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Comparison of real-world outcomes between a clinical-genomics database and other real-world databases among immunotherapy-treated patients with advanced non-small cell lung cancer (aNSCLC)

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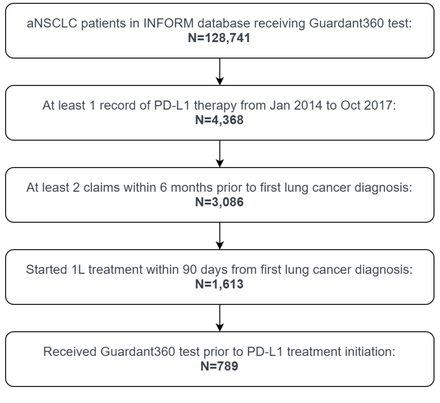
Introduction

- Real-world data is increasingly being used to generate real world evidence for a variety of purposes: from measuring of healthcare utilization and post-market surveillance, to comparative effectiveness research and others.
- Real-world end points from six diverse healthcare data organizations with claims and/or electronic health records data (EHR) have been compared and showed consistency in patients with aNSCLC treated with immunotherapy.[1]
- We seek to replicate the study and compare the real-world outcomes identified in the GuardantINFORM™ clinical-genomics database to the results from the other healthcare data organizations.

Methods

- **Data Source:** Patients were identified from the GuardantINFORM, which links cell-free circulating tumor DNA (cfDNA) results to de-identified claims data, with study time period from January 2014 to April 2018.
- **Inclusion and exclusion criteria:**
  - Adult patients in the US with non-small cell lung cancer diagnosis indicated on their Guardant360 test requisition form
  - Received PD-L1 treatments (nivolumab, pembrolizumab or atezolizumab) post first lung cancer diagnosis from January 2014 to October 2017.
  - Patients were excluded if they had less than two claims in the six months prior to first lung cancer diagnosis in claims and start of first line treatment was more than 90 days after first diagnosis.
- To account for left truncation of clinical-genomic databases, only patients who received a cfDNA test prior to PD-L1 treatment initiation were included.
- **Real-world outcomes and statistical analysis:**
  - Real-world time to treatment discontinuation (rwTTD), defined as interval from start of PD-L1 therapy to date the patient discontinues the therapy or death, whichever occurred earlier
  - Real-world time to next treatment (rwTTNT), defined as interval from start of PD-L1 therapy to start of next line of therapy or death, whichever occurred earlier
  - Real-world overall survival (rwOS), defined as time from initiation of PD-L1 therapy to death
  - Patients who did not experience any of the qualifying events within the study observation period were censored on last known claim activity
  - Time-to-event outcomes were assessed using the Kaplan Meier method with median time to event and 95% confidence intervals (CI) reported.

Figure 1. Patient attrition



Results

789 aNSCLC patients were identified from the real-world database (**Figure 1**). Patient demographic and clinical characteristics is summarized and compared with information from 5 other healthcare data organizations in **Table 1.** [1]

Table 1. Patient demographic and clinical characteristics

Demographic	Guardant INFORM	Data Set B	Data Set C	Data Set D	Data Set E	Data Set F
Median age at diagnosis, years (IQR)	65 (14)	64 (14)	66 (14)	69 (14)	68 (14)	70 (14)
Median age at PD-L1 inhibitor initiation, years (IQR)	66 (14)	65 (14)	68 (14)	69 (14)	69 (14)	71 (14)
Age categories at PD-L1 inhibitor initiation						
≤49	44 (6)	24 (4)	21 (5)	219 (3)	80 (3)	8 (3)
50-64	316 (40)	242 (45)	129 (30)	2,048 (30)	863 (30)	65 (24)
65-74	271 (34)	194 (35)	169 (39)	2,504 (36)	1,047 (37)	94 (35)
≥75	158 (20)	86 (15)	116 (27)	2,153 (31)	870 (30)	102 (38)
Sex, No. (%)						
Female	411 (52)	275 (49)	212 (49)	3,172 (46)	1,351 (47)	125 (46)
Male	378 (48)	281 (51)	222 (51)	3,752 (54)	1,509 (53)	143 (53)
Unknown/missing	0	0	5	0	0	1
Race/ethnicity, No. (%)						
White	487 (81)	477 (86)	284 (65)	4,969 (79)	676 (87)	160 (87)
Black or African American	66 (11)	67 (12)	37 (9)	594 (9)	44 (6)	14 (8)
Asian	18 (3)	6 (1)	83 (19)	155 (3)	13 (2)	9 (5)
Other	33 (5)	6 (1)	31 (7)	580 (9)	42 (5)	1 (1)
Unknown/missing	185	0	0	626	2,085	85
Histology						
Non-squamous-cell carcinoma	358 (45)	369 (66)	320 (74)	4,679 (70)	1,981 (69)	194 (73)
Squamous-cell carcinoma	73 (9)	147 (26)	73 (17)	1,983 (30)	659 (23)	61 (23)
NSCLC histology, not otherwise specified	358 (45)	40 (7)	42 (10)	262 (3)	220 (8)	10 (4)
Missing						4
Line of first PD-L1 inhibitor in advanced setting, No. (%)						
1 (no prior therapy recevied)	136 (17)	144 (26)	80 (18)	2,074 (30)	777 (27)	77 (29)
2	523 (66)	272 (49)	205 (47)	3,357 (49)	1,414 (49)	87 (32)
3	93 (12)	96 (17)	85 (20)	1,012 (15)	448 (16)	51 (19)
≥4	37 (5)	44 (8)	65 (15)	481 (7)	221 (8)	54 (20)
Median time from advanced diagnosis to first PD-L1 inhibitor initiation, months (Q1, Q3)	7 (4, 13)	7 (3, 14)	8 (4, 15)	6 (2, 13)	8 (3, 17)	7 (2, 14)
Structured follow-up time						
From advanced diagnosis, months, median (Q1, Q3)	15 (9, 25)	18 (10, 28)	18 (10, 31)	14 (8, 25)	18 (10, 30)	18 (10, 28)
From PD-L1 inhibitor initiation, months, median (Q1, Q3)	7 (3, 12)	8 (3, 16)	9 (3, 16)	6 (2, 12)	8 (3, 14)	8 (4, 13)

* Participating data sources in the reference included Cancer Research Network, Cota Healthcare, Flatiron Health, IQVIA, OptumLabs Data Warehouse and PCORnet, all of which were anonymized for results summary

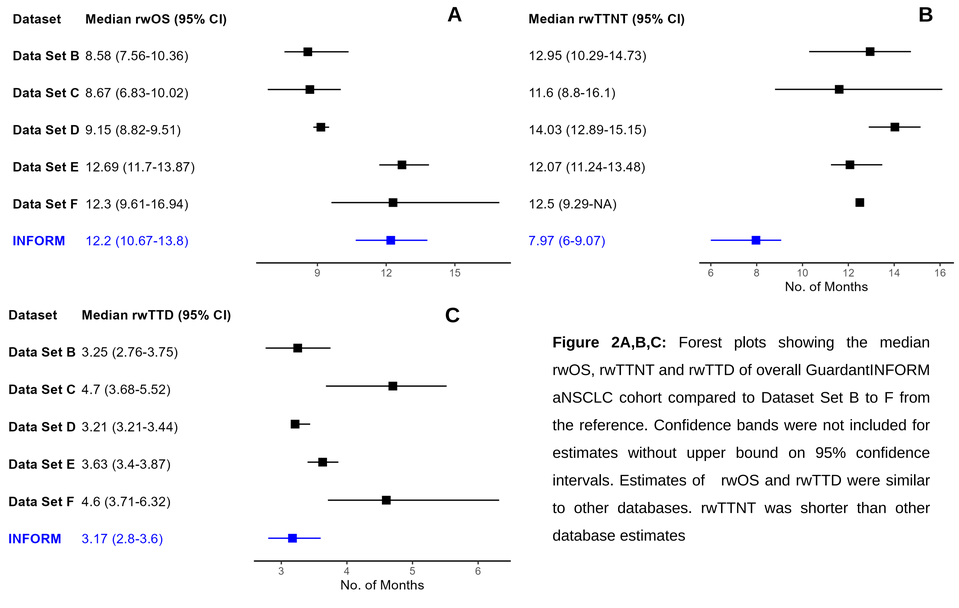


Figure 2A,B,C: Forest plots showing the median rwOS, rwTTNT and rwTTD of overall GuardantINFORM aNSCLC cohort compared to Dataset Set B to F from the reference. Confidence bands were not included for estimates without upper bound on 95% confidence intervals. Estimates of rwOS and rwTTD were similar to other databases. rwTTNT was shorter than other database estimates

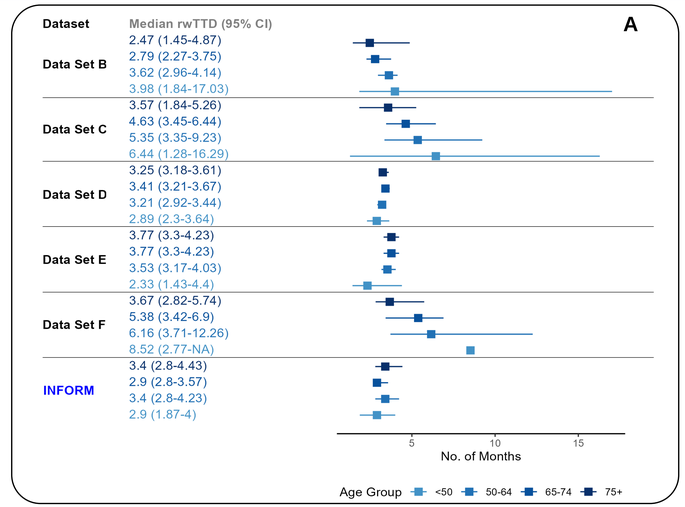


Figure 3A,B: Forest plots showing the median rwTTD and rwOS by age groups. Age group <50 was excluded for rwOS analysis due to lack of estimates for some datasets.

Conclusions

- We demonstrated that the real-world end points from GuardantINFORM database is generally consistent with other real-world databases in this aNSCLC patient cohort.
- Analysis is limited to information available in the reference and may not incorporate all analytical details implemented in the other datasets.

References

1. Mark Stewart et al., An Exploratory Analysis of Real-World End Points for Assessing Outcomes Among Immunotherapy-Treated Patients With Advanced Non–Small-Cell Lung Cancer. JCO Clin Cancer Inform 3, 1-15(2019). DOI:10.1200/CCI.18.00155

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