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Dynamics of unmet need for social care in England

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Abstract
Meeting individuals' social care needs is a core element of UK social policy. However, the conceptualisation and operationalisation of 'unmet need' remain a challenge. This paper advances our understanding by incorporating a temporal dimension into the conceptual framework on unmet need to investigate the dynamics of met and unmet need for social care over time. Using data from Waves 8 and 9 of the English Longitudinal Study of Ageing, this paper examines five possible trajectories among individuals with a social care need for bathing or dressing at baseline: (a) no longer having such a need; (b) having continued needs met; (c) delayed needs met; (d) newly arisen unmet needs; and (e) repeated unmet needs. The results indicate that amongst those with need at baseline, unmet need has decreased over time – indicating that some needs for social care may be fulfilled with a delay. However, a significant proportion of older people experienced repeated unmet needs, particularly those who were younger, with no spouse or civil partner, and those whose activities of daily living index scores worsened over time. Understanding the dynamics of unmet need can support policy makers in better ensuring that those facing an elevated risk of repeated unmet need over time do not fall through the social care safety net.

Introduction and background

The ageing of the United Kingdom's (UK) population, especially the increase in the number of those aged 85 and over, is linked to an increase in health-care and social care requirements (Freedman and Spillman, 2014*a*; Jagger, 2015; Office for National Statistics, 2018). Social care enables individuals to function on a daily basis, *e.g.* getting in and out of bed, or getting dressed. However, meeting the needs of a growing older population with constrained public and private resources remains an ongoing debate (Mortimer and Green, 2015; Department of Health and

Social Care, 2020). Between 2016 and 2018, the number of older people reporting unmet needs for support in carrying out their activities of daily living (ADLs) had risen from 1.2 million to 1.4 million (Age UK, 2019). Previous research shows that unmet needs can result in a range of adverse consequences for older people's health status, wellbeing and dignity (Allen *et al.*, 2014). Those reporting unmet needs face greater challenges and vulnerabilities associated with their ADLs (Komisar *et al.*, 2005), higher odds of falls (Momtaz *et al.*, 2012), more physician and emergency-room visits, more hospitalisations (Xu *et al.*, 2012) and re-admissions (DePalma *et al.*, 2012), and a higher mortality rate (He *et al.*, 2015). Such studies are reflective of the wide range of domains of wellbeing to which the concept of unmet need has been applied. Therefore, measuring the extent and nature of unmet need is critical in assessing the effectiveness of social care provision, and identifying and quantifying the types of unmet need which can help policy makers to address it (Vlachantoni *et al.*, 2011).

In the UK, as in other countries, the support received by a person in need comes from a range of sources, including informal sources (*e.g.* family), formal statutory (public) sources (*e.g.* local council) or formal paid sources (*e.g.* private sector). The majority of care is provided by family, particularly by female partners or adult daughters over most of the lifecourse (Maplethorpe *et al.*, 2015), and male spouses in later life (Robards *et al.*, 2015). However, the demand for informal care by disabled older people is projected to rise substantially in the future (Pickard *et al.*, 2007; Wittenberg and Hu, 2015), while the supply of informal care is likely to reduce as a result of lower fertility, higher female employment rates (Lewis and West, 2014) and an increase in one-person households, partly due to a decrease in marriages alongside a rise in partnership breakdown (Age UK, 2019).

When austerity funding and pressures on health services are considered, the challenge of social care provision becomes more pressing (Forder and Fernández, 2010). In England, local authorities are responsible for adult social care, and this duty is set in law. Since 2008, the budgets of the majority of local authorities, which are responsible for adult social care, have been cut (Ismail *et al.*, 2014), *e.g.* by raising the eligibility thresholds and increasing user fees. The combination of spending cuts and a reduced number of individuals supported results in more older people relying on their own resources, *e.g.* paying privately for care, seeking more informal care or going without care. Existing research has evidenced a significant level of 'unmet need' for certain daily tasks (Maplethorpe *et al.*, 2015; Vlachantoni, 2019). This paper builds on this background to expand our understanding of the extent and nature of unmet need for social care in later life, using a longitudinal perspective.

Conceptualising the dynamics of the unmet need

There is no universally accepted definition of 'need' and 'unmet need'. Bradshaw (1972) distinguished between user, professionally or comparative definitions of need, with 'user need' referring to demand for particular services in the context of a person's experiences and expectations, 'professionally defined' need as determined by experts or service agencies, and 'comparative need' understood with reference to the level of available resources. Need in social policy is inextricably linked

with cost containment and the increasing targeting of public resources on those with complex needs (Godfrey and Callaghan, 2000). At the aggregate level, some unmet need may be deemed acceptable by some against scarce resources, but what is critical is whether observed unmet need is inequitable or systematically related to personal characteristics (Allin *et al.*, 2010).

Vlachantoni *et al.* (2011) provided a comprehensive conceptualisation of unmet need, determined by the interaction between a person's type and level of need, and the type and level of support they receive, and affected by their demographic, socio-economic and health status characteristics. This framework is applicable to different perspectives (*e.g.* local council, older person), as well as capturing composite need (*e.g.* both physical and emotional need) or different types of need. Unmet need may reflect different groups of people: those with a low level of need who receive no support, those with a moderate level of need who fall just below the eligibility threshold for receiving support or those with high needs who receive formal support but who are not satisfied by it. Qualitative interviews with older persons reflect their dynamic situations, moving in and out of unmet need as their condition deteriorates or improves, and the support available to them increases or diminishes (Ipsos MORI, 2017). However, this temporal dimension of need and unmet need is rarely specified (Diwan and Moriarty, 1995). Existing research from other areas, such as health care, has also offered useful insights, by highlighting the importance of studying societal and individual determinants of care utilisation (Andersen and Newman, 2005), care recipients over time (Rapkin *et al.*, 2008) and identifying health needs through a dynamic perspective (Smith and Connolly, 2019).

Building on this body of literature, we develop further the conceptual framework of unmet need for social care advanced by Vlachantoni *et al.* (2011) by examining the need for social care over time. Five different trajectories are identified between two points in time, illustrated in Figure 1. Among individuals who reported a social care need at baseline, it is possible that by the second time-point they: (a) no longer have needs for social care; (b) they have continued needs, which are met; (c) their needs are met with a delay; (d) they have newly arisen unmet needs; and (e) they have repeated unmet needs. 'Delayed needs met' refers to a scenario where the older persons' need has been met by the next time-point, while 'newly arisen unmet needs' refer to older people's increased care needs over time, or previously provided support no longer being available. Finally, 'repeated unmet needs' refer to the experience of unmet needs over both time-points. These five different trajectories are affected by individual's demographic, socio-economic and health status as well as the availability of a source of support over time. The framework allows for changes in the level of needs (*e.g.* different types), formal assessment criteria or support satisfaction, as well as the demographic, socio-economic, health status characteristics of respondents, and the source of support received (*e.g.* formal, informal).

Previous empirical evidence on unmet need

Cross-sectional studies are useful in estimating the prevalence of unmet need for the whole population at a single point in time (Sedgwick, 2014). Unmet needs
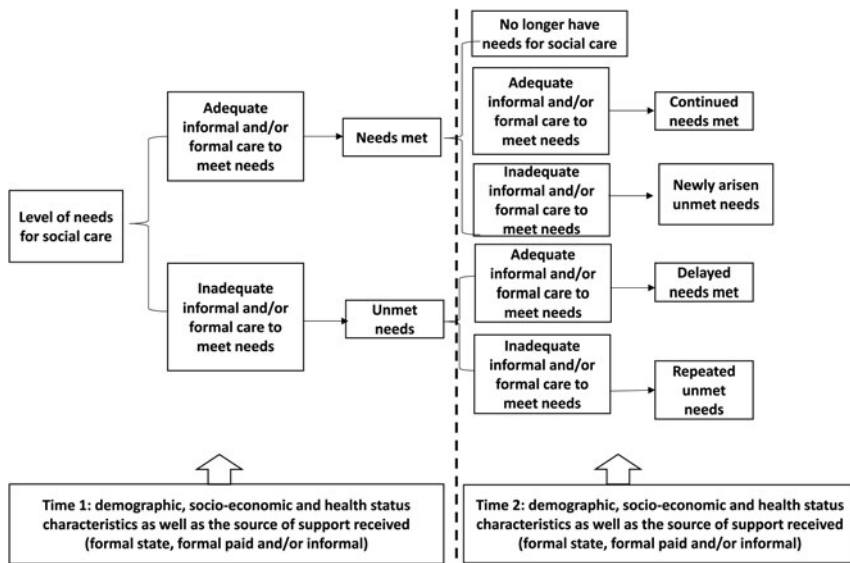
Figure 1. Conceptual framework of dynamic of unmet needs for social care over time.

for social care are widespread in developed and developing countries (Allen *et al.*, 2014; Zhu, 2015). Depending on the study sample and definitions and measurements used, the proportion of disabled older people who receive no support from either family or formal sources varies. In traditional community housing, the percentage of persons aged 65 and older who had difficulty with daily activities who experienced a consequence unmet need for 'getting cleaned up' and dressing in the previous month was 3.8 and 2.8 per cent, respectively (Freedman and Spillman, 2014*b*). Unmet care needs amongst older people are particularly high in some European countries with low social service use, or an imbalance between health and social care service use (Bien *et al.*, 2013). Analysis of a representative sample from Taiwan of 6,820 elders and family care-giver dyads shows that the highest proportion of unmet ADL needs referred to climbing stairs (21.0%), and the lowest pertained to support whilst eating (5.9%) (Liu *et al.*, 2012). Hu *et al.* (2020) showed that lower socio-economic groups were more likely to need (more) long-term care, and particular types of difficulties are associated with support received from specific sources (Vlachantoni *et al.*, 2015).

Previous studies have predicted the factors associated with unmet needs for long-term care. Older people's conceptions of need and unmet need can shift due to the challenges they have faced and their resources (Godfrey and Callaghan, 2000). The number of ADLs is a strong determinant of receiving support from any source (Vlachantoni *et al.*, 2015). Adopting a longitudinal perspective to study unmet needs for social care has been rare. For example, Dubuc *et al.* (2011) examined changes in unmet needs over time amongst older people in Canada, showing a decrease in the level of unmet needs over time. Having a higher level of disabilities was linked to a steeper decline of unmet needs over time. Another study in England found that unmet needs in ten years from 2002 to

2012 were associated with living alone, losing a spouse and developing more severe needs (Dunatchik *et al.*, 2019). Burchardt *et al.* (2018) found that older persons who live alone and have a high level of need (but not the highest) in the UK can 'fall through the cracks' of formal and informal systems of support. Evidence of the effect of economic conditions on individuals' unmet needs of social care is mixed. In China, the economic independence and better economic status among the oldest old persons reduced their odds of having unmet needs (Zhu, 2015). However, in the UK, wealth was not associated with unmet needs (Dunatchik *et al.*, 2019).

Building on this emerging body of longitudinal empirical evidence, this paper examines the changing patterns of unmet need for social care over time and the predicting factors for such patterns. Two hypotheses are derived:

- Hypothesis 1: Met or unmet needs for social care are dynamic over time.
- Hypothesis 2: Such dynamics are associated with changes in an individual's circumstances, which affect the demand for care and/or the supply of care provision.

Data and method

The analysis uses data from the two most recent waves of the English Longitudinal Study of Ageing (ELSA), Waves 8 and 9 (collected May 2016 to June 2017 and June 2018 to July 2019, respectively). The ELSA started in 2002 and collects information on the physical and mental health, as well as demographic and socio-economic circumstances, of a representative sample of the English population aged 50 and over, living in the community (Banks *et al.*, 2019). The respondents have been followed up with an interview every two years (Steptoe *et al.*, 2012). These two waves of data included a consistent set of questions about whether respondents who reported difficulties with undertaking particular ADLs, including bathing and dressing, received support for such activities from informal or formal sources. The ELSA collected information about unmet needs for six daily activities (dressing, bathing or showering, getting in and out of bed, walking across a room, using the toilet and eating). The empirical analysis below focuses on unmet need with respect to two specific ADLs (bathing and dressing), for two reasons. Firstly, the prevalence of need in these two areas is significant among the older population (Kalankova *et al.*, 2020) (*see also* Table S1 in the online supplementary material). Secondly, the paper is aimed at illustrating patterns of unmet need in two areas where the intervention of social policy is of critical importance (Mortimer and Green, 2015). The social support received by a person in relation to these two ADLs is likely to come from informal sources such as one's family, the availability of which can fluctuate over time.

Respondents aged 65 and above are selected for this study, as they were asked questions about their difficulty with ADLs. Because of the high attrition of ELSA (Banks *et al.*, 2011), our prospective longitudinal analyses use only the two latest successive waves, following respondents aged 65 and above who reported difficulty with bathing or dressing at the baseline (Wave 8) and observing whether their care needs were met at Waves 8 and 9. The flow chart (Figure 2) shows the analytical sample selection from Waves 8 and 9.
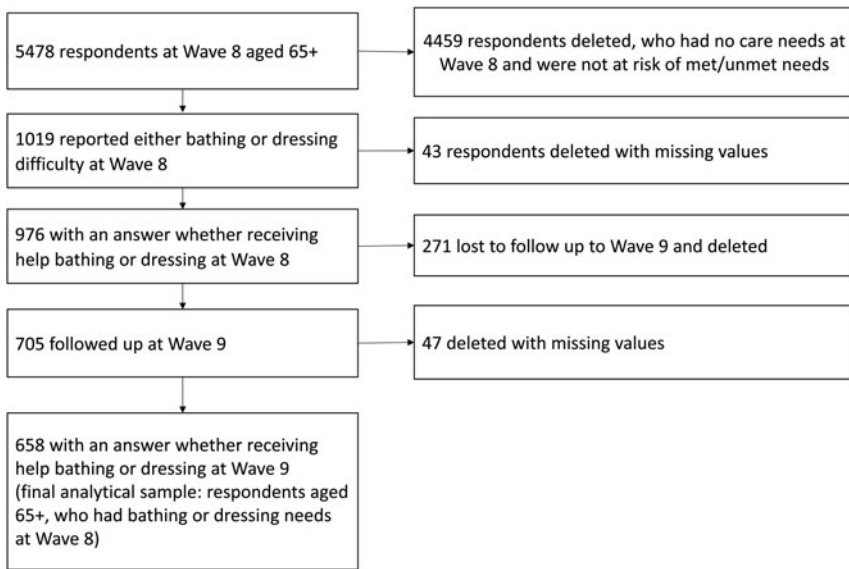
Figure 2. Flow chart with analytical sample selection, Waves 8 and 9.

Measures
Dependent variables

In the ELSA, respondents were asked the following questions:

> Here are a few more everyday activities. Please tell me if you have any difficulty with these because of a physical, mental, emotional or memory problem. Again exclude any difficulties you expect to last less than three months.
>   01 Dressing, including putting on shoes and socks.
>   …
>   03 Bathing or showering.
> IF reported at least one difficulty with an ADL or IADL [instrumental ADL], I'd now like to ask about any help you have received in the last month. Have you received help from anyone with dressing, including putting on shoes and socks, in the last month?
>   01 Yes.
>   02 No.
> Have you received help from anyone with bathing or showering, in the last month?
>   01 Yes.
>   02 No.

All respondents who reported a difficulty in performing the selected ADL at the baseline are included in the analysis (together for bathing and/or for dressing). As such, individuals' report of a difficulty with such ADLs is utilised for defining their need for social care, an approach used elsewhere (*e.g.* Vlachantoni, 2019). The tool of ADLs is widely used to evaluate an individual's ability to perform functional

activities independently (Katz *et al.*, 1963). For this study, a person is defined as having 'unmet need' when they report needing help for bathing or dressing, but do not receive support with such tasks from any source, either formal or informal.

As described in Figure 1, over the observation period (Waves 8 and 9), some respondents received help at Wave 8. Among these, at Wave 9, the majority continued to receive support which met their needs (continued need met); a number of people reported no such difficulty anymore (no longer have needs); and a small number of people did not receive help anymore and thus now had unmet needs (newly arisen unmet needs). Some older people did not receive support and had unmet needs at Wave 8. Among these, at Wave 9, some now received help which met their needs (delayed needs met); while some still did not receive any help (repeated unmet needs). In the multivariate statistical analyses, we applied binary logistic regression to hone in on each particular group, capturing the dynamic of social care needs for bathing or dressing, met or unmet, across two points in time:

(1) No longer have needs for social care (binary, 1 = yes).
(2) Continued needs met (binary, 1 = yes).
(3) Newly arisen unmet needs (binary, 1 = yes).
(4) Delayed needs met (binary, 1 = yes).
(5) Repeated unmet needs (binary, 1 = yes).

The five outcomes reflecting the dynamics of met or unmet social care needs for bathing or dressing measure the change in scores between two time-points. The method of using change scores for analysing panel data was discussed by Berrington *et al.* (2006) and Allison (1990).

Independent variables

The variables used in the analysis are informed by previous research on unmet need and directly relate to the conceptual framework of understanding change in unmet need over time as shown in Figure 1. The independent variables include demographic characteristics (age, gender, marital status), socio-economic variables including benefit-unit equivalised non-housing wealth that is the sum of savings, investments and physical wealth after financial debt is subtracted (Banks *et al.*, 2019), and variables reflecting one's need such as their ADL index score at baseline which added the number of difficulties one experienced. More variables that measure changes between waves are also included, such as living arrangements with three categories: living with spouse/others in both waves, living alone in both waves and change in living arrangements at the second wave. The change in the respondents' ADL index score has two categories: no change or improved between the two waves (improvement meaning a reduction in the score) and worsening (meaning an increase in the score). The change in quintiles of the benefit-unit equivalised non-housing wealth has three categories: no change, richer (meaning an increase in the quintile scale) and poorer (meaning a decrease in quintile scale). Very few respondents changed their marital status across the two waves (18 respondents became widowed/divorced). This variable was measured only in Wave 8.

Table 1. Characteristics of the analytical sample of respondents: aged 65 and above and reporting bathing or dressing difficulty in Wave 8

	Number of respondents	%
Total	658	100.0
Age:		
65–74	325	46.4
75–84	226	31.3
85+	107	22.3
Gender:		
Men	283	42.8
Women	375	57.2
Marital status:		
Married/civil partnered	369	52.9
Divorced/separated/widowed/single never married	289	47.1
Living arrangement change across Waves 8 and 9:		
No change, living with spouse or others	390	57.6
Living alone in both waves	220	36.2
Living arrangements changed	48	6.2
ADL index score at Wave 8:		
1 ADL difficulty	322	47.8
2+ ADL difficulties	336	52.2
Changes in ADL index score across Waves 8 and 9:		
No change or improved	508	76.3
Worsening	150	23.7
Quintiles of benefit unit equivalised non-housing wealth at Wave 8:		
Poorest quintile	125	18.9
Second-poorest quintile	197	33.8
Middle quintile	153	23.1
Second-richest quintile	112	15.1
Richest quintile	71	9.1
Changes in quintiles of benefit unit equivalised non-housing wealth across Waves 8 and 9:		
No change	401	59.2
Richer	144	23.2
Poorer	113	17.5

Notes: Unweighted N, weighted % (Wave 9 longitudinal weight (Wave 4 base)). ADL: activity of daily living.
Source: Authors' analysis of the English Longitudinal Study of Ageing (Waves 8 and 9).

Statistical analyses

The method of separate binary logistic regression is applied, with five outcome variables: no longer has needs for social care, continued needs met, newly arisen unmet needs, delayed needs met and repeated unmet needs (Abraham and Ledolter, 2006). After fitting the binary logistic regression models, we estimated average marginal effects (AME), providing an estimate of the percentage points difference in the probabilities of an outcome event when the independent variable changes by one unit. The reasons why AME are generally preferable to odds ratios in terms of communicating results regarding the effect of the explanatory variable on binary dependent variables are usefully described in a previous study (Norton and Dowd, 2018). Odds ratios are conditional on the data and the model specification. In contrast, AME offer an alternative to odds ratios that do not share the property of being sensitive to the inclusion of additional variables (Norton and Dowd, 2018). For each binary logistic regression model, the model diagnostics statistics, including checking for specification error (the linktest), multicollinearity (variance inflation factor), influential outliers (the deviance residual and the leverage (the hat value)) and goodness-of-fit (likelihood ratio test), were monitored. All statistical analyses were performed using Stata version 15 (StataCorp, College Station, TX).

Sample characteristics

The characteristics of respondents reporting difficulty with bathing or dressing are presented in Table 1. More than half were women (57.2%) and were married/civil partnered (52.9%). Twenty-two per cent of respondents were in the 85+ age group, and 36 per cent were living alone at both Waves 8 and 9. More than half reported difficulty with more than one ADL (52.2%). Over the observation period, the ADL score worsened for less than one-quarter of respondents. Some respondents (6.2%) changed their living arrangements. Compared with those with no bathing and dressing difficulty at Wave 8, the analytical sample was more likely to be older, not married, living alone, with one or more ADL difficulties and poorer in terms of household non-housing wealth (*see* Table S2 in the online supplementary material).

Results

Dynamics of unmet need

Figure 3 shows the percentages of older persons in each of the categories identified in the original conceptual framework (Figure 1), for the two ADLs under study. Among those with a care need for bathing or dressing in Wave 8 (N = 658), 33.6 per cent (202) had met and 66.4 per cent (456) had unmet needs. By Wave 9, 34.5 per cent (226) of those with a care need in Wave 8 no longer had needs, 21.7 per cent (132) continued to have their needs met, 5.3 per cent (32) had new unmet needs, 10.8 per cent (72) had their needs met with a delay and 27.8 per cent (196) had repeated unmet needs.

Determinants of the dynamics of unmet need

Turning to the longitudinal analysis using Waves 8 and 9 (Table 2), among the 685 respondents with a need for help with bathing or dressing at Wave 8, the
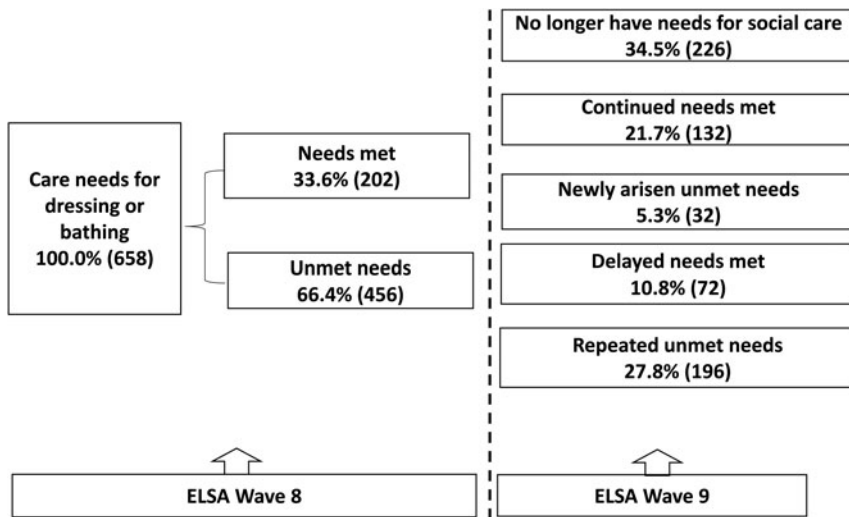
Figure 3. Number and proportion of respondents in each of the defined categories.
Note: Unweighted N, weighted %.

proportion of older persons' unmet needs for bathing or dressing declined from 66.4 per cent at Wave 8 to 33.1 per cent (5.3% newly arisen unmet needs plus 27.8% repeated unmet needs) at Wave 9. These results indicate that the overall unmet need with support for bathing or dressing decreased over time. Respondents who were more likely to report repeated unmet needs with bathing or dressing were those divorced or single, living alone at both waves, or changing their living arrangements across two waves, with a lower ADL index score at Wave 8 and with a worsening ADL score over time. Respondents who were more likely to report delayed needs met were those in the older age group and those with a higher ADL index score at Wave 8. Respondents who were more likely to report newly arisen unmet needs were aged 75–84, married/civil partnered and changing living arrangements across two waves. Respondents who were more likely to have their needs met at both waves were married/civil partnered, living with spouse or others, and not changing their living arrangements across two waves, with a lower ADL score at Wave 8 and a worsened ADL score across two waves. Respondents who were more likely to report no longer having needs for bathing or dressing were married/civil partnered, with a lower ADL score at Wave 8, and ADL score not changed or improved across two waves. It is noted that quintiles of non-housing wealth and changes across two waves were not associated with any dynamic category. Therefore, in the multivariate analysis, we treated non-housing wealth as a continuous variable for control purposes.

Table 3 shows the results from the separate multivariate binary logistic regressions, *i.e.* the AME of experiencing each dynamic of met or unmet needs with bathing or dressing across Waves 8 and 9, amongst those who reported difficulty in bathing or dressing at Wave 8. The AME of age on reporting repeated unmet needs were negative (AME = −0.006) indicating that the probability of experiencing

Table 2. Dynamics of met or unmet needs with bathing or dressing across Waves 8 and 9, by individual characteristics

	Dynamics of met or unmet needs				
	No longer have needs for social care	Continued needs met	Newly arisen unmet needs	Delayed needs met	Repeated unmet needs
	Percentages				
Total	34.5	21.7	5.3	10.8	27.8
Age:	*	NS	***	*	NS
65–74	38.7	21.6	3.5	8.7	27.5
75–84	34.2	17.6	10.4	9.3	28.5
85+	26.1	27.5	1.4	17.4	27.5
Gender:	NS	NS	†	NS	NS
Men	33.0	22.7	6.8	11.0	26.5
Women	35.7	21.0	4.0	10.5	28.9
Marital status:	NS	***	*	NS	***
Married/civil partnered	37.5	26.8	7.3	11.3	17.1
Divorced/separated/widowed/single never married	31.2	15.8	3.1	10.3	39.7
Living arrangements change across Waves 8 and 9:	NS	***	*	NS	***
No change, living with spouse or others	35.7	30.1	5.3	10.4	18.5
Living alone in both waves	32.4	10.7	3.6	11.6	41.8
Living arrangements changed	34.2	7.9	15.8	10.5	31.6
ADL index score at Wave 8:	***	***	NS	***	NS

(*Continued*)

Table 2. (*Continued.*)

	Dynamics of met or unmet needs				
	No longer have needs for social care	Continued needs met	Newly arisen unmet needs	Delayed needs met	Repeated unmet needs
1	43.6	15.5	5.4	5.7	29.4
2+	26.0	27.2	5.0	15.5	26.3
Changes in ADL index score across Waves 8 and 9:	***	***	NS	NS	***
No change or improved	44.9	15.7	4.7	10.8	23.9
Worsening	0.7	40.8	7.5	10.9	40.1
Quintiles of benefit unit equivalised non-housing wealth at Wave 8:	NS	NS	NS	NS	NS
Poorest quintile	35.0	23.9	4.3	5.1	31.6
Second-poorest quintile	28.7	21.5	9.1	11.5	29.2
Middle quintile	39.2	23.8	2.8	12.6	21.7
Second-richest quintile	43.0	19.1	4.3	8.6	25.5
Richest quintile	28.6	16.1	1.8	17.9	33.9
Changes in quintiles of benefit unit equivalised non-housing wealth across Waves 8 and 9:	NS	NS	NS	NS	NS
No change	33.5	21.0	5.5	9.8	30.1
Richer	35.4	20.8	6.9	11.8	25.7
Poorer	36.7	25.7	2.8	13.0	22.8

Notes: N = 658. ADL: activity of daily living.
Source: Authors' analysis of the English Longitudinal Study of Ageing (Waves 8 and 9).
Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, NS: not statistically significant.

Table 3. Average marginal effects (AME) estimated from separate binary logistic regression models

	Dynamics of met and unmet needs				
	No longer have needs for social care	Continued needs met	Newly arisen unmet needs	Delayed needs met	Repeated unmet needs
	AME (95% confidence intervals)				
Age	−0.001 (−0.005, 0.004)	0.003 (−0.001, 0.007)	−0.001 (−0.003, 0.002)	0.004* (0.001, 0.007)	−0.006* (−0.011, −0.001)
Gender (Ref. Men):					
Women	0.074* (0.008, 0.140)	0.022 (−0.038, 0.081)	−0.025 (−0.059, 0.009)	−0.021 (−0.070, 0.028)	−0.038 (−0.108, 0.032)
Marital status (Ref. Married/civil partnered):					
Divorced/ separated/ widowed/ single never married	−0.099† (−0.200, 0.002)	−0.043 (−0.133, 0.047)	−0.031 (−0.082, 0.019)	−0.074† (−0.159, 0.011)	0.235*** (0.125, 0.344)
Living arrangements (Ref. No change, living with spouse or others):					
Living alone in both waves	0.047 (−0.064, 0.158)	−0.143** (−0.231, −0.055)	0.004 (−0.056, 0.064)	0.032 (−0.072, 0.135)	0.062 (−0.051, 0.175)
Living arrangements changed	−0.017 (−0.142, 0.108)	−0.161** (−0.254, −0.067)	0.090† (−0.001, 0.182)	0.032 (−0.068, 0.131)	0.025 (−0.110, 0.160)
ADL index score at Wave 8	−0.103*** (−0.126, −0.079)	0.068*** (0.051, 0.084)	0.003 (−0.009, 0.015)	0.029*** (0.013, 0.044)	−0.018 (−0.043, 0.007)
ADL index score change (Ref. No change or improved):					
Worsening	−0.434*** (−0.479, −0.389)	0.213*** (0.137, 0.290)	0.037 (−0.008, 0.083)	0.020 (−0.039, 0.079)	0.185*** (0.101, 0.270)

(Continued)

Table 3. (*Continued.*)

	Dynamics of met and unmet needs				
	No longer have needs for social care	Continued needs met	Newly arisen unmet needs	Delayed needs met	Repeated unmet needs
Benefit unit equivalised non-housing wealth at Wave 8	-5.30×10^{-8} $(-1.45 \times 10^{-7}, 3.90 \times 10^{-8})$	-1.69×10^{-7}† $(-3.62 \times 10^{-7}, 2.37 \times 10^{-8})$	-1.49×10^{-7} $(-3.72 \times 10^{-7}, 7.48 \times 10^{-8})$	4.32×10^{-8}† $(-4.98 \times 10^{-9}, 9.14 \times 10^{-8})$	7.08×10^{-8} $(-2.01 \times 10^{-8}, 1.62 \times 10^{-7})$
Pseudo R^2	0.2383	0.1637	0.0772	0.0543	0.0959
p-Value of likelihood ratio χ^2	<0.001	<0.001	0.0112	0.0018	<0.001

Notes: N = 658. Ref.: reference group. ADL: activity of daily living.
Source: Authors' analysis of the English Longitudinal Study of Ageing (Waves 8 and 9).
Significance levels: † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

repeated unmet needs decreases by 0.6 percentage points if age increase by one year. By contrast, such probability was higher among divorced or single persons (AME = 0.235) compared to their married counterparts or when respondents' ADL index scores worsened across two waves (AME = 0.185). The AME of delayed needs met were higher amongst older age groups (AME = 0.004), or a higher ADL index score at Wave 8 (AME = 0.029), or a higher benefit unit equivalised non-housing wealth at Wave 8 (AME < 0.001), but lower among those who were divorced or single (AME = −0.074). The AME of reporting newly arisen unmet needs were higher when living arrangements changed across two waves (AME = 0.09). The AME of reporting no longer having needs for social care were higher among women (AME = 0.074) but lower among those with a higher ADL index score at Wave 8 (AME = −0.103) or when respondents' ADL index scores worsened across two waves (AME = −0.434). For all statistical models, model diagnostic statistics show there were no issues of model specification error, multicollinearity or influential observations (detailed results available upon request to the author). The *p*-value of the likelihood ratio test was smaller than 0.05 (Table 3), meaning that the overall model is statistically significant.

Discussion and conclusion

This paper was aimed at advancing our understanding of patterns of unmet need for social care by adding a temporal dimension, contributing both towards a conceptual framework of unmet need dynamics and an empirical investigation of factors associated with particular trends of unmet need over time.

The analysis shows that the experience of unmet need with daily activity tasks can be a transient occurrence for some older persons, but it can also be a repeated occurrence for a sizeable proportion. The proportion of older persons with unmet needs for bathing or dressing declined from 66 to 33 per cent from Wave 8 to Wave 9; and over one in four experienced unmet needs at both waves. Moreover, across two waves, one in ten experienced delayed needs met and a small proportion of older people faced newly arisen unmet needs. These results supported Hypothesis 1 that met or unmet needs of social care are dynamic over time. The question then is, what are the characteristics associated with each of these risk groups, particularly those experiencing repeated unmet needs and newly arisen unmet needs, and whether social policy can take these into account in the design of social care support for older persons.

The results show that relatively young age (compared to older age), widowed, divorced or single, or increase in limitations in ADLs are the risk factors for experiencing repeated unmet need with bathing or dressing. Social care for bathing or dressing demands in-home assistance. Family members such as one's spouse/partner or children are the primary resources of care provision in the UK. Widows, widowers or elders without children are more likely to live alone, limiting their opportunities to obtain informal support. Moreover, an increase in demand for social care for other ADLs might generate a discrepancy in care provision. These are in line with existing research which has also highlighted the role of existing frailty measured through the number of ADL difficulties (Dubuc *et al.*, 2011; Dunatchik *et al.*, 2019), and age (Vlachantoni, 2019) in terms of older persons' risk of having unmet need.

Binary logistic regression findings revealed that newly arisen unmet needs are associated with increased limitations in ADLs and living arrangement change. An increase in limitations in ADLs reflects the increase in demand for social care and might generate a discrepancy of care provision. Living with someone often, though not always, ensures the availability of informal care. A living arrangement change might mean that people's care resources at one point of time became unavailable at the second point, and care needs which were met at the previous time-point would become unmet at the later time-point. The results supported Hypothesis 2 that changes in an individual's circumstance (the demand of care and or supply of care provision) are linked with the dynamic of met or unmet needs of social care.

When considering the dynamic patterns of unmet need for social care, this paper also highlights that when different indicators of vulnerability are taken into account at the same time, it is not the most vulnerable individuals who are at risk of having unmet needs with social care. As discussed earlier in this paper, this may be in part due to the fact that the focus of both policy and services within the long-term care sector has been increasingly concentrated on those most in need (Mortimer and Green, 2015), with the result of other at-risk groups being placed just below the threshold for having their needs met.

The implications of these findings for policy are threefold. Firstly, the evidence reflecting dynamic patterns of unmet need implies that older persons' needs assessment at regular intervals is pivotal, and such assessment should include not only individuals' capacity to perform ADLs/IADLs, but also their broader living environment and sources of support, both formal and informal (Department of Health and Social Care, 2020). A second implication refers to the specific nature of activities examined in this paper, in that the source of support for particular tasks matters. Previous research has shown that among older persons reporting difficulties with ADLs/IADLs, and receiving support, state or private formal support tends to be used for more basic and personal tasks, while informal support tends to be used for more instrumental tasks (Vlachantoni *et al.*, 2015). If repeated unmet need with personal tasks is experienced by groups of individuals in society with particular characteristics, then local authorities need to ensure that formal support is available to such groups, especially where informal care support is not available. This is an important insight which goes at the crux of the debate on whether support received from one source (formal, informal) can complement or substitute support received from another source (Burchardt *et al.*, 2018). Indeed, the balance between different sources of support is also dynamic and may change over time and with each cohort of older people (Lewis and West, 2014).

Notwithstanding the paper's unique contribution to our understanding of dynamic patterns of unmet need for social care, and its conceptualisation, this paper has the following limitations which should be taken into account. Firstly, the regression analysis may include heterogeneity between individuals with different characteristics which cannot be observed using the variables available. Such additional factors may include the proximity of family members, which could help us achieve a more nuanced distinction between different categories of unmet need. A second limitation relates to the nature of attrition in the respondents aged 65 and above between Waves 8 and 9 (detailed in Table S3 in the online

supplementary material). Such attrition stood at 35.4 per cent (361 out of 1,019). The lost to follow-up sample was older than the Wave 8 sample. Slightly more men than women were lost to follow-up. Moreover, the lost to follow-up sample was more likely to report their needs met with bathing or dressing. This implies that the prevalence of unmet need in Wave 8 may be somewhat over-estimated. Finally, the empirical focus of this paper on individuals experiencing unmet need could imply that those who report receiving help with a particular task have all their needs 'met', when in fact they may be unsatisfied with the source, level or nature of help received. Although such investigation is beyond the scope of this paper, it is important to be mindful of the complexity in understanding self-perceived need among older persons. This study only included the population aged 65 and over. It is important to recognise that younger adult recipients of social care are a significant and growing part of England's adult social care system (Idriss *et al.*, 2020). The care they receive may, however, be differentiated from that received by older people, including more support in the community. Future research may expand the study of unmet need to include adults of all ages.

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