

RESEARCH ARTICLE

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Evaluating the communication within fire and rescue services and the NHS on the fire risk of emollients in accordance of the MHRA safety update

Kirsty J. Blackburn¹ | Joanne Morrissey¹ | Claire L. Tabert² | Sarah W. Hall³ 

¹School of Life Sciences, Anglia Ruskin University, Cambridge, UK

²Prevention team, West Yorkshire Fire and Rescue Services, Leeds, UK

³Leicester School of Pharmacy, De Montfort University, Leicester, UK

Correspondence

Sarah W. Hall, Leicester School of Pharmacy, De Montfort University, Gateway House, LE1 9BH Leicester, UK.

Email: sarah.hall@dmu.ac.uk

SUMMARY

The Medicines and Healthcare products Regulatory Agency update in 2018 reported 50 fatal fires linked with emollient use. It detailed the fire risk and new advice aimed at fire service and health care professionals in reporting of such fire incidents and educating the public on safer use of emollients. This study investigates how this has been communicated internally and publicly, with 52 Fire and Rescue Services (FRSs) websites and, 191 Clinical Commissioning Groups (CCGs), and 21 Local Health Boards (LHBs) formularies accessed. A Freedom of Information Request (FOIR) was also made, giving further details of implementations. Our study revealed that 63% of FRSs, 32% of CCGs and, 72% of LHBs gave no safety advice within their website or formularies. Of the 37% of FRSs and 68% of CCGs that did, only 5% and 4% were sufficiently up to date. 27% of FRSs and 28% of CCGs/LHBs revealed that they had no warning/advice internally in their FOIR responses and 25% of FRSs and, 35% of CCG/LHBs had not disseminated advice on using emollient safely to the public. We suggest improvements in safety campaigns using a multiagency and national approach and recommend organizations to educate professionals to improve reporting and effective dissemination.

KEYWORDS

communication, emollient flammability, fire risk, MHRA, prevention, safety advice

1 | INTRODUCTION

In 2008, the National Patient Safety Agency (NPSA) issued a warning about the possible flammability of bandages and other material when impregnated with emollient products, based on 50% paraffin content or above.¹ A recent Freedom of Information Request (FOIR) from the British Broadcasting Corporation (BBC) described 37 fire deaths linked to the use of skin emollients in the United Kingdom (UK) from 2010 to 2017.² The Medicines and Healthcare products Regulatory Agency (MHRA) in 2018 subsequently described 50 fire deaths involving the use of emollients.³ However, the number of fatalities is thought to be higher, owing to underreporting and the lack of awareness within the Fire and

Rescue Services⁴ and healthcare professionals and, among patients.⁵ This is despite the MHRA report, which in part targeted such organizations and other editorials and articles trying to highlight similar concerns on the flammability of skin care products when dried into fabrics and clothing.^{6–9} There have also been several media accounts^{2,10,11} and coroners' reports describing the possible acceleration of fires by emollients, with the victims usually elderly smokers with reduced mobility.^{12–17} The coroner's reports state that there is an increased risk of fire when emollients are soaked into clothing and bedding and recommend that more information should be available to patients and healthcare professionals.

The MHRA publication³ requested any fire incidents linked with emollient use to be reported using their yellow card scheme.

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This triggered, the National Fire Chiefs Council to provide links to the MHRA advice for use by the Fire and Rescue Services and for public communication. The MHRA also provided healthcare professionals with advice on prescribing skin emollient products and how the information should be delivered to patients.

The recent message from the MHRA is not to stop or deter people from using medication, but to help people to use such products in a safer way. Currently, the MHRA are recommending that labeling and product information for emollients should include a warning about their fire risk.³ Their previous guidance only related to products with a paraffin content of 50% or greater but has now changed to include low paraffin content and paraffin free products based on flammability tests.¹⁸ The study showed that the mean ignition time is reduced from 60 seconds for blank cotton sheeting to under 10 seconds when contaminated with a 27.1% paraffin base cream (14.5% white soft paraffin/12.6% light liquid) and left to dry for 24 hours, using an indirect flame. The vertical flammability tests also showed quicker ignition times of polyester and cotton blend sheeting, reducing from 336 to 13 seconds with the same emollient present and dried for 24 hours. These large reduction in ignition times could have an impact on the possibility for a person to react quickly enough to remove ignited clothing or bedding especially if elderly or immobile. This also raises concerns about impregnated bed sheets, surgical dressings, gowns or night wear made of blended fabrics, such as those used in hospitals or care homes. Blended fabrics exhibit inherent flame-retardant characteristics, but these results suggest that using such fabrics for bedding may not mitigate the risk, as proposed in research based on oil based contaminated flame-retardant materials.¹⁹

It is crucial that the appropriate warnings and cautions are communicated effectively to the public and within organizations, especially in view of the wide use and variety of such products. In 2018, General Practitioners (GPs) in England prescribed over 10.5 million individual items of emollient and barrier preparations; worth over £70 million.²⁰ Additionally, over-the-counter purchases of these preparations' accounts for an industry worth over £2.2 billion.²¹

A study has not yet been carried out on how and if these new warnings are being distributed within relevant service professions and subsequently communicated to the public. Therefore, here, we describe and measure the response to the MHRA guidance on the updated safety advice and dissemination by public bodies regulating large sectors of the relevant professional community including the Fire and Rescue Services, Clinical Commissioning Groups and Local Health Boards.

2 | METHODS

2.1 | Data collection from websites and freedom of information requests

Fifty-two FRs were identified from the National Fire Chiefs Council (NFCC) website²² and 191 CCGs (England), and 21 LHBs (Scotland and Wales) using the NHS website²³⁻²⁵ and included in this study. The overall website search of FRs and CCGs/LHBs for advice on the safe use of emollients and assessing the quality and currency was

carried out between May 20 and July 04, 2019. Within the FRs websites, the search word "emollients," "cream," and then "moisturiser" was used in the homepage search bar and then the relevant results navigated to. For the homepage of CCGs and LHBs, links to the formulary or prescribing guidelines were navigated to and any warnings were searched for. If the formulary or prescribing guideline could not be found, or obvious, a search for "formulary," "emollient," "cream," and then "moisturiser" was carried out. In the case of CCGs that used a joint formulary, this was also recorded.

A FOIR was emailed to 51 FRs and all 191 CCGs, 14 Scottish LHBs and, 7 Welsh LHBs (that were accountable under the UK's Freedom of Information Act 2000) on the August 13, 2019, with responses collated on September 24, 2019. The request consisted of four questions based upon the 2018 MHRA report on emollient flammability:

1. Has this information provided by the MHRA been implemented across your "organisation" to advise staff?
2. How has this been implemented? Please also provide details of any future intentions.
3. Has this information provided by the MHRA been implemented across your "organisation" to advise the public on how to use emollient skin products safely?
4. How has this been implemented? Please also provide details of any future intentions.

2.2 | System of scoring the quality of recommended fire warnings and advice from websites

The parameters used to assess the quality of warning were based upon the current MHRA published report mirrored by published information on the NFCC website²² and the British National Formulary.²⁶ The quality of warning and advice on emollients was scored using the parameters in Table 1. The number of links on all the websites where the information was found was also recorded and for FRs, whether the information was directed more to the public or to carers was also recorded.

2.3 | Analysis

All the findings (from websites and through the FOIR) and scorings were recorded in an Excel spreadsheet and summarized in Tables 2 and 3, with Supporting Information containing further details on the FOIR responses. The resulting levels of warning and corresponding color code were also presented on a map of Great Britain using QGIS software (V 3.6.2) and data from Ordnance Survey.²⁷ Also recorded on the maps are the fatalities linked with emollient use that have been reported by the MHRA. For the FRs, the level of warning is represented in counties as shown in Figure 1. For the CCGs in England, the scores were applied to each and then averaged and organized into their corresponding counties of England and represented with the LHBs for Scotland and Wales in Figure 2.

TABLE 1 Scoring parameters and the corresponding scoring level and color coding for the available emollient fire warnings and advice within FRS websites and CCGs/LHBs formularies

Parameter of scoring	Scoring level and color coding ^a
Warning includes paraffin emollients.	Green (4) all parameters
Warning also includes non-paraffin emollients.	Yellow (3) 4-5 of the parameters
Good explanation of the flammability danger, including dangers of emollients soaked into clothing.	Orange (2) 2-3 of the parameters
Gives warnings on the ignition sources for example, naked flame, cigarettes etc.	Red (1) 0-2 of the parameters
Details advice on the washing of clothing and that it may not completely remove residue.	Grey (0) no formulary available or link broken
Includes link to up to date (2018) MHRA advice	

Abbreviations: CCG, Clinical Commissioning Groups; FRS, Fire and Rescue Service; LHBs, Local Health Boards; MHRA, Medicines and Healthcare products Regulatory Agency.

^aShown in Figures 1 and 2.

TABLE 2 Summary of emollient safety advice on Fire and Rescue Services websites in England, Scotland, and Wales

Information available on website	Fire and Rescue Services					
	in England		in Scotland		in Wales	
	%	Number	%	Number	%	Number
No warning on FRS website	63	30	100	1	100	3
Warning on FRS website	38	18	0	0	0	0
Warning directed toward the public	61 [*]	11	0	0	0	0
Warning directed toward carers	39 [*]	7	0	0	0	0
Warning via link to 2018 MHRA publication	11 [*]	2	0	0	0	0
Warning to out of date MHRA publication	17 [*]	3	0	0	0	0
Quality of warning	n = 18					
Just on paraffin base emollients	83	15	0	0	0	0
Include paraffin free base emollients	17	3	0	0	0	0
Explanation of impregnation into fabrics	94	17	0	0	0	0
Ignition source warning	94	17	0	0	0	0
Advice on laundering	39	7	0	0	0	0
Warning level score	n = 48					
4 (green)	4	2	0		0	
3 (yellow)	8	4	0		0	
2 (orange)	23	11	0		0	
1 (red)	65	31	100	1	100	3
Range of number of links to the warning		2-6		0		0
Average number of links to warning		3		0		0

Note: England = 48 FRS (8 regions + London); Scotland = 1 FRS and Wales = 3 FRS ^{*}n = 18.

Abbreviations: FRS, Fire and Rescue Service; MHRA, Medicines and Healthcare products Regulatory Agency.

3 | RESULTS

3.1 | Fire and rescue services emollient safety advice on websites

Table 2 and Figure 1 show that across Great Britain (n = 52), 67% of FRSs were given a warning level of 1 with either insufficient warnings or no warnings at all (red) in place. 21% had a warning level of 2 (orange); 8% a warning level of 3 (yellow), and only 4% of the FRSs

had good warnings (green) in place within their websites similar to the MHRA recommendations.

The maps (Figures 1 and 2) include the number of recorded fatalities linked with skin emollient use and the corresponding counties in Great Britain. Figure 1 shows a correlation between the good level of warning (green) available on two FRS website (West Yorkshire and London) and the high number of linked fatalities recorded in the county. Figure 2 shows little relationship between fatalities and the level of warnings offered by

TABLE 3 Summary of emollient safety advice in the formularies across England, Scotland, and Wales

Information available on website	CCGs in England		Health boards in Scotland		Health boards in Wales	
	%	number	%	number	%	number
No warning in formulary, prescribing guidelines or joint formulary via CCG website	32	62	69	9	57	4
Warning in formulary, prescribing guidelines or joint formulary via CCG website	68	129	38	5	43	3
Warning via a link with out of date information	53 [*]	79	23 [†]	3	0 [‡]	0
Warning via link to 2018 MHRA publication	36 [*]	47	0 [†]	0	0 [‡]	0
Quality of warning	n = 129		n = 8		n = 3	
Just on paraffin base emollients	69	89	80	4	100	3
Include paraffin free base emollients	29	38	20	1	0	0
Explanation of impregnation into fabrics	73	94	60	3	67	2
Ignition source warning	55	71	20	1	67	2
Advice on laundering	16	21	20	1	0	0
Warning level score	n = 191		n = 13		n = 7	
4 (green)	5	9	0	0	0	0
3 (yellow)	13	24	7	1	0	0
2 (orange)	31	60	0	0	29	2
1 (red)	51	98	70	9	71	5
0 (No formulary available or broken link)	0	0	23	3	0	0
Range of number of links to the warning	2-5		2-4		3-4	
Average number of links to warning	3		3		3	

Note: England = 191 CCGs; Scotland = 14 health boards and Wales = 7 health boards *n = 129 †n = 8 ‡n = 3.

Abbreviations: CCG, Clinical Commissioning Groups; MHRA, Medicines and Healthcare products Regulatory Agency.

CCGs or LHBs within the related county apart from West Yorkshire.

3.2 | Clinical Commissioning Groups and Local Health Boards emollient safety advice in formularies

Table 3 represents the warnings related to the use of emollients (up to 4th of July 2019) in the NHS across Great Britain, with 32% of CCGs in England, 69% and 57% of LHBs (Scotland and Wales) having no warning in their formularies, prescribing guidelines or through shared formularies following the MHRA publication.³

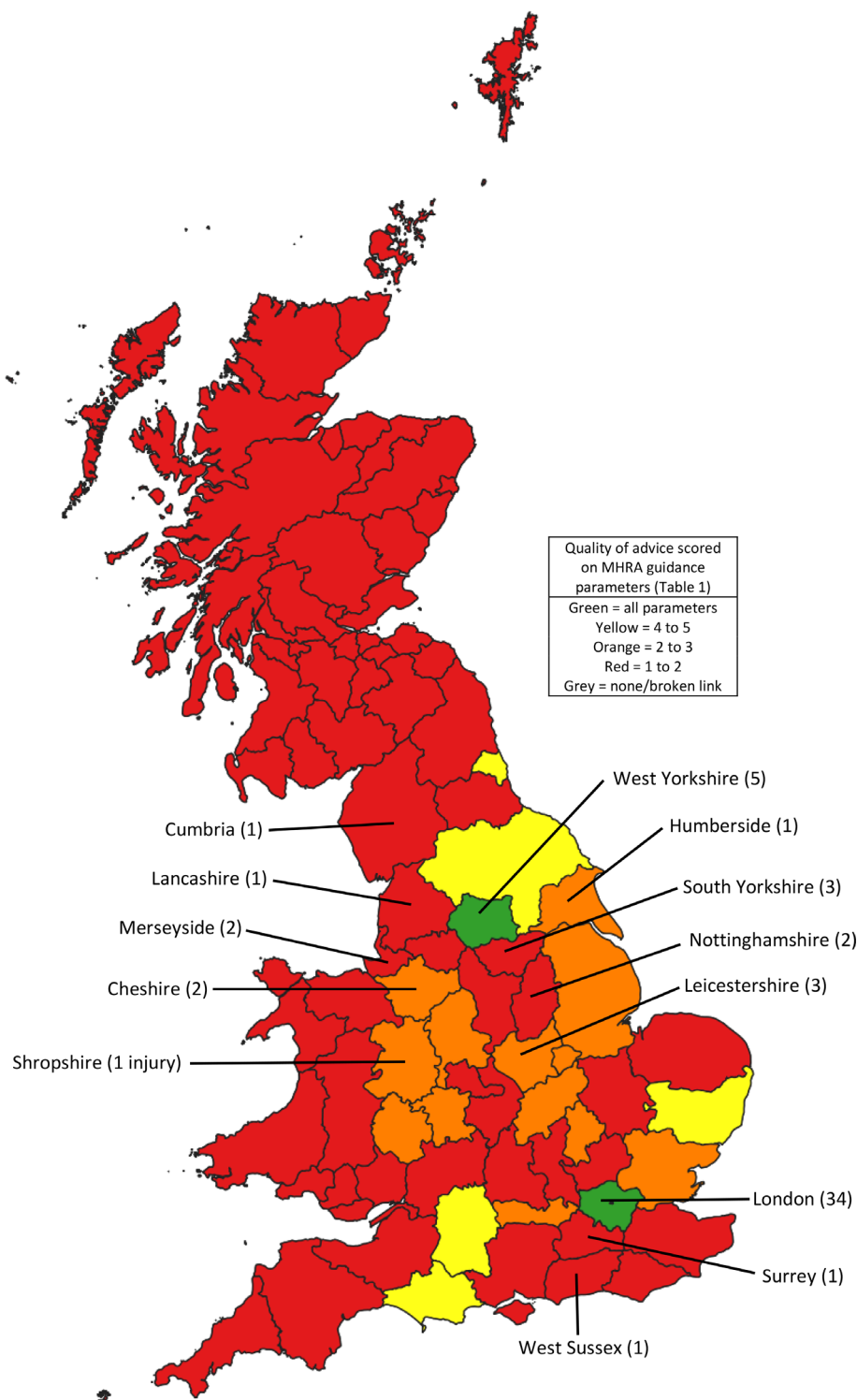
In England, 51% of CCGs were given a warning level of 1 (red); 31% a warning level of 2 (orange); 13% a warning level of 3 (yellow), and 5% a warning level of 4 (green). For LHBs in Wales, 71% were given a warning level of 1 (red); 29% a warning level of 2 (orange), with no level 3 or 4 scored. Of the LHBs in Scotland, 43% were given a warning level of 1 (red); 29% a warning level of 2 (orange); no level 3 and 7% a warning level of 4 (green). The study also found little consistency between CCGs in the same county, as an example Essex has 10 CCGs and four were given a warning level of 1 (red); five with a warning level of 2 (orange); none with a warning level of 3 and one scoring a warning level of 4 (green). 5% of the NHS (ie, in total) had good warnings (green) in place within online formularies or prescribing

guidelines similar to the MHRA recommendations. Only 12% had sufficient (yellow) warnings in place, 29% had mostly insufficient (orange) warnings, and 53% had either insufficient warnings or no warnings at all (red) in place.

3.3 | Fire and rescue services emollient safety advice in response to a freedom of information request

80% of FRS responded to the FOIR (see Supporting Information), with 27% of responses revealing no implementation of the MHRA warning internally within their organization, with a similar 25% of responses with no implementation to the public. This is different to the 63% found through the website searches; however, a lot of implementation to FRS personnel was either through internal communication or via training (Figure 3). Similarly, public information was communicated via home safety advice rather than through FRS websites. Therefore, we were unable to assess if these different implementations were up to date for this study. Table 2 includes the scoring of the quality of warning and if available, whether it was up to date, with the largest percentages (65%, 100%, and 100%) of FRSs in Great Britain placed in the lowest score category (Figure 1).

FIGURE 1 Quality of advice based on MHRA emollient fire warnings on FRS websites across counties of England, Scotland, and Wales, and fatality numbers linked with emollient use. FRS, Fire and Rescue Service; MHRA, Medicines and Healthcare products Regulatory Agency



3.4 | Clinical Commissioning Groups and Local Health Boards emollient safety advice in response to a freedom of information request

88% of CCGs and LHBs responded to the FOIR (see Supporting Information) with 16% revealing they had not implemented the MHRA guidance to health care professionals within their organization and 12% describing that this was the responsibility of GPs and pharmacists.

A total of 28% described having no warning internally within their organization (see Supporting Information) or that it was GPs or pharmacist's responsibility (Figure 4) which is similar to our website search findings (32%). In addition, 35% of CCGs and LHBs (see Supporting Information) stated they had not implemented any information on using emollients safely to the public and 48% it was the responsibility of GPs and pharmacists. The CCGs/LHBs that did implement the warning to the public, mostly did this via patient

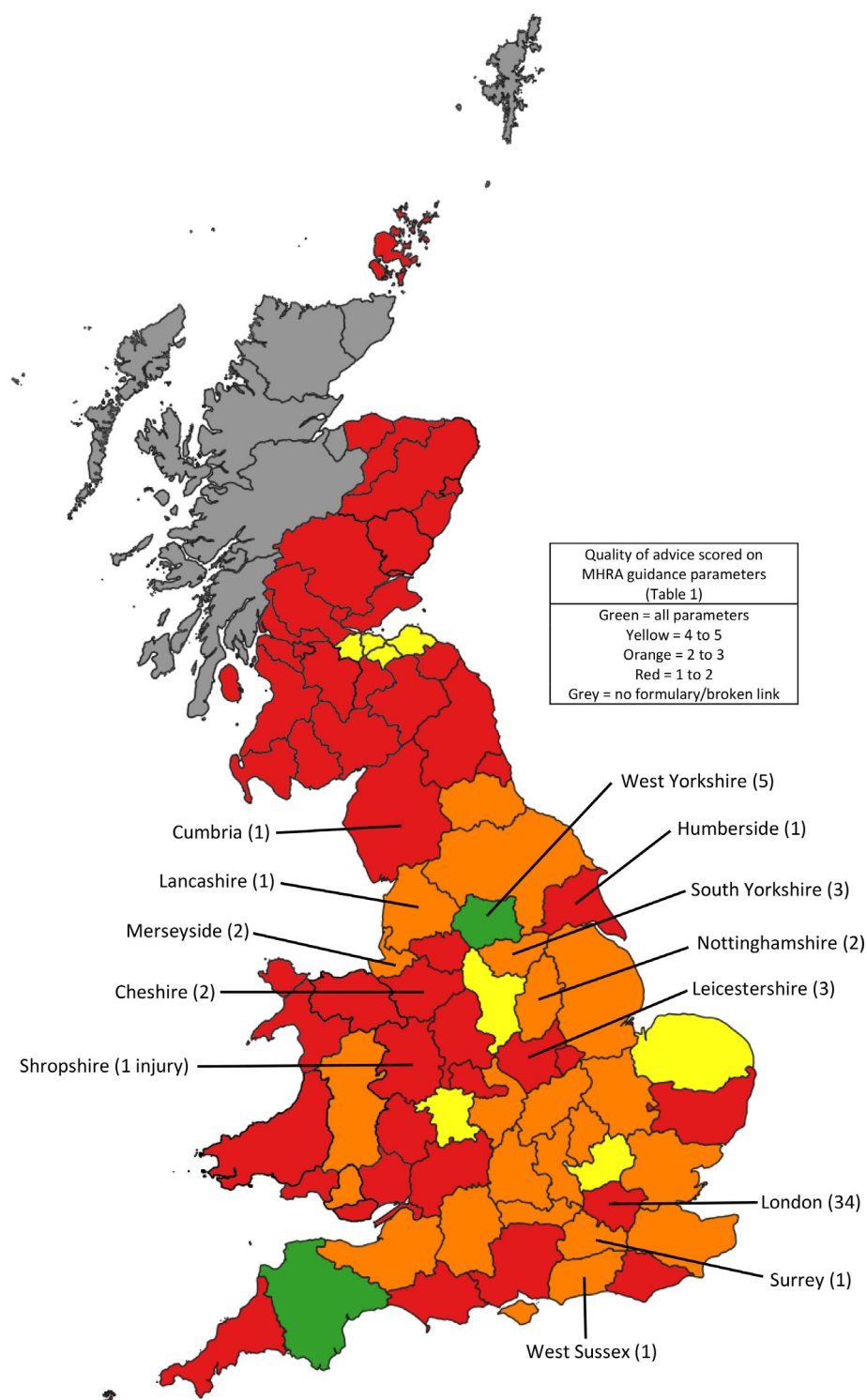


FIGURE 2 Quality of advice based on MHRA emollient fire warnings in the formularies of CCGs and LHBs across counties of England, Scotland, and Wales and fatality numbers linked with emollient use. CCG, Clinical Commissioning Groups; LHBs, Local Health Boards; MHRA, Medicines and Healthcare products Regulatory Agency

leaflets (Figure 4); however, we were unable to check if this included the new up to date advice. Table 3 includes the scoring of the quality of warning and if available, whether it was up-to-date, with the largest percentages (51%, 70%, and 71%) of CCGs and Health boards in Great Britain placed in the lowest score category (as shown in Figure 2).

When comparing FRSs to CCGs and LHBs only 38% FRSs websites included a warning compared to 68% of formulary/

prescribing websites. When a warning was present on FRS websites in England, only 17% included paraffin-free emollients compared to 29% across CCGs. However, 94% of FRSs (Table 2) included a good explanation of impregnation into the fabric and ignition sources compared to 73% and 55%, respectively, across CCGs in England (Table 3).

There have been various ways that CCG and LHBs have implemented the information from the MHRA (Figure 4) with some

FIGURE 3 Summary of results of Freedom of Information Request responses based on Medicines and Healthcare products Regulatory Agency advice disseminated to fire service personnel



describing and sending screenshots of the warning being added to *Scriptswitch* and other prescribing software for healthcare professionals. Some CCG/LHBs had described that the implementation had been carried out by updating formularies/guidelines; however, a larger percentage (56%) were using the old 2016 MHRA advice or NPSA warning. This reflects the findings of website searches, which found 53% had a warning via a link to out of date information. This was also the case of FRS webpages and FOIR response for advising the public with 45% still using the old MHRA advice.

32% and 37% of FRSs detailed that that had no future plans to implement this further internally to personnel or the public, respectively (see Supporting Information). Where, 56% and 87% of CCGs/LHBs had no future intentions for implementation to health care professionals or the public, respectively. Those who do have future plans describe dissemination mostly via prescribing updates or internal communication for professionals and patient leaflets for public information. A few FRSs and CCGs/LHBs described their implementation or future intentions of disseminating advice on the fire risk of emollients by partnering with each other. The FOIR results are summarized in a table in Supporting Information, but they did not change the scoring or maps. Some CCGs had updated the advice available after July 4th when our public website search concluded and therefore were not included in our scoring.

4 | DISCUSSION

This study found overall that warnings were poor across both FRSs and NHS services in Great Britain. Only 4% of FRSs websites contained the correct and most current information as published by the MHRA. Similarly, only 5% of health services produced a sufficient warning alongside emollient prescribing information. Extensive searching of FRSs and CCG/LHBs websites revealed differences in not only the format but also the level of information presented. In addition, navigation of CCG and LHB formularies to the correct information was often complicated and not user friendly for health care professionals and the public. Similar findings were also commented on in a study on the variations in the structure of emollient formularies on CCG websites leading to confusion for prescribers and patients.²⁸ The FOIR reaffirmed the high level of variation within FRSs and healthcare services and how they have implemented the MHRA update, even though the National Health and Care Excellence have published guidelines to reduce variation in prescribing.²⁵ This study shows that MHRA warning updates have not been disseminated adequately to help in providing information to healthcare providers, FRSs, and the public.

When carrying out the scoring (Table 1) on the level of warning based on the MHRA published report, low scores were given when



FIGURE 4 Summary of results of Freedom of Information Request responses from CCGs/LHBs based on MHRA advice disseminated to healthcare professionals. CCG, Clinical Commissioning Groups; LHBs, Local Health Boards; MHRA, Medicines and Healthcare products Regulatory Agency

just a link to the MHRA warning was available, as it did not give a further explanation or clarity and often added more cumbersome links. Low scores were also awarded when there the link was to the out of date 2016 MHRA warning (only including paraffin or high paraffin base emollients) or to the archived/old NPSA website. Similar findings via the responses to the FOIR confirmed our scoring, with some CCGs and LHBs describing they had included information in their formulary, but on inspection, this was still out of date, commonly from the older 2016 MHRA report. In comparison, if a CCG website gave further details on the formulary site supplementary to the prescription information, these were reflected in a higher score, as healthcare professionals and the public would be made fully aware of the risk. As part of the scoring level, paraffin free emollients should also be included in warnings, as this mirrors the most up to date alert from the MHRA. If the warnings on FRSs or CCGs/LHBs websites only included paraffin-based emollients or above 50% paraffin content, these were scored lower, as this could lead to the increased use of lower paraffin content or non-paraffin-based emollients, which still pose a fire risk.

There are some limitations to the evaluation of NHS formularies and FRSs websites. Whilst websites were searched extensively, there is the possibility that information could be missed. We tried to limit

this and to account for any missed information by conducting the FOIR. In addition, this research does not include any assessment of the warnings or advice regarding over the counter emollients and only includes those prescribed. All information via the website search is correct up to July 04, 2019 and due to the nature of the data retrieval process there will be slight variability in the information given on FRS websites or formularies during the time frame it was collected. All information via the FOIR is correct up to September 24, 2019. Our study findings from the initial formulary and website search and subsequent scoring had not changed with regard to the additional results from the FOIR.

The responses of the FOIR to FRSs and CCGs/LHBs gave more information on how the safety advice on using emollients had been delivered differently to professionals and the public via the websites or formularies. A large percentage of responses described the methods, with some examples given that is, patient/public information leaflets. However, we were unable to access most of the methods described and therefore unable to measure if the information was up to date. A lot of responses from CCGs and LHBs stated that it was the responsibility of GPs and pharmacists to inform the public. Therefore, we were unable to assess the information given via this route, but

useful information when considering potential targets within the healthcare professions in future safety campaigns. Many responses to the FOIR from FRSs indicated that the information was delivered via a newsletter or bulletin or delivered in internal training programs. Although newsletters and bulletins are still useful dissemination, it is more of a “read once” document, so it could be suggested that these are reissued to make sure the message is reiterated and distributed to new employees. Some FOIR to FRSs responded by detailing how advice is given during home safety visits and therefore important that safety campaigns should also target staff who offer fire risk advice to the public.

5 | CONCLUSIONS

Our study indicates in 2019 many Fire and Rescue Services, Clinical Commissioning Groups and Local Health Boards were neither promoting fire safety issues about emollients within their organizations nor externally to the public; this was despite the regulatory recommendation by the MHRA in late 2018. Much of the advice, which was identified, was outdated, incorrect or insufficient and some organizations stated they had no plans in place to improve this situation.

Our study showed that in areas where there was a higher number of fire fatalities linked with emollients, the quality of fire safety advice shown on the FRSs website was better. However, this was not reflected on CCG and LHB websites in the same area and suggested more collaborative partnership with FRS might improve the fire safety risk awareness of the public and those working within organizations.

A number of organizations also responded to the FOIR suggesting that there was a need for consistent and clear safety advice. This would not only support them to raise better awareness within their organizations, but also help to identify fatalities where emollients had been involved in the development of the fire thereby ensuring better reporting and recording of incidents. This information would also enable a more accurate understanding of the fire risks, which could facilitate future targeted public campaigns and help save lives.

The National Consensus Statement (2016) signed by the NHS, Public Health England, Local Government and Chief Fire Officers Association and Age UK, stated that health and well-being outcomes could improve by working together on intelligence-led, early intervention prevention strategies. The Working Together report²⁹ also encouraged local health and social care services to maximize opportunities with their local FRS, identifying common risk interventions for vulnerable people.³⁰

Our research and other intelligence-led data have since been used to inform a national campaign about emollient safety. Using a multi-agency approach,³¹ the campaign was delivered in July 2020 by the MHRA, the National Fire Chiefs Council and a number of health, care and academic sector stakeholders. Several website resources were developed for health and care providers enabling clear and consistent messaging. A toolkit for FRSs, containing training and advice and information about working in partnership with local health

organizations was also developed. These resources, further research, and the commitment of partners should ensure the future sustainability and consistency of emollient fire safety messaging.

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DATA AVAILABILITY STATEMENT

Data is available in Supporting Information.

ORCID

Sarah W. Hall  <https://orcid.org/0000-0003-1266-4958>

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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