

Supplemental material

End of life care for cancer patients identified using community prescribing data: a population-based study

Gabrielle Emanuel ¹, Julia Verne ², Karen Forbes ³, Luke Hounsome ¹, Katherine
E Henson ¹

Running title: End of life prescribing for cancer patients

Table A1. Drugs included in the study as defined using the British National Formulary (BNF version 68).

Symptom group	Drug group	Drug subgroup	Drugs for symptom control	Anticipatory prescribing
Anxiety delirium and agitation	Antipsychotic Depot Injections	Haloperidol Decanoate	N	Y
Anxiety delirium and agitation	Antipsychotic Drugs	Haloperidol	N	Y
Anxiety delirium and agitation	Anxiolytics	Diazepam	Y	N
Anxiety delirium and agitation	Anxiolytics	Lorazepam	Y	N
Anxiety delirium and agitation	Benzodiazepines	Midazolam Hydrochloride	N	Y
Anxiety delirium and agitation	Hypnotics	Temazepam	Y	N
Anxiety delirium and agitation	Hypnotics	Triazolam	Y	N
Anxiety delirium and agitation	Hypnotics	Zopiclone	Y	N
Breathlessness	Oxygen	Oxygen	Y	N
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Cyclizine Hydrochloride	Y	Y
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Cyclizine Lactate	Y	Y
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Domperidone	Y	N
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Hyoscine	Y	N
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Hyoscine Hydrobromide	Y	Injectable only
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Ketamine Hydrochloride	Y	N
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Metoclopramide Hydrochloride	Y	Injectable only
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Ondansetron Hydrochloride	Y	N
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Prochlorperazine Maleate	Y	N
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Prochlorperazine Mesilate	Y	N
Nausea and vomiting	Drugs Used In Nausea And Vertigo	Promethazine Teoclate	Y	N
Noisy respiratory secretion	Antispasmod.&Other Drgs Alt.Gut Motility	Hyoscine Butylbromide	Y	Injectable only
Pain	Non-Opioid Analgesics	Ketorolac Trometamol	Y	Injectable only
Pain	Non-Opioid Analgesics	Parecoxib Sodium	Y	N
Pain	Non-Opioid Analgesics And Compound Prep	Co-Codamol (Codeine Phos/Paracetamol)	Y	N

Pain	Non-Opioid Analgesics And Compound Prep	Co-Dydramol (Dihydrocodeine/Paracet)	Y	N
Pain	Non-Opioid Analgesics And Compound Prep	Paracetamol	Y	N
Pain	Non-Opioid Analgesics And Compound Prep	Paracetamol Combined Preparations	Y	N
Pain	Non-Steroidal Anti-Inflammatory Drugs	Diclofenac Potassium	Y	N
Pain	Non-Steroidal Anti-Inflammatory Drugs	Diclofenac Sodium	Y	N
Pain	Non-Steroidal Anti-Inflammatory Drugs	Diflunisal	Y	N
Pain	Non-Steroidal Anti-Inflammatory Drugs	Ibuprofen	Y	N
Pain	Non-Steroidal Anti-Inflammatory Drugs	Ibuprofen Lysine	Y	N
Pain	Non-Steroidal Anti-Inflammatory Drugs	Ibuprofen Sodium Dihydrate	Y	N
Pain	Non-Steroidal Anti-Inflammatory Drugs	Naproxen	Y	N
Pain	Opioid Analgesics	Alfentanil Hydrochloride	Y	Y
Pain	Opioid Analgesics	Buprenorphine	Y	N
Pain	Opioid Analgesics	Codeine Phosphate	Y	N
Pain	Opioid Analgesics	Diamorphine Hydrochloride (Systemic)	Y	Injectable only
Pain	Opioid Analgesics	Diamorphine Hydrochloride (Top)	Y	N
Pain	Opioid Analgesics	Dihydrocodeine Tartrate	Y	N
Pain	Opioid Analgesics	Fentanyl	Y	Injectable only
Pain	Opioid Analgesics	Fentanyl Citrate	Y	Y
Pain	Opioid Analgesics	Hydromorphone Hydrochloride	Y	Injectable only
Pain	Opioid Analgesics	Methadone Hydrochloride	Y	Injectable only
Pain	Opioid Analgesics	Morphine Anhydrous	Y	Injectable only
Pain	Opioid Analgesics	Morphine Hydrochloride	Y	Injectable only
Pain	Opioid Analgesics	Morphine Sulfate	Y	Injectable only
Pain	Opioid Analgesics	Oxycodone	Y	N
Pain	Opioid Analgesics	Oxycodone HCl/Naloxone HCl	Y	N
Pain	Opioid Analgesics	Oxycodone Hydrochloride	Y	Injectable only
Pain	Opioid Analgesics	Pentazocine Hydrochloride	Y	N
Pain	Opioid Analgesics	Tapentadol Hydrochloride	Y	N
Pain	Opioid Analgesics	Tramadol Hydrochloride	Y	N

Y: all drugs listed within that chemical substance contributed to the category

Table A2. Drug groupings for the opioid sub-analysis.

Group for analysis	Drug group	Drug subgroup
Buprenorphine	Opioid Analgesics	Buprenorphine
Fentanyl	Opioid Analgesics	Fentanyl
Hydromorphone Hydrochloride	Opioid Analgesics	Hydromorphone Hydrochloride
Methadone Hydrochloride	Opioid Analgesics	Methadone Hydrochloride
Morphine	Opioid Analgesics	Diamorphine Hydrochloride (Top)
	Opioid Analgesics	Diamorphine Hydrochloride (Systemic)
	Opioid Analgesics	Morphine Hydrochloride
	Opioid Analgesics	Morphine Sulfate
Oxycodone	Opioid Analgesics	Oxycodone Hydrochloride
	Opioid Analgesics	Oxycodone HCl/Naloxone HCl
	Opioid Analgesics	Oxycodone
Tapentadol Hydrochloride	Opioid Analgesics	Tapentadol Hydrochloride
Tramadol Hydrochloride	Opioid Analgesics	Tramadol Hydrochloride

Table A3. Classification of cancer sites using ICD-10 (International Classification of Diseases version 10) codes.

Cancer site	ICD-10 code
Trachea, Bronchus and Lung	C33-C34
Prostate	C61
Breast	C50
Colorectal	C18-C20
Cancer of Unknown Primary	C77-C80
Pancreas	C25
Oesophagus	C15
Bladder	C67
Liver and Intrahepatic Bile Ducts	C22
Non-Hodgkin's Lymphoma	C82-C85
Other	C01-C14; C21; C23; C24; C26; C30-32; C37; C38; C40; C41; C43; C45; C48; C49; C51-57; C60; C62-66; C68; C69; C71-76; C81; C88; C90-93; C95

Table A4. Prescribing activity among all people who died from cancer in England during 2017 in either a care home or their own home, by drug group prescribed in the four-month period prior to death.

	Category of prescribed drugs			
	Drugs for symptom control		Anticipatory prescribing	
	Individuals who died (N)	% ^a	Individuals who died (N)	% ^a
Total	53 881	93%	37 380	65%
Sex				
Male	28 556	93%	19 583	64%
Female	25 325	94%	17 797	66%
Age at death				
Less than 60	4 898	94%	3 493	67%
60-69	8 821	94%	6 173	66%
70-79	16 332	94%	11 458	66%
80-89	17 778	93%	12 246	64%
90 and over	6 052	92%	4 010	61%
Ethnicity				
White	49 532	93.7	34 512	65.3
Non-White	2 049	90.7	1 269	56.2
Not stated or not known	2 300	91.5	1 599	63.6
Time elapsed between cancer diagnosis and date of death				
Less than six months	10 558	88.7	6 753	56.7
Six months to one year	7 192	95.3	5 164	68.4
One to two years	8 086	95.1	5 702	67.1
Two to five years	12 007	94.8	8 499	67.1
Five to ten years	7 507	94.8	5 338	67.4
Ten to fifteen years	3 321	94.5	2 305	65.6
More than fifteen years	5 210	93.5	3 619	65
Stage at cancer diagnosis				
1	3 571	93.6	2 438	63.9
2	5 040	94.5	3 495	65.5
3	8 089	94.6	5 634	65.9
4	19 985	94.6	13 959	66.1
Unknown	17 196	91.4	11 854	63
Cancer site at diagnosis				
Trachea, Bronchus and Lung	11 793	93.4	7 632	60.4
Prostate	4 537	93.9	3 074	63.6
Breast	3 661	94.1	2 556	65.7
Colorectal	7 024	94.1	5 019	67.2
Cancer Of Unknown Primary	2 167	92.4	1 497	63.9
Pancreas	3 201	95.4	2 363	70.4
Oesophagus	2 376	94.6	1 639	65.2
Bladder	1 720	92.8	1 158	62.5
Liver And Intrahepatic Bile Ducts	1 735	93.5	1 249	67.3
Non-Hodgkin's Lymphoma	1 254	89.3	832	59.2
Other	14 413	93	10 361	66.9
Income domain of the IMD^b				
1 - least deprived	10 166	93.7	7 469	68.9

	2	11 623	93.8	8 342	67.3
	3	11 190	93.8	7 827	65.6
	4	10 432	92.7	7 014	62.4
5 - most deprived		10 470	93.4	6 728	60

^a Proportion of those who died within each individual characteristic category

^b Index of Multiple Deprivation

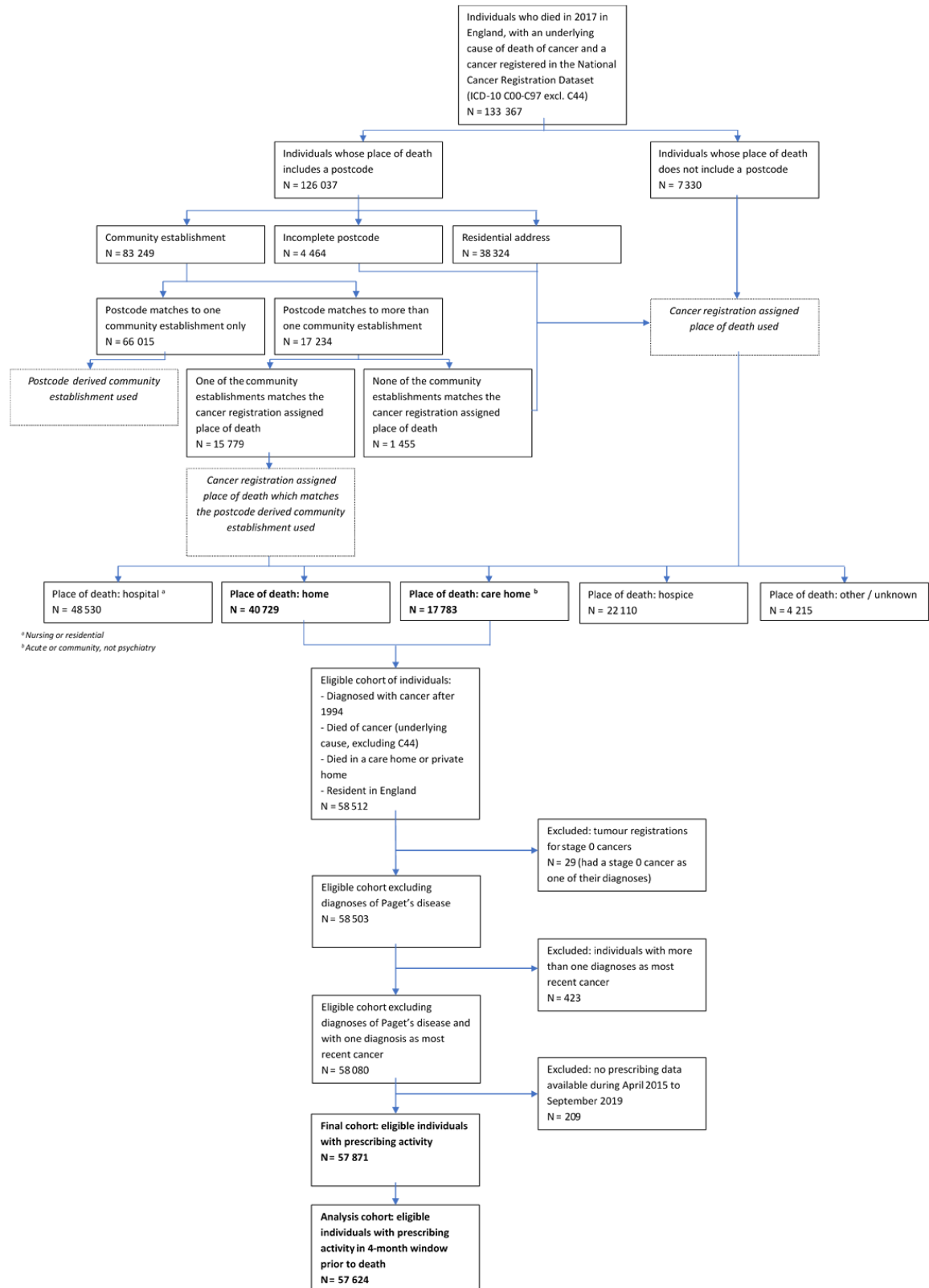
Figure A1. Flow chart illustrating the cohort selection process and identification of place of death.

Figure A2. Time trend of prescribing activity among people aged 80 and over who died from cancer in England during 2017 in either a care home or their own home, by location of death. Panel 1 is for drugs used for symptom control and panel 2 is for anticipatory prescribing.

