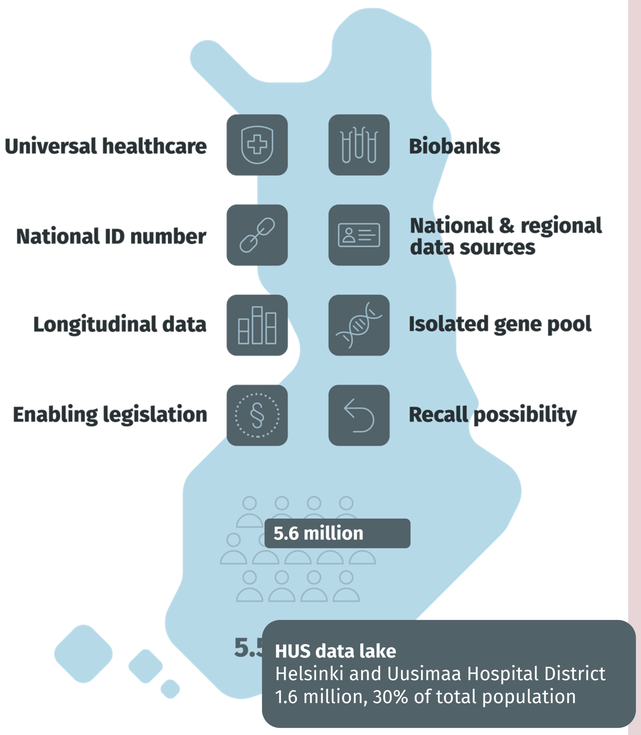
PCR180

Time Toxicity in Cancer Care and Time Spent in Healthcare Across Cancer and Treatment Types in Finland

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Medaffcon's Collaboration Research (CORE) dataset

- A retrospective registry-based cohort investigation in Helsinki and Uusimaa region (HUS) data lake
- All patients with a cancer diagnosis (C00-C99*; '*' indicates any character) starting from 2013 are included in the cohort and the dataset is updated continuously
- The dataset includes all diagnoses, healthcare contacts (outpatient and inpatient visits), laboratory measures, pathological tests and results, procedures and operations, hospital medications and prescriptions, radiological tests and results from the baseline and follow-up period.



BACKGROUND

Time toxicity (TT), defined as time spent in contact with healthcare captures the care-related time burden experienced by patients.

OBJECTIVES

This real-world study describes TT by cancer type and treatment modality in Finland.

METHODS

This retrospective registry-based cohort study used secondary data on adult patients treated for breast, lung, urothelial or kidney cancer, or melanoma, in 2018–2024 in the Helsinki and Uusimaa region (1.6 million inhabitants).

Treatment modality was assigned hierarchically from first-year treatments: immuno-oncology (IO), then tyrosine kinase inhibitors (TKI), other chemotherapy (CT) and, lastly, resection only of the primary tumour (resection). TKI included drugs under the ATC-class L01E*. IO included ipilimumab, durvalumab, atezolizumab, nivolumab, and pembrolizumab.

TT, measured as specialty healthcare contact days (outpatient or inpatient contact) in the first follow-up year, was analysed with negative binomial regression adjusted for sex, age, radiotherapy, surgery, index year and time to treatment. Contact days by treatment and cancer type were estimated with a model including these two factors only.

RESULTS

- The cohort included 16,954 treated patients: 9,071 with breast, 2,380 lung, 725 urothelial and 1,111 kidney cancer, and 3,667 with melanoma (Table 1). On average, patients had **39 contact days** in their first year.
- Compared with chemotherapy, IO was associated with **24% more contact days**, and TKI and resection with **15%** and **46% fewer** (Figure 1).
- Compared with breast cancer, lung cancer was associated with **10% more contact days**, and melanoma, kidney and urothelial cancer with **46%, 10%** and **7% fewer**.
- Resection was the most common modality, from 28% (lung) to 93% (melanoma) of patients (Figure 2).
- Among patients with lung cancer, time toxicity was highest for IO treated, **97 contact days** (≈ 2 days per week), and lowest for resected patients, **55 contact days** (Figure 3). A similar pattern was observed among the other cancers.

Table 1. Patient characteristics by cancer type, treated cohort.

n (%)	Breast n = 9,071	Lung n = 2,380	Urothelial n = 725	Kidney n = 1,111	Melanoma n = 3,667	All treated n = 16,954
Age, years						
18–49	1,467 (16.2%)	102 (4.3%)	22 (3.0%)	124 (11.2%)	715 (19.5%)	**2,430 (14.3%)**
50–59	1,969 (21.7%)	337 (14.2%)	81 (11.2%)	197 (17.7%)	659 (18.0%)	**3,243 (19.1%)**
60–69	2,599 (28.7%)	784 (32.9%)	193 (26.6%)	324 (29.2%)	741 (20.2%)	**4,641 (27.4%)**
70+	3,036 (33.5%)	1,157 (48.6%)	429 (59.2%)	466 (41.9%)	1,552 (42.3%)	**6,640 (39.2%)**
Other treatment in first year						
Surgery[1]	7,931 (87.4%)	868 (36.5%)	354 (48.8%)	959 (86.3%)	3,590 (97.9%)	**13,702 (80.8%)**
Radiotherapy	6,623 (73.0%)	806 (33.9%)	92 (12.7%)	98 (8.8%)	107 (2.9%)	**7,726 (45.6%)**
Index year						
2018–2019	2,627 (29.0%)	670 (28.2%)	231 (31.9%)	348 (31.3%)	1,052 (28.7%)	**4,928 (29.1%)**
2020–2021	2,597 (28.6%)	719 (30.2%)	179 (24.7%)	344 (31.0%)	1,015 (27.7%)	**4,854 (28.6%)**
2022–2023	2,794 (30.8%)	712 (29.9%)	245 (33.8%)	314 (28.3%)	1,178 (32.1%)	**5,243 (30.9%)**
2024	1,053 (11.6%)	279 (11.7%)	70 (9.7%)	105 (9.5%)	422 (11.5%)	**1,929 (11.4%)**

[1] Any surgery in the first year.

Figure 1. Adjusted difference in healthcare contact days during the first year by treatment modality, cancer type and patient factors. Rate ratio expressed as % difference with 95% confidence interval (CI). Multivariable negative binomial regression model predicting first-year healthcare contact days, n=16,954 treated patients.

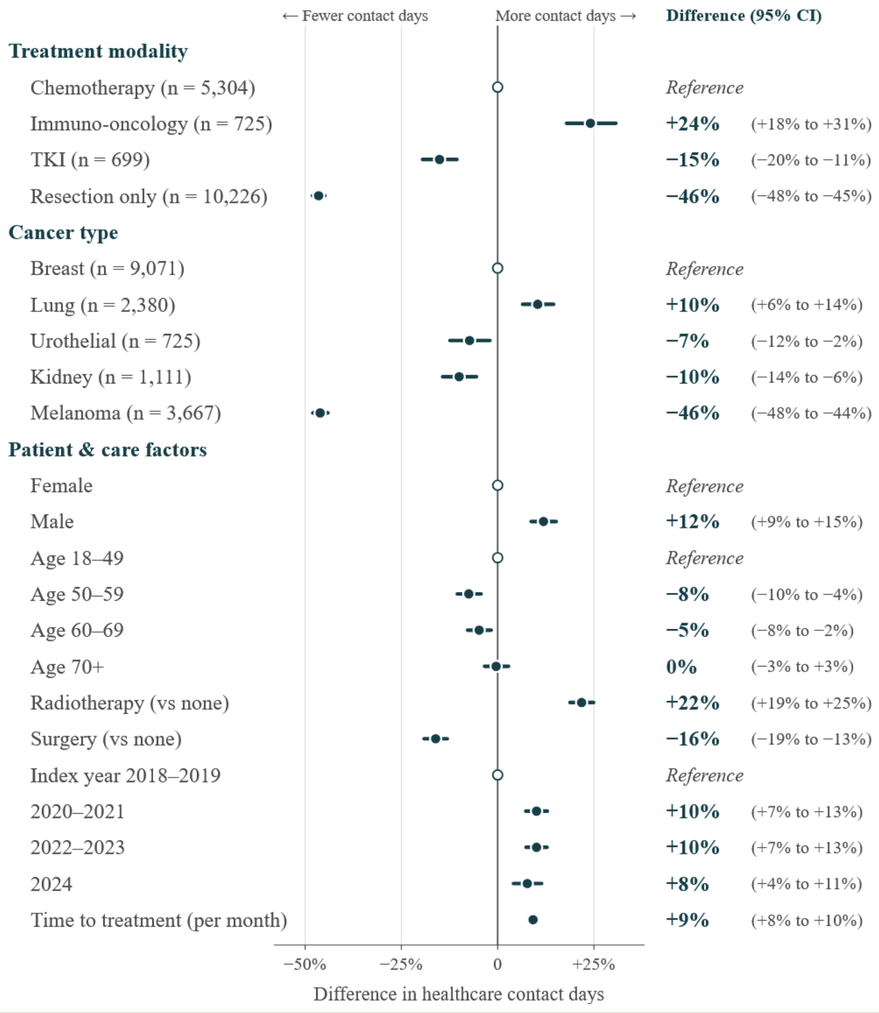


Figure 2. Treatment modality received during the first year, by cancer type.

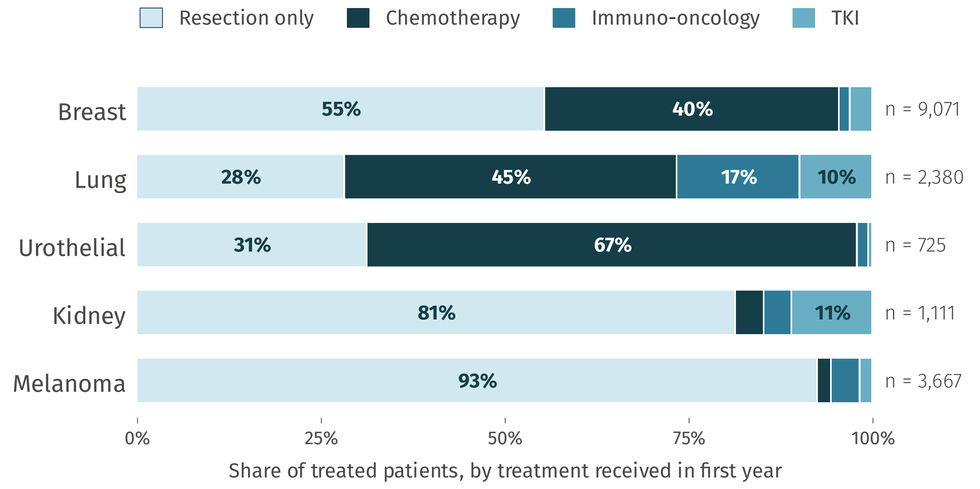


Figure 3. Estimated healthcare contact days during the first year, by treatment modality and cancer type (95% CI), from a negative binominal model including treatment modality and cancer type (not adjusted for patient factors).

	Lung	Breast	Urothelial	Kidney	Melanoma	All cancers
Immuno-oncology n = 725	**97** 93–102 n = 397	**83** 79–87 n = 133	**84†** 78–89 n = 11	**69** 65–74 n = 42	**41** 39–43 n = 142	**72** 69–75
Chemotherapy n = 5,304	**70** 68–72 n = 1,076	**60** 59–61 n = 3,632	**60** 57–63 n = 483	**50** 48–52 n = 43	**30** 29–30 n = 70	**52** 51–53
TKI n = 699	**67** 64–71 n = 235	**57** 54–60 n = 276	**58†** 54–62 n = 4	**48** 45–51 n = 122	**28** 27–30 n = 62	**50** 47–52
Resection only n = 10,226	**35** 34–36 n = 672	**29** 29–30 n = 5,030	**30** 28–31 n = 227	**25** 24–26 n = 904	**15** 14–15 n = 3,393	**26** 25–26

Model-predicted healthcare contact days in the first year(95% CI), negative binomial model including treatment modality and cancer type only(not adjusted for patient factors).
Differences between treatments are assumed proportional across cancer types
All cancers: averaged across cancer types, each weighted equally. Grey †: fewer than 30 patients; estimate is driven by the model rather than the group's own data.

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CONCLUSIONS

TT is an emerging, patient-centred outcome that reflects patients' burden and quality of life. As TT does not capture clinical benefit, it should be interpreted alongside available evidence on treatment effectiveness. Differences observed between treatment modalities across several cancers highlight the importance of considering time spent in healthcare when evaluating cancer treatments and supporting clinical decision-making.