

## Predictors of care home resident conveyance to hospital by ambulance services during medical emergencies: a cross sectional study

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### Background and Aims

- Residents of care homes may be affected by medical emergencies, resulting in ambulance attendance and conveyance to hospital which add extra pressure and costs on an already strained emergency and healthcare system.
- The aim of this study was to determine the factors predicting care home resident conveyance to hospital by ambulance services.

### Methods

- A cross-sectional study design analysing routine data from electronic clinical records from East Midlands Ambulance Service NHS Trust (EMAS).
- There were 170,612 attendances to care homes representing 7.5% of the total number of EMAS attendances between 2018-2021.
- A multivariable multinomial regression model was used to identify the main predictors of conveyance to hospital or referral to community services.

### Results

Table 1. Most frequent injuries in care homes as indicated by impression on scene

Condition	Care Homes	Entire Sample (Baseline)
Head Injury **	15,483 (9.28%)	76,924 (3.44%)
Chest Infection**	13,889 (8.32%)	119,170 (5.33%)
Limb Injury	7,553 (4.52%)	74,241 (3.32%)
Collapse	7,098 (4.25%)	72,986 (3.27%)
Other Infection	5,768 (3.46%)	54,400 (2.44%)
Other respiratory problem	4,806 (2.88%)	79,493 (3.56%)
Acute Abdominal Problem*	4,799 (2.87%)	125,007 (5.60%)
Sepsis	4,687 (2.81%)	23,982 (1.07%)
No apparent problem	4,667 (2.80%)	53,298 (2.39%)
Fall Non-Injury	4,511 (2.70%)	38,083 (1.70%)

\* p<0.05; \*\* p<0.001

- The most frequent conditions include head and limb injuries and chest or other infections.
- The main predictors of conveyance to hospital were being male, aged 70-79 years, being in an area of higher deprivation, or having dispatch categories which included cardiovascular, trauma such as falls or neurological conditions.
- Calls made by health care professionals (HCPs) or where patients had a higher National Early Warning Score (NEWS2) resulted in significantly increased conveyance.

Table 2. Predictors of conveyance and referral in care homes

	Baseline (Not conveyed)		Conveyed		Referred	
	RRR	95% CI	RRR	95% CI	RRR	95% CI
Sex (Female)	1	-	1	-	1	-
Male	1.07**	1.03, 1.10	0.97	0.91, 1.03	0.97	0.91, 1.03
Transgender	2.19	0.98, 4.87	0.58	0.07, 4.66	0.58	0.07, 4.66
Age (under 60)	1	-	1	-	1	-
60-69	1.05	0.96, 1.14	1.19	1.00, 1.42	1.19	1.00, 1.42
70-79	1.09**	1.03, 1.17	1.38	1.20, 1.59	1.38	1.20, 1.59
80-89	1.10**	1.03, 1.17	1.59	1.40, 1.80	1.59	1.40, 1.80
90-99	0.98	0.92, 1.04	1.84	1.62, 2.09	1.84	1.62, 2.09
100 and over	0.61	0.54, 0.70	1.88	1.51, 2.33	1.88	1.51, 2.33
Deprivation (Low)	1	-	1	-	1	-
High	1.06**	1.03, 1.09	0.97	0.92, 1.03	0.97	0.92, 1.03
Rurality (Rural)	1	-	1	-	1	-
Urban	1.01	0.98, 1.05	1.22**	1.13, 1.30	1.22**	1.13, 1.30
Impression Group (Other)	1	-	1	-	1	-
Medical	8.93**	8.46, 9.42	3.79**	3.45, 4.17	3.79**	3.45, 4.17
Gynaecological	23.84**	15.37, 36.99	4.36**	2.01, 9.49	4.36**	2.01, 9.49
Mental Health	3.25**	2.93, 3.60	3.08**	2.60, 3.66	3.08**	2.60, 3.66
Neurological	9.06**	8.42, 9.75	2.78**	2.43, 3.18	2.78**	2.43, 3.18
Trauma	9.50**	8.97, 10.05	1.54**	1.37, 1.73	1.54**	1.37, 1.73
Respiratory	6.81**	6.35, 7.30	3.67**	3.26, 4.13	3.67**	3.26, 4.13
Cardiovascular	11.29**	10.43, 12.22	1.93**	1.64, 2.27	1.93**	1.64, 2.27
Call Category (1)	1	-	1	-	1	-
2	1.48**	1.39, 1.57	1.18**	1.07, 1.31	1.18**	1.07, 1.31
3	1.22**	1.14, 1.30	0.86*	0.77, 0.96	0.86*	0.77, 0.96
4	13.28**	11.48, 15.35	1.06	0.76, 1.48	1.06	0.76, 1.48
5	1.05**	0.79, 1.41	0.39*	0.17, 0.90	0.39*	0.17, 0.90
HCP	15.37**	13.41, 17.62	1.11	0.83, 1.50	1.11	0.83, 1.50
First NEWS2	1.23**	1.22, 1.24	1.11**	1.10, 1.12	1.11**	1.10, 1.12

\* p<0.05; \*\* p<0.001

### Discussion and Conclusions

- A series of factors significantly predicted conveyance of care home residents to hospital by ambulance. These include HCP referral and a higher NEWS2 score confirming that the severity of clinical condition of the patient was associated with significantly increased conveyance.
- Future interventions to prevent or address certain conditions such as falls resulting in head, limb and other injuries or provide enhanced care in care homes may prevent some emergencies or reduce the risk of conveyance to hospital.

#### Disclaimer:

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