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Rayne Roberts , Caitlin Paul , Ann Alonge , Callum Gutteridge , Holly Bain , [Angeliki Papadaki](#) *

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Article

Online Information Provision on Meals on Wheels: A Review of Local Authority Websites in the United Kingdom

Rayne Roberts *, Caitlin Paul *, Ann Alonge *, Callum Gutteridge, Holly Bain and Angeliki Papadaki *

Centre for Exercise, Nutrition and Health Sciences, School for Policy Studies, University of Bristol, Bristol, UK

* Correspondence: Centre for Exercise, Nutrition and Health Sciences, School for Policy Studies, University of Bristol, 8 Priory Road, Bristol BS8 1TZ; Tel: +44 117 456 0887; Email: angeliki.papadaki@bristol.ac.uk

* These authors contributed equally to the paper and share first authorship.

Abstract: Meals on Wheels (MoWs) are critical in enabling adults with care and support needs to live independently. However, many individuals are unaware that the service exists. The aim of this study was to review the websites of local authorities in the UK, and those of 3rd-party providers they signpost to, to establish the quality of online information available on MoWs services, and the websites' overall quality. Two data capture forms were used to extract information from local authority and 3rd-party providers, consisting of 35 items across five domains, and 36 items across five domains, respectively. Items were awarded a score based on whether certain criteria were met or not, resulting in a maximum total score of 50 and 43 points for each local authority, and 3rd-party provider, website, respectively. A total of 271 websites (223 local authority and 48 3rd-party provider) were reviewed. The mean total score was 14.9 (SD 10.6, range: 1-40 points) for local authority websites, and 21.4 (SD 5.3, range: 10-35 points) for 3rd-party provider websites. For all websites combined, online provision of MoWs information was generally poor, with the vast majority of websites (69.4%, n=188) assessed as requiring improvement, whereas only 4.4% of websites (n=12) were assessed as very good. These findings suggest that local authorities and 3rd-party providers in the UK should seek to improve their online information provision on MoWs to enhance awareness of the service, and ensure that potential service users, and individuals who refer them to the service, can access high-quality information on MoWs.

Keywords: community meals; e-government; home-delivered meals; local authority websites; Meals on Wheels

1. INTRODUCTION

Meals on Wheels (MoWs) is an essential preventative service that delivers meals to individuals who are not able to acquire ingredients and prepare their own meals. MoWs offer a multitude of benefits to service users, including improvements in dietary quality [1] and social care outcomes, such as loneliness [2], and social isolation [3,4]. In addition, the wellbeing checks conducted by MoWs drivers have an important role in allowing service users to live independently, and decreasing the need for hospitalization and residential care [5,6], thereby reducing financial burdens to health and social care systems [7]. In England, an Age UK report estimated that 300,000 people aged >65 years needed help with eating or preparing meals in 2015 [8]. This figure is likely higher in the post-pandemic world, as COVID-19 increased the demand for MoWs throughout the country [9]. Nevertheless, a recent qualitative study among service providers in South West England reported a perceived lack of sufficient publicity of the MoWs service and that many individuals are unaware that the service exists [3]. With an increasing number of individuals in potential need of MoWs, it is essential to establish how future users of the service access information on MoWs [10].

The internet poses an opportunity for potential MoWs service users, many of whom live alone or rarely leave their homes, to access information on the service. This includes older adults, whose internet literacy has improved in recent years [11]. In 2020, 86.6% and 54% of British adults aged 65-

74 and >75 years, respectively, had used the internet in the previous three months, almost a double proportion since 2013 [12]. Indeed, the Care Act 2014 legislates that high-quality information relating to social care services that prevent the need for residential care should be accessible to those for whom services are provided [13]. As food and nutrition are a domain of the Adult Social Care Outcomes Framework that contributes to social care-related quality of life [14], MoWs should fall under this legislation. However, with each UK local authority (LA) having responsibility for its locality's adult social care, there is no single, national MoWs provider. Moreover, there is currently no central information point to determine the provision of MoWs in the UK, other than a postcode checker on the Government's website (for England and Wales only), which links to matched LA websites [15]. This highlights the need for LAs to provide high-quality online information pertaining to MoWs, which would enable more adults, who could benefit from MoWs, to access the service.

To our knowledge, no research has assessed the information available on the MoWs service in LA websites in the UK. The aim of this study was therefore to review the websites of LAs from all UK nations, in order to establish the MoWs information that is available online, as well as the websites' quality and accessibility of MoWs information. As LAs signposting to 3rd-party service providers is a recognised model of MoWs provision [16], a secondary aim of this study was to review the websites of 3rd-party MoWs providers that LAs from all UK nations signpost to. Similar to earlier research reviewing information on support for carers on LA websites in England [17], our aim was not to comment on how individual LA or 3rd-party provider websites perform, but rather to understand the aspects of MoWs online provision that could help, or inhibit, the ease of accessing information and understanding what MoWs services offer to service users.

2. METHODS

2.1. Identification and selection of websites

The study was approved by the University of Bristol, School for Policy Studies Research Ethics Committee (SPSREC/11119). The websites of LAs in England were identified [18] and accessed between June 26th-July 29th 2021 by the first author, using a desktop Mac (MacOS operating system, Google Chrome browser). The websites of those LAs identified as having adult social care responsibilities (n=149) were selected for review. These included county councils (n=26), unitary authorities (n=55), metropolitan districts (n=36), and London boroughs (n=32) [19]. The Surrey County Council's website signposted visitors to its nine district councils for MoWs information, and these were included in the review. The review was later extended to websites of all LAs in Wales [20], Scotland [21] and Northern Ireland [22], which were identified and reviewed by the second author between 9th-14th June 2022, using a Macbook Air 2017 (Monteray MacOS operating system, Google Chrome). The 3rd-party provider websites, as signposted by the aforementioned LA websites of all UK nations, and identified by the aforementioned reviews, were then identified, and those with working hyperlinks were reviewed by the third author between 6th-10th July 2023, using an HP Notebook (Windows 11 pro OS operating system, Microsoft Edge).

2.2. Data extraction

Data extraction was approached from the perspective of a service user, i.e., a member of the public, without assuming advanced web skills, as, according to the Care Act 2014, it is important that information is 'accessible to those for whom it is intended' [13]. This method extracts information and website features experientially, from the perspective of a 'mystery shopper' [23], and has been used in earlier research assessing the content and quality of online information for carers [24], the quality of adult social services [25], and user experiences with the National Health Service [26].

To extract data from LA websites, a data capture form was adapted from those previously used to review LA websites in England, with regards to information provided to carers following the implementation of the Care Act 2014 [17,24,27], the latest MoWs survey of LAs [16], and earlier research evaluating the quality of e-government websites [28,29]. The form was first piloted by the first and fourth author, by independently reviewing six websites from LAs in England (resulting in

89% agreement). Discrepancies were discussed until consensus was reached, which resulted in amendments to reflect questions, definitions and explanations (Table S1). Using the final form, the first author then extracted data from all websites of LAs in England, with the fourth author independently reviewing data from 10% of websites (n=16). This same form was used to review LA websites in the other three UK nations by the second author, with the fifth author independently reviewing 11% of websites (n=7) (85% agreement). Discrepancies were discussed and further clarifications (Table S1) were taken into account for the remaining data extraction, in order to assure data quality. This form was further adapted (see section 2.3), and used to review websites of 3rd-party MoWs providers by the third author, with the last author independently reviewing 10.4% of websites (n=5) (100% agreement). No further clarifications were needed, and the third author proceeded with extracting data from all 3rd-party provider websites.

2.3. Data capture forms

The final data capture form for LA websites (Table S2) consisted of 35 items to capture information across five domains: 'Council details' (n=6 items), 'Website navigation' (n=4 items), 'Council MoWs provision' (n=4 items), 'MoWs information provision' (n=14 items, including two items relating to COVID-19 measures for safe food preparation and delivery, to reflect pandemic guidelines for food preparation and social distancing [30,31]), and 'Website quality' (n=7 items). If MoWs information could not be located on LA websites, website quality was still assessed to allow the evaluation of this aspect of online provision. Website quality dimensions were initially developed for the e-business market and designed to allow assessment of quality across multiple websites [32]. Thus, they were deemed appropriate to assess website quality in the current study, given that LAs are urged to consider their websites as tangible delivery systems for customers, rather than one-way broadcast channels [33]. Despite being a controversial subject [34,35], superior website navigation, often assessed by the number of 'clicks', has been associated with the speed of accessing desired information [36]. Therefore, a note was made when MoWs information could be accessed from an LA's homepage in three or fewer 'clicks'.

The data capture form for 3rd-party MoWs provider websites (Table S3) was adapted from the LA website form, and consisted of 36 items to capture information across five domains: 'Council details' (n=7 items), '3rd-party MoWs provider details' (n=5 items), 'Website navigation' (n=5 items), 'MoWs information provision' (n=12 items), and 'Website quality' (n=7 items). The 'Council MoWs provision' domain was omitted, as this form aimed to extract data from 3rd-party MoWs providers signposted from LAs. One item ('search engine available to locate MoWs information') was added to the 'Website navigation' domain, to reflect that the websites of some 3rd-party providers did not direct to MoWs at the first 'click'. In addition, two items ('MoWs information located' and 'subsidy/eligibility information') were omitted from the 'MoWs information provision' domain. Respectively, this was because this form was used to review websites of MoWs providers, and it was therefore assumed that MoWs information would be located, and because unlike LAs, 3rd-party MoWs providers do not have responsibility of assessing eligibility to access services [37].

2.4. Scoring

Items within all domains of the data capture forms, other than 'Council details' (for the LA website form) and 'Council details' and '3rd-party MoWs provider details' (for the 3rd-party MoWs provider form), were awarded a score, based on whether certain criteria, related to the amount and quality of information provided against each item, were met or not (Table S4). Scoring involved either a binary (Yes=1, No=0) or a ternary [Yes (sufficient information)=2, Partial (incomplete information or lacks clarity)=1, No (no information)=0] scoring system (Tables S2 and S3). Scoring was based on DISCERN, a reliable and valid tool for assessing the quality of written consumer information about treatment choices [38,39]. Scores for each domain were summed, resulting in a maximum total score of 50 and 43 points for each LA and 3rd-party provider website, respectively. Websites of LAs and 3rd-party MoWs providers scoring ≥ 35 , and ≥ 30 , points were rated as 'very good'; 30-34, and 25-29, points

were rated as ‘good’; 25-29, and 20-24, points were rated as ‘acceptable’; and ≤ 24 , and ≤ 19 , points were rated as ‘requiring improvement’, respectively.

2.5. Data analysis

Data were analysed using SPSS software (IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp). Results were presented descriptively, using means and standard deviations (SD) for continuous variables, and frequencies and percentages for categorical variables.

3. FINDINGS

Data extraction was completed for a total of 223 LA websites (England: n=158; Wales: n=22; Scotland: n=32; Northern Ireland: n=11). Of these, 77 signposted to 3rd-party providers (69 in England, four in Wales, and four in Scotland), and data were extracted from 48 3rd-party MoWs provider websites (which had working hyperlinks from the LA websites). The list of the websites reviewed is provided in Table S5. Across all websites, the mean review time was 8.4 minutes (SD 3.8; range: 3-23 minutes). Table 1 presents the number and percentage of LA and 3rd-party MoWs provider websites meeting the different criteria of the data capture forms’ domains, and Table 2 demonstrates the mean scores for each domain, as well as the mean total score.

Table 1. Local authority and 3rd-party Meals on Wheels provider websites meeting the criteria of the data capture forms’ domains, *n* (%).

	England	Wales	Scotland	Northern	Total	3 rd -party
	(<i>n</i> = 158)	(<i>n</i> = 22)	(<i>n</i> = 32)	Ireland	(local authority)	providers
				(<i>n</i> = 11)	(<i>n</i> = 223)	(<i>n</i> = 48)
Website navigation						
Home page directs to MoWs	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	46 (95.8)
(yes)						
Sub-pages direct to MoWs (yes)	107	9	16 (50.0)	1 (9.1)	133 (59.6)	40 (83.3)
	(67.7)	(40.9)				
Search engine available (yes)	N/A	N/A	N/A	N/A	N/A	12 (25.0)
Navigation issues necessitated	72 (45.6)	15	20 (62.5)	10 (90.9)	117 (52.5)	2 (4.2)
search engine use (yes)		(68.2)				

Navigation issues necessitated	27 (17.1)	3	3 (9.4)	0 (0.0)	33 (14.8)	0 (0.0)
search engine use and MoWs		(13.6)				
information was successfully						
located ^a						
Use of search engine	98 (62.0)	9	15 (46.9)	1 (9.1)	123 (55.2)	5 (10.4)
successfully located MoWs		(40.9)				
information (yes) ^b						

Council MoWs provision

Council key provider (yes)	21 (13.3)	7	6 (18.8)	0 (0.0)	34 (15.2)	N/A
		(31.8)				
Council contracts out to	13 (8.2)	1 (4.5)	5 (15.6)	1 (9.1)	20 (9.0)	N/A
external supplier (yes)						
3 rd party supplier with link (yes)	74 (46.8)	0 (0.0)	3 (9.4)	0 (0.0)	77 (34.5)	N/A
3 rd party supplier without link	7 (4.4)	1 (4.5)	1 (3.1)	0 (0.0)	9 (4.0)	N/A
(yes)						
Council does not provide	43 (27.2)	13	17 (53.1)	10 (90.9)	83 (37.2)	N/A
MoWs, does not signpost or		(59.1)				
provides no information about						
who the MoWs provider is						

MoWs information provision^c

MoWs information located	106	10	16 (50.0)	1 (9.1)	133 (59.6)	N/A
	(67.1)	(45.4)				
General explanation of MoWs	85 (80.2)	9	12 (75.0)	1 (100.0)	107 (80.5)	45 (93.8)
service provided ^d		(90.0)				
Types of meals outlined ^d	64 (60.4)	8	12 (75.0)	1 (100.0)	85 (63.9)	44 (91.7)
		(80.0)				
Specific dietary requirements	53 (50.0)	6	9 (56.3)	0 (0.0)	68 (51.1)	37 (77.1)
catered for ^d		(60.0)				
Prices stated ^d	30 (28.3)	6	10 (62.5)	1 (100.0)	47 (35.3)	33 (68.8)
		(60.0)				
Menu published ^d	22 (20.8)	4	3 (18.8)	0 (0.0)	29 (21.8)	37 (77.1)
		(40.0)				
Service standards outlined ^d	42 (39.6)	5	10 (62.5)	0 (0.0)	57 (42.9)	39 (81.3)
		(50.0)				
Extra services offered ^d	22 (20.8)	4	4 (25.0)	1 (100.0)	31 (23.3)	15 (31.3)
		(40.0)				
How to order/apply	50 (47.2)	8	11 (68.8)	1 (100.0)	70 (52.6)	39 (81.3)
information ^d		(80.0)				
Cancellation details ^d	9 (8.5)	3	2 (12.5)	0 (0.0)	14 (10.5)	14 (29.2)
		(30.0)				

Subsidy/eligibility information	18 (17.0)	5	8 (50.0)	0 (0.0)	31 (23.3)	N/A
and/or contact details ^d		(50.0)				
COVID-19 safe meal	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)	2 (4.2)
preparation statement ^d						
COVID-19 safe delivery	3 (1.9)	0 (0.0)	1 (6.3)	0 (0.0)	4 (3.0)	6 (12.5)
statement ^d						
Council/ 3 rd -party provider	49 (31.0)	6	12 (75.0)	1 (100.0)	68 (51.1)	4 (8.3)
MoWs contact details ^d		(60.0)				
Website quality ^c						
Content	104	10	15 (46.9)	1 (9.1)	130 (58.3)	48 (100.0)
	(65.8)	(45.5)				
Design - Sensory	150	21	26 (81.3)	10 (90.9)	207 (92.8)	4 (8.3)
	(94.9)	(95.5)				
Design - Cultural	77 (48.7)	21	11 (34.4)	10 (90.9)	119 (53.4)	0 (0.0)
		(95.5)				
Organisation - Navigation	96 (60.7)	21	27 (84.4)	6 (54.5)	155 (69.5)	48 (100.0)
		(95.5)				
Organisation - Key links	104	21	29 (90.6)	11 (100.0)	165 (73.9)	48 (100.0)
	(65.8)	(95.5)				
User-friendliness - Search	135	10	16 (50.0)	1 (9.1)	162 (72.7)	8 (16.7)
engine	(85.4)	(45.5)				

User-friendliness - Dated	23 (14.5)	6	6 (18.8)	1 (9.1)	36 (16.2)	10 (20.8)
MoWs webpages	(27.3)					

MoWs, Meals on Wheels; N/A, not applicable (question was not available). ^a Refers to when the search engine had to be used, and that led to successful location of Meals on Wheels information. ^b Refers to when the search engines of all websites were tested to locate Meals on Wheels information. ^c Refers to the number and % of websites that met the criteria sufficiently (score =2) or partially (score = 1). ^d For local authority websites, this refers to the % of websites out of the ones where MoWs information was located.

Table 2. Local authority and 3rd-party Meals on Wheels provider websites’ overall scores for each domain of the data capture forms and overall quality of Meals on Wheels provision.

	England (<i>n</i> = 158)	Wales (<i>n</i> = 22)	Scotland (<i>n</i> = 32)	Northern Ireland (<i>n</i> = 11)	Total (local authority) (<i>n</i> = 223)	3 rd -party providers (<i>n</i> = 48)
Website navigation ^a (maximum score = 4 for local authority websites; maximum score = 5 for 3 rd -party provider websites)	1.8 (1.2, 0-3)	1.1 (1.4, 0-3)	1.3 (1.4, 0-3)	0.3 (0.9, 0- 3)	1.6 (1.3, 0- 3)	3.1 (0.8, 2- 5)
Council MoWs provision ^a (maximum score = 4 for local authority websites)	0.7 (0.6, 0-2)	0.4 (0.5, 0-1)	0.4 (0.5, 0-1)	0.1 (0.3, 0- 1)	0.6 (0.6, 0- 2)	N/A
MoWs information provision ^a (maximum score = 28 for local authority websites; maximum	5.8 (6.6, 0-21)	5.9 (8.3, 0-22)	5.7 (7.6, 0-24)	0.9 (3.0, 0- 10)	5.6 (6.9, 0- 24)	12.3 (3.8, 3- 21)

score = 24 for 3 rd -party provider						
websites)						
Website quality ^a	7.1 (3.1,	8.3 (2.4,	6.9 (3.2,	7.3 (1.1, 6-	7.2 (3.0, 1-	6.0 (1.4, 4-
(maximum score = 14)	1-13)	6-13)	1-14)	10)	14)	11)
Total score ^a	15.5	15.7	14.4	8.9 (5.2, 6-	14.9 (10.6,	21.4 (5.3,
(maximum score = 50 for local	(10.4, 1-	(12.0, 6-	(11.9, 3-	24)	1-40)	10-35)
authority websites; maximum	38)	37)	40)			

score = 43 for 3rd-party provider

websites)

Overall quality of MoWs online

provision ^b	4 (2.5)	4 (18.2)	1 (3.1)	0 (0.0)	9 (4.0)	3 (6.3)
Very good						
(total score ≥35 points for local						
authority websites;	19 (12.0)	1 (4.5)	5 (15.6)	0 (0.0)	25 (11.2)	9 (18.8)
total score ≥30 points for 3 rd -						
party provider websites)						
Good						
(total score = 30-34 points for	14 (8.9)	0 (0.0)	4 (12.5)	0 (0.0)	18 (8.1)	19 (39.6)
local authority websites; total						
score = 25-29 points for 3 rd -party						
provider websites)						

Acceptable	121 (76.6)	17 (77.3)	22 (68.8)	11 (100.0)	171 (76.7)	17 (35.4)
(total score = 25-29 points for local authority websites; total score = 20-24 points for 3 rd -party provider websites)						
Requires improvement						
(total score ≤24 points for local authority websites; total score ≤19 points for 3 rd -party provider websites)						

MoWs, Meals on Wheels; N/A, not applicable (question was not available). ^a Values are mean (standard deviation, range). ^b Values are *n* (%).

3.1. Website navigation

None of the LA websites, but 95.8% (n=46) signposted to MoWs information directly from the homepage. In ~60% of LA websites (n=133), MoWs information was provided within subpages, typically under an ‘Adult Social Care’ or ‘Social Care’ section of the website. Use of the search engine was required in ~53% of LA (n=117), and 8% (n=3) of 3rd-party provider websites, due to inability to find MoWs information by navigating the site. Of these, MoWs information was successfully located in 28% of LA websites (~15% of the total sample) (n=33), but in none of the 3rd-party provider websites. When all LA websites’ search engines were tested, MoWs information was successfully located in ~55% (n=123) of websites. Only 26% (n=12) of 3rd-party provider websites had a search engine, but relevant MoWs information was located in only 10.4% (n=5) of them, when this was tested (Table 1). The mean scores for website navigation was 1.6 (SD 1.3) and 3.1 (SD 0.8), out of possible maximum scores of 4 and 5, for LA and 3rd-party provider websites, respectively (Table 2).

3.2. Council MoWs provision

In total, 15.2% of LA websites (n=34) reported that the LA was the key provider of MoWs, preparing and/or distributing meals, whereas 9% (n=20) reported that the LA outsourced MoWs to an external supplier. Two websites (England) did not disclose the LA suppliers, and one (Scotland) reported that the suppliers were both the LA and Apetito. From the 39% of websites (n=86) that signposted visitors to third-party suppliers, the vast majority provided links (n=77), although one link was broken (England) and one redirected to a blank page (Scotland). Approximately 37% of LA websites (n=83) did not report any information on who provided MoWs (two of these, one in Wales and one in Scotland, stated that they no longer provided the service) (Table 1). The mean score for council MoWs provision was 0.6 (SD 0.6) and the maximum possible score was 4 (Table 2).

3.3. MoWs information provision

In total, MoWs information was located, either fully or partially, in 59.6% of LA websites (n=133). Of those, the majority (80.5%, n=107) offered some general explanation of the service, with websites scoring 2 points if they provided comprehensive descriptions (e.g., *'our Meals on Wheels service delivers a hot meal to you in the comfort of your home every lunch time. If you prefer, we can deliver the week's meals frozen, for you to heat up yourself. We deliver seven days a week, every day of the year, so you can enjoy our meals every day, or just the days you choose.'*), and 1 point if MoWs were referenced but without adequate supporting information (e.g., *'there are companies who will deliver you meals, frozen or cooked. There is a charge for these services. You can find these online.'*). Approximately 64% of LA websites (n=85) and 91.7% (n=44) of 3rd-party websites provided information on the types of meals offered, either in more detail (*'tasty, nutritionally balanced two-course meals - usually a main course and a dessert'*) or partially (e.g., *'ready-made meals'*). Some LA websites (33.8%, n=45) reported frozen meal delivery services, either as the only option or as an option alongside hot meals, whereas seven and 26 3rd-party provider websites, respectively, reported providing both hot and frozen, and only hot meals. Whether MoWs catered for specific dietary requirements was addressed in 51.1% of LA (n=68) and 77.1% (n=37) of 3rd-party provider websites. Prices of meals were stated by 35.3% of LA (n=47), and 68.8% of 3rd-party provider websites (n=33), either fully or partially (e.g., *'There is a small charge for each meal ordered'*). Where full pricing information was available from LA websites, the average cost of a two-course hot meal was £4.79 (SD 1.06, range £2.88-£7.20, n=25), and the average cost of a two-course frozen meal was £3.59 (SD 1.26, range £2.57-£5.78, n=5). In contrast, the average cost of a two-course hot meal from 3rd-party provider websites was £7.58 (SD 1.58, range £5.50-£10.50, n=14), and the price range of a frozen meal was £2.95-£7.99, while desserts ranged from £1.55-£6.50 (n=14). Sample meal menus were available, either fully (e.g., 7-day cycle menus) or partially (e.g., *'choose between three main meal options every day'*) from 21.8% of LA (n=29), and 77.1% of 3rd-party provider (n=37) websites.

Of the 133 LA websites where MoWs information was located, comprehensive service standards (e.g., days and times of deliveries) were reported by 42.9% (n=57); this was the case for 81.3% (n=39) of 3rd-party websites. In addition, 23.3% (n=31) of LA, and 31.3% (n=15) of 3rd-party provider websites reported that additional services were provided by drivers who deliver the meals. Additional services included welfare checks (n=19 and n=10), help with plating up or cutting the meal and/ or medication prompts (n=7 and n=4), and meal storage (n=5 and n=3) (e.g., the rental of a freezer and/ or microwave for a small weekly cost, which was provided for as little as 20 pence per week). Some LA websites referred to the offer of help with preparing meals as part of a larger care service but no delivery of MoWs (n=5), a chargeable 15-minute wellbeing check through the MoWs provider (n=2), help with plating food but no mention of welfare checks (n=1), and free property safety checks and hazard removals (n=1). Only just over half of LA websites (52.6%, n=70) and 81.3% (n=39) of 3rd-party websites provided information on how to order the MoWs service, either by providing online forms or telephone lines, or directing users to third-party websites to order (for LA websites only), whereas information on how someone could cancel the service was located on only 10.5% of LA websites (n=14) and 29.2% (n=14) of 3rd-party provider websites. Subsidy information or eligibility criteria and/ or relevant contact details at the LA were provided by 23.3% of LA websites (n=31), either comprehensively (e.g., *'To find out if you are eligible for the subsidized rate, initially you should complete a self-assessment'*), or partially (*'a referral must be made to Social Work Services who will assess your eligibility'*). Only one LA website and two 3rd-party provider websites addressed safe meal preparation relating to COVID-19, and four and six, respectively, provided a COVID-19 safe delivery statement (e.g., *'for social distancing, your delivery driver may need to leave your meal at the door'*, or *'COVID-safe delivery by friendly & DBS-checked volunteers'*). Finally, only half of LA websites (51.1%, n=68) and 8.3% (n=4) of 3rd-party websites provided details of a contact for MoWs queries, either through non-generic email addresses and phone numbers, or via more generic email addresses and/ or online forms. Only one council provided the details of a named individual to contact.

Figure 1 illustrates the proportion of LA websites providing sufficient information, partial information, and no information against the different items of the data capture form's MoWs information provision domain. The respective information for 3rd-party MoWs provider websites can be found in Figure S1. Overall, most LA and 3rd-party provider websites did not meet the criteria for

this domain for eight out of 14 items, and four out of 12 items, respectively. Out of a maximum score of 28, the mean score for MoWs information provision across the LA websites of all UK nations was 5.6 (SD 6.9) (Table 2). The mean score for this domain for 3rd-party MoWs provider websites was 12.3 (SD 3.8) (with a maximum possible score of 24).

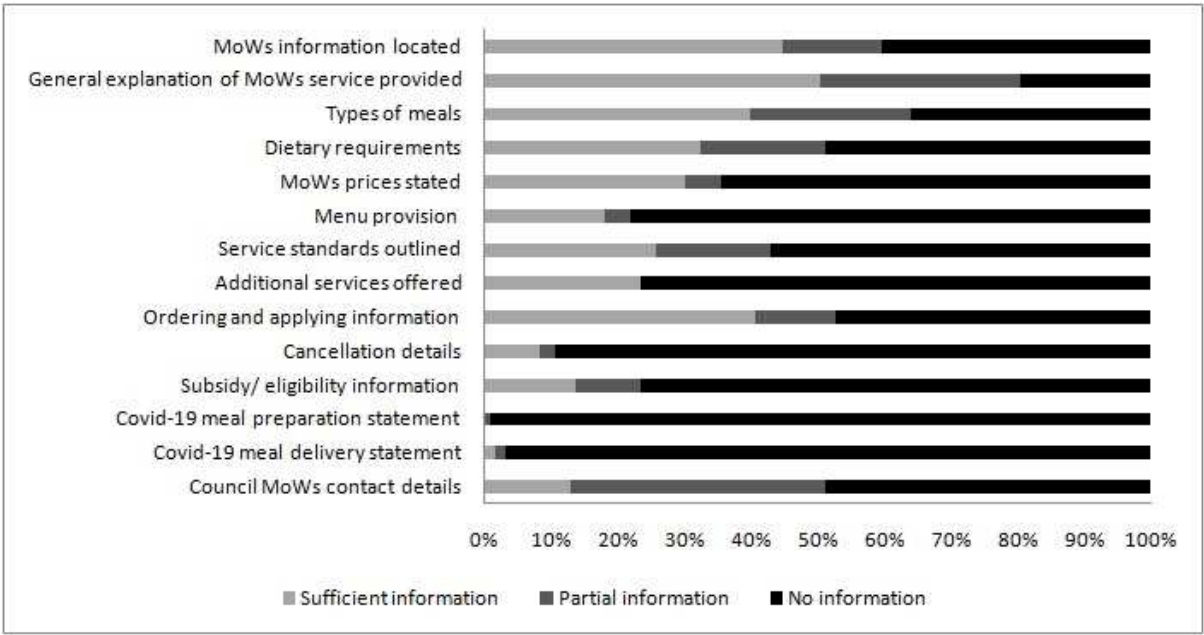


Figure 1. Proportion of local authority websites providing sufficient information, partial information, and no information against the different criteria of the data capture form's Meals on Wheels information provision domain. MoWs, Meals on Wheels.

3.4. Website quality

The content of more than half of LA websites (58.3%, n=130) was assessed as being a good fit for users' needs, either fully or partially, whereas no 3rd-party provider website was awarded a score of zero for 'content', since all contained MoWs information to a certain level of detail. The majority of LA websites (92.8%, n=207) were considered to meet the criteria for sensory design fully (e.g., when prominent text or icons were placed on the homepage and linked to assistive reading technology software platforms, such as ReachDeck or ReciteMe) or partially (e.g., when websites provided accessibility statements, stating that changing features, such as the font color and text size, was possible, but did not provide a prominent button with which to do so). Only 8.3 % of 3rd-party provider websites (n=4) met this criterion, by linking to accessibility software (n=2), or having large print order forms and guides (n=2), and audio brochures (n=1), available. Only 53.4% of LA websites (n=119) met the criteria for cultural aspects of design, by providing a translating facility from English to another language, using assistive technology software systems, such as Google Translate, which was displayed prominently or less prominently (e.g., via a text link at the bottom of the websites' homepage or within an accessibility statement). None of the 3rd-party provider websites provided a translating function.

With regards to organization, information on MoWs could be located in three or fewer 'clicks' from the homepage, or via an intuitive pathway (e.g., LA website homepage led to social care subpages, and then to subsections entitled 'Help to live independently', 'Independent living at home' or 'Support at home') in approximately half of LA websites (47.5%, n=106), and 91.7% (n=44) 3rd-party provider websites. A longer pathway, which necessitated four 'clicks' or more to retrieve MoWs information, was needed for 22% of LA websites (n=49) and 8.3% (n=4) 3rd-party provider websites (e.g., when information was located in 'Frequently Asked Questions' sections). The majority of LA (73.9%, n=165), and all 3rd-party provider, websites were assessed as being sufficiently or partially

functional, as key weblinks led to key MoWs information (e.g., email addresses, third-party websites), or key information existed but was not hyperlinked, or led to a blank page or a page with irrelevant information, respectively. Website search engines were tested to assess user-friendliness, with 57% of LA (n=127), and 8.3% (n=4) of 3rd-party provider, websites returning relevant results with the process considered easy and fast, whereas 15.7% (n=35) and 8.3% (n=4) of LA and 3rd-party provider websites, respectively, returned MoWs information which was listed under less relevant sections, or did not come up first in the results, e.g., primary results of searches related to school meals. Finally, the criterion of user-friendliness, based on the reporting of the date MoWs webpages were published or last updated, was fully or partially met (i.e., when not all MoWs pages were dated) by only 16.2% (n=36) and 20.8 (n=10) of LA and 3rd-party provider websites, respectively.

Figure 2 illustrates the proportion of LA websites which fully, partially and did not meet the different criteria for the website quality domain. The respective information for 3rd-party MoWs provider websites can be found in Figure S2. Overall, most LA and all 3rd-party provider websites fully or partially met the criteria for this domain for six, and three, out of seven items, respectively. Out of a maximum score of 14, the mean score for website quality across the LA websites of all UK nations, and across 3rd-party MoWs provider websites, was 7.2 (SD 3.0), and 6.0 (SD 1.4), respectively (Table 2).

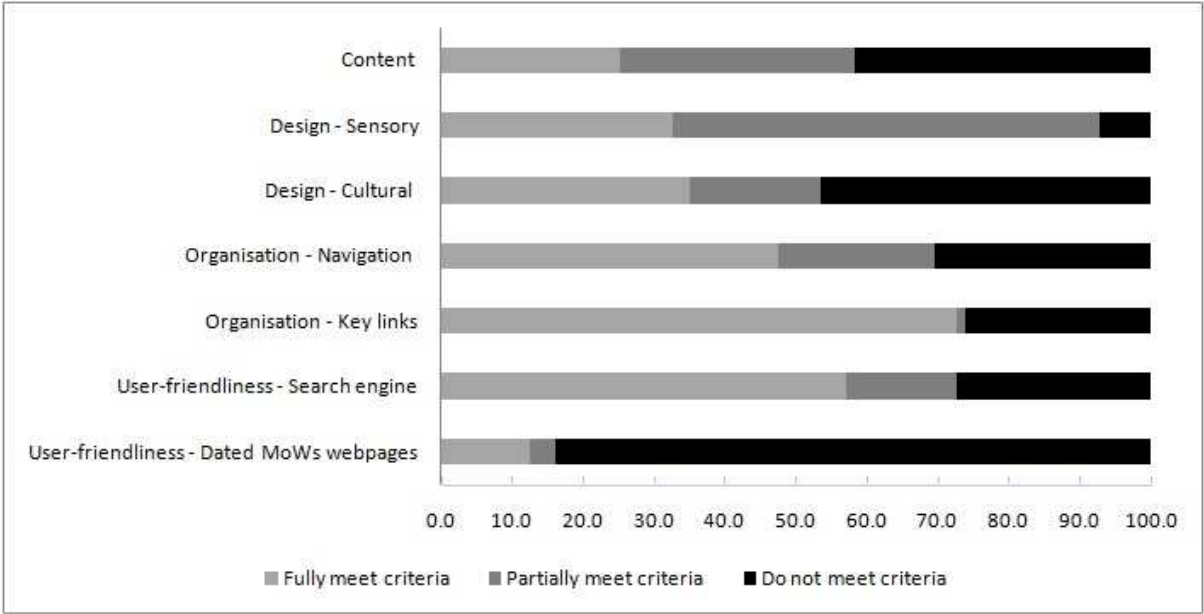


Figure 2. Proportion of local authority websites providing sufficient information, partial information, and no information against the different criteria of the data capture form’s website quality domain. MoWs, Meals on Wheels.

3.5. Overall scores

Of a possible maximum score of 50 and 43 (for LA and 3rd-party provider websites, respectively), the mean overall score across domains of the data capture form was 14.9 (SD 10.6) and 21.4 (SD 5.3). The majority of LA websites (76.7%, n=171) were assessed as requiring improvement, whereas the online MoWs provision of only 4% of websites (n=9) was assessed as very good. In addition, 35.4 (n=17) of 3rd-party MoWs provider websites were considered to require improvement, but only 6.3% (n=3) were considered to be very good (Table 2). For all websites combined, online provision of MoWs information was generally poor, with the vast majority of websites (69.4%, n=188) assessed as requiring improvement, whereas only 4.4% of websites (n=12) were assessed as very good. The anonymised scoring for all items of the data capture forms, alongside the notes supporting scoring decisions for each LA and 3rd-party provider website, are available from the corresponding author upon reasonable request.

4. DISCUSSION

This study, reviewing the websites of LAs and 3rd-party MoWs providers (as signposted by LAs) in the UK, with regards to the provision of MoWs information, found that the vast majority of LA websites (~77%) and approximately one third of 3rd-party provider websites (~35%) require improvement, while only ~15% and ~25% of websites, respectively, were assessed as 'very good' or 'good'. These findings highlight several areas of online information provision on MoWs services that could be enhanced to help potential service users, and individuals considering referring someone to MoWs, access information about this social care service.

With regards to website navigation, none of the LA websites reviewed linked to MoWs information directly from their homepage, which could make locating relevant information challenging. Nevertheless, relevant MoWs information could be located through subpages for more than 50% of the LA websites reviewed. This pathway of retrieving MoWs information was sometimes considered intuitive, for example when subpages were titled 'older adults' or 'help to live independently'. Often, however, MoWs information was located under an 'Adult Social Care' or 'Domiciliary Care' LA subpage, which might assume understanding of these terms. Earlier research has acknowledged jargon-heavy terminology as a barrier to navigating information in local government websites [17], and it has been suggested that page titles and navigation links should use simple language that lay audiences can easily understand [40]. In addition, some LA websites presented subpages in a drop-down menu, which might be difficult to access via smartphone [40]. When the search engine had to be used to locate MoWs information, 72% of LA websites did not return relevant MoWs pages. An earlier customer survey indicated that 40% of users of council websites seeking information on social care services failed to find what they were looking for [40], suggesting that LA website visitors might struggle to navigate the pathways to finding MoWs information and accessing the service. As expected, MoWs information was readily available from the homepage of the vast majority of 3rd-party MoWs provider websites (~96%), as these providers would not be expected to offer information on the wide range of social care services that LAs do, and LA websites signposted directly to their relevant webpages.

The current study indicated that only 24.2% of the reviewed LA websites reported that LAs offer a MoWs service, either by being the key provider or outsourcing to an external supplier. The national MoWs survey found that 66%, 48% and 42% of LAs offered MoWs in 2014, 2016 and 2018, respectively [16]. Comparisons of this survey's findings with the provision reported in our study should be interpreted with caution, as some LAs might still offer MoWs but not report who is responsible for provision on their website. Nevertheless, these findings suggest a continuing trend of terminations of MoWs services by LAs in all UK nations. This is a concerning finding, as the termination of MoWs services has raised concerns about the impact on service users' mental wellbeing and physical health [8]. In a few cases, links to MoWs subpages in LA websites were broken or led to a blank page, which might cause uncertainty to website visitors. In addition, 38.5% of reviewed LA websites provided lists of 3rd-party MoWs providers, with or without links to their websites. In several cases, information on MoWs provision could not be located on LA websites, but a postcode check [15] revealed MoWs were available in the area through private providers. This places the onus on website visitors to run their own searches to identify if MoWs are provided locally.

Individuals wishing to access MoWs services are likely to benefit from detailed descriptions of the meals offered; 63.9% of LA websites where MoWs information was located, and 91.7% of 3rd-party provider websites, provided information on the types of meals that could be ordered, e.g., a two-course hot lunch. However, ~50% of LA and ~23% of 3rd-party provider websites did not provide information on whether special dietary requirements are catered for (e.g., soft or pureed foods), despite the prevalence of poor oral health and dysphagia in older adults who could be in need of MoWs [41,42]. In addition, only 21.8% of LA websites (but 77.1% of 3rd-party provider websites) published sample menus to support decision-making. A study in New Zealand found that a lack of menu choice was a barrier to using MoWs among ethnic groups [43], making this important information for potential service users to be presented with. Informed decisions could also be facilitated if MoWs provider websites reported the cost of MoWs services on their websites. The cost

of a two-course hot meal (average=£4.79 and £7.58 for LAs and 3rd-party providers, respectively) was located on only 39 websites. This was higher than the average cost of the two-course meals (£3.60) in 2018 [16], which is likely due to current increases in food and fuel prices [44]. It is noteworthy however, that this cost would respectively average £143.70 and £227.4 per month, which is lower than the average monthly cost of residential (£2,816) and nursing home care (£3,552) [45], suggesting that MoWs could help service users stay independent, in their homes, for less. Nevertheless, the current cost-of-living crisis might necessitate that subsidy information on MoWs is more pertinent on LA websites, however only 23.3% of websites provided this information. If exact MoWs costs cannot be provided as they vary based on circumstances, MoWs providers could consider providing average costs, or range of prices, on their websites, to help interested individuals decide if the service is affordable to them.

It is increasingly recognised that the welfare checks carried out by MoWs drivers are essential in helping service users to live independently, and safely, in their own homes [3,4]. Only 23.3% and 31.3% of the LA and 3rd-party provider websites reviewed mentioned this, or other crucial MoWs features, such as checking for household hazards or the benefits of social interaction in reducing service users' feelings of loneliness and isolation [2,46]. In 2018, 59% of MoWs providers reported offering additional services, including welfare checks [16]. It is likely that provision of additional services in the current study is underestimated, as MoWs providers might offer these but not report so on their websites. Another finding that should be highlighted is that, of those LA websites where MoWs information was located, information on how to order the service, or a designated MoWs contact to enquire about the service, could not be located in approximately half the websites. Some LA websites provided a link to an online form for ordering, which was assessed as good practice, while others offered vague directions, for example 'contact your local Trust', which might increase burden for potential service users. Finally, it is noteworthy that the vast majority of websites did not provide information on precautionary measures to address COVID-19, despite the availability of relevant guidelines [30,31], at least when the review of English LA websites took place. The review of LA websites from the other UK nations took place a year later, when COVID-19 cases in the UK were at their lowest [47], and that of 3rd-party provider websites in 2023, which might justify the low number of websites reporting such information. Nevertheless, the emergence of new COVID-19 variants continues to put pressure on national healthcare systems [48], and since MoWs service users are likely to be at increased risk of COVID-19 infection due to older age, disabilities or multi-morbidities [49], MoWs providers should consider reporting COVID-19 protective measures on their websites.

At least half of the LA websites fully or partially met the criteria for six out of seven website quality items, and all 3rd-party provider websites met three of these criteria. Proportions varied however, with lowest scores allocated to items related to how often MoWs pages are updated, content, cultural and sensory design, depending on the type of MoWs providers. Only 58.3% of LA websites, but all of 3rd-party provider websites, provided information that was considered a good fit for potential service users' needs, when judged on relevance and comprehensiveness, and only 25.1% met these criteria fully. This was similar to a recent study, where just one in three council websites were rated as above average in terms of comprehensiveness [24]. Although LAs are required to publish an online statement outlining the ways in which their website is accessible to all users [50], it has been found that 40% of local council homepages failed basic accessibility tests [51]. Whilst 92.8% of LA websites reviewed in this study offered some form of sensory support, such as text enlargement, just 32.7% offered specialist assistive technology software to support audio or visual impairment, and only 8.3% of 3rd-party providers fully or partially met the criterion of sensory design. Earlier research found that one third of adults who use MoWs in New York have visual impairments [52], and that information on UK LA websites was difficult to access for older people [53]. Therefore, technology that changes background colors or increases text size would be useful, while speech recognition could aid adults with arthritis access information [54]. Furthermore, almost half of LA websites, and all of 3rd-party provider websites, did not offer a translation tool, which could make accessing MoWs information challenging. A systematic review revealed that language barriers can lead to low

awareness of social care services [55]. Therefore, MoWs providers may wish to implement assistive technology software and consider the use of intuitive icons to make their websites more accessible.

Several other aspects of website quality need to be highlighted. In line with earlier research [17,27], some LA websites seemed to over-rely on external websites, in lieu of providing pertinent MoWs information themselves. When the LA websites of all UK nations were reviewed in the summers of 2021 and 2022, links to external websites were found to not work in 26% of websites where MoWs information was located. As a secondary aim of the current work, the LA websites of those UK nations which signposted to external websites in 2021 and 2022 were reviewed again in summer 2023, in order to identify and review websites of 3rd-party MoWs providers; we found that links to external websites did not work for 38% of signposted providers. Although working links to external websites can be useful to guide interested individuals to additional information, their presence means that website visitors will need to collate information from a variety of sources, relying on individuals' ability to do so, and increasing burden to access information [17]. Fast, easy access to MoWs information from a homepage (in three or fewer clicks) was achieved by only 47.5% of LA websites. Long navigation pathways were also noted in similar research [27], and while a controversial measure of website quality [56], the notion of 'three clicks or less' might support potential service users in quickly accessing MoWs information. Additionally, some of the most comprehensive MoWs websites (which addressed menus, pricing, ordering procedures, delivery days and times, welfare checks and cancellation policies) published information in PDF format. PDFs typically require users to download, save and reopen files, making information more difficult to use [40,57]. These findings indicate that discrepancies between availability of information and quality of presentation, or user-friendliness, are not uncommon, and we recommend that all these aspects are considered when MoWs providers develop their webpages.

4.1. Strengths and limitations

To our knowledge, this is the first study to assess the online provision of MoWs information on LA websites in the UK, and the websites of those 3rd-party providers signposted by LA websites, by conducting a comprehensive evaluation of all LAs with adult social care responsibilities in England, and those of all LAs in Wales, Scotland and Northern Ireland. Our data capture forms incorporated elements from the latest national MoWs survey [16] for comparison purposes, but expanded these with other timely items (e.g., related to COVID-19) to provide a wider ranging assessment of online MoWs provision. Finally, the scoring system was based on the DISCERN tool, which has previously shown high face and content validity in evaluating the quality of consumer information [38].

Several limitations hinder the external validity of the findings. The data capture forms utilised to extract data have not been validated. In addition, websites were reviewed using specific devices and browsers, and it is unclear if the use of alternate devices would impact users' experience, or the results of this evaluation. As the number of adults in the UK who use smartphones is increasing [58], future research should replicate our findings by conducting this review using smartphone devices. Further, scoring of websites was at the discretion of the researchers, and therefore subjective to a degree. We reduced researcher bias by having additional researchers extract data independently for ~10% of websites and documenting the approach to scoring for replication purposes. In addition, website review was approached from the perspective of a service user [23], without assuming online literacy or understanding of website navigation pathways. Nevertheless, subconscious biases might remain. Future studies could overcome this limitation by having websites tested by individuals for whom MoWs are intended [40]. Further, we only assessed online information on MoWs provided through LA websites, and websites of 3rd-party MoWs providers, at a specific point in time. As such, our results cannot be generalized to MoWs information provided in the websites of other organizations who might be providing the service, and online information provision might have improved since data extraction took place. Finally, we only reviewed the websites of 3rd-party MoWs providers that LA websites signposted to, and therefore findings cannot be generalized to all non-LA MoWs providers in the UK. This is imperative to note, because individuals may access information from sources beyond their LA [59]. However, this study provides important insights about the online

provision areas that all 3rd-party MoWs providers in the UK could benefit from, in order to maximize their impact [60].

4.2. Implications

This research is timely, as the National Health Service (NHS) Long Term Plan has committed to the provision of improved social care and community support to reduce, or delay, the need to move into residential or nursing care homes [61]. In addition, potential service users should be able to access information 'that helps them to prevent/reduce any needs developing, connect with their local community, and delay the onset of greater needs' [62]. Despite the aforementioned limitations, our findings therefore have important implications for the development of websites as platforms for the delivery of information on MoWs services in the UK, but also globally where MoWs services are commissioned. MoWs are not a statutory requirement, but they are an essential preventative social care service, and LAs should prioritize providing comprehensive MoWs information, via dedicated pages on their websites, to allow anyone wishing to access the service make informed decisions. As a key responsibility of LAs is to provide information and advice on social care [13], this information should be provided irrespective of whether LAs are the key provider of MoWs or outsource the service to 3rd-party providers. As such, if MoWs are not provided by an LA, this should be clearly highlighted and, ideally, links to 3rd-party providers who operate in the area provided. Since 54% of healthcare professionals in England are not aware of available MoWs services [63], and many potential service users are perceived to be unaware that MoWs exist [3,64], it is of utmost importance to raise awareness of the service via appropriate publicity strategies and clearly signposting to MoWs from LA website homepages.

It is also important for MoWs provider websites to provide detailed information on the actual MoWs provision. Our recent qualitative study with 28 MoWs service users and referrers from four areas in England suggested that, when considering accessing MoWs, participants valued having details about the types of meals (e.g., whether meals require any preparation, variety and nutritional information of the meals), the cost of MoWs, and whether the service is provided regularly (including the time and frequency of deliveries) [65]. Some participants also expressed their frustration for not always being able to find this information online, and having to spend time using the telephone to enquire about details. Some of the websites reviewed in this study should be commended for their good practice in providing this valued information. Overall however, our findings showed that more could be done for MoWs provider websites to provide the MoWs information that service users and their referrers wish to access before they decide whether to commence MoWs. The items assessed in our data capture forms could therefore inform the development of a checklist detailing what information should ideally be included on MoWs websites, which MoWs providers can use to guide their online MoWs information provision.

Information on MoWs should also be presented in a way that is functional, easy to find, navigate and understand, and updated regularly as circumstances change, while offering accessibility options to ensure provision of information on MoWs is inclusive, and can be accessed by anybody who could benefit from the service. However, when updating websites, providing high quality MoWs information should remain a priority, as websites with good levels of accessibility and that are easy to use may not always meet informational needs.

5. CONCLUSIONS

This study highlights that the online information provision on MoWs, as offered by the LA websites reviewed, and those of 3rd-party MoWs providers signposted to by LAs, is generally poor, with the majority of websites (~70%) assessed as requiring improvement. It also highlights the improvements that MoWs providers in the UK could make to their webpages, in order to enhance both the quality of information provided, but also how this information is presented. These recommendations aim to assist LAs and other MoWs providers in raising awareness of MoWs as an essential preventative service. They will also help ensure that potential MoWs service users, and

people wishing to refer someone to MoWs, have an enhanced online user experience that meets their needs, so that the impact of MoWs services is maximized.

Supplementary material: The following supporting information can be downloaded at the website of this paper posted on Preprints.org. Table S1: Amendments to the data capture form and/or data extraction process following the pilot; Table S2: Data capture form for local authority websites. Table S3: Data capture form for 3rd-party Meals on Wheels provider websites. Table S4: Considerations when reviewing the domains of the data capture form and scoring criteria; Table S5: Local authority and 3rd-party Meals on Wheels provider websites reviewed in the current study. Figure S1: Proportion of 3rd-party Meals on Wheels provider websites providing sufficient information, partial information, and no information against the different criteria of the data capture form's Meals on Wheels information provision domain. Figure S2: Proportion of 3rd-party Meals on Wheels provider websites providing sufficient information, partial information, and no information against the different criteria of the data capture form's website quality domain.

Author Contributions: AP conceived and supervised the study; RR, CP and AA collected the data; RR, CP, AA and AP analysed the data; CC and HB validated the data extraction; AP led the drafting of this manuscript. All authors provided critical input, reviewed the manuscript for important content, take responsibility for the contents of this article and approved the final version submitted for publication.

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Conflicts of Interest: The authors declare that there is no conflict of interest regarding the publication of this article.

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