Recent trends in incidence, survival and mortality of prostate cancer in Northern Ireland

(A comparison between April-December of 2021, 2020 and 2018-2019)

Further information

Further information is available at: www.qub.ac.uk/research-centres/nicr

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Acknowledgements

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N. Ireland Cancer Registry

Queen's University Belfast

HSC Public Health Agency

INCIDENCE

During the April-December period the number of cases of prostate cancer diagnosed increased between 2018-2019 and 2021 by 6.1% from 1,040 cases per year to 1,103 cases.

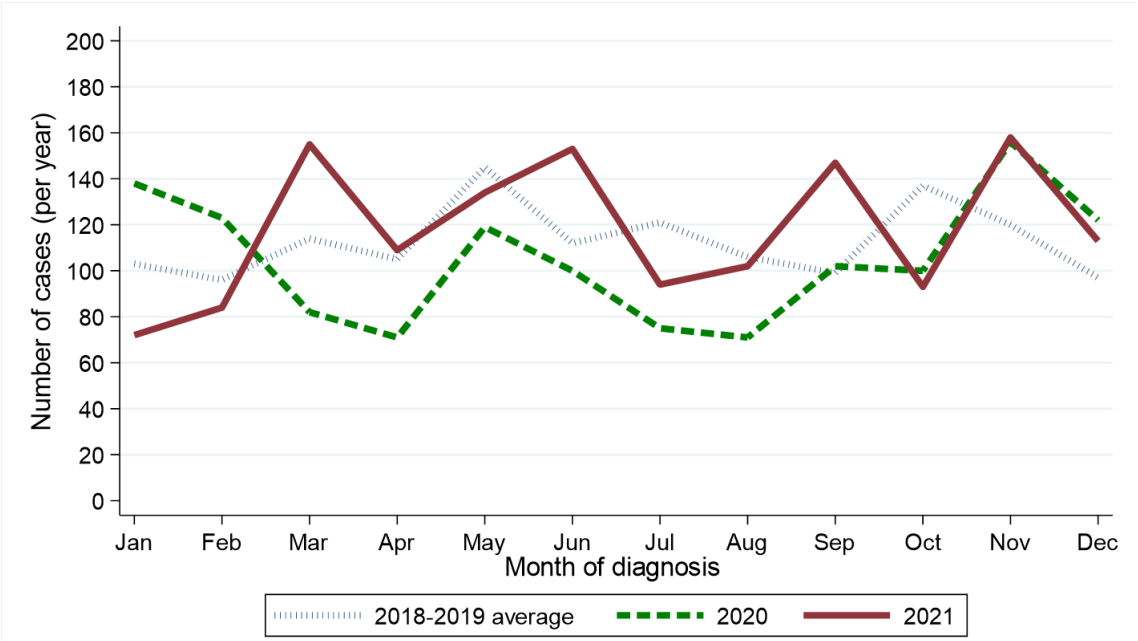
Table 1: Number of prostate cancer cases diagnosed in 2018-2021 by month and year of diagnosis

Period of diagnosis	Annual total	Month diagnosed											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2018-2019*	1,353	103	96	114	105	145	112	121	106	99	137	120	97
2020	1,259	138	123	82	71	119	100	75	71	102	100	156	122
2021	1,414	72	84	155	109	134	153	94	102	147	93	158	113

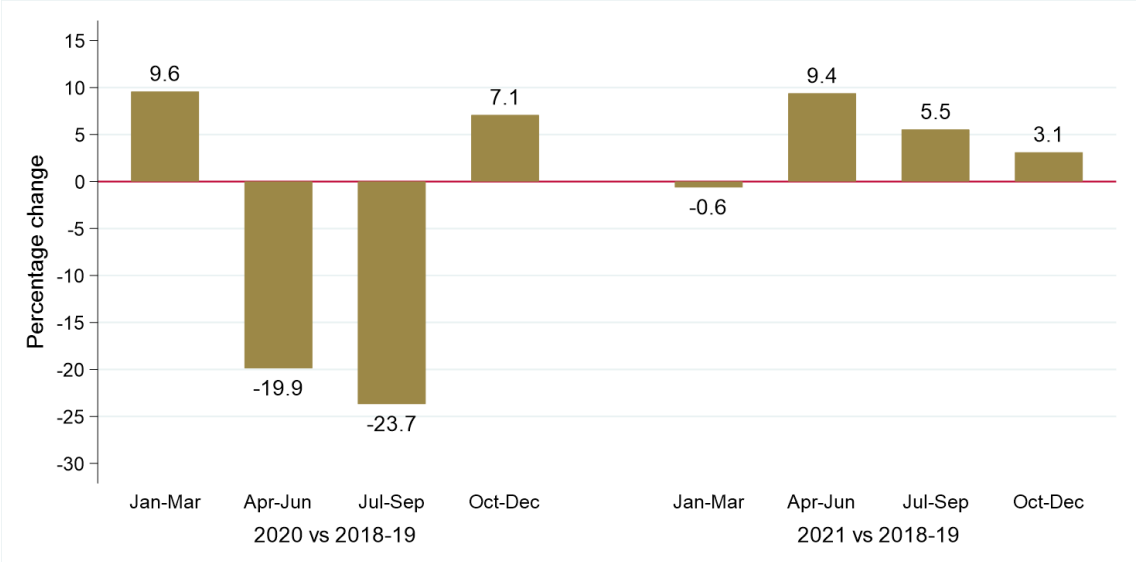
** Average cases per year rounded to the nearest integer. Row sums may thus differ slightly from the total.*

Figure 1: Number of prostate cancer cases diagnosed in 2018-2021 by month/quarter and year of diagnosis

(a) Number of cases diagnosed by month of diagnosis



(b) Percentage change over time in number of cases by quarter of diagnosis



AGE

Excluding the first quarter of each year the number of cases of prostate cancer diagnosed among those aged 0 to 54 decreased by 5.0% from 40 per year in 2018-2019 to 38 in 2021. Between the same two time periods the number of cases of prostate cancer diagnosed among those aged 75 and over increased by 11.7% from 366 per year in 2018-2019 to 409 in 2021. The change in case distribution by age between 2018-2019 and 2021 was not statistically significant.

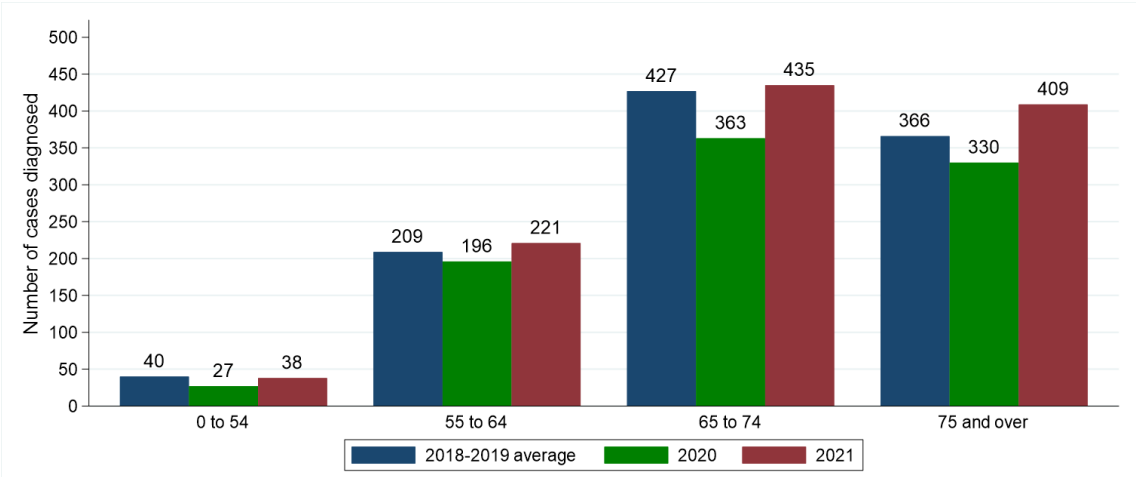
Table 2: Number and proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by age and period of diagnosis

Age	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All ages	1,040	916	1,103	-11.9%	+6.1%
0 to 54	40 (3.8%)	27 (2.9%)	38 (3.4%)	-32.5%	-5.0%
55 to 64	209 (20.1%)	196 (21.4%)	221 (20.0%)	-6.2%	+5.7%
65 to 74	427 (41.1%)	363 (39.6%)	435 (39.4%)	-15.0%	+1.9%
75 and over	366 (35.2%)	330 (36.0%)	409 (37.1%)	-9.8%	+11.7%

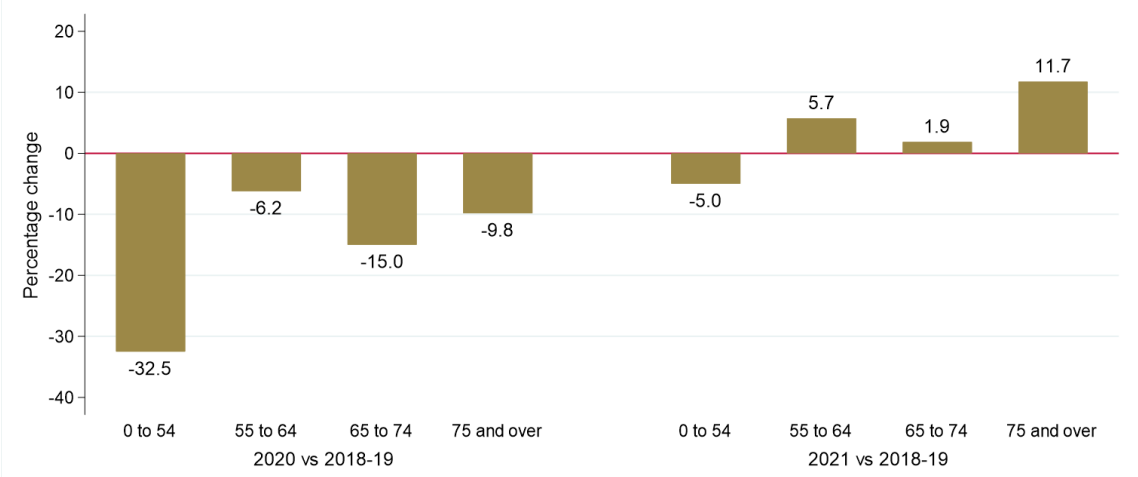
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*

Figure 2: Number of prostate cancer cases diagnosed in April-December of 2018-2021 by age and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



HEALTH AND SOCIAL CARE TRUST

Excluding the first quarter of each year the number of cases of prostate cancer diagnosed among those resident in Southern HSCT decreased by 8.7% from 173 per year in 2018-2019 to 158 in 2021. Between the same two time periods the number of cases of prostate cancer diagnosed among those resident in Belfast HSCT increased by 17.5% from 166 per year in 2018-2019 to 195 in 2021. The change in case distribution by Health and Social Care Trust between 2018-2019 and 2021 was not statistically significant.

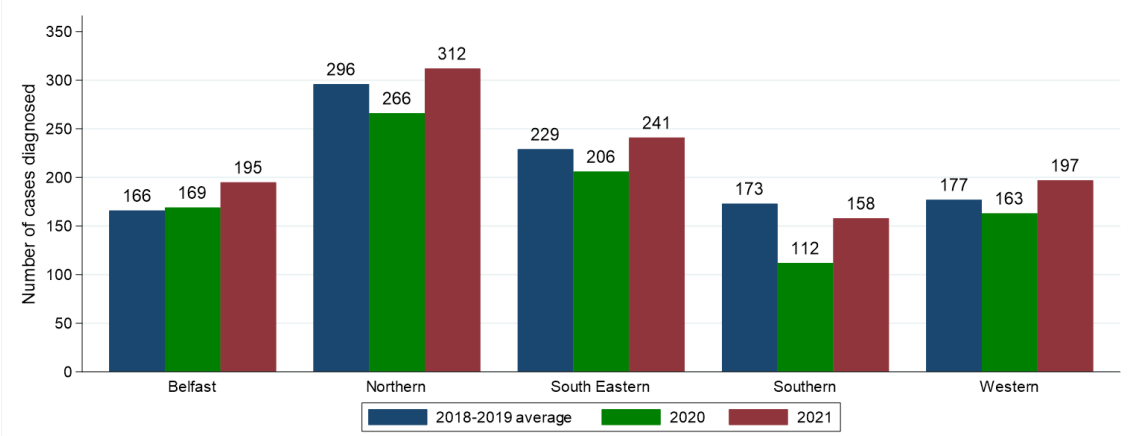
Table 3: Number and proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by Health and Social Care Trust and period of diagnosis

Health and Social Care Trust	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
Northern Ireland	1,040	916	1,103	-11.9%	+6.1%
Belfast	166 (16.0%)	169 (18.4%)	195 (17.7%)	+1.8%	+17.5%
Northern	296 (28.5%)	266 (29.0%)	312 (28.3%)	-10.1%	+5.4%
South Eastern	229 (22.0%)	206 (22.5%)	241 (21.8%)	-10.0%	+5.2%
Southern	173 (16.6%)	112 (12.2%)	158 (14.3%)	-35.3%	-8.7%
Western	177 (17.0%)	163 (17.8%)	197 (17.9%)	-7.9%	+11.3%

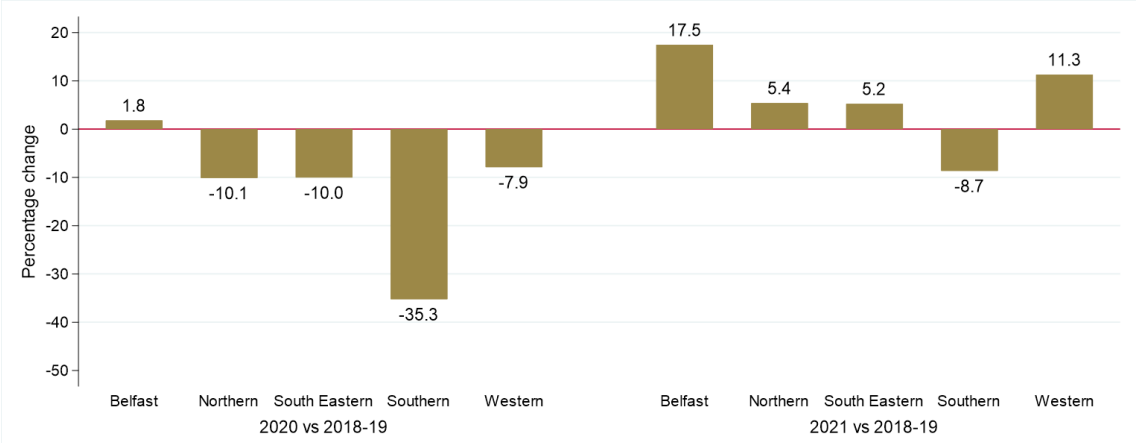
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*
Note: Cases with unknown Health and Social Care Trust are included in totals.

Figure 3: Number of prostate cancer cases diagnosed in April-December of 2018-2021 by Health and Social Care Trust and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



SOCIO-ECONOMIC DEPRIVATION

Excluding the first quarter of each year the number of cases of prostate cancer diagnosed among those resident in the least deprived quintile increased by 3.1% from 256 per year in 2018-2019 to 264 in 2021. Between the same two time periods the number of cases of prostate cancer diagnosed among those resident in the most deprived quintile increased by 35.7% from 140 per year in 2018-2019 to 190 in 2021. The change in case distribution by deprivation quintile between 2018-2019 and 2021 was not statistically significant.

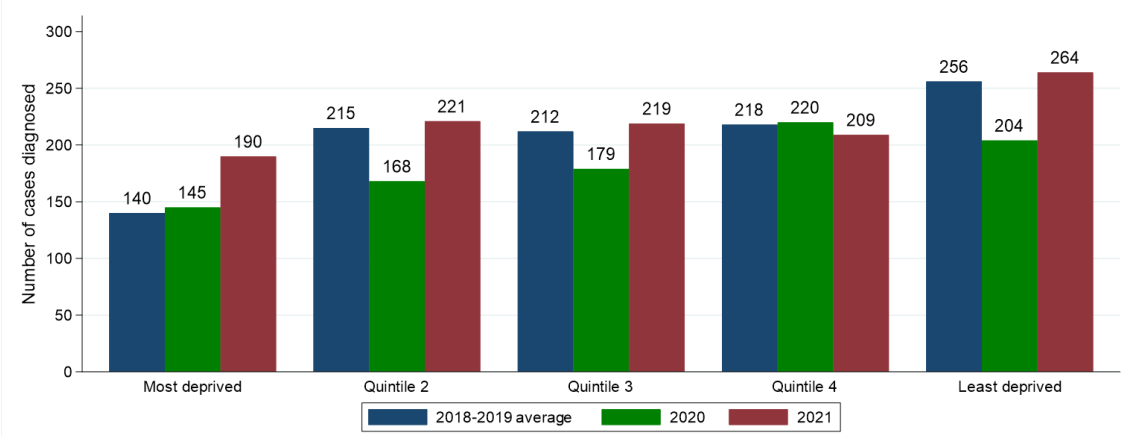
Table 4: Number and proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by deprivation quintile and period of diagnosis

Deprivation quintile	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
Northern Ireland	1,040	916	1,103	-11.9%	+6.1%
Most deprived	140 (13.5%)	145 (15.8%)	190 (17.2%)	+3.6%	+35.7%
Quintile 2	215 (20.7%)	168 (18.3%)	221 (20.0%)	-21.9%	+2.8%
Quintile 3	212 (20.4%)	179 (19.5%)	219 (19.9%)	-15.6%	+3.3%
Quintile 4	218 (21.0%)	220 (24.0%)	209 (18.9%)	+0.9%	-4.1%
Least deprived	256 (24.6%)	204 (22.3%)	264 (23.9%)	-20.3%	+3.1%

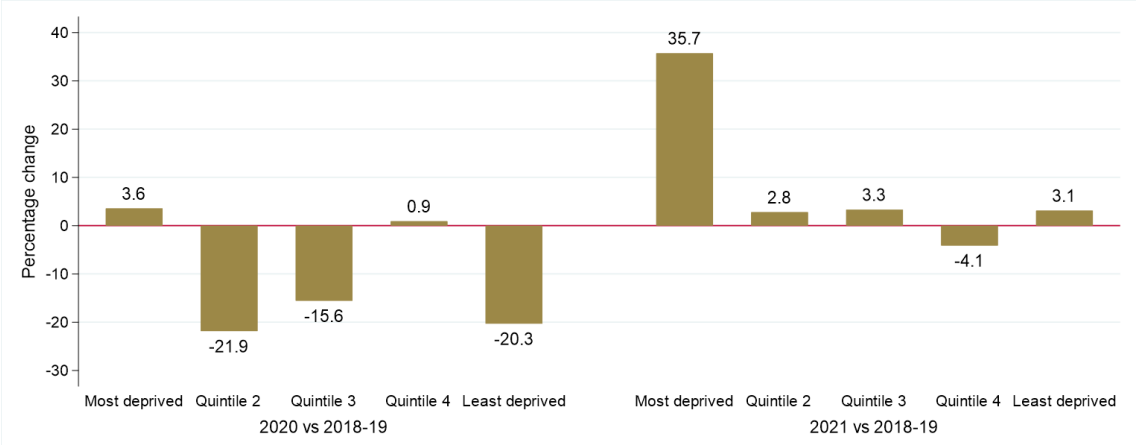
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*
Note: Cases with unknown deprivation quintile are included in totals.

Figure 4: Number of prostate cancer cases diagnosed in April-December of 2018-2021 by deprivation quintile and period of diagnosis

(a) Number of cases diagnosed



(b) Percentage change over time in number of cases



BASIS OF DIAGNOSIS

Excluding the first quarter of each year the number of cases of prostate cancer diagnosed via histology/cytology increased by 4.5% from 876 per year in 2018-2019 to 915 in 2021. As a proportion of all cases, histology/cytology diagnosis decreased from 84.2% in 2018-2019 to 83.0% in 2021. The change in case distribution by basis of diagnosis between 2018-2019 and 2021 was not statistically significant.

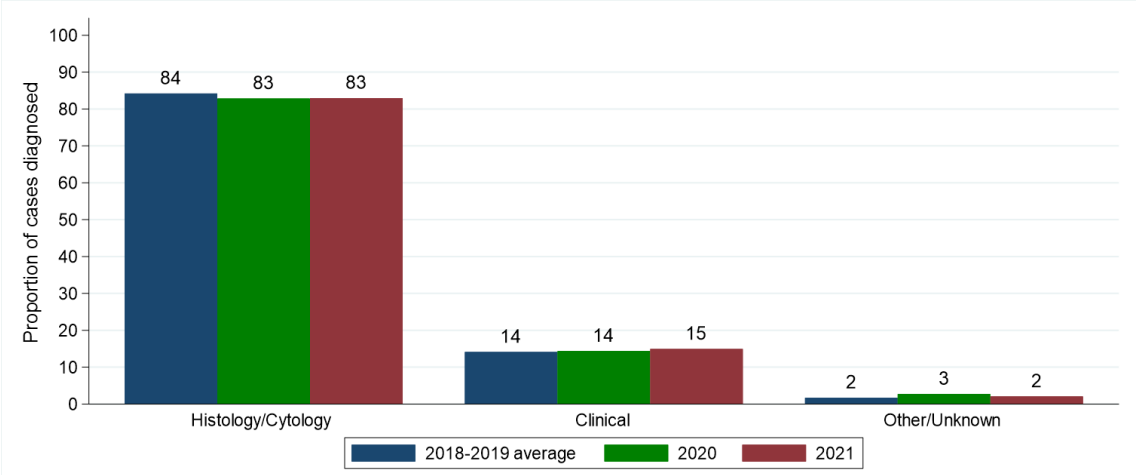
Table 5: Number and proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by basis and period of diagnosis

Basis of diagnosis	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All types	1,040	916	1,103	-11.9%	+6.1%
Histology/Cytology	876 (84.2%)	759 (82.9%)	915 (83.0%)	-13.4%	+4.5%
Clinical	147 (14.1%)	132 (14.4%)	165 (15.0%)	-10.2%	+12.2%
Other/Unknown	18 (1.7%)	25 (2.7%)	23 (2.1%)	+38.9%	+27.8%

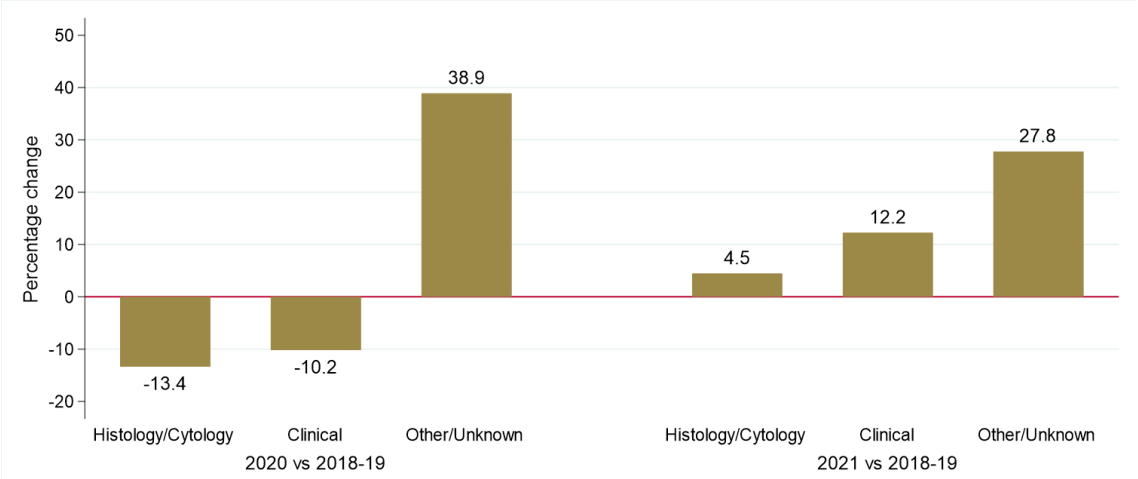
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*

Figure 5: Proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by basis and period of diagnosis

(a) Proportion of cases diagnosed



(b) Percentage change over time in number of cases



STAGE AT DIAGNOSIS

The number of prostate cancer cases diagnosed at stage I in April to December of each year increased by 14.3% from 453 per year in 2018-2019 to 518 in 2021. In addition the number of prostate cancer cases diagnosed at stage IV increased by 8.4% from 179 per year in 2018-2019 to 194 in 2021. As a proportion of all cases, stage IV diagnosis increased from 17.2% in 2018-2019 to 17.6% in 2021. The change in stage distribution between 2018-2019 and 2021 was not statistically significant.

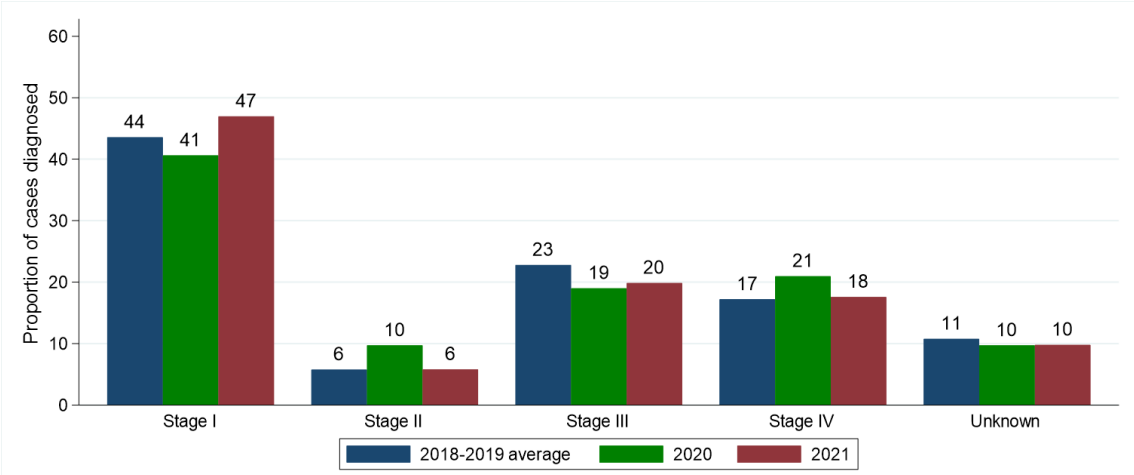
Table 6: Number and proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by stage and period of diagnosis

Stage at diagnosis	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
All stages	1,040	916	1,103	-11.9%	+6.1%
Stage I	453 (43.6%)	372 (40.6%)	518 (47.0%)	-17.9%	+14.3%
Stage II	60 (5.8%)	89 (9.7%)	64 (5.8%)	+48.3%	+6.7%
Stage III	237 (22.8%)	174 (19.0%)	219 (19.9%)	-26.6%	-7.6%
Stage IV	179 (17.2%)	192 (21.0%)	194 (17.6%)	+7.3%	+8.4%
Unknown	112 (10.8%)	89 (9.7%)	108 (9.8%)	-20.5%	-3.6%

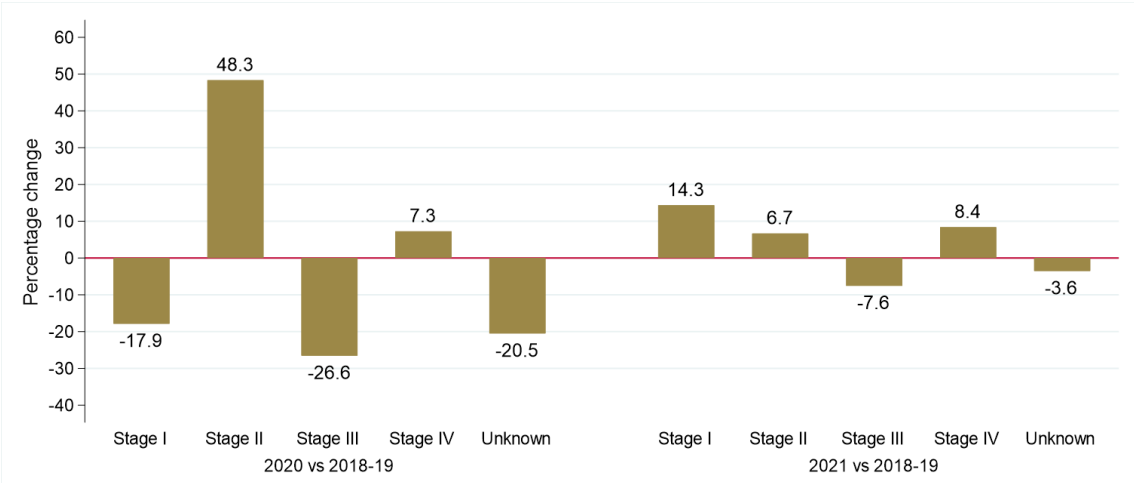
** Average cases per year rounded to the nearest integer. Column sums may thus differ slightly from the total.*

Figure 6: Proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by stage and period of diagnosis

(a) Proportion of cases diagnosed



(b) Percentage change over time in number of cases



TREATMENT

Excluding the first quarter of each year the number of prostate cancer cases resulting in treatment by surgery within six months decreased by 16.2% from 99 per year in 2018-2019 to 83 in 2021. The resulting decrease in the proportion receiving surgery from 9.5% in 2018-2019 to 7.5% in 2021 was not statistically significant.

Between the same two time periods the number of prostate cancer cases resulting in treatment by systemic therapy increased by 51.2% from 80 per year in 2018-2019 to 121 in 2021. The resulting increase in the proportion receiving systemic therapy from 7.7% in 2018-2019 to 11.0% in 2021 was statistically significant ($p = 0.002$).

The number of prostate cancer cases treated with radiotherapy decreased by 20.1% from 304 per year in 2018-2019 to 243 in 2021. The resulting decrease in the proportion receiving radiotherapy from 29.2% in 2018-2019 to 22.0% in 2021 was statistically significant ($p < 0.001$).

The number of prostate cancer cases resulting in treatment by hormone therapy decreased by 6.9% from 666 per year in 2018-2019 to 620 in 2021. The resulting decrease in the proportion receiving hormone therapy from 64.0% in 2018-2019 to 56.2% in 2021 was statistically significant ($p < 0.001$).

Excluding the first quarter of each year the number of prostate cancer cases receiving none of these treatments within six months of diagnosis increased by 35.3% from 269 per year in 2018-2019 to 364 in 2021. The resulting increase in the proportion receiving none of these treatments from 25.9% in 2018-2019 to 33.0% in 2021 was statistically significant ($p < 0.001$).

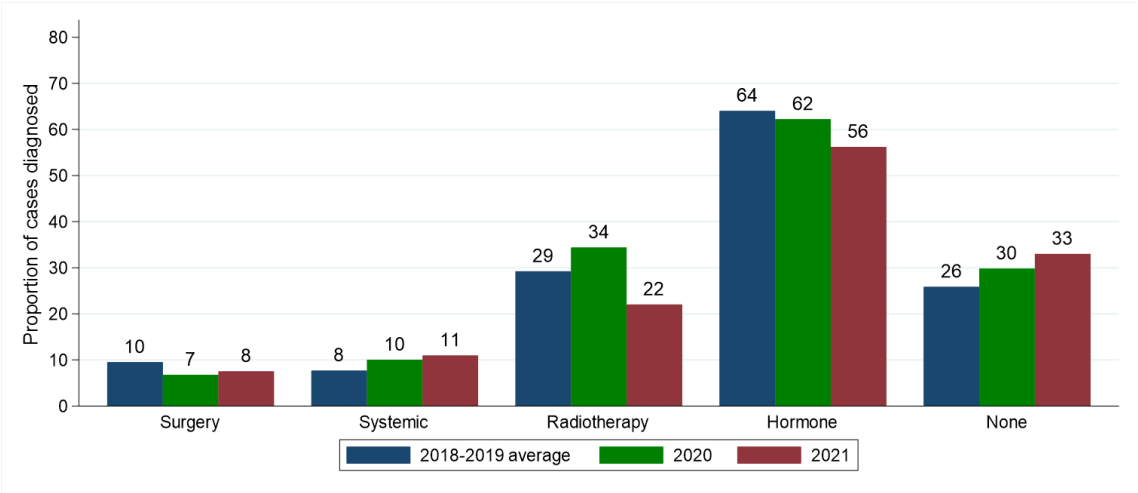
Table 7: Number and proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by treatment type (within six months of diagnosis) and period of diagnosis

Treatment type	Period of diagnosis (Apr-Dec)			Percentage change	
	2018-2019*	2020	2021	2020 vs 2018-2019	2021 vs 2018-2019
Surgery	99 (9.5%)	62 (6.8%)*	83 (7.5%)	-37.4%	-16.2%
Systemic therapy	80 (7.7%)	92 (10.0%)*	121 (11.0%)*	+15.0%	+51.2%
Radiotherapy	304 (29.2%)	315 (34.4%)*	243 (22.0%)*	+3.6%	-20.1%
Hormone therapy	666 (64.0%)	570 (62.2%)	620 (56.2%)*	-14.4%	-6.9%
None of these treatments	269 (25.9%)	273 (29.8%)*	364 (33.0%)*	+1.5%	+35.3%

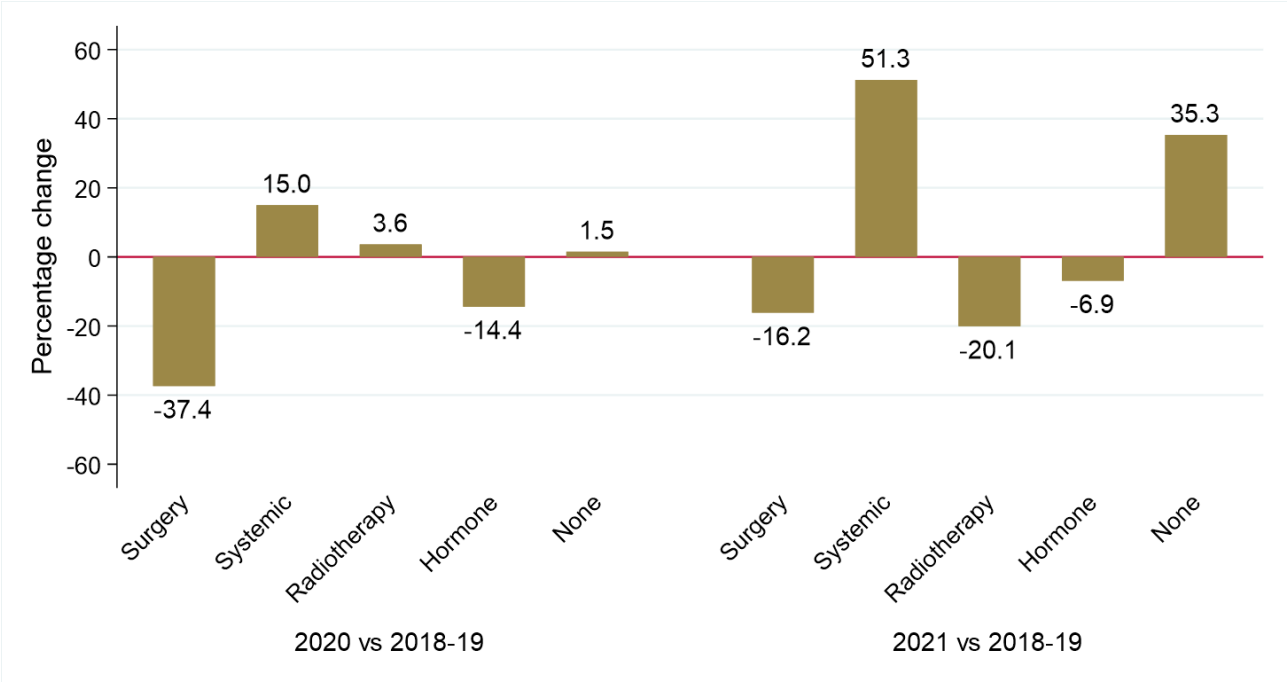
** Statistically significant change compared to 2018-2019*

Figure 7: Proportion of prostate cancer cases diagnosed in April-December of 2018-2021 by treatment type (within six months of diagnosis) and period of diagnosis

(a) Proportion of cases diagnosed



(b) Percentage change over time in number of cases



SURVIVAL

Changes in survival are evaluated using two measures. Observed survival examines the time between diagnosis and death from any cause. It thus represents what cancer patients experience, however, due to the inclusion of non-cancer deaths (e.g. heart disease), it may not reflect how changes in cancer care impact survival from cancer. Thus changes in age-standardised net survival are also examined. This measure provides an estimate of patient survival which has been adjusted to take account of deaths unrelated to cancer. It also assumes a standard age distribution thereby removing the impact of changes in the age distribution of cancer patients on changes in survival over time. While this measure is hypothetical, as it assumes patients can only die from cancer related factors, it is a better indicator of the impact of changes in cancer care on patient survival.

OBSERVED SURVIVAL

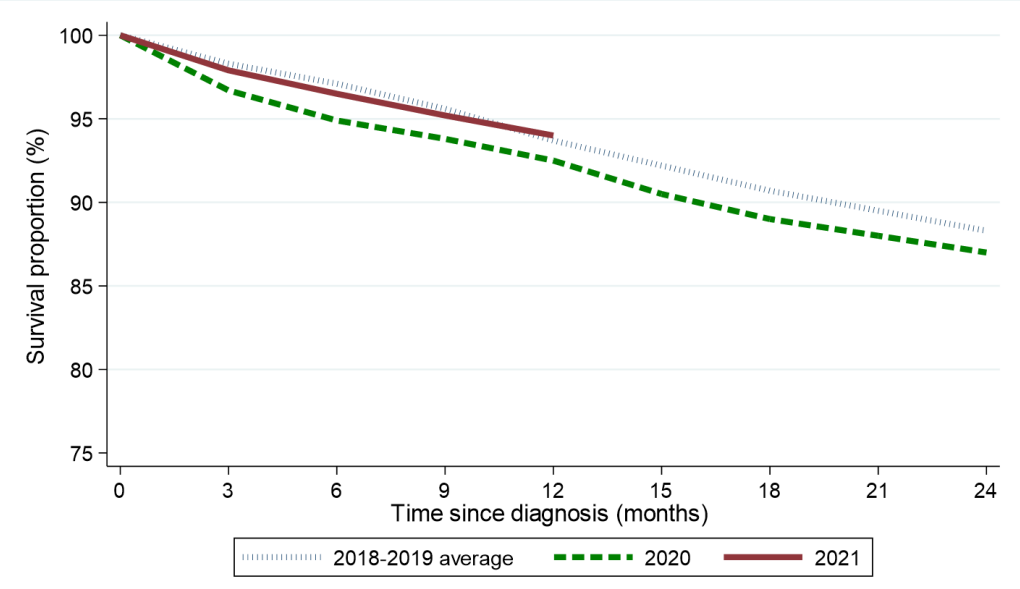
Survival among prostate cancer patients six months after diagnosis decreased from 97.1% among those diagnosed in April-December of 2018-2019 to 96.5% among those diagnosed in April-December of 2021. This change was not statistically significant. Between the same two diagnosis periods, one-year survival increased from 93.7% to 94.0%. This change was not statistically significant. The log-rank test of equality indicates no statistically significant difference between the survival functions for 2018-2019 and 2021 (p=0.927).

Table 8: Observed survival for patients with prostate cancer diagnosed in April-December of 2018-2021 by period of diagnosis

Survival time	Period of diagnosis (Apr-Dec)		
	2018-2019	2020	2021
Three months	98.3% (97.7% - 98.8%)	96.7% (95.3% - 97.7%)	97.9% (96.9% - 98.6%)
Six months	97.1% (96.2% - 97.7%)	94.9% (93.3% - 96.2%)	96.5% (95.3% - 97.5%)
One year	93.7% (92.6% - 94.7%)	92.5% (90.6% - 94.0%)	94.0% (92.4% - 95.2%)
Two years	88.3% (86.8% - 89.6%)	87.0% (84.7% - 89.1%)	-

No statistically significant reductions compared to 2018-2019

Figure 8: Observed survival for patients with prostate cancer diagnosed in April-December of 2018-2021 by period of diagnosis



DEATHS FROM COVID-19

During 2021 there were a total of 86 deaths from Covid-19 among prostate cancer patients diagnosed at any point since 1993. Among the patients who died of Covid-19, 8 were diagnosed with prostate cancer in 2021, 3 were diagnosed in 2020 and 75 were diagnosed in 1993-2019.

NET SURVIVAL

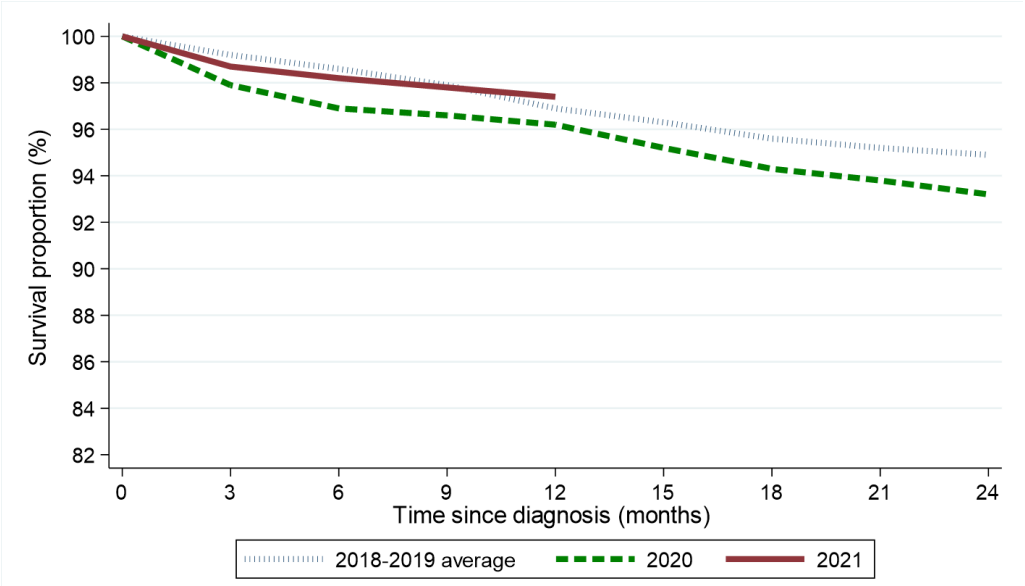
Net survival among prostate cancer patients six months after diagnosis decreased from 98.6% among those diagnosed in April-December of 2018-2019 to 98.2% among those diagnosed in April-December of 2021. This change was not statistically significant. Between the same two diagnosis periods, one-year net survival increased from 96.9% to 97.4%. This change was not statistically significant.

Table 9: Age-standardised net survival for patients with prostate cancer diagnosed in April-December of 2018-2021 by period of diagnosis

Survival time	Period of diagnosis (Apr-Dec)		
	2018-2019	2020	2021
Three months	99.2% (98.6% - 99.8%)	97.9% (96.9% - 98.9%)	98.7% (97.9% - 99.5%)
Six months	98.6% (97.8% - 99.4%)	96.9% (95.6% - 98.2%)	98.2% (97.2% - 99.2%)
One year	96.9% (95.8% - 98.0%)	96.2% (94.7% - 97.7%)	97.4% (96.1% - 98.7%)
Two years	94.9% (93.4% - 96.4%)	93.2% (90.9% - 95.6%)	-

No statistically significant reductions compared to 2018-2019

Figure 9: Age-standardised net survival for patients with prostate cancer diagnosed in April-December of 2018-2021 by period of diagnosis



Note: All patients are followed up to the end of 2022. This enables calculation of two-year survival for patients diagnosed in 2018-2020, however only survival up to one year from diagnosis can be calculated for patients diagnosed in 2021.

MORTALITY

During the April-December period the number of deaths from prostate cancer increased between 2018-2019 and 2021 by 12.0% from 208 deaths per year to 233 deaths.

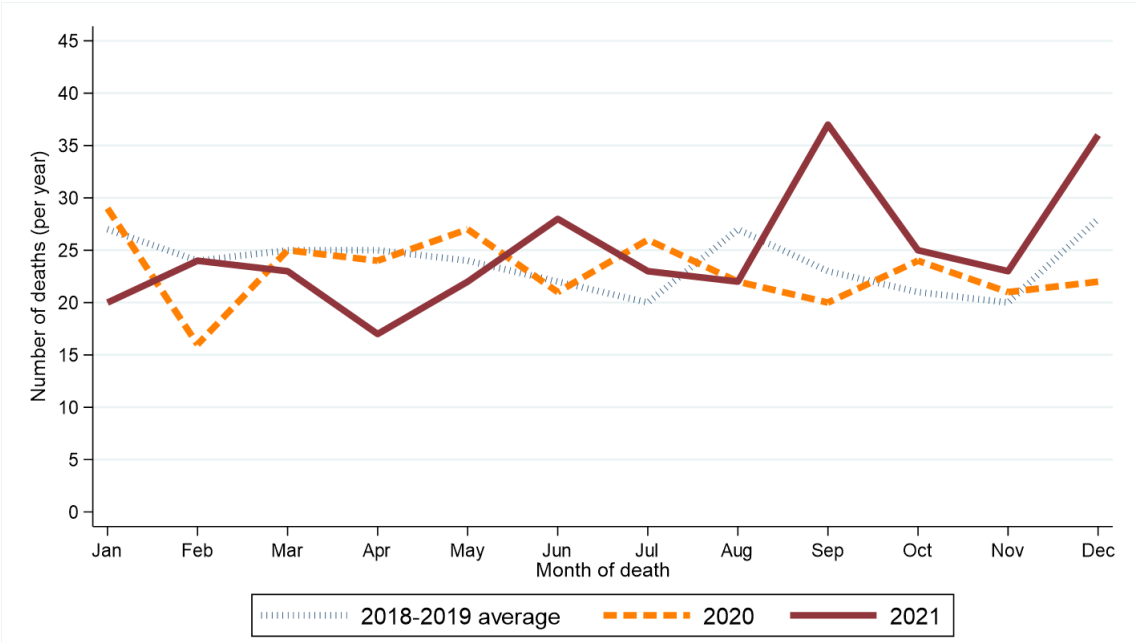
Table 10: Number of prostate cancer deaths in 2018-2021 by month and year of death

Period of death	Annual total	Month death occurred											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2018-2019*	283	27	24	25	25	24	22	20	27	23	21	20	28
2020	277	29	16	25	24	27	21	26	22	20	24	21	22
2021	300	20	24	23	17	22	28	23	22	37	25	23	36

** Average deaths per year rounded to the nearest integer. Row sums may thus differ slightly from the total.*

Figure 10: Number of prostate cancer deaths in 2018-2021 by month/quarter and year of death

(a) Number of deaths by month of death



(b) Percentage change over time in number of deaths by quarter of death