

Supplementary material

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Table S1. Heart failure epidemiology with patients characteristics in years 2019–2021

INCIDENCE	2019		2020		2021	
	Newly dignosed patients n (%)	Incidecne [%]	Newly dignosed patients n (%)	Incidecne [%]	Newly dignosed patients n (%)	Incidecne [%]
Total number	144464 (100%)	0,39%	117328 (100%)	0,32%	111554 (100%)	0,30%
Age, [years]	73.2		72.7		72,3	
Female sex	73705 (51,02%)		58629 (49,97%)		54583 (48,93%)	
Urban residence	87884 (60,83%)		71235 (60,71%)		70189 (62,92%)	
non-ischaeamic HF	69213 (47,91%)		59000 (50,29%)		59447 (53,29%)	
HF etiology ischemic	75251 (52,10%)		58328 (49,71%)		52107 (46,71%)	
Arterial Hypertension	30155 (20,87%)		26277 (22,40%)		25923 (23,24%)	
Atrial flutter & fibrillation	12958 (8,70%)		9449 (8,05%)		7854 (7,04%)	
ICD / CRTD & P implantation	986 (0,68%)		725 (0,62%)		618 (0,55%)	
Anemia	1449 (1,00%)		1220 (1,04%)		1202 (1,08%)	
Mean CCI	1,23		1,25		1,25	
CCI: 0	77970 (53,97%)		62242 (53,05%)		58958 (52,85%)	
CCI: 1-2	59257 (41,01%)		48769 (41,57%)		46537 (41,71%)	
CCI: 3-4	6814 (4,72%)		5961 (5,08%)		5702 (5,11%)	
CCI: >=5	423 (0,29%)		356 (0,30%)		357 (0,32%)	
Myocardial Infarction	5229 (3,62%)		4584 (3,91%)		4289 (3,84%)	
Peripheral vascular disease	11412 (7,90%)		9295 (7,92%)		8842 (7,92%)	
Cerebral vascular disease	18099 (12,53%)		15293 (13,03%)		14399 (12,90%)	
Dementia	2251 (1,56%)		1741 (1,48%)		1658 (1,49%)	
COPD	19548 (13,53%)		15980 (13,62%)		15631 (14,01%)	
Connective tissue disease	3827 (2,65%)		3258 (2,78%)		3360 (3,01%)	
Peptic ulcer disease	1376 (0,95%)		1145 (0,98%)		1102 (0,99%)	
Liver disease mild	1904 (1,32%)		1760 (1,50%)		1720 (1,54%)	
Liver disease moderate/severe	100 (0,07%)		122 (0,10%)		88 (0,079%)	
DM uncomplicated	7341 (5,08%)		6328 (5,39%)		6143 (5,50%)	
DM end-organ damage	5518 (3,82%)		4662 (3,97%)		4341 (3,90%)	
Moderate / severe CKD	5244 (3,63%)		4470 (3,81%)		4108 (3,68%)	
Cancer without metastases	15557 (10,77%)		13261 (11,30%)		12641 (11,33%)	
Cancer with metastases	452 (0,31%)		368 (0,31%)		342 (0,31%)	
AIDS/HIV	7 (0,01%)		9 (0,01%)		17 (0,02%)	
Hemi / paraplegia	2207 (1,53%)		1760 (1,50%)		1668 (1,50%)	
PREVALENCE	Prevalent patients n (%)	Prevalence [%]	Prevalent patients n (%)	Prevalence [%]	Prevalent patients n (%)	Prevalence [%]
Total number	1260175 (100%)	3,63%	1218593 (100%)	3,59%	1164212 (100%)	3,48%
Age, [years]	75.1		75.1		74.9	
Female sex	721188 (57,16%)		693252 (56,89%)		656964,8316 (56,43%)	
Urban residence	764320 (60,65%)		737864 (60,55%)		706443,8416 (60,68%)	
non-ischaeamic HF	463016 (36,74%)		457181 (37,45%)		449376 (38,60%)	
HF etiology ischemic	798428 (63,36%)		762288 (62,55%)		714836 (61,40%)	
Arterial Hypertension	365170 (28,98%)		374152 (30,70%)		377785 (32,45%)	
Atrial flutter & fibrillation	207393 (16,46%)		207602 (17,04%)		205321 (17,64%)	
ICD / CRTD & P	57554 (4,57%)		58129 (4,77%)		58888 (5,06%)	
Anemia	14970 (1,19%)		14841 (1,22%)		15022 (1,29%)	

Mean CCI	1,3		1,31		1,28	
CCI: 0	608609 (48,30%)		575386 (47,22%)		604743 (51,94%)	
CCI: 1-2	565443 (44,30%)		554826 (45,53%)		485497 (41,70%)	
CCI: 3-4	80057 (6,35%)		81946 (6,72%)		68802 (5,91%)	
CCI: >=5	6066 (0,48%)		6435 (0,53%)		5170 (0,44%)	
Myocardial Infarction	53759 (4,27%)		55041 (4,52%)		47770 (4,10%)	
Peripheral vascular disease	112274 (8,91%)		110626 (9,98%)		93310 (8,01%)	
Cerebral vascular disease	199527 (15,83%)		199667 (16,39%)		174790 (15,01%)	
Dementia	21594 (1,71%)		20971 (1,72%)		16354 (1,40%)	
COPD	215104 (17,07%)		213186 (17,49%)		187509 (16,11%)	
Connective tissue disease	36301 (2,88%)		36744 (3,02%)		32544 (2,80%)	
Peptic ulcer disease	13136 (1,04%)		13194 (1,08%)		11624 (1,00%)	
Liver disease mild	18645 (1,48%)		19093 (1,57%)		16932 (1,45%)	
Liver disease moderate/severe	903 (0,07%)		889 (0,07%)		730 (0,06%)	
Diabetes mellitus uncomplicated	74574 (5,92%)		76035 (6,24%)		66982 (5,75%)	
Diabetes mellitus end-organ damage	58032 (4,61%)		57408 (4,71%)		48026 (4,13%)	
Moderate / severe CKD	74502 (5,91%)		71909 (5,90%)		59461 (5,11%)	
Cancer without metastases	127375 (10,11%)		127918 (10,50%)		108316 (9,13%)	
Cancer with metastases	2212 (0,18%)		2244 (0,18%)		1680 (0,14%)	
AIDS/HIV	62 (0,00%)		65 (0,01%)		62 (0,01%)	
Hemi / paraplegia	21187 (1,68%)		21227 (1,74%)		17876 (1,54%)	
MORTALITY	Ceased patients n (%)	Mortality [%]	Ceased patients n (%)	Mortality [%]	Ceased patients n (%)	Mortality [%]
Total number	138831 (100%)	9,92%	158919 (100%)	11,54%	165925 (100%)	12,47%
Age, [years]	81.5		81.5		81.6	
Female sex	76204 (54,89%)	9,56%	85657 (53,90%)	11,00%	90993 (54,84%)	12,17%
Urban residence	9304 (60,02%)	1,20%	104140 (65,53%)	12,37%	110104 (66,36%)	13,48%
non-ischaemic HF	58719 (42,29%)	11,25%	64638 (40,67%)	12,39%	66750 (40,23%)	12,93%
HF etiology ischemic	80112 (57,70%)	9,12%	94281 (59,33%)	11,01%	99175 (59,77%)	12,18%
Arterial Hypertension	24421 (17,59%)	6,27%	32572 (20,50%)	8,01%	37443 (22,57%)	9,02%
Atrial flutter & fibrillation	19113 (13,77%)	8,44%	23854 (15,01%)	10,31%	26386 (15,90%)	11,39%
ICD / CRTD & P implantation	5714 (4,12%)	9,03%	7119 (4,48%)	10,91%	19379 (11,68%)	24,76%
Anemia	2597 (1,87%)	14,78%	3138 (1,97%)	17,45%	3138 (1,89%)	17,28%
Mean CCI	1,37		1,41		1,42	
CCI: 0	61052 (43,98%)	9,12%	67031 (42,18%)	10,43%	68631 (41,36%)	10,19%
CCI: 1-2	65423 (47,12%)	10,37%	75953 (47,79%)	12,04%	80116 (48,28%)	14,16%
CCI: 3-4	11379 (8,20%)	12,44%	14537 (9,15%)	15,07%	15646 (9,43%)	18,53%
CCI: >=5	977 (0,70%)	13,87%	1398 (0,88%)	17,85%	1532 (0,92%)	22,86%
Myocardial Infarction	6174 (4,45%)	10,30%	7627 (4,80%)	12,17%	8379 (5,05%)	14,92%
Peripheral vascular disease	16437 (11,84%)	12,77%	19372 (12,19%)	14,90%	20406 (12,30%)	17,94%
Cerebral vascular disease	21339 (15,37%)	9,66%	26582 (16,73%)	11,75%	28707 (17,30%)	14,11%
Dementia	4383 (3,16%)	16,87%	5352 (3,37%)	20,33%	5700 (3,44%)	25,85%
COPD	21966 (15,82%)	9,27%	26141 (16,45%)	10,92%	28600 (17,24%)	13,23%
Connective tissue disease	3371 (2,43%)	8,50%	4312 (2,71%)	10,50%	4865 (2,93%)	13,00%
Peptic ulcer disease	1327 (0,96%)	9,18%	1651 (1,04%)	11,12%	1801 (1,09%)	13,42%
Liver disease mild	2029 (1,46%)	9,81%	2519 (1,59%)	11,66%	2635 (1,59%)	13,47%
Liver disease moderate/severe	214 (0,15%)	19,16%	264 (0,17%)	22,90%	217 (0,13%)	22,91%
Diabetes mellitus uncomplicated	7120 (5,13%)	8,72%	9378 (5,90%)	10,98%	10333 (6,23%)	13,36%
Diabetes mellitus end-organ damage	8216 (5,92%)	12,40%	10344 (6,51%)	15,27%	10859 (6,54%)	18,44%
Moderate / severe CKD	10745 (7,72%)	12,60%	13791 (8,68%)	16,09%	13995 (8,43%)	19,05%
Cancer without metastases	21618 (15,57%)	14,51%	24525 (15,43%)	16,09%	25252 (15,22%)	18,91%
Cancer with metastases	1026 (0,74%)	31,69%	1058 (0,67%)	32,04%	1022 (0,62%)	37,82%
AIDS/HIV	2 (0,0%)	3,13%	6 (0,0%)	8,45%	7 (0,00%)	10,14%
Hemi / paraplegia	3111 (2,24%)	12,80%	3797 (2,39%)	15,17%	4066 (2,45%)	18,53%

AIDS immunodeficiency syndrome; CCI Charlson Comorbidity Index; CKD chronic kidney failure; COPD chronic obstructive pulmonary disease; CRT implantable cardiac resynchronization therapy (D) defibrillator & P (pacemaker); HF, heart failure; HIV human immunodeficiency virus; ICD implantable cardioverter defibrillator;

Table S2. Heart failure epidemiology in years 2010–2021

Year	Total Polish population [n]	Newly diagnosed patients [n]	Incidence [%]	Newly diagnosed IHF patients n (%)	IHF incidence [%]	Newly diagnosed nonIHF patients n (%)	nonIHF incidence [%]	HF pts in public service [n]
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2021	38080411	111554	0,30%	52107 (46,7%)	0,14%	59447 (53,3%)	0,16%	569453
2020	38265013	117328	0,32%	58328 (49,7%)	0,16%	59000 (50,3%)	0,16%	558109
2019	38382576	144464	0,39%	75251 (52,1%)	0,20%	69213 (48,9%)	0,19%	626859
2018	38411148	150457	0,40%	80971 (53,8%)	0,22%	69486 (46,2%)	0,19%	625386
2017	38433558	156444	0,42%	86834 (55,5%)	0,23%	69610 (44,5%)	0,19%	629906
2016	38432992	151379	0,41%	86179 (56,9%)	0,23%	65200 (43,1%)	0,18%	619373
2015	38437239	160641	0,43%	92465 (57,6%)	0,25%	68176 (42,4%)	0,18%	630682
2014	38478602	174010	0,47%	101246 (58,2%)	0,27%	72764 (42,8%)	0,19%	650774
2013	38495659	186154	0,50%	109563 (58,9%)	0,29%	76591 (41,1%)	0,20%	650266
2012	38533299	211183	0,56%	124463 (58,9%)	0,33%	86720 (41,1%)	0,23%	666978
2011	38538447	242033	0,64%	143641 (59,4%)	0,38%	98392 (40,6%)	0,26%	664763
2010	38529866	284112	0,75%	167194 (58,9%)	0,44%	116918 (41,2%)	0,31%	655606
Year	Total Polish population [n]	Prevalent HF patients [n]	Prevalence [%]	Prevalent IHF patients n (%)	IHF prevalence [%]	Prevalent nonIHF pts n (%)	nonIHF prevalence [%]	HF pts in public service [n]
2021	38080411	1164212	3,48%	714836 (61,4%)	2,14%	449376 (38,6%)	1,36%	569453
2020	38265013	1218593	3,59%	761740 (62,5%)	2,24%	456853 (37,5%)	1,36%	558109
2019	38382576	1260175	3,63%	797624 (63,3%)	2,29%	462551 (36,7%)	1,36%	626859
2018	38411148	1256009	3,61%	803418 (64,0%)	2,30%	452591 (36,0%)	1,33%	625386
2017	38433558	1242602	3,56%	800615 (64,4%)	2,27%	441987 (35,6%)	1,30%	629906
2016	38432992	1216383	3,46%	786924 (64,7%)	2,22%	429459 (35,3%)	1,25%	619373
2015	38437239	1182756	3,37%	766169 (64,8%)	2,16%	416587 (35,2%)	1,23%	630682
2014	38478602	1140663	3,23%	737421 (64,6%)	2,06%	403242 (35,4%)	1,18%	650774
2013	38495659	1074124	3,06%	692288 (64,4%)	1,93%	381836 (35,6%)	1,13%	650266
2012	38533299	994230	2,83%	635015 (63,9%)	1,76%	359215 (36,1%)	1,07%	666978
2011	38538447	881063	2,51%	555551 (63,0%)	1,53%	325512 (37,05)	0,98%	664763
2010	38529866	726538	2,08%	447702 (61,6%)	1,23%	278836 (38,4%)	0,85%	655606
Year	Total Polish population [n]	Ceased HF patients [n]	Mortality [%]	Ceased IHF patients n (%)	IHF mortality [%]	Ceased nonIHF patients n (%)	nonIHF mortality [%]	HF pts in public service [n]
2021	38080411	165925	12,47%	99175 (59,8%)	12,18%	66750 (40,2%)	12,93%	569453
2020	38265013	158919	11,54%	94281 (59,3%)	11,01%	64638 (40,7%)	12,39%	558109
2019	38382576	138831	9,92%	80112 (57,7%)	9,13%	58719 (42,3%)	11,26%	626859
2018	38411148	137047	9,84%	78121 (57,0%)	8,86%	58926 (43,0%)	11,52%	625386
2017	38433558	130493	9,50%	73283 (56,2%)	8,39%	57210 (43,8%)	11,46%	629906
2016	38432992	118045	8,85%	65569 (55,6%)	7,69%	52476 (44,5%)	10,89%	619373
2015	38437239	118373	9,10%	63638 (53,8%)	7,67%	54735 (46,2%)	11,61%	630682
2014	38478602	107467	8,61%	56076 (52,2%)	7,07%	51391 (47,8%)	11,30%	650774
2013	38495659	105922	8,98%	52163 (49,3%)	7,01%	53759 (50,8%)	12,34%	650266
2012	38533299	98075	8,98%	44965 (45,9%)	6,61%	53110 (54,2%)	12,88%	666978
2011	38538447	87468	9,03%	35819 (41,0%)	6,06%	51649 (59,1%)	13,69%	664763
2010	38529866	76863	9,57%	26292 (34,2%)	5,55%	50571 (65,8%)	15,35%	655606

IHF ischaemic heart failure; nonIHF- nonischaemic heart failure; pts -patients

Table S3. Trends in heart failure hospitalizations by month in years 2019–2021

	2019	January	February	March	April	May	June	July	August	September	October	November	December	whole year
Total number of hospitalizations		24998	23540	25472	25062	25270	22090	24142	22374	21061	25644	21898	22650	284200
Hospitalization ceased with death (n,%)		3197 (12.79%)	3248 (13.80%)	2890 (11.35%)	2634 (10.51%)	2500 (9.89%)	2471 (11.19%)	2391 (9.9%)	2245 (10.03%)	2267 (10.76%)	2539 (9.90%)	2404 (10.98%)	2547 (11.25%)	31333
Hospitalization ceased with death on the day of admission (n,%)		253 (1.01%)	243 (1.03%)	203 (0.80%)	223 (0.89%)	208 (0.82%)	233 (1.05%)	193 (0.8%)	209 (0.93%)	210 (1%)	230 (0.9%)	221 (1.01%)	220 (0.97%)	2646
2020														
Total number of hospitalizations		24320	23876	19360	11653	16587	20036	21336	18558	20192	16575	10201	13457	216151
Change vs 2019 ("-" decrease; "+" increase)		-2,71%	1,43%	-24,00%	-53,52%	-34,44%	-9,71%	-11,83%	-17,33%	-5,08%	-39,32%	-60,12%	-50,56%	
Hospitalization ceased with death (n,%)		2881 (11.85%)	3029 (12.69%)	2545 (13.15%)	1781 (15.28%)	2213 (13.34%)	2271 (11.33%)	2219 (10.4%)	2227 (12%)	2322 (11.5%)	2340 (14.12%)	1871 (18.34%)	1989 (14.78%)	27688

Hospitalization ceased with death on the day of admission (n,%)	230 (0.95%)	220 (0.92%)	217 (1.12%)	161 (1.38%)	180 (1.09%)	201 (1.0%)	181 (0.85%)	206 (1.11%)	200 (0.99%)	235 (1.42%)	182 (1.78%)	181. (1.35%)	2394
2021													
Total number of hospitalizations	14015	15051	16581	14468	17145	20824	20631	19717	20476	20260	16134	14792	210094
Change vs 2019 ("-" decrease; "+" increase)	-43,94%	-36,06%	-34,90%	-42,27%	-32,15%	-5,73%	-14,54%	-11,88%	-2,78%	-20,99%	-26,32%	-34,69%	
Hospitalization ceased with death (n,%)	2202 (15.71%)	1982 (13.71%)	2021 (12.19%)	2037 (14.08%)	2216 (12.93%)	2511 (12.06%)	2421 (11.73%)	2180 (11.06%)	2332 (11.39%)	2421 (11.95%)	2149 (13.32%)	2123 (14.35%)	26595
Hospitalization ceased with death on the day of admission (n,%)	150 (1.07%)	166 (1.01%)	161 (0.97%)	148 (1.02%)	170 (0.99%)	173 (0.83%)	202 (0.98%)	179 (0.91%)	187 (0.91%)	187 (0.92%)	172 (1.07%)	157. (1.06%)	2052

Table S4. Trends in load of ambulatory care and hospital care in years 2019–2021

Year	Ambulatory Care				Hospital care			
	Primary and noncardiac care	drop vs 2019 (%)	Cardiac care	drop vs 2019 (%)	Cardiac hospital units	drop vs 2019 (%)	Noncardiac hospital units	drop vs 2019 (%)
2019	911781		242544		93466		192925	
2020	804999	11,71%	217066	10,50%	75960	18,73%	148255	23,15%
2021	855701	6,15%	242109	0,18%	84622	9,46%	133027	31,05%

Table S5. Characteristics of hospitalized heart failure patients in years 2019–2021

	2019		2020		2021	
	Patients hospitalised	Inhospital mortality n (%)	Patients hospitalised	Inhospital mortality n (%)	Patients hospitalised	Inhospital mortality n (%)
Total number, percentage	222426	31306 14,07%	172960	27667,00 16,00%	169153	26584 15,72%
Age, [years]	76,2		75,8		75,4	
Female sex	110679 50%		84681 49%		82766 49%	
Urban residence	132216 59%		84019 49%		80463 48%	
non-ischaemic HF	81551 37%	14839 18,20%	64635 37%	12696 19,64%	66591 39%	12443 18,69%
ischaemic HF	140875 63%	16467 11,69%	108325 63%	14971 13,82%	102562 61%	14141 13,79%
Arterial Hypertension	46919 21%		38833 22%		41024 24%	
Atrial flutter & fibrillation	37065 17%		29657 17%		30440 18%	
ICD / CRTD & P implantation	21187 10%		18920 11%		19379 11%	
Anemia	3353 2%		2842 2%		2858 2%	
Mean CCI	1,33		1,36 0%		1,37	
CCI: 0	104853 47%		78801 46%		76502 45%	
CCI: 1-2	100270 45%		79134 46%		77572 46%	
CCI: 3-4	15938 7%		13793 8%		13758 8%	
CCI: >=5	1364 1%		1232 1%		1321 1%	
Myocardial Infarction	12312 6%		10581 6%		10677 6%	
Peripheral vascular disease	23269 10%		19050 11%		18647 11%	
Cerebral vascular disease	32055 14%		25933 15%		25693 15%	
Dementia	3732 2%		2806 2%		2790 2%	
COPD	38470 17%		30016 17%		30125 18%	
Connective tissue disease	5601 3%		4620 3%		4890 3%	
Peptic ulcer disease	2279 1%		1915 1%		1952 1%	
Liver disease mild	3020 1%		2725 2%		2769 2%	
Liver disease moderate/severe	172 0%		191 0%		146 0%	
Diabetes mellitus uncomplicated	13285 6%		11539 7%		11683 7%	
Diabetes mellitus end-organ damage	12769 6%		10891 6%		10324 6%	
Moderate / severe CKD	15741 7%		13057 8%		12309 7%	
Cancer without metastases	23832 11%		19711 11%		19532 12%	
Cancer with metastases	611 0%		497 0%		496 0%	
AIDS/HIV	6 0%		8 0%		11 0%	

Hemi / paraplegia	3769 2%	3025 2%	2947 2%
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AIDS immunodeficiency syndrome; CKD chronic kidney failure; COPD chronic obstructive pulmonary disease; CRT implantable cardiac resynchronization therapy (D) defibrillator & P (pacemaker); HIV human immunodeficiency virus; ICD implantable cardioverter defibrillator;

Heart failure hospitalisations ceased with death by month in years 2019-2021

Both etiologies, regardless of covid

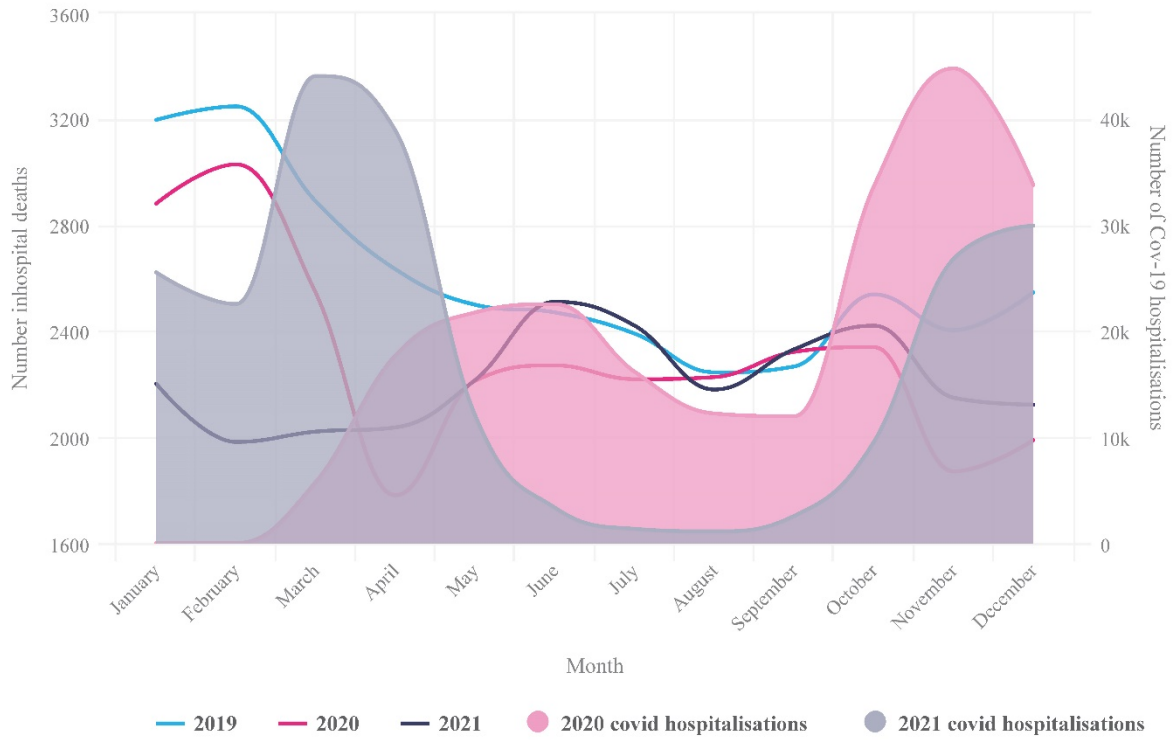


Figure S1. Trends in heart failure hospitalizations ceased with death by month in years 2019–2021