of **£91.5m**. The breakdown is provided in **Table 11** below.

Table 11: Present Value Cost by counterfactual and preferred policy option by cost type

Costs	Counterfactual Costs	Preferred Policy Option Costs	PV of Costs
Sprinkler system installation	£458.0m	£567.7m	£109.7m
Sprinkler system maintenance	£72.6m	£85.0m	£12.4m
Retrofitting sprinklers	£35.7m	£2.1m	-£33.6m
Familiarisation / Transition costs	£0.00m	£0.01m	£0.01m

Provision of self-closing doors	£25.6m	£28.0m	£2.4m
Set 10 bed limit on compartment sizes	£0.6m	£1.2m	£0.6m
Total	**£592.6m**	**£684.0m**	**£91.5m**

Non-monetised costs

88. No non-monetised costs for this policy have been identified as significant. There are potential wider impacts from the policy, see the relevant section below.

Monetised Benefits

89. Sprinklers in a building activate in the event of fire or smoke being present at a high enough degree that a detector is triggered. After they are activated, sprinklers across the entire system spray water to extinguish and prevent the spread of both fire and smoke within the building. By preventing the spread of fire, property damage and potential harm to people from heat exposure, smoke inhalation and structural failure are decreased. Sprinklers are only able to create these benefits to a certain degree of effectiveness however, therefore these incidents are not prevented entirely by the installation of a sprinkler system, only minimised to the extent of that system's capabilities. The effectiveness of a sprinkler system is based on a report from BRE[9], indicating a sprinkler system can:
    - Reduce the number of fatalities by 41%
    - Reduce the number of injuries by 12%
    - Reduce the amount of property damage by 94%

Valuing avoided property damage

90. Property damage in care homes that had sprinklers and in those without sprinklers can be compared to derive a monetised value of property that is protected by sprinkler implementation in minor and major fires.

91. These individual values of property damage were based on a combination of consultant estimates, BRE estimates on the effectiveness of sprinklers and further backed up by consultation responses. Major property damage was assumed to be an entire loss of a building. This value was estimated by taking an assumed build cost per bed of £133,900[10] and multiplying up to a 48-bed care home, coming to around £6.4m. Expected avoided average property damage in a 19-bed care home, when adjusted to 2023 prices, was £45,422[11].

Valuing avoided fatalities and injuries

92. It is expected that the provision of sprinklers will improve the fire safety of the care home by reducing the fire spread and likelihood of a fire in the building.

93. The value of prevented fatalities and injuries is taken from the DfT TAG Data Book[12] using 2023 prices and 2023 values. These values are:

---

[9] DCLG Compartment sizes etc Final Work Stream 5 Report BD 2887 (D27V1) 286859 VF1.docx (publishing.service.gov.uk), Table B7.

[10] 2022 value was £125,000 and adjusted to 2023 prices using a GDP deflator

[11] 2010 value was £33,600 and adjusted to 2023 prices using a GDP deflator
Sourced from a cost benefit analysis of residential sprinklers by the Wales Business Research Establishment on sprinkler effectiveness.

[12] DfT. (2022), WEBtag https://www.gov.uk/guidance/transport-analysis-guidance-tag#tag-data-book

- Value of prevented fatality: £2.6m.
- Value of prevented serious injury: £291,000
- Value of prevented minor injury: £22,000

94. The value of an injury is weighted to account for the average injury caused by a fire. It is assumed that only 20% of injuries would be considered to be serious[13], and 80% of injuries are expected to be minor. Weighting the two values together gives an average injury value of £77,000.

Valuing avoided relocations

95. After a fire occurs, a care home operator will have to relocate residents whilst any damage is repaired or suitable alternative care facility is arranged in the event of a major building loss which will cost them money and time to do. These relocation costs are monetised based on the weekly cost of a care home of around £380, and it is assumed that for an average fire, a resident is displaced for 5 weeks. For a fire that may have otherwise occurred in total building loss, it is estimated that displacement would last around half a year (26 weeks). The value of an avoided relocation is estimated at around £1,900 per resident for an average incident, and £9,800 per resident for a major incident or an avoided building loss.

Table 12: Summary of undiscounted value of avoided costs by type of incident

Value of avoided cost	Benefits (2023 Prices)
Average Property damage in care homes	£45,000
Major property damage or building loss	£6,400,000
Prevented fatality	£2,610,000
Prevented injury	£77,300
Avoided per resident relocation cost per fire involving average property damage	£1,900
Avoided per resident relocation cost per fire involving major property damage or building loss	£9,800

Likelihood of an incident and expected value

96. To calculate the expected present value of avoiding these costs, first the yearly probability of each event was calculated. Home Office statistics on the number of fires in care homes between 2012-2018 were used to calculate a yearly average of 388 incidents per annum[14]. This was then divided by the total number of care homes in England, around 15,000 and adjusted to an incidents per 1,000 care home figure of roughly 25.9 per year. By taking an average of the fatalities per incident between the years 2015-2021, the average number of fatalities per fire was calculated as 0.0016. The same process was used to calculate non-fatal casualties. Across the 388 incidents, only 1 building was completely lost meaning that the total building losses per fire came to 1 in every 388. The summary of these figures is given in the table below:

[13] CFOA (2012), prepared by BRE, Cost Benefit Analysis of Residential Sprinklers – Final Report. HOM00000005_BRE Final Report (for Chief Fire Officers Association)_Cost Benefit Analysis of residential sprinklers.pdf (grenfelltowerinquiry.org.uk)

[14] Detailed analysis of fires attended by fire and rescue services, England, April 2018 to March 2019 (publishing.service.gov.uk)

Table 13: Likelihood of fire and likelihood of incidents per fire per year

Type of event	Number of events on average	Number of events accounting for sprinkler effectiveness
Fires per 1000 care homes	**25.9**	**25.9**
Fatalities per fire	**0.0016**	**0.0010**
Non-Fatal Casualties per fire	**0.1465**	**0.1289**
Total building losses per fire	**0.0026**	**0.0002**

97. Multiplying the number of additionally sprinkler provisioned care homes each year by the total value and probability of fatalities, non-fatal injuries and minor and major property damage across the measured period, whilst accounting for the effectiveness of sprinklers in reducing these events, gives the gross expected benefit of the policy. The total present benefit of the policy is **£19.7m**, which is split by benefit in the table below.

Table 14: Total discounted value of avoided costs across 2025-2034 appraisal period

Avoided cost	Present Value for avoided costs
Property damage	**£12.9m**
Major property damage or building loss	**£4.7m**
Non-fatal injuries avoided	**£0.7m**
Fatalities avoided	**£0.8m**
Relocations avoided	**£0.6m**

98. This data in terms of number of incidents avoided is shown in the table below:

Table 15: Total number of avoided cost across 2025-2034 appraisal period

Avoided cost	Number of incidents avoided across measured period
Property damage	**687.3**
Major property damage or building loss	**1.8**
Non-fatal injuries avoided	**12.9**
Fatalities avoided	**0.5**
Relocations avoided (minor and major)	**416.3**

Non-monetised benefits

99. The implementation of sprinklers in care homes offers several non-monetised benefits.

100. Peace of mind and reduced stress contribute to overall well-being. Improvements in well-being are difficult to quantify as they will not impact people in a standard manner and cannot be directly observed.

101. In addition to the sense of security from having a sprinkler system, there is the avoided impacts on mental health from experiencing a more severe fire. Fires are traumatic experiences and have a lasting mental impact on people even if they lose no property and are physically unharmed. For those that do lose personal property, sentimental value can be

attached to possessions lost in a fire which is hard to quantify but can be extremely important to surviving victims.

102. The value of contents and personal possessions that avoided destruction is monetised in the case of a minor fire, however the analysis does not account for saved stock/contents in a major building loss. Due to the lack of available specific data on this and assumed insignificance of the monetary value of stock compared to the rebuild cost of a building, the avoided cost of lost contents was not included in the overall monetised benefits.

103. Business operation can be interrupted after a fire by more than just relocating displaced residents. Staff can quit, insurance processes can be lengthy and major or minor losses of property result in periods of time where regular business procedures are severely disrupted during the recruitment, investigation and re-construction process.

104. Additionally, there are significant reputational benefits. Enhanced fire safety can boost community confidence, attract residents, and elevate the care home's reputation as a socially responsible entity. As an employer, investing in safety infrastructure can improve staff morale and job satisfaction, as employees feel safer and more valued.

105. Removal of allowances also comes with difficult to monetise benefits. The peace of mind and wellbeing from having additional fire doors to slow down fire spread can improve residents' mental health as they know they will have more time to evacuate in the event of a fire. Self-closing doors and a limit on the number of beds per compartment will ensure the spread of a fire can be controlled more reliably, avoiding the need for action from residents to close doors appropriately, and the compartment limit can limit the impact a single fire can have on surrounding residents.

Total Net Present Value to Society

106. To find the Net Present Social Value (NPSV) of each policy option, as mentioned previously in the Impact Assessment, the costs and benefits faced by society in each policy scenario are compared to the counterfactual scenario where no changes are made and the difference in net cost/benefit is the policy's impact. The Equivalent Annual Net Direct Cost to Business (EANDCB) represents the yearly direct cost to businesses excluding any discounting. The Benefit to Cost Ratio (BCR) is simply the value of all monetised benefits divided by the value of all monetised costs.

107. The costs and benefits of the counterfactual have also been calculated. This reflects the current cost and benefits of sprinkler systems without government intervention under policy options 1 and 2, and represents the change in costs and benefits against if no new builds or extensions were to implement sprinkler systems.

108. **The preferred policy option 2 has a total cost and benefit of £684.0m and £135.3m respectively.** Under policy option 1, the total cost and benefit is £681.1m and £135.3m respectively. The cost is slightly higher under option 2, as it includes the cost of allowances, estimated at around £3.0m. The counterfactual has a total cost of £592.6m and a total benefit of £115.6m, suggesting a large proportion of the costs are already captured under the 'Do Nothing' option, compared to if no sprinklers were installed in any new builds. This is broken out further in *Table 16* below.

Table 16: Total Net Present Costs and Benefits to society, Equivalent annual net direct cost to businesses (EANDCB) and Benefit Cost Ratio, broken down by cost and benefit for counterfactual, policy option 1 and policy option 2. (Central scenario, discounted, 2023 prices)

		Counter factual	Policy Option 1	Policy Option 2 (Preferred)
Costs	Sprinkler system installation	£458.0m	£567.7m	£567.7m
	Sprinkler system maintenance	£72.6m	£85.0m	£85.0m
	Retrofitting sprinklers	£35.7m	£2.1m	£2.1m
	Familiarisation / Transition costs	£0.00m	£0.01m	£0.01m
	Provision of self-closing doors	£25.6m	£25.6m	£28.0m
	Set 10 bed limit on compartment sizes	£0.6m	£0.6m	£1.2m
	Total cost	**£592.6m**	**£681.1m**	**£684.0m**
Benefits	Avoided fatalities	£5.2m	£6.1m	£6.1m
	Avoided non-fatal casualties	£4.1m	£4.7m	£4.7m
	Reduced property damage incidents	£75.5m	£88.4m	£88.4m
	Avoided major property damage	£27.5m	£32.2m	£32.2m
	Avoided relocations	£3.3m	£3.9m	£3.9m
	Total benefit	**£115.6m**	**£135.3m**	**£135.3m**
Net	**Net Present Value to Society**	**-£476.9m**	**-£545.8m**	**-£548.8m**
	EANDCB	**£68.8m**	**£79.1m**	**£79.5m**
	Benefit Cost Ratio to Society	**0.20**	**0.20**	**0.20**

109. **After accounting for counterfactual net cost, the preferred policy option's additional expected impact has an NPSV of -£71.8m. The EANDCB of the preferred option is therefore £10.6m and the BCR came to 0.21** which is broadly consistent with the other policy options, with the cost being marginally higher from the additional allowances.

110. The impact of each of the policy options after counterfactual is removed are indicated in ***Table 17*** below:

Table 17: Additional net present value to business and society compared to counterfactual, broken down by cost and benefit for policy option 1 and policy option 2. (central scenario, discounted, 2023 prices)

Policy Option 1	Policy Option 2 (Preferred)

Costs	Sprinkler system installation	£109.7m	£109.7m
	Sprinkler system maintenance	£12.4m	£12.4m
	Retrofitting sprinklers	-£33.6m	-£33.6m
	Familiarisation / Transition costs	£0.01m	£0.01m
	Provision of self-closing doors	£0.0m	£2.4m
	Set 10 bed limit on compartment sizes	£0.0m	£0.6m
	Total cost	£88.5m	£91.5m
Benefits	Avoided fatalities	£0.8m	£0.8m
	Avoided non-fatal casualties	£0.7m	£0.7m
	Reduced property damage incidents	£12.9m	£12.9m
	Avoided major property damage	£4.7m	£4.7m
	Avoided relocations	£0.6m	£0.6m
	Total benefit	£19.7m	£19.7m
Net	**Net Present Value to Society**	**-£68.8m**	**-£71.8m**
	EANDCB	**£10.3m**	**£10.6m**
	Benefit Cost Ratio to Society	**0.22**	**0.21**

Sensitivity analysis

111. Sensitivities around various assumptions have been assessed to find a best case and worst-case net present value. This includes:

- Installation and maintenance costs vary by +/-30% to account for uncertainty in sprinkler cost estimates.
- Costs for removing allowances on provision of self-closing doors and setting a limit on compartment sizes will also vary by +/-30% in overall cost, to account for uncertainty in the proportion of care homes that need to account for these, as well as cost variation in components for fire doors and self-closing devices.
- The effectiveness of sprinklers to prevent injury, fatality, and property damage vary in line with the confidence intervals from the BRE used for estimating the effectiveness of a sprinkler[15]. These intervals are:
    - Reducing the number of fatalities: 41% with low/high sensitivities of +/- 33ppt.
    - Reducing the number of injuries: 12% with low/high sensitivities of +/- 19ppt.[16]
    - Reducing the amount of property damage by 94%, with low/high sensitivities of +3ppt.

[15] BRE (2015), prepared for DCLG, Compartment sies, resistance to fire and fire safety project, Workstream 5 – Sprinkler provisions. Table B7 – Estimated Sprinkler effectiveness in different building types for a four-year period (2009/10 to 20212/13) (IRS data) DCLG Compartment sizes etc Final Work Stream 5 Report BD 2887 (D27V1) 286859 VF1.docx (publishing.service.gov.uk)

[16] Given the 19ppt confidence interval and the 12% central estimate, under the low scenario, the effectiveness for reducing injuries is estimated at 0%.

- The avoided cost of relocation varies with the amount of time expected to be spent in a different care home during repairs, these variations are:
    - Reduced duration of relocation due to sprinklers in an average fire: 5 weeks, varying from 1 to 10 weeks for the low/high sensitivities.
    - Reduced duration of relocation due to sprinklers in a fire that would've otherwise caused total building loss: 26 weeks, varying from 12 to 52 weeks for the low/high sensitivities.

112. The sensitivity analysis around the preferred policy option suggests that the net present cost to society will vary by around +/-£30m. **Compared to the central NPV scenario of -£71.8m under the preferred option. Under the Low NPV and High NPV scenarios, the net present cost to society will be around -£101.6m and -£40.8m respectively. Compared to the central EANDCB of £10.6m and BCR of 0.21, the EANDCB falls to £7.4m under the High NPV scenario and £13.8m under the low NPV scenario, and the BCR changes to 0.15 and 0.36 respectively.**

Table 18: Additional net cost to business and society compared to counterfactual, broken down by cost and benefit for the Preferred Policy Option 2 and all sensitivity scenarios, (2023 prices, 10 year appraisal period).

		Central scenario	Low NPV scenario	High NPV scenario
Present Costs	Sprinkler system installation	£109.7m	£142.6m	£76.8m
	Sprinkler system maintenance	£12.4m	£16.1m	£8.7m
	Retrofitting sprinklers	-£33.6m	-£43.7m	-£23.5m
	Familiarisation / Transition costs	£0.01m	£0.01m	£0.01m
	Provision of self-closing doors	£2.4m	£3.2m	£1.7m
	Set 10 bed limit on compartment sizes	£0.6m	£0.7m	£0.4m
	Total cost (discounted)	£91.5m	£118.9m	£64.0m
Present Benefits	Avoided fatalities	£0.8m	£0.2m	£1.5m
	Avoided non-fatal casualties	£0.7m	£0.0m	£1.7m
	Reduced property damage incidents	£12.9m	£12.5m	£13.3m
	Avoided major property damage	£4.7m	£4.6m	£4.9m
	Avoided relocations	£0.6m	£0.1m	£1.9m
	Total benefit (discounted)	£19.7m	£17.3m	£23.3m
Net	**Net cost to business / society**	**-£71.8m**	**-£101.6m**	**-£40.8m**
	EANDCB	**£10.6m**	**£13.8m**	**£7.4m**
	Benefit Cost Ratio to Society	**0.21**	**0.15**	**0.36**

Figures above are provided in 2023 prices and in present value, based on an appraisal period of 2025-2034.

The high NPV scenario represents low installation and maintenance costs and high effectiveness of sprinklers and vice versa for the Low NPV scenario.

113. Applying the same sensitivity for Policy Option 1 returns similar estimates except with the cost of allowances removed. The sensitivity analysis around the Policy Option 1 similarly suggests that the net present cost to society will vary by around +/-£30m. **Compared to the central NPV scenario of -£68.8m under the preferred option. Under the Low NPV and High NPV scenarios, the net present cost to society will be around -£97.7m and -£38.7m respectively. Compared to the central EANDCB of £10.3m and BCR of 0.22, the EANDCB falls to £7.2m under the High NPV scenario and £13.4m under the low NPV scenario, and the BCR changes to 0.15 and 0.38 respectively.**

Table 19: Additional net cost to business and society compared to counterfactual, broken down by cost and benefit for the Policy Option 1 and all sensitivity scenarios, (2023 prices, 10 year appraisal period).

		Central scenario	Low NPV scenario	High NPV scenario
Present Costs	Sprinkler system installation	£109.7m	£142.6m	£76.8m
	Sprinkler system maintenance	£12.4m	£16.1m	£8.7m
	Retrofitting sprinklers	-£33.6m	-£43.7m	-£23.5m
	Familiarisation / Transition costs	£0.01m	£0.01m	£0.01m
	Provision of self-closing doors	£0.0m	£0.0m	£0.0m
	Set 10 bed limit on compartment sizes	£0.0m	£0.0m	£0.0m
	Total cost (discounted)	£88.5m	£115.0m	£62.0m
Present Benefits	Avoided fatalities	£0.8m	£0.2m	£1.5m
	Avoided non-fatal casualties	£0.7m	£0.0m	£1.7m
	Reduced property damage incidents	£12.9m	£12.5m	£13.3m
	Avoided major property damage	£4.7m	£4.6m	£4.9m
	Avoided relocations	£0.6m	£0.1m	£1.9m
	Total benefit (discounted)	£19.7m	£17.3m	£23.3m
Net	**Net cost to business / society**	**-£68.8m**	**-£97.7m**	**-£38.7m**
	EANDCB	**£10.3m**	**£13.4m**	**£7.2m**
	Benefit Cost Ratio to Society	**0.22**	**0.15**	**0.38**

Figures above are provided in 2023 prices and in present value, based on an appraisal period of 2025-2034.

The high NPV scenario represents low installation and maintenance costs and high effectiveness of sprinklers and vice versa for the Low NPV scenario.

Switching analysis

114. The non-monetised benefits above have not been estimated due to limited evidence or data to base this on. The most significant non-monetised benefit is expected to be the improved wellbeing of residents and family members through reduced fear of future fires. This particularly applies to residents that are unable to self-evacuate in the event of a fire. This can also be inferred as a willingness to pay as well by residents for the inclusion of a sprinkler or the allowances.

115. Green Book guidance recommends using a Wellbeing Adjusted Life Year, or WELLBY, to understand the value of wellbeing per year per person. Life satisfaction can be expressed on a 0 to 10 scale. This value represents a one-point change in life satisfaction for one year. The value of a one-point change in a wellbeing adjusted life year per person is valued at £13,000 in 2019 prices and values[17].

116. The number of residents in a care home is assumed to be the same as the number of beds in a care home, and the rate of care home occupancy is estimated at 90%[18]. The average number of residents in care homes with a sprinkler per year is calculated. To reach a switching value, a proportion of a WELLBY per resident is estimated to reach the same net costs of the policy.

Care Homes

117. To account for this, a switching value has been calculated to show the level of improvement in wellbeing of care home residents required for the provision of sprinklers in care homes to be cost neutral.

118. **Under the central estimate, this shows that an increase in life satisfaction of approximately 0.0163 points per resident each year would be needed for Policy Option 1 (sprinkler systems in new care homes) to be cost neutral, equivalent to around £212 annually per resident, or £4.08 per week per resident.** For the high and low NPV scenarios, a life satisfaction increase of around 0.0092 points or 0.0231 points would be needed, equivalent to around £120/year and £300/year per resident per year respectively.

Allowances

119. The same wellbeing improvements can be applied for the two allowances, to remove the allowances for self-closing doors, and to set an upper limit on the number of beds per compartment in a care home to 10. Given the additional cost of these policies is drastically lower than the cost of sprinklers, and will effect a different number of care homes and residents, these estimates have been broken down separately.

[17] This value has not been uplifted to 2023 prices for simplicity. Source: HMT (2021), Wellbeing_guidance_for_appraisal_-_supplementary_Green_Book_guidance.pdf (publishing.service.gov.uk).

[18] CMA (2017), Care homes market study: final report (publishing.service.gov.uk)

120. **For the removal of the allowances of self-closing doors, this shows that an increase in wellbeing of approximately 0.0014 points per resident each year would be needed for the policy to be cost neutral, equivalent to around £18 annually per resident.** For the high and low NPV scenarios, a life satisfaction increase of around 0.0010 points or 0.0019 points would be needed, equivalent to around £13/year and £25/year per resident per year respectively.

121. **Setting the upper limit of care home beds to 10 per compartment would require a wellbeing improvement of 0.0001 points per resident each year. This would be equivalent to around £1 annually per resident.** This value is the same for both the low and high NPV scenarios.

122. **In total, for the preferred Policy Option 2, the provision of sprinkler systems in new care homes and the removal of allowances would need an increase in life satisfaction of around 0.0178 points would be needed, or the equivalent of around £231 annually per resident under the central scenario, or £4.45 per week per resident.** For the high and low NPV scenarios, a life satisfaction increase of around 0.0103 points or 0.0251 points would be needed, equivalent to around £134/year and £326/year per resident per year respectively.

Costs and benefits to business calculations

123. All costs of this policy are assumed to effect care home providers. No passthrough of costs is expected to go to residents. The proportion of local authority costs compared to businesses could also not be identified. In 2019, it is suggested that around 3% of care homes were owned by local authorities[19], however the proportion of new build care homes funded or owned by local authorities each year is unknown. This assessment therefore does not monetise the cost to local authorities or the public sector.

124. The total direct cost of implementing the preferred option for businesses is expected to be total sum of monetised costs. It is not expected that any benefits will directly impact businesses. This is because avoided property damage, and avoided relocation benefits (as insurers or the care home provider will relocate the resident) are expected to be an indirect benefit to businesses, where a fire must occur before it can benefit a business.

125. **Therefore, the total direct cost to business in present value terms expected to be -£91.6m under the preferred option. The equivalent annual net direct cost to business is expected to be £10.6m.**

126. **The Business Net Present Value will include both indirect and direct costs and benefits. As above, it is expected that avoided property damage (including average damage and building loss) and avoided relocations will benefit businesses, adding an additional benefit of £18.2m altogether. Therefore, the BNPV is -£73.4m.**

Impact on small and micro businesses

127. It is important to distinguish between small and micro enterprises (SMBs) and small care homes. The business that owns or runs a small care home may be a large provider that

[19] IPPR (2019), Who Cares? The Financialisation of Adult Social Care who-cares-financialisation-in-social-care-2.pdf (svdcdn.com)

has a wider portfolio of developments which runs a wide range of care homes and extra care facilities but is itself a large business. It is therefore difficult to isolate the impact on SMBs compared to medium and large businesses.

128. Barriers to entry in the care sector might be increased if the base capital requirement to build a care home is increased by the added cost of installing a sprinkler system. Small and micro businesses may have reduced financial capital to develop a new build. If the additional cost burden of a sprinkler system reduces viability for SMBs within the care sector, there is a risk of greater market concentration into a lower number of incumbent businesses who can obtain the necessary resources for building and purchasing care homes with sprinkler systems, which can further reduce choice for residents in a sector where proximity to family members can take precedence.

129. This can be derived from the data showing that half of all new build small care homes of less than 10 beds do not install sprinklers whilst a majority of mid-sized (10-50 beds) and large (>50 beds) care homes install sprinklers. This suggests that sprinklers in smaller care homes are not perceived as economical, implying that small contracts typically reserved for smaller developments will decrease in number from the added costs resulting in a disproportionate impact on SMBs. By subsidising SMB care providers and developers' sprinkler implementation process, this disproportionate impact can be minimised and the establishment of more SMBs can be cultivated.

130. There is difficulty exempting SMBs as the overall purpose of the policy is to prevent fires and ensure a sufficient standard of safety in care facilities, leaving little room for exempting certain homes from this standard based on their size, especially if a SMB is developing or running a large care home as a significant number of lives may be affected by the lack of sprinklers. In this way, it may be easier to exempt small care homes from the policy under the assumption that SMBs are more likely to be involved in their construction than large homes and that it is less economically viable to install sprinklers in homes of this size.

Costs and benefits to households' calculations

131. The direct costs to households are estimated to be zero since all of the costs of the policy are assumed to fall to businesses. Within this impact assessment, costs are not assumed to be passed on to residents, however limited scope for care home providers with excess profits or regional monopolies may cause providers to do so. Demand for care homes can be considered inelastic as the services provided by homes are often essential to vulnerable residents. Therefore, care home operators could increase prices whilst retaining their residents. However, there is no explicit evidence to say that these costs will be passed on to resident, hence no passthrough is assumed.

132. Similar to the direct benefits for businesses, it is not expected that any benefits will directly impact households. **Therefore, the EANDCH is expected to be zero.**

133. **The Household Net Present Value will include both indirect and direct costs and benefits. Households are expected to benefit through avoided fatalities and injuries, adding an additional benefit of around £0.8m and £0.6m respectively. Therefore, the HNPV is £1.3m[20].**

[20] Figures do not sum due to rounding.

Business environment

134. This policy is not expected to have a significant negative impact on innovation, supply chains, barriers to entry or trade of goods between NI and GB. There may be some minor impacts to attractiveness of investment which are highlighted below.

135. The higher costs associated with constructing and maintaining care homes negatively impact the profitability of such investments. This strain affects Local Authority funding of care homes and residents and may disincentivise private investment.

136. Overall, the impact on the business environment and attractiveness to the care homes market is expected to be minor. The capital costs of a sprinkler system and self-closing doors and compartment size changes are expected to be around 5% of a typical care home capital cost, and 2% in additional maintenance costs. This policy is also not expected to impact a large proportion of the new care home sector which are anticipated to already install sprinkler systems.

137. Although the number of new builds is not assumed to decrease in the monetised costs and benefits analysis. The higher costs may decrease the provision of care homes due to increased entry barriers. If small care homes become unprofitable, access to care in these high-density, low-space areas will be limited. Additionally, small developments in remote areas may become less common or more expensive, inhibiting consumer and investor choices, potentially harming both inhabitant well-being and investor confidence.

138. The impact on the private business environment is expected to be minorly negative. It is expected that a large proportion of new builds are already implementing sprinklers. The addition of sprinkler systems and allowances will only have a cost impact of 5.5% of the capital cost, and additional maintenance cost of 1.5% for a new build care home. Therefore, the change will only impact a minority of care homes by a low amount, hence the minor negative impact to private business

139. Companies insuring care homes may benefit from increased safety and reduced risk, leading to fewer claims.

140. Smaller and more rural care homes may feel the negative impact more acutely, as the costs of implementing sprinklers will be slightly larger compared to large care homes and care homes in urban or suburban areas.

Trade implications

141. This policy change is not expected to have significant impact to international trade. A qualitative assessment has been provided below.

142. Implementation of the preferred policy change may lead to the import of more sprinkler system components. Greater safety measures protecting care homes from fire damage and major property damage or building loss could encourage private investment into the UK care sector since there is a lower likelihood of losing the investment and having to rehome tenants of care facilities. Furthermore, investors often seek stable environments when choosing where to invest so a more regulated, low insurance country may be more attractive. Alternatively, the greater up-front costs of construction and the high retrofit costs may discourage investors due to the lesser yield and profitability of their investment.

Environment: Natural capital impact and decarbonisation

143. The environmental impact of the policy options is likely to be limited. The provision of a sprinkler system can reduce the spread of a fire and therefore could reduce the amount of CO2 emissions that occur due to a fire. However, this impact could be mitigated by water damage or the additional usage of water compared to a care home without a sprinkler system.

Other wider impacts (consider the impacts of your proposals)

144. This policy is to have some wider impacts, particularly for low income residents.

Low-income care home residents

145. The provision of a sprinkler system will introduce an additional cost to care home providers, which may be passed onto residents of a care home. Where competition could typically reduce the ability of care homes to pass the cost on to residents, there may be limitations such as regional monopolies where residents or families cannot choose an alternative care home nearby to them. Therefore, this policy could impact the ability for low income residents or families to afford appropriate care.

146. To mitigate this, funding is available for low income residents through local authorities[21], though this may increase the burden to local authorities without additional funding.

Risks and assumptions

Counterfactual assumptions

147. Part of the NPSV calculations includes assumptions on the proportion of care homes that fitted sprinklers or needed to retrofit them which was informed by consultant assumptions and a survey of care homes in England. Using a survey like this comes with a risk of collection bias. The survey received a large number of participating homes from London and Cornwall. This increased significance of two regions of the country specifically may skew the assumed proportions of new builds or care home extensions that would or wouldn't implement sprinklers. Changes in these figures would impact every year across the observed period which could have a large effect on the final NPV of each policy option.

148. Primary research was also undertaken to collect information of the number of care homes that make use of the existing allowances in ADB which carries the same risk of collection bias.

149. It was assumed that there was a 10-year policy period during which sprinklers are installed and then each system would have a lifetime of 60 years. This was altered to coincide with the lifetime of the building as the most common sprinkler systems quote a minimum 50-

[21] Source: NHS, Accessed 30th July 2024, When the council might pay for your social care - Social care and support guide - NHS (www.nhs.uk)

year lifespan. A shorter lifespan may reduce the benefit of the policy or misrepresent the costs in the analysis, but is unlikely to affect the overall result.

Other Assumptions

150. The data and assumptions used in the analysis have been sourced from a variety of sources including the Adroit Consortium – industry experts including Adroit Economics, PRP Architects and MGAC cost consultants, and planning datasets and other published sources.

151. Each assumption used in the model and subsequent analysis has been outlined below and divided into four categories; the assumption itself, its scope, the year it was collected, and the quality of the information informing it. The most important category is Evidence Quality, with each assumption given a rating ranging from low to high:

High	Published data from a respectable statistical authority e.g., ONS
Medium	Internal data from within MHCLG, Adroit etc.
Low	All other data not published, from internal databases, or judgement calls

152. The scale of the risk of errors or bias in the evidence is summarised in the Impact Risk column. Lower quality evidence and assumptions have a higher likelihood of being inaccurate and the Impact Risk represents how severely this could change the CBA results in the event of inaccuracy. The key for this column is as below:

High	Degree of uncertainty/scale of impact is significant on results of analysis
Medium	Uncertainty/Scale of impact is moderately significant on analysis results
Low	Uncertainty/Scale has a low impact on results of analysis

Table 20: Assumptions in CBA by scope, date, quality and scale of impact

Assumption	Scope	Timing	Evidence Quality	Impact Risk
Counterfactual - New Build - % of new care homes installing sprinkler per annum	Consultants assumption – based on PRP industry experience of designing new care homes.	2024	Small – Low Medium – Low Large - Medium The level of counterfactual sprinkler installations is not reported in published documents - the assumption is based on PRP industry knowledge of new build schemes, although this is	High The counterfactual assumptions have a significant impact on the net cost of the policy, particularly the assumed % not installing sprinklers

			skewed towards larger schemes	
Counterfactual - Extensions - % of care home extension including sprinkler installations per annum	Consultants assumption – same % installing sprinklers in extensions as for new build by size band. PRP have more limited experience of designing care home extensions compared to new buildings	2024	Low The level of counterfactual sprinkler installations is not reported in published documents - the assumption is based on PRP industry knowledge although this is skewed towards larger new build schemes	High The counterfactual assumptions have a significant impact on the net cost of the policy, particularly the assumed % not installing sprinklers
Counterfactual - % of existing care homes instructed to retrofit sprinklers by insurers/fire service p.a. (assume higher specification 2021-Cat3)	Consultants assumption based on enquiries from clients who have had a requirement to retrofit.	2024	Medium The anecdotal evidence suggests a small number of existing care homes are being instructed to retrofit. However, there is no publish data to inform the analysis.	Medium impacts on the potential cost of the counterfactual - as assumes a more costly retrofit of sprinklers than would have been incurred at new build
Policy Option	Assume 100% compliance with the policy	2024	High	Low Proposed policy
Effectiveness of Sprinklers – preventing damage, fatalities, and injuries	BRE 2015 report on the effectiveness of sprinklers[22]. This report identifies a range in effectiveness of sprinklers at preventing damage and casualties in the event of a fire.	2015	High The data from reports on effectiveness of sprinklers is dated but appears to be based on robust research – no evidence to suggest sprinkler effectiveness has changed	Low Proposed policy

[22] Efficiency_and_Effectiveness_of_Sprinkler_Systems_in_the_United_Kingdom-Supplementary_Report-1.pdf (nfcc.org.uk)
Optimal_Sprinkler_Report.pdf (nfcc.org.uk)
DCLG Compartment sizes etc Final Work Stream 5 Report BD 2887 (D27V1) 286859 VF1.docx (publishing.service.gov.uk)

Table B7

Avoided costs - Average Property damage in care homes (19 bed care home)	Data taken from the BRE report – this estimate is based on a Home Office report on the economic cost of fire – the costs used are calculated from the repair costs for the area of building typically damaged in a fire	2012	Medium The data from the cost of property damage is based on published data, although does not appear to be specific costs for a care home so the area of fire damage and average repair costs are based on averages across building types	Medium The assumptions of the effectiveness of sprinklers at reducing injuries and fatalities is the most uncertain, but there are a relatively low number of casualties per annum, so the scale of impact is limited
Avoided costs - Major Property damage in care homes (39 bed care home)	Consultants assumption – based on an average rebuilding cost of £125,000 per bed	2024	Medium Based on a high level estimate of the cost of rebuilding a care home based on care home new build projects	Medium The value would have to be much higher to have a significant impact on the results, but avoided property damage represents two-thirds of total benefits – so any change to the value will affect the benefits assessment
Value of prevented fatality	Data on value of a prevented fatality based on data used across regulatory impact appraisals	2013	High standard values/data sources used for appraisal	Medium The analysis estimates that there will be small number of whole building losses avoided - so the cost impact should not have a major impact on assessment
Value of prevented injury	Value of an injury in a care home fire is based on weighting DfT WEBTAG values for serious (20%) and minor (80%) injuries	2013	High standard values/data sources used for appraisal	Low standard values used for appraisal

Avoided relocation costs – property damage	Estimates using data on weekly care home costs and assumptions about number of persons and duration of relocation and proportion of costs that are additional as a result of a relocation	2024	Medium Assumptions about the proportion of care costs avoided and duration of relocation are based on consultants assumptions.	Low standard values used for appraisal
Avoided relocation costs – major fire	Estimates using data on weekly care home costs and assumptions about number of persons and duration of relocation and proportion of costs that are additional as a result of a relocation	2024	Medium Assumptions about the proportion of care costs avoided and duration of relocation are based on consultants assumptions.	Low relatively small numbers involved, so will not have significant impact on assessment
Proportion of care homes impacted by removal of compartment size allowance	Assumption that only 47% of large care homes would be impacted due to small/medium care homes not having sufficient floor sizes to warrant additional horizontal cross-corridor fire doors after the policy change.	2024	Estimates taken from a survey of existing care homes by PRP and analysis of new care home registrations between 2018-2021. Care home layout assumptions based on designs by PRP	Low relatively small numbers involved, so will not have significant impact on assessment