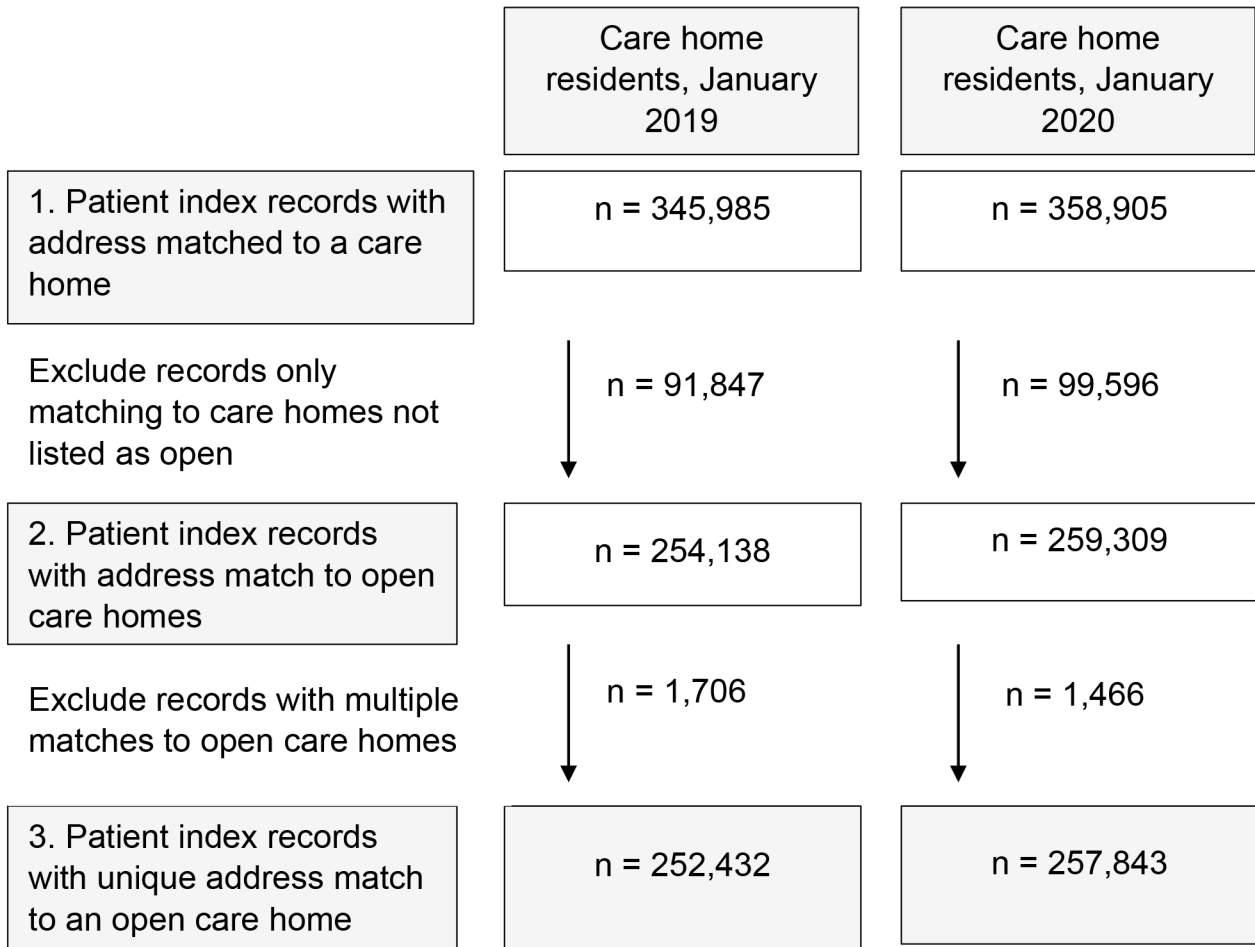Appendix Figure S1: Data cleaning workflow to create cohorts of care home residents in January 2019 and January 2020

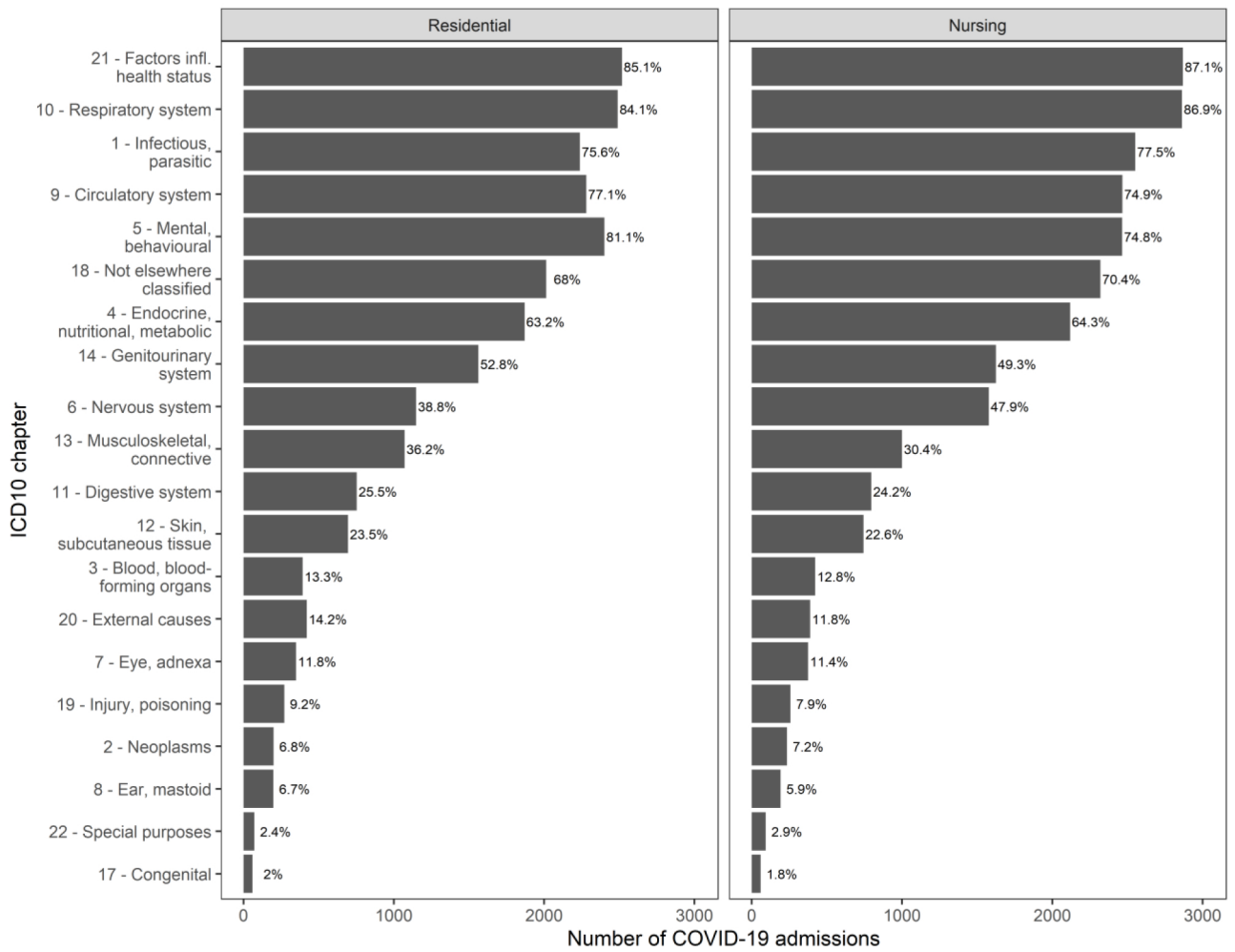|	Care home residents, January 2019	Care home residents, January 2020
1. Patient index records with address matched to a care home	n = 345,985	n = 358,905
Exclude records only matching to care homes not listed as open	n = 91,847	n = 99,596
2. Patient index records with address match to open care homes	n = 254,138	n = 259,309
Exclude records with multiple matches to open care homes	n = 1,706	n = 1,466
3. Patient index records with unique address match to an open care home	n = 252,432	n = 257,843

Appendix Figure S2: Assessment of similarity between cohorts of care home residents in January 2019 and January 2020
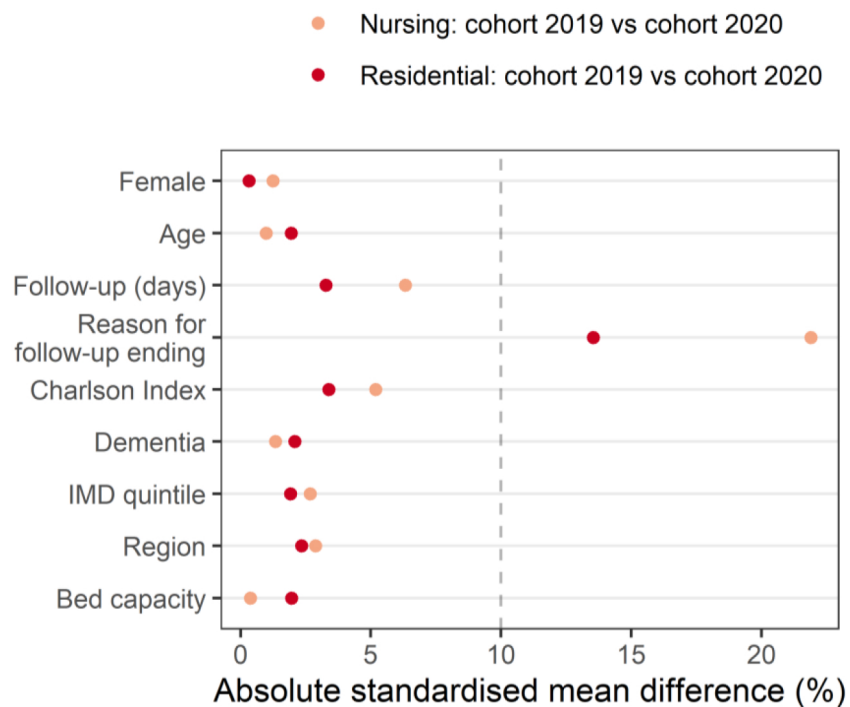
Appendix Figure S3: Number and percentage of COVID-19 hospital admissions between 1 March and 31 May 2020, by number of additional diagnoses codes and care home type
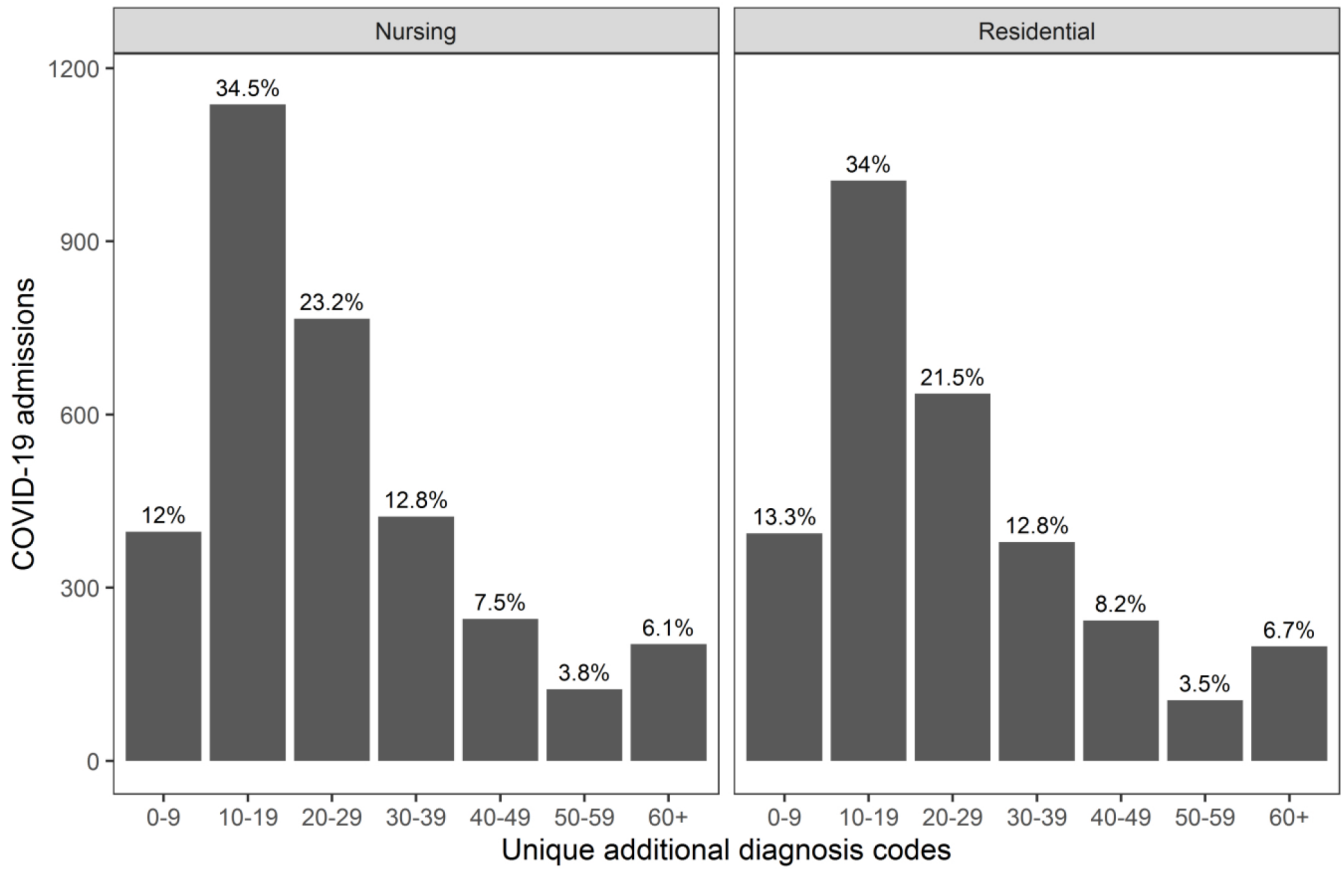
Appendix Figure S4: Number and percentage of COVID-19 hospital admissions with additional diagnosis codes in other ICD-10 chapters (1 March to 31 May 2020), by care home type

Appendix Figure S5: Assessment of similarity of the characteristics between care home residents admitted to National Health Service hospital trusts in England for suspected or confirmed COVID-19 or for other primary diagnoses, by care home type (1 March to 31 May 2019, and 1 March to 31 May 2020)
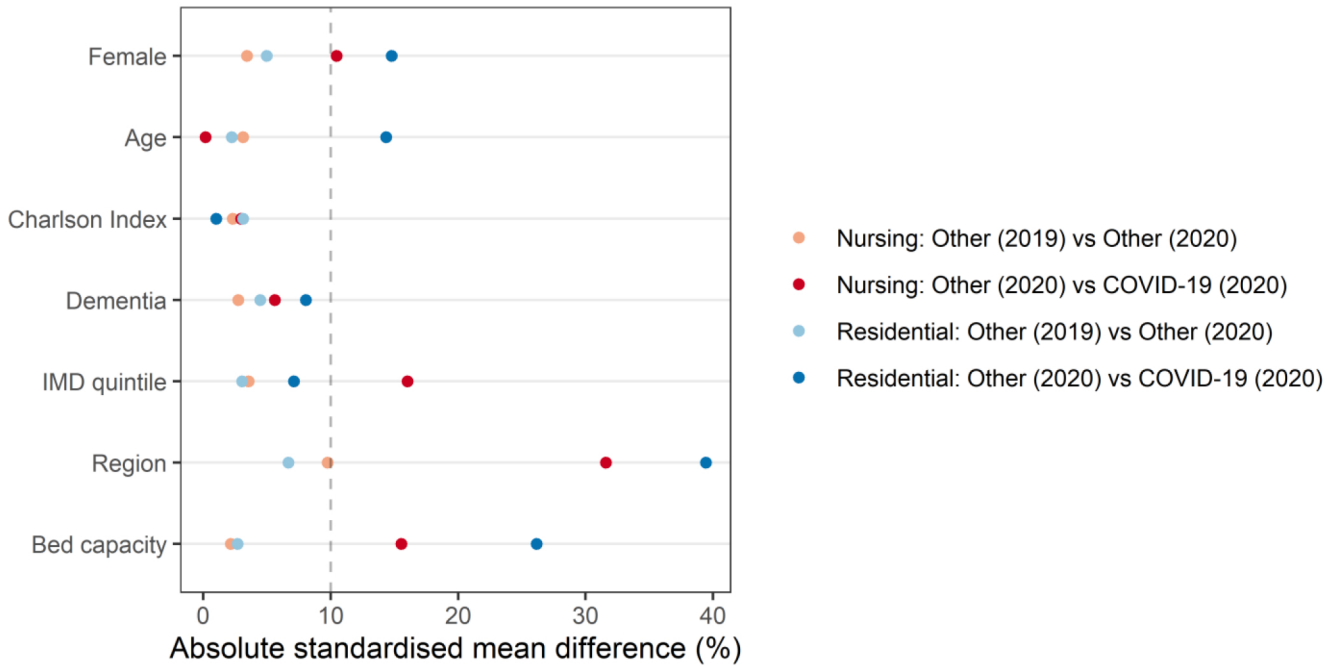
Includes ordinary elective admissions, elective day cases and emergency admission.

Appendix Table S1: ICD-10 chapters, diagnosis code ranges and chapter descriptions. ICD-10, International Statistical Classification of Diseases and Related Health Problems, 10th revision

Chapter	Code range	Description	Short description
1	A00-B99	Certain infectious and parasitic diseases	Infectious, parasitic
2	C00-D49	Neoplasms	Neoplasms
3	D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	Blood, blood-forming organs
4	E00-E89	Endocrine, nutritional and metabolic diseases	Endocrine, nutritional, metabolic
5	F01-F99	Mental, Behavioral and Neurodevelopmental disorders	Mental, behavioral
6	G00-G99	Diseases of the nervous system	Nervous system
7	H00-H59	Diseases of the eye and adnexa	Eye, adnexa
8	H60-H95	Diseases of the ear and mastoid process	Ear, mastoid
9	I00-I99	Diseases of the circulatory system	Circulatory system
10	J00-J99	Diseases of the respiratory system	Respiratory system
11	K00-K95	Diseases of the digestive system	Digestive system
12	L00-L99	Diseases of the skin and subcutaneous tissue	Skin, subcutaneous tissue
13	M00-M99	Diseases of the musculoskeletal system and connective tissue	Musculoskeletal, connective
14	N00-N99	Diseases of the genitourinary system	Genitourinary system
15	O00-O9A	Pregnancy, childbirth and the puerperium	Pregnancy, childbirth
16	P00-P96	Certain conditions originating in the perinatal period	Perinatal
17	Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities	Congenital
18	R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	Not elsewhere classified
19	S00-T88	Injury, poisoning and certain other consequences of external causes	Injury, poisoning
20	V00-Y99	External causes of morbidity	External causes
21	Z00-Z99	Factors influencing health status and contact with health services	Factors infl. health status
22	U00–U99	Codes for special purposes	Special purposes

Appendix Table S2: ICD-10 diagnosis codes for potentially avoidable causes of emergency admissions. ICD-10, International Statistical Classification of Diseases and Related Health Problems, 10th revision

Description	Code range
Acute lower respiratory tract infections (LRTI)	J20-J22
Chronic lower respiratory tract infections (LRTI)	J40-J44
Pressure sores	L89
Diabetes	E10-E14
Food and drink issues	R63 (63.0, 63.1, 63.2, 63.3, 63.4, 63.6 and 63.8)
Food and liquid pneumonitis	J69
Fractures and sprains	S02, S03, S08, S12, S13, S18, S22, S23, S28, S32, S33, S38, S42, S43, S48, S52, S53, S58, S62, S63, S68, S72, S73, S78, S82, S83, S88, S92, S93, S98, T02, T03, T05, T08, T10 and T12
Intestinal infections	A02-A09
Pneumonia	J12-J18
Urinary tract infections (UTI)	N390

Appendix Table S3: Comparison of baseline characteristics of the cohorts of residential care home and nursing home residents in January 2019 and January 2020

Care home type	Residential		Nursing	
Year	**2019**	**2020**	**2019**	**2020**
N	139925	141891	112507	115952
Female (%)	90956 (65.0)	92018 (64.9)	73223 (65.1)	74862 (64.6)
Age in years*	77 (19)	77 (19)	81 (14)	81 (14)
Aged >= 65 years (%)	109321 (78.1)	111809 (78.8)	100371 (89.2)	103762 (89.5)
Charlson Comorbidity Index*	1.39 (1.71)	1.45 (1.75)	1.79 (1.87)	1.89 (1.94)
Dementia (%)	54306 (38.8)	56509 (39.8)	51803 (46.0)	54162 (46.7)
Follow-up in days*	150 (33)	150 (32)	145 (38)	142 (40)
Reason for follow-up ending (%)				
End of care home flag	6888 (4.9)	3822 (2.7)	5394 (4.8)	2828 (2.4)
Death	15431 (11.0)	19232 (13.6)	18679 (16.6)	28080 (24.2)
End of study	117606 (84.0)	118837 (83.8)	88434 (78.6)	85044 (73.3)
IMD quintile† (%)				
1 (least deprived)	25129 (18.0)	25590 (18.0)	21710 (19.3)	22661 (19.5)
2	29691 (21.2)	30434 (21.4)	21486 (19.1)	21910 (18.9)
3	32209 (23.0)	32386 (22.8)	23554 (20.9)	24402 (21.0)
4	29013 (20.7)	29503 (20.8)	24012 (21.3)	24106 (20.8)
5 (most deprived)	23479 (16.8)	23693 (16.7)	21392 (19.0)	22625 (19.5)
Missing	404 (0.3)	285 (0.2)	353 (0.3)	248 (0.2)
Region (%)				
East Midlands	14409 (10.3)	14814 (10.4)	10079 (9.0)	10055 (8.7)
East of England	19887 (14.2)	19991 (14.1)	10271 (9.1)	10470 (9.0)
London	9723 (6.9)	9472 (6.7)	11110 (9.9)	11459 (9.9)
North East	6963 (5.0)	7016 (4.9)	7426 (6.6)	7878 (6.8)
North West	17511 (12.5)	17899 (12.6)	15684 (13.9)	16042 (13.8)
South East	24408 (17.4)	24494 (17.3)	22243 (19.8)	23492 (20.3)
South West	17661 (12.6)	18145 (12.8)	13623 (12.1)	14009 (12.1)
West Midlands	14395 (10.3)	14832 (10.5)	11933 (10.6)	12566 (10.8)
Yorkshire and the Humber	14564 (10.4)	14943 (10.5)	9785 (8.7)	9733 (8.4)
Missing	404 (0.3)	285 (0.2)	353 (0.3)	248 (0.2)
Bed capacity*	34 (21)	35 (21)	60 (27)	60 (26)

*Mean (standard deviation),
†Index of Multiple Deprivation quintiles.

Appendix Table S4: Number and percentage of COVID-19 hospital admissions with additional diagnosis codes for acute coronary syndromes or stroke (1 March to 31 May 2020), by care home type

Care home type	Acute coronary syndromes		Stroke	
	N	**%**	**N**	**%**
Residential	35	1.2	18	0.6
Nursing	49	1.5	12	0.4

Appendix Table S5: Number of emergency admissions and emergency admission rates between 1 March and 31 May in 2019 and 2020, by care home type and ICD-10 chapter of the primary diagnosis code. ICD-10, International Statistical Classification of Diseases and Related Health Problems, 10th revision

Care home type		Residential			Nursing		
		2019	**2020**	**Change (%)**	**2019**	**2020**	**Change (%)**
ICD-10 chapter							
1	Infectious, parasitic						
	N	1523	754	-769 (-50)	1433	738	-695 (-48)
	Rate*	4.76	2.32	-2.44 (-51)	5.78	2.95	-2.83 (-49)
3	Blood, blood-forming organs						
	N	183	93	-90 (-49)	157	74	-83 (-53)
	Rate*	0.57	0.29	-0.29 (-50)	0.63	0.3	-0.34 (-53)
2	Neoplasms						
	N	140	72	-68 (-49)	88	60	-28 (-32)
	Rate*	0.44	0.22	-0.22 (-49)	0.36	0.24	-0.12 (-32)
10	Respiratory system						
	N	4603	2588	-2015 (-44)	4140	2361	-1779 (-43)
	Rate*	14.39	7.96	-6.43 (-45)	16.69	9.45	-7.25 (-43)
14	Genitourinary system						
	N	1740	986	-754 (-43)	1271	717	-554 (-44)
	Rate*	5.44	3.03	-2.41 (-44)	5.13	2.87	-2.26 (-44)
5	Mental, behavioural						
	N	625	354	-271 (-43)	328	206	-122 (-37)
	Rate*	1.95	1.09	-0.87 (-44)	1.32	0.82	-0.5 (-38)
12	Skin, subcutaneous tissue						
	N	640	369	-271 (-42)	318	188	-130 (-41)
	Rate*	2.00	1.14	-0.87 (-43)	1.28	0.75	-0.53 (-41)
18	Not elsewhere classified						
	N	3012	1934	-1078 (-36)	1816	1069	-747 (-41)
	Rate*	9.42	5.95	-3.47 (-37)	7.32	4.28	-3.05 (-42)
11	Digestive system						
	N	1339	880	-459 (-34)	956	617	-339 (-35)
	Rate*	4.19	2.71	-1.48 (-35)	3.86	2.47	-1.39 (-36)
13	Musculoskeletal, connective						
	N	821	540	-281 (-34)	441	287	-154 (-35)
	Rate*	2.57	1.66	-0.91 (-35)	1.78	1.15	-0.63 (-35)
9	Circulatory system						
	N	1604	1106	-498 (-31)	1036	633	-403 (-39)
	Rate*	5.02	3.4	-1.61 (-32)	4.18	2.53	-1.64 (-39)
6	Nervous system						
	N	560	413	-147 (-26)	382	258	-124 (-32)
	Rate*	1.75	1.27	-0.48 (-27)	1.54	1.03	-0.51 (-33)
21	Factors infl. health status						
	N	109	85	-24 (-22)	67	54	-13 (-19)
	Rate*	0.34	0.26	-0.08 (-23)	0.27	0.22	-0.05 (-20)
4	Endocrine, nutritional, metabolic						
	N	513	405	-108 (-21)	429	322	-107 (-25)
	Rate*	1.60	1.25	-0.36 (-22)	1.73	1.29	-0.44 (-26)
19	Injury, poisoning						
	N	3883	3305	-578 (-15)	2419	1880	-539 (-22)
	Rate*	12.14	10.17	-1.97 (-16)	9.75	7.52	-2.23 (-23)
	COVID-19						
	N	0	2960	-	0	3295	-
	Rate*	0	9.11	-	0	13.18	-
	Other/Unknown						
	N	207	198	-9 (-4)	111	157	+46 (+41)
	Rate*	0.65	0.61	-0.04 (-6)	0.45	0.63	+0.18 (+40)

*Admissions per 100 residents per year.

Admissions where the primary diagnosis code was missing or where the primary diagnosis code corresponded to a chapter that had <10 admissions for at least one year in one care home type were grouped into Other/Unknown. The ICD-10 codes for suspected or confirmed COVID-19 are part of ICD-10 chapter 22. Rows are sorted by increasing % change in residential care homes.

Appendix Table S6: Number and rates of emergency hospital admissions for acute coronary syndromes or stroke between 1 March and 31 May in 2019 and 2020, by care home type

Care home type	Acute coronary syndromes			Stroke		
	2019	2020	Change (%)	2019	2020	Change (%)
Residential						
N	184	106	-78 (-42)	416	349	-67 (-16)
Rate*	0.58	0.33	-0.25 (-43)	1.30	1.07	-0.23 (-17)
Nursing						
N	96	69	-27 (-28)	252	191	-61 (-24)
Rate*	0.39	0.28	-0.11 (-29)	1.02	0.76	-0.25 (-25)

*Admissions per 100 residents per year.

Appendix Table S7: Number and rates of potentially avoidable emergency admissions between 1 March and 31 May in 2019 and 2020, by primary admission reason and care home type. LRTI, lower respiratory tract infection

Care home type	Residential			Nursing		
Condition	2019	2020	Change (%)	2019	2020	Change (%)
Pneumonia						
N	2354	1437	-917 (-39)	1958	1214	-744 (-38)
Rate*	7.36	4.42	-2.94 (-40)	7.90	4.86	-3.04 (-38)
Fractures and sprains						
N	1646	1589	-57 (-3)	922	826	-96 (-10)
Rate*	5.15	4.89	-0.26 (-5)	3.72	3.31	-0.41 (-11)
Urinary tract infections						
N	1295	630	-665 (-51)	903	452	-451 (-50)
Rate*	4.05	1.94	-2.11 (-52)	3.64	1.81	-1.83 (-50)
Acute LRTIs						
N	827	439	-388 (-47)	587	343	-244 (-42)
Rate*	2.59	1.35	-1.23 (-48)	2.37	1.37	-1 (-42)
Food and liquid pneumonitis						
N	595	320	-275 (-46)	914	494	-420 (-46)
Rate*	1.86	0.99	-0.88 (-47)	3.69	1.98	-1.71 (-46)
Chronic LRTIs						
N	516	248	-268 (-52)	443	206	-237 (-53)
Rate*	1.61	0.76	-0.85 (-53)	1.79	0.82	-0.96 (-54)
Intestinal infections						
N	229	100	-129 (-56)	122	77	-45 (-37)
Rate*	0.72	0.31	-0.41 (-57)	0.49	0.31	-0.18 (-37)
Diabetes						
N	114	112	-2 (-2)	142	109	-33 (-23)
Rate*	0.36	0.35	-0.01 (-3)	0.57	0.44	-0.14 (-24)
Food and drink issues						
N	52	26	-26 (-50)	27	16	-11 (-41)
Rate*	0.16	0.08	-0.08 (-51)	0.11	0.06	-0.05 (-41)
Pressure sores						
N	24	25	+1 (+4)	34	18	-16 (-47)
Rate*	0.08	0.08	0.002 (+3)	0.14	0.07	-0.07 (-47)

*Admissions per 100 residents per year.

Appendix Table S8: Number and rates of elective admissions with cataract procedures between 1 March and 31 May in 2019 and 2020, by care home type

Care home type	Admissions			Rate*		
	2019	2020	Change (%)	2019	2020	Change (%)
Residential	371	71	-300 (-81)	1.16	0.22	-0.94 (-81)
Nursing	252	49	-203 (-81)	1.02	0.20	-0.82 (-81)

*Admissions per 100 residents per year.

Supplementary Table: The RECORD statement – checklist of items, extended from the STROBE statement, that should be reported in observational studies using routinely collected health data

	Item No.	STROBE items	Location in manuscript where items are reported	RECORD items	Location in manuscript where items are reported
Title and abstract					
	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found		RECORD 1.1: The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included. RECORD 1.2: If applicable, the geographic region and timeframe within which the study took place should be reported in the title or abstract. RECORD 1.3: If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract.	Title and methods section of abstract Title and methods section of abstract Title and methods section of abstract
Introduction					
Background rationale	2	Explain the scientific background and rationale for the investigation being reported			Introduction paragraphs 1-4
Objectives	3	State specific objectives, including any prespecified hypotheses			Introduction paragraph 4
Methods					
Study Design	4	Present key elements of study design early in the paper			Study populations section, Hospital admissions section
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection			Study populations section, Patient characteristics section, Hospital admissions section, Appendix Table S3
Participants	6	(a) Cohort study - Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up Case-control study - Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls Cross-sectional study - Give the eligibility criteria, and the sources and methods of selection of participants		RECORD 6.1: The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If this is not possible, an explanation should be provided. RECORD 6.2: Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided.	Study population selection: Data sources section; Clinical codes in Hospital admissions section and Appendix Figure S1 and S2, Appendix Tables 1 and 2 References in Data sources section

Supplementary Table: Continued

	Item No.	STROBE items	Location in manuscript where items are reported	RECORD items	Location in manuscript where items are reported
		(b) Cohort study - For matched studies, give matching criteria and number of exposed and unexposed *Case-control study* - For matched studies, give matching criteria and the number of controls per case		RECORD 6.3: If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage.	Appendix Figure 1
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.		RECORD 7.1: A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	Clinical codes in Hospital admissions section, Supplementary Tables 1 and 2
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group			Patient characteristics section, Hospital admissions section, Table 1 and Appendix Figure S3
Bias	9	Describe any efforts to address potential sources of bias			Strengths and limitations section
Study size	10	Explain how the study size was arrived at			Study population section
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why			Hospital admissions section, Statistical analyses section
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) *Cohort study* - If applicable, explain how loss to follow-up was addressed *Case-control study* - If applicable, explain how matching of cases and controls was addressed *Cross-sectional study* - If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses			Statistical analyses section

Supplementary Table: Continued

	Item No.	STROBE items	Location in manuscript where items are reported	RECORD items	Location in manuscript where items are reported
Data access and cleaning methods		..		RECORD 12.1: Authors should describe the extent to which the investigators had access to the database population used to create the study population. RECORD 12.2: Authors should provide information on the data cleaning methods used in the study.	Data sources section Data sources section, Hospital admissions section, Appendix Figure S1
Linkage		..		RECORD 12.3: State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.	Data sources section, Strengths and Limitations section (data linkage quality and evaluation)
Results					
Participants	13	(a) Report the numbers of individuals at each stage of the study (*e.g.*, numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed) (b) Give reasons for non-participation at each stage. (c) Consider use of a flow diagram		RECORD 13.1: Describe in detail the selection of the persons included in the study (*i.e.*, study population selection) including filtering based on data quality, data availability and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.	Data sources section, Study population section, Appendix Figure S1
Descriptive data	14	(a) Give characteristics of study participants (*e.g.*, demographic, clinical, social) and information on exposures and potential confounders (b) Indicate the number of participants with missing data for each variable of interest (c) *Cohort study* - summarise follow-up time (*e.g.*, average and total amount)			Appendix Table 3

Supplementary Table: Continued

	Item No.	STROBE items	Location in manuscript where items are reported	RECORD items	Location in manuscript where items are reported
Outcome data	15	*Cohort study* - Report numbers of outcome events or summary measures over time *Case-control study* - Report numbers in each exposure category, or summary measures of exposure *Cross-sectional study* - Report numbers of outcome events or summary measures			Table 1, 2 and 3, Appendix Table S4, S5 and S6
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period			N/A
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses			N/A
Discussion					
Key results	18	Summarise key results with reference to study objectives			Principal findings section
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias		RECORD 19.1: Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over time, as they pertain to the study being reported.	Strengths and limitations section
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence			Comparison with previous work section, Implications section

Supplementary Table: Continued

	Item No.	STROBE items	Location in manuscript where items are reported	RECORD items	Location in manuscript where items are reported
Generalisability	21	Discuss the generalisability (external validity) of the study results			Implications section
Other Information					
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based			Funding declaration
Accessibility of protocol, raw data, and programming code		..		RECORD 22.1: Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	Code availability in Statistical Analyses section, Availability of data and materials statement

*Reference: Benchimol EI, Smeeth L, Guttmann A, Harron K, Moher D, Petersen I, Sørensen HT, von Elm E, Langan SM, the RECORD Working Committee. The REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) Statement. *PLoS Medicine* 2015; in press.