

Median pathway analysis by patient demographics, cancer stage and route to diagnosis, for lung cancer (2013-2017)

England

Produced by the Cancer Alliance Data, Evidence and Analysis Service, a partnership between NHS England and NHS Improvement & Public Health England

May 2019

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Purpose of work

Aim: to provide Cancer Alliances with in-depth analysis of the median time taken for different intervals of the patient pathway (referral, first seen in secondary care, diagnosis, first MDT meeting and treatment start).

What does it tell a Cancer Alliance?

The analysis informs Cancer Alliances of variation in time from referral to first treatment by socio-demographic factors, routes to diagnosis and geography for patients diagnosed with lung cancer (2013-2017). Cancer Alliances are provided with pathway data for all 19 Cancer Alliances with an England benchmark, and for their respective CCGs and trusts.

How should a Cancer Alliance use the data?

Cancer Alliances can use the data to identify variation, investigate differences as appropriate and develop local strategies to address health inequalities. Cancer Alliances can also use the analysis to identify best practice that can be shared for faster diagnosis and to improve patient experience. Analysis from this project should be considered in conjunction with other related analyses (see below).

Link to strategic priorities in cancer programme

This work supports the strategic priorities outlined in the NHS [Long Term Plan](#) (3.57) of faster diagnosis and reducing health inequalities.

Purpose of work (cont.)

Related work

This is one of two strategic projects the Cancer Alliance Data, Evidence and Analysis Service (CADEAS) has undertaken on pathway lengths. The first project '[Analysis of 62-day pathways using 2017/2018 Cancer Waiting Times data for colorectal, lung and prostate cancers](#)' was published in December 2018. Both projects look at the time taken from referral to first treatment for those diagnosed with colorectal, lung and prostate cancers. The first project used the Cancer Waiting Times dataset only. This project covers all incidence of cancer and provides granular demographic data by linking the Cancer Waiting Times dataset to the Cancer Registry. The data are therefore more comprehensive but less timely and includes cases diagnosed up to 31 Dec 2017.

Other related work:

[Routes to diagnosis](#)

Acknowledgements

This work is produced by CADEAS, a partnership between NHS England and NHS Improvement & Public Health England. It builds on work previously carried out by the NCRAS-TCST (National Cancer Registration and Analysis Service - Transforming Cancer Services Team for London) Partnership.

We would like to thank patients and clinicians who provide the information that is collected by the NHS as part of patients' cancer care.

Methodology

This analysis uses linked Cancer Registry, Cancer Care Plan and Cancer Waiting Times (CWT) datasets for patients aged twenty years or older, diagnosed with lung (C34) cancer.

The median time taken between the different intervals in the pathway has been calculated and segmented by the following:

- Year of diagnosis
- Sex
- Stage at diagnosis
- Age at diagnosis
- Ethnicity
- Income domain quintile

Cancer cases diagnosed until the end of 2016 can now be linked to the route to diagnosis. Further analysis can therefore be carried out on the median pathways for those diagnosed with cancer through the 62-day pathway and other routes.

A supplementary report will be provided with analysis of the median pathways for patients diagnosed through a Two Week Wait referral (TWW) compared with all other routes to diagnosis.

As outlined in the [National Cancer Waiting Times Monitoring Dataset Guidance](#), the two CWT adjustments; first seen adjustment (2.4) and treatment adjustment (4.19), have been included in the median time taken calculations, in line with CWT official statistics.

Methodology (cont.)

Cancer Alliances will receive reports presented at the following geographical levels:

- England
- Cancer Alliance
- Resident CCG
- Diagnosis Trust

Caveats:

1. Figures for Cancer Alliances as a whole are derived from their respective CCGs.
2. Caution should be taken when interpreting results with small cohorts as small numbers can lead to variation and unreliability of data. In cases where there are less than six patients, the patient number is recorded as <6.
3. Please note that the median pathway length from referral to first treatment may not be the same as the sum of the median lengths for each pathway interval.

Data completeness: lung cancer - England (2013-2017)

	Variable	Sources used	2013		2014		2015		2016		2017	
			Patient count (N)	Completeness (%)	Patient count (N)	Completeness (%)	Patient count (N)	Completeness (%)	Patient count (N)	Completeness (%)	Patient count (N)	Completeness (%)
Cancer Registry¹	Total patients	PHE national cancer registration data	37,570	100.0	38,033	100.0	38,277	100.0	39,048	100.0	38,878	100.0
	Death Certificate Only²	PHE national cancer registration data	222	0.6	88	0.2	44	0.1	31	0.1	208	0.5
Median Pathway Cohort	Analysis cohort	PHE national cancer registration data	37,348	100.0	37,945	100.0	38,233	100.0	39,017	100.0	38,670	100.0
	Referral date	Cancer Waiting Times database	22,057	59.1	22,319	58.8	23,166	60.6	24,938	63.9	25,711	66.5
	First seen date	Cancer Waiting Times database	21,920	58.7	22,095	58.2	22,914	59.9	23,882	61.2	24,482	63.3
	Diagnosis date	Derived from PHE's national cancer registration data ³	37,348	100.0	37,945	100.0	38,233	100.0	39,017	100.0	38,670	100.0
	MDT date	Cancer Waiting Times database, Cancer Care Plan database	28,131	75.3	30,138	79.4	30,752	80.4	32,124	82.3	32,516	84.1
	Treatment start date	Cancer Waiting Times database	27,533	73.7	27,858	73.4	28,354	74.2	29,278	75.0	29,734	76.9

1. **Cancer Registry:** cohort is as used by the Office for National Statistics and [CancerData](#)
 2. Records identified as **Death Certificate Only** are not included in this analysis.
 3. The cancer registry derives the diagnosis date from the following events in order of prioritisation: first histological/ cytological confirmation of the malignancy, the first admission to hospital because of the malignancy, and when a patient is evaluated in outpatient clinic.
- Due to data completeness, the count of patients will differ in any given interval of the patient pathway and therefore, any labels detailing patient counts are those for the pathway as a whole i.e. patients diagnosed.

Key findings

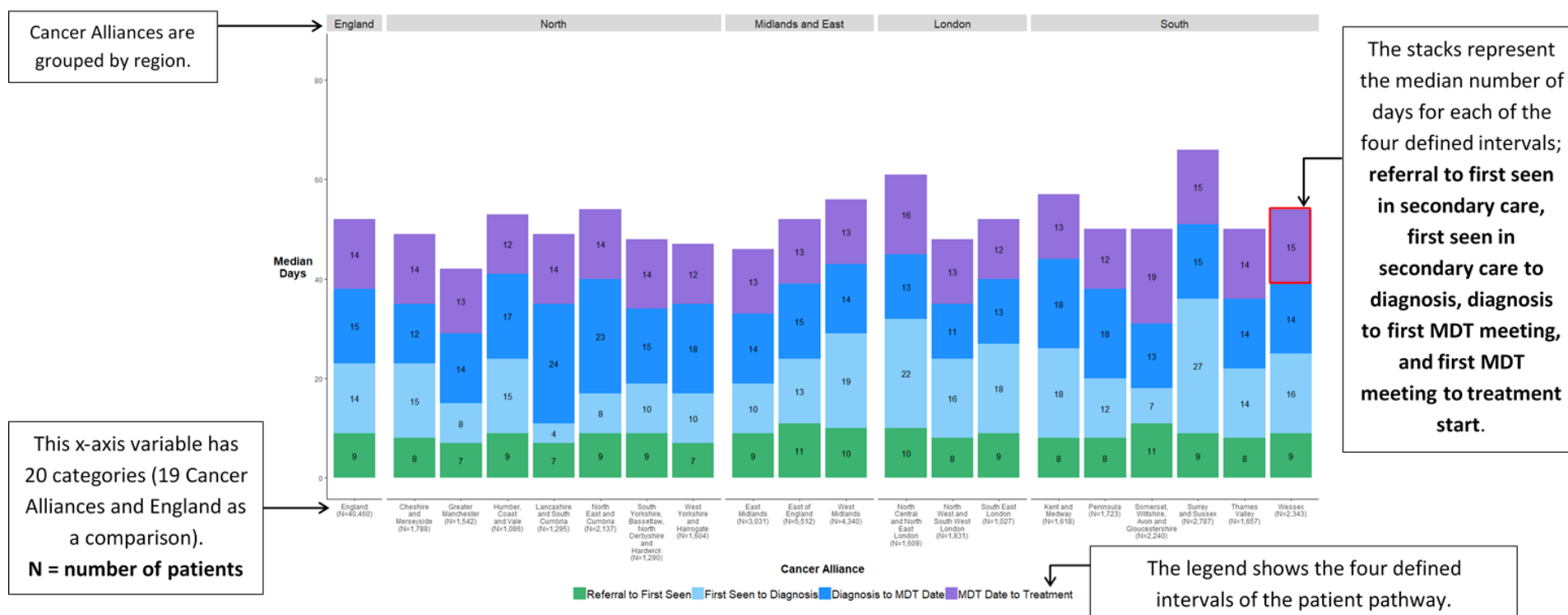
*Statistically significant findings are denoted with **

- Lung cancer has the shortest median pathway of colorectal, lung and prostate cancers with the shortest median time taken from diagnosis to MDT date.
- Patients being seen via emergency presentation and inpatient elective have the shortest median pathway, and those seen via a GP referral have the longest median pathway.*
- Patients diagnosed with stage 1 lung cancer have the longest median pathways, and stage 4 patients have the shortest pathways. Stages 2, 3, and 4 have statistically significantly shorter median pathway lengths for the first seen to diagnosis, diagnosis to MDT date, and MDT date to treatment intervals of the pathway compared with stage 1 patients.*
- There is little variation in the median pathway lengths for men and women with no statistically significant findings in any part of the patient pathway in 2017.
- The oldest patients typically have the shortest median pathway lengths.*
- Patients of Asian and Black ethnicity have typically had longer median pathway lengths than patients of White ethnicity, with statistically significantly longer median pathway lengths in the first seen to diagnosis interval for patients of Black ethnicity and MDT date to treatment for patients of Asian ethnicity.*
- There is little variation in the median pathway length across the different income domain quintiles.

How to interpret the graphs

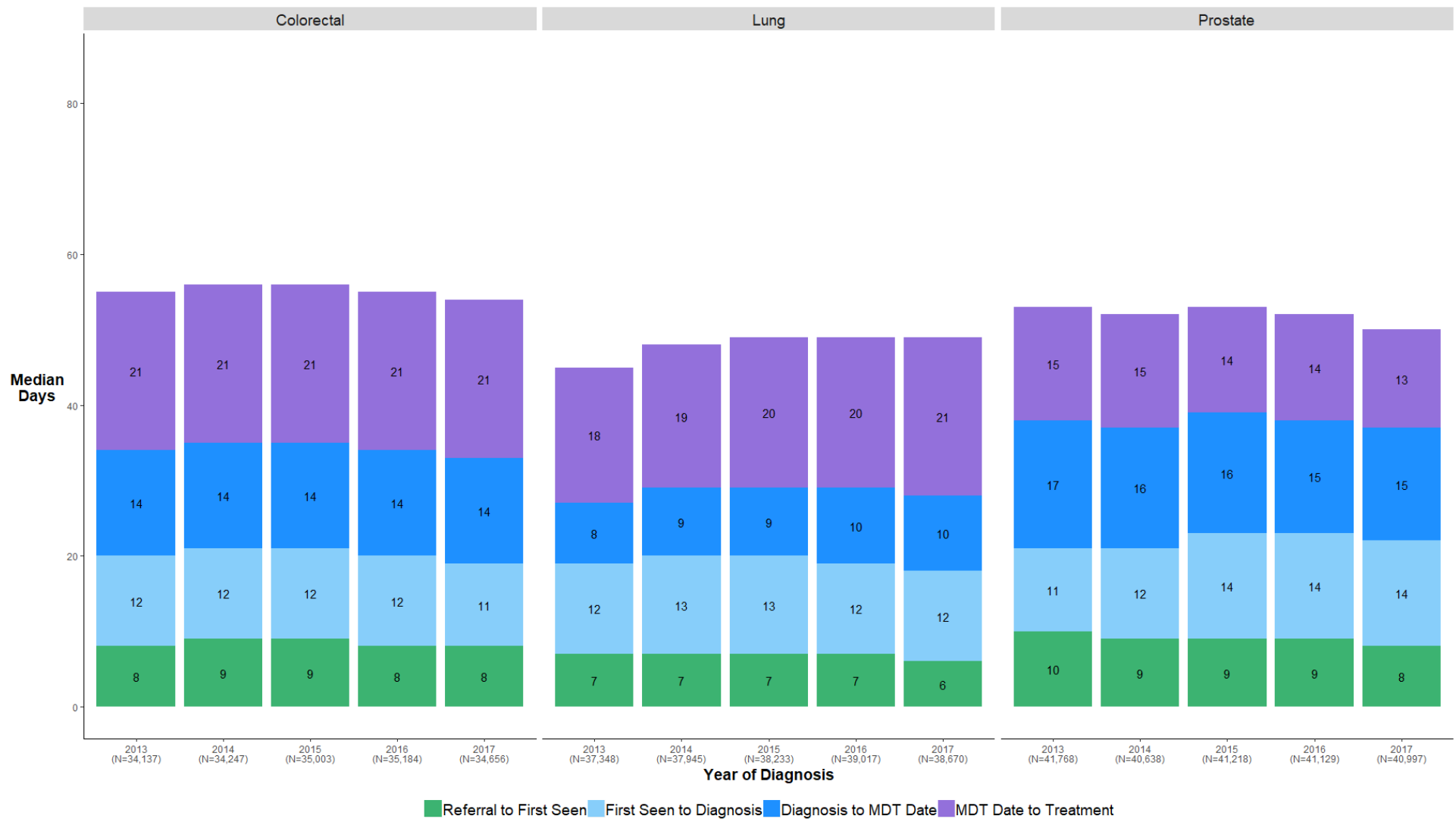
The patient pathway has been stratified into four intervals; **referral to first seen in secondary care, first seen in secondary care to diagnosis, diagnosis to first MDT meeting, and first MDT meeting to treatment start** - each graph is presented as stacked column bar charts and the figures within the bars show the median number of days for each interval of the pathway.

Below is an example graph displaying variation in the median number of days taken from referral to first treatment received for prostate cancer, stratified by the defined intervals of the pathway and Cancer Alliances in 2016.

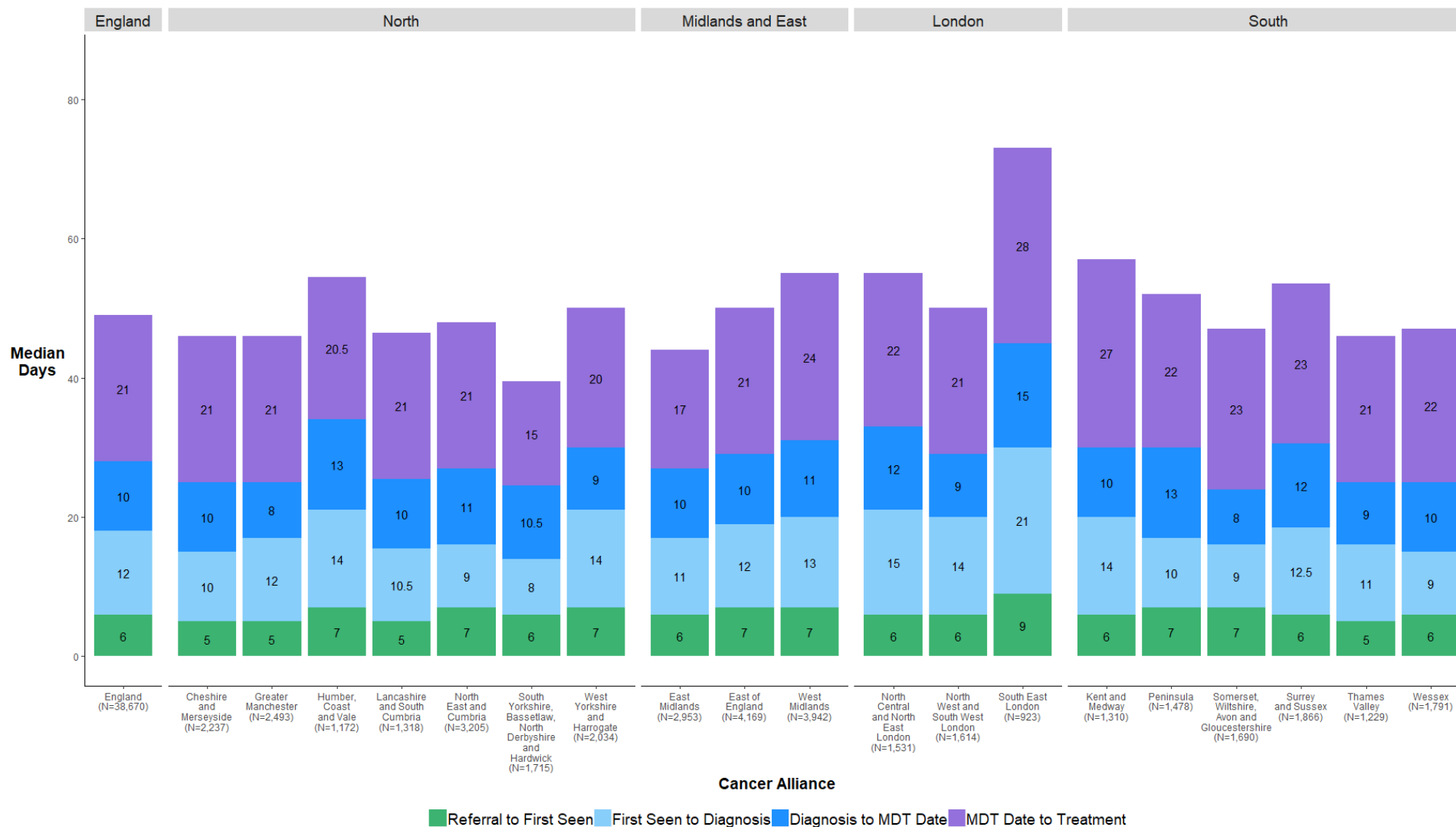


Overview

National Overview: median days from referral to treatment, for colorectal, lung and prostate cancers, by year of diagnosis (2013-2017)

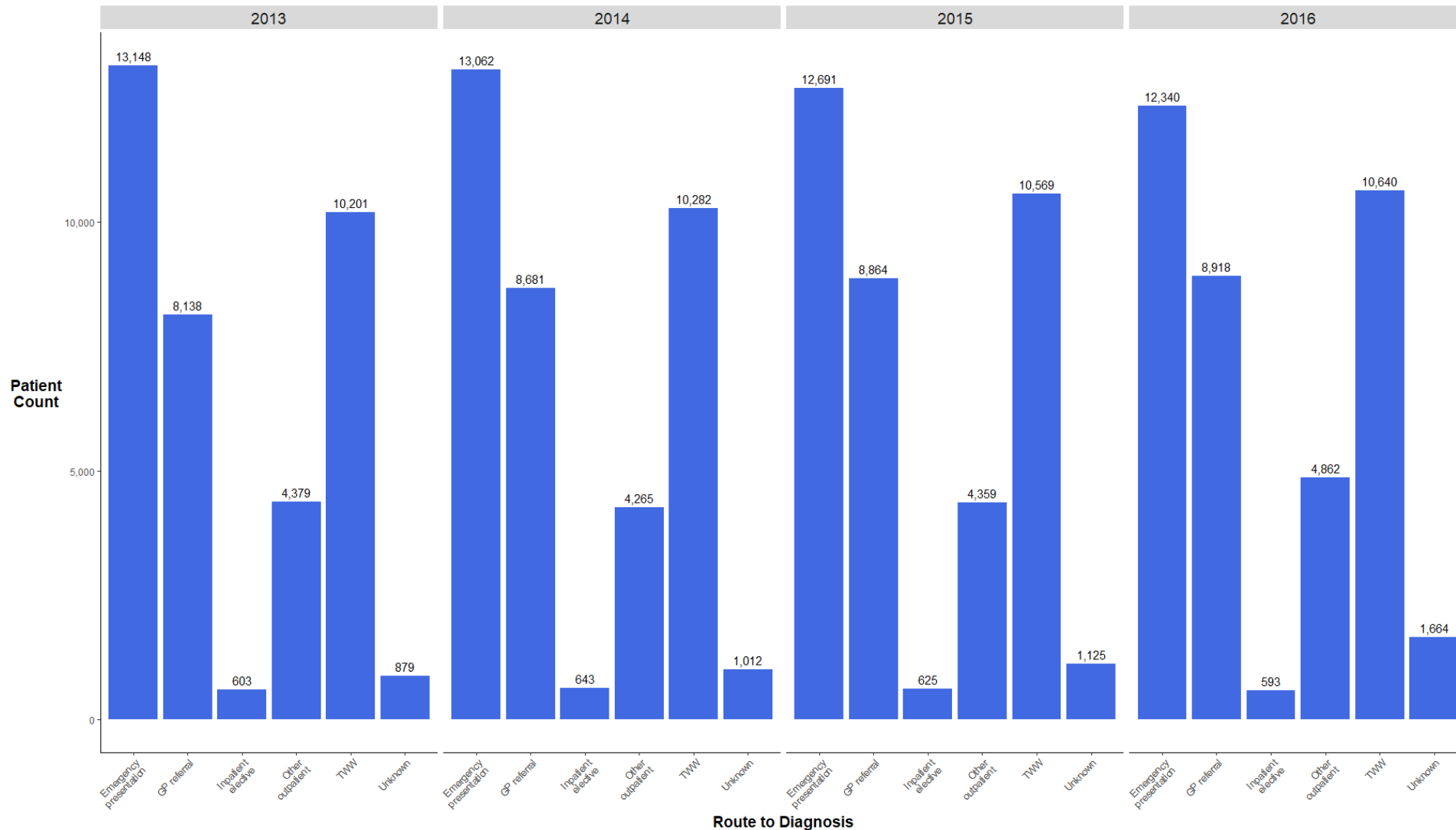


Lung cancer: median days from referral to treatment, by Cancer Alliance (2017)

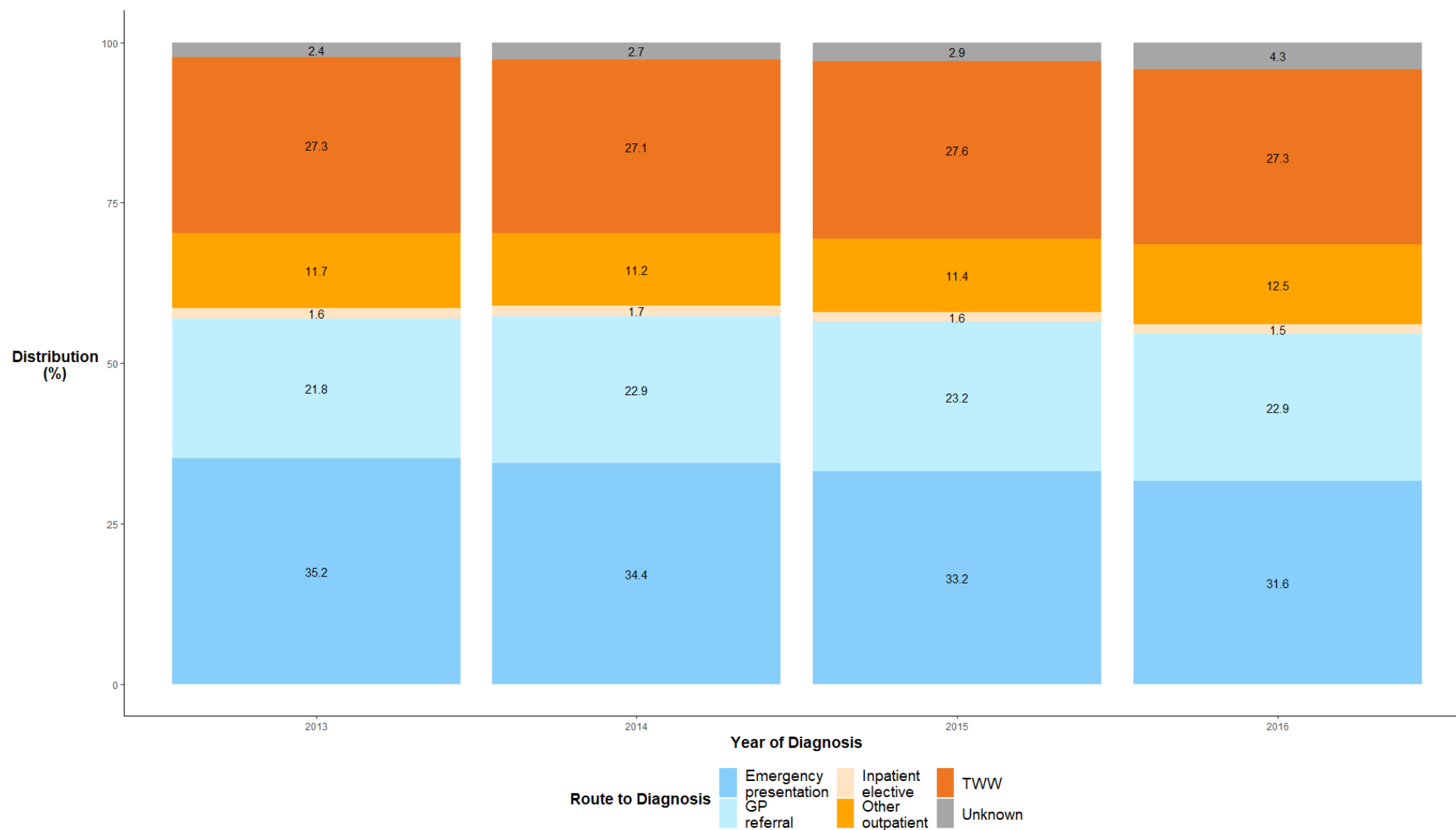


Route to diagnosis

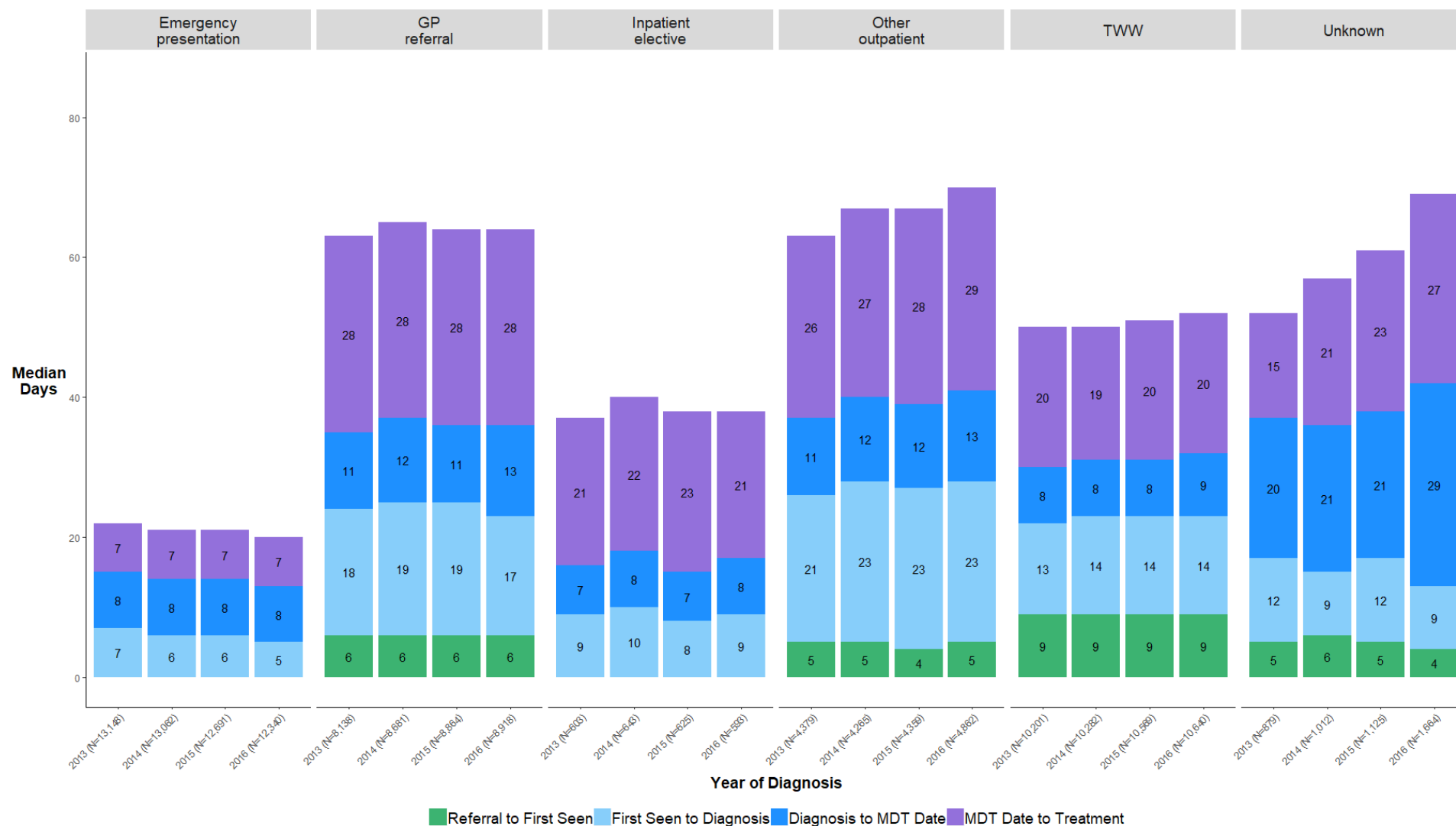
Lung cancer: patient counts, by route to diagnosis (2013-2016)



Lung cancer: distribution of patients, by route to diagnosis (2013-2016)

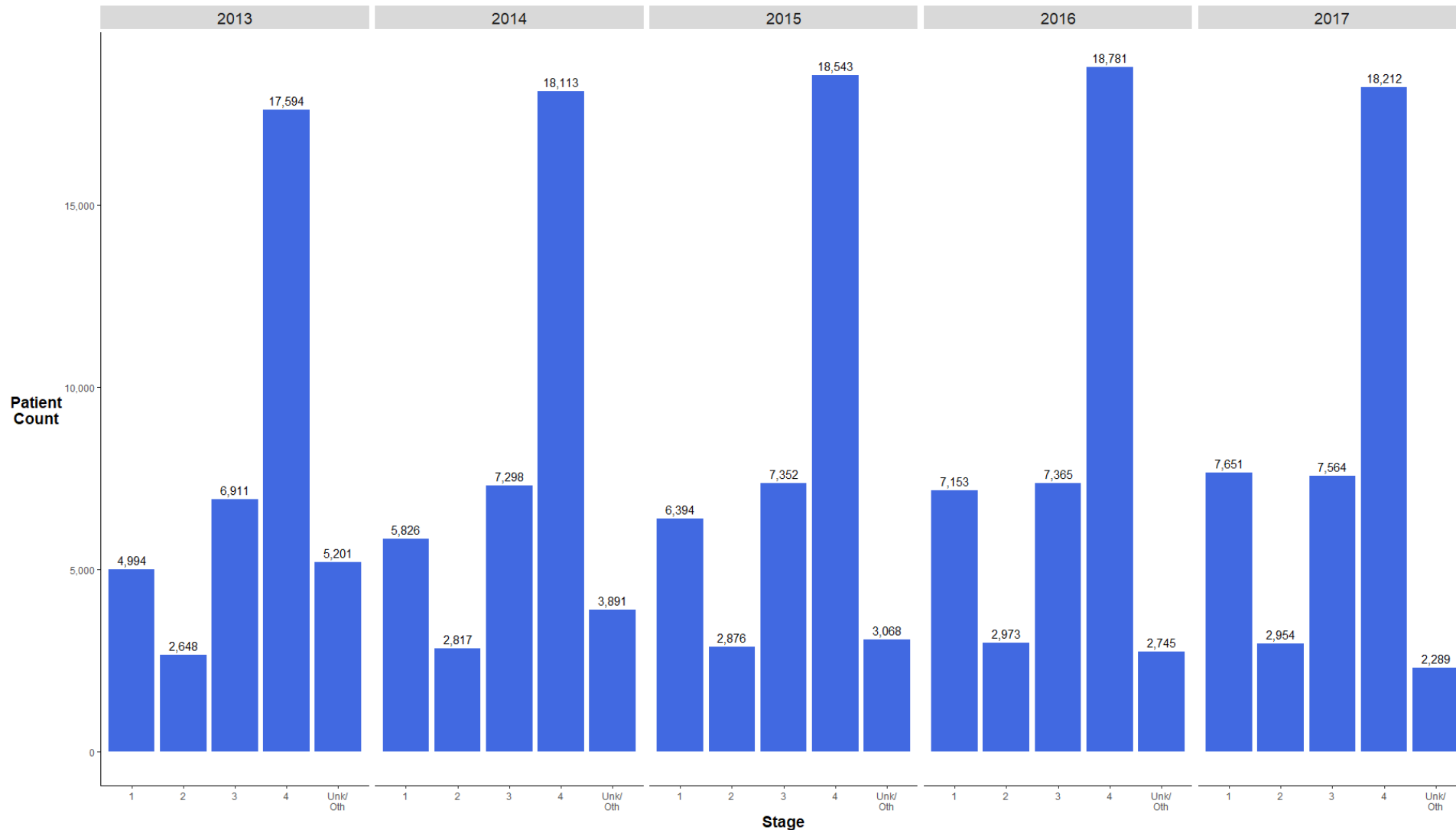


Lung cancer: median days from referral to treatment, by route to diagnosis (2013-2016)

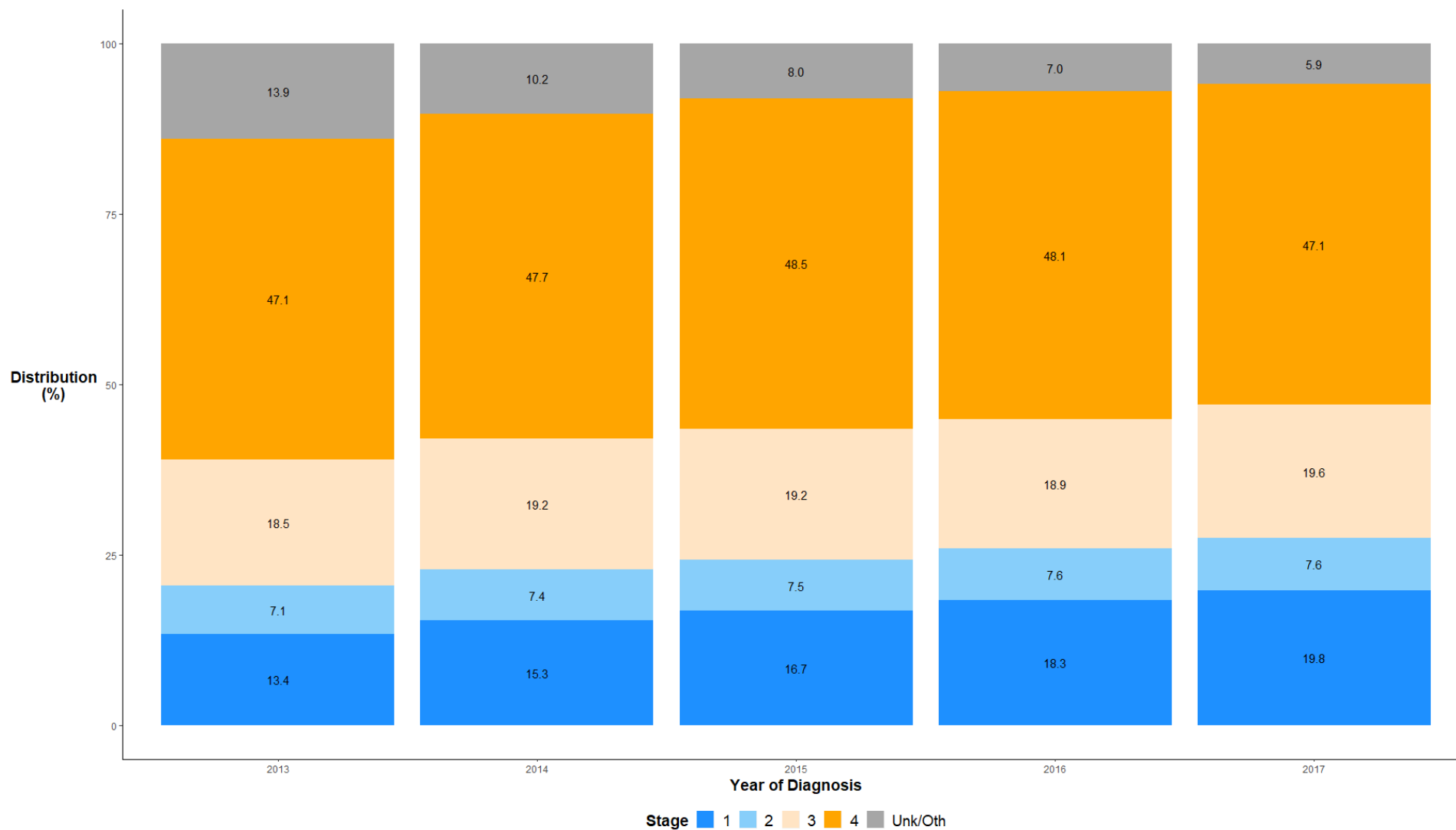


Stage at diagnosis

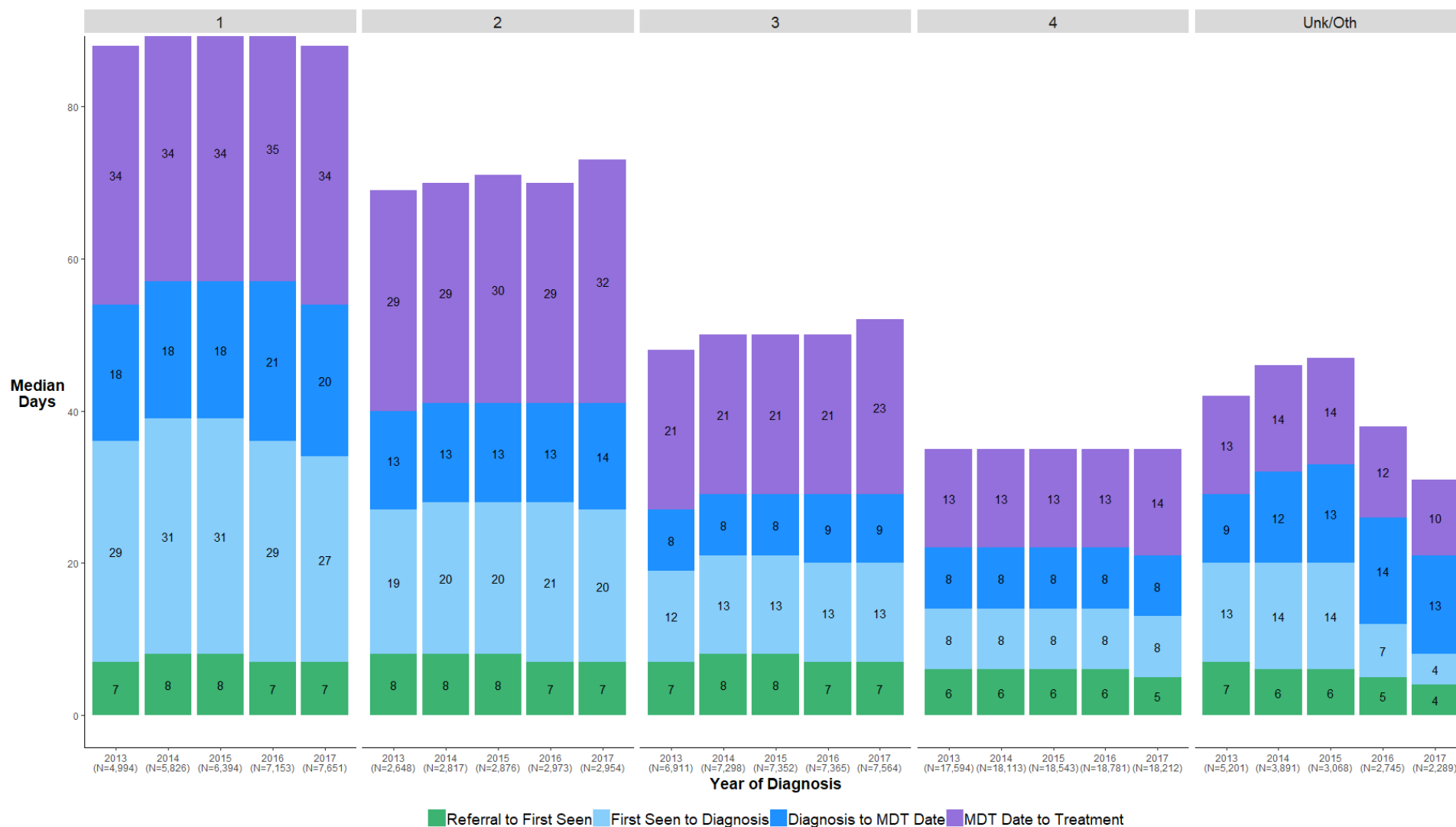
Lung cancer: patient counts, by stage at diagnosis (2013-2017)



Lung cancer: distribution of patients, by stage at diagnosis (2013-2017)

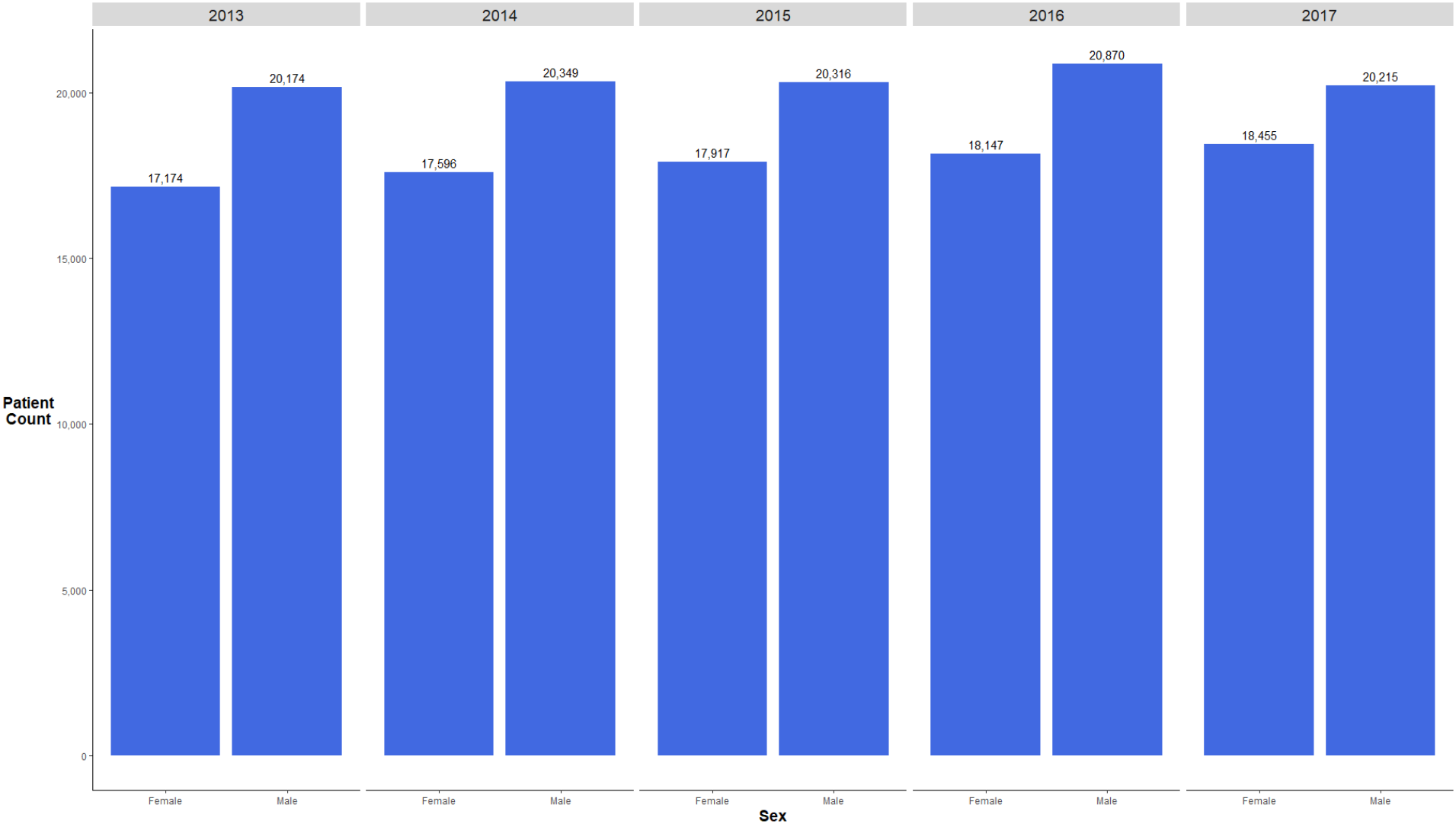


Lung cancer: median days from referral to treatment, by stage at diagnosis (2013-2017)

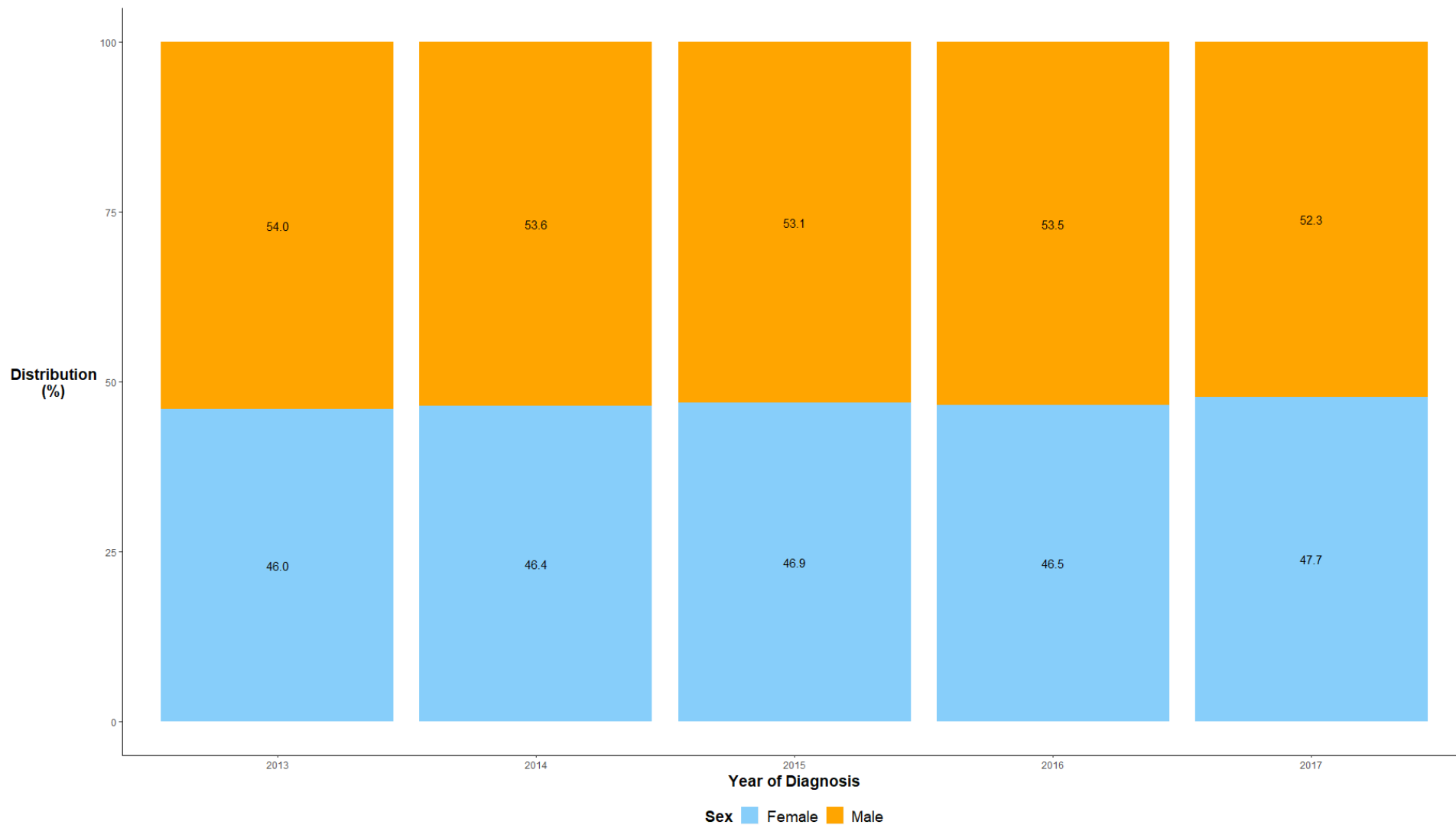


Sex

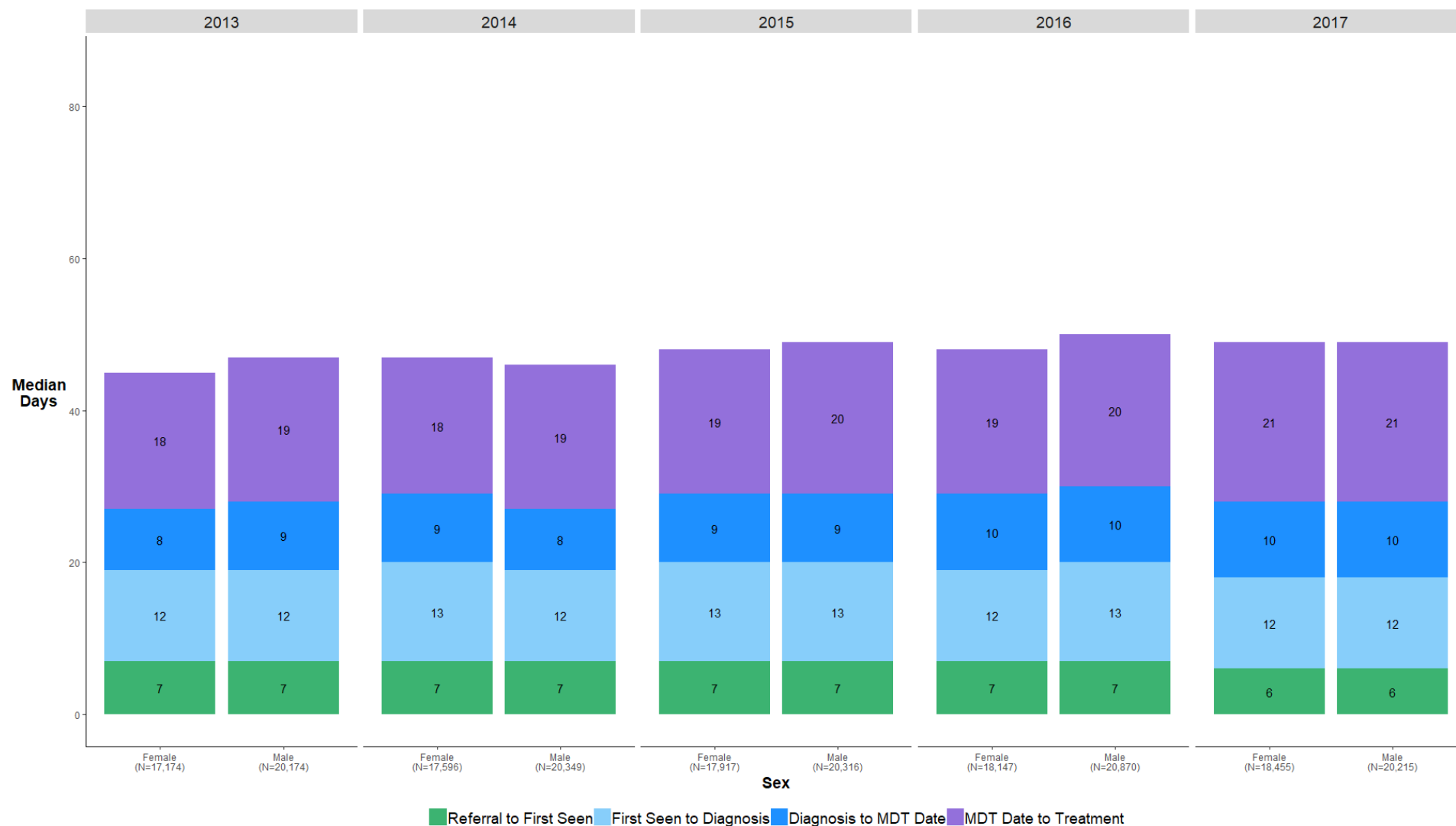
Lung cancer: patient counts, by sex (2013-2017)



Lung cancer: distribution of patients, by sex (2013-2017)

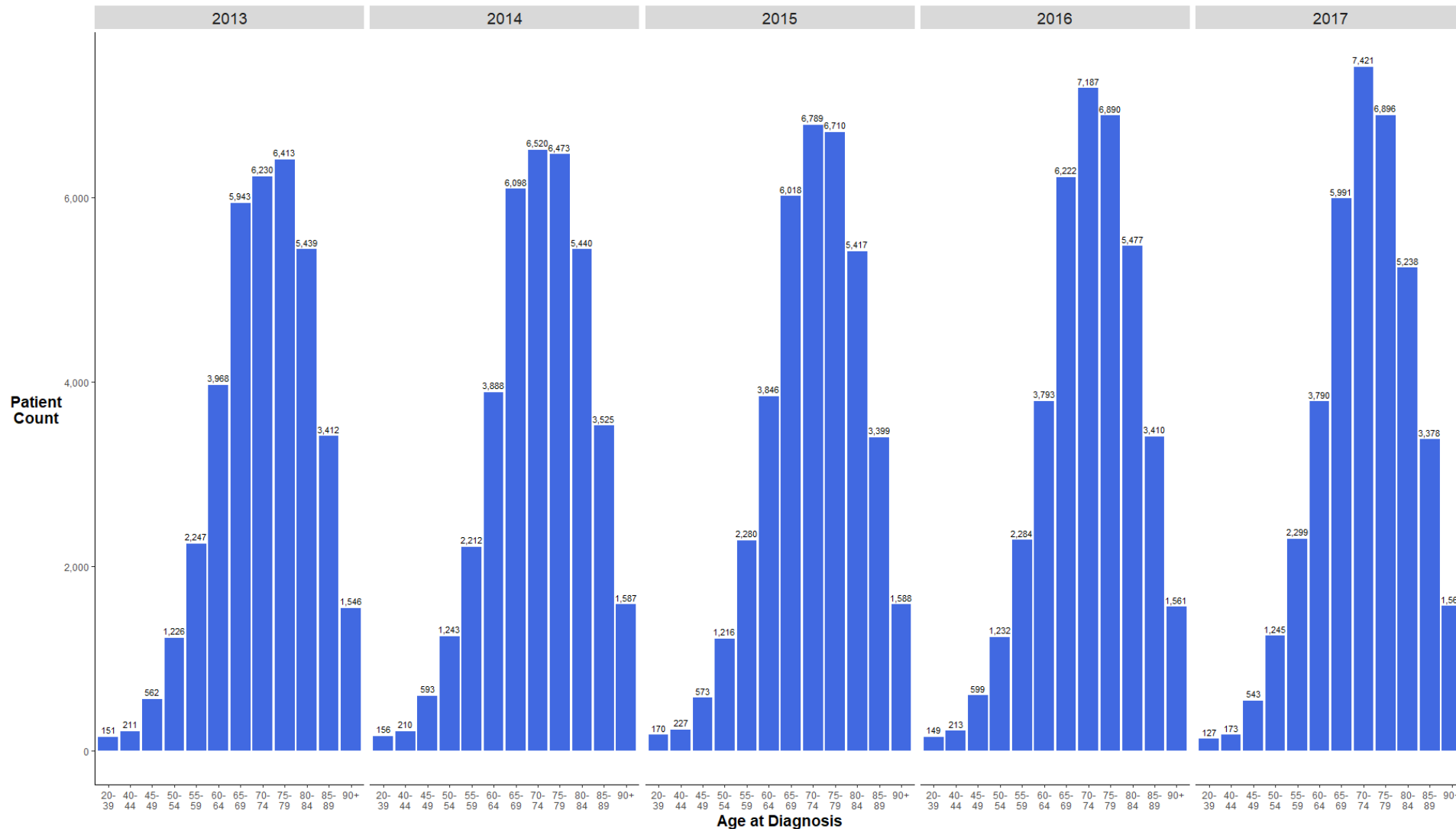


Lung cancer: median days from referral to treatment, by sex (2013-2017)

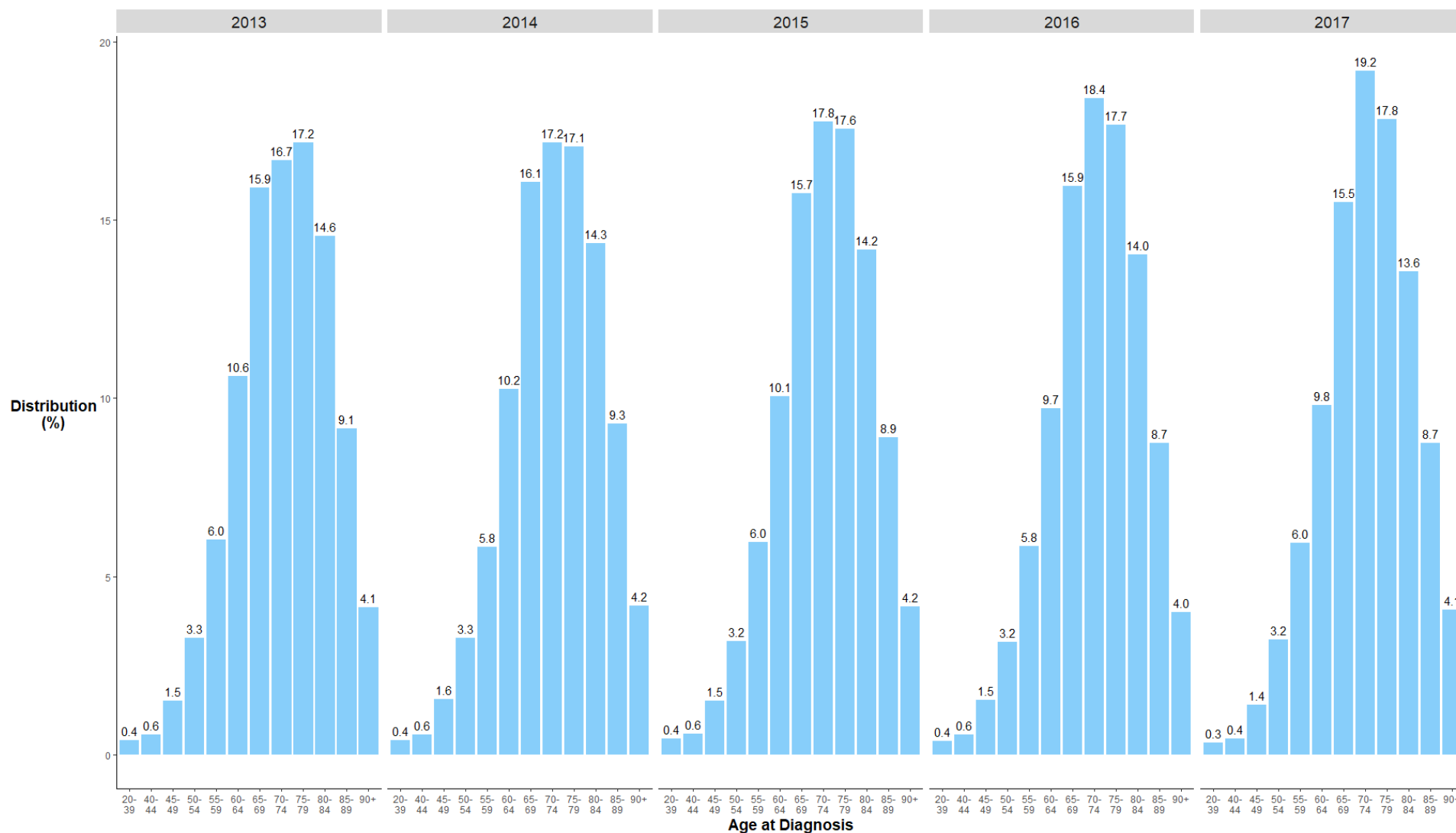


Age at diagnosis

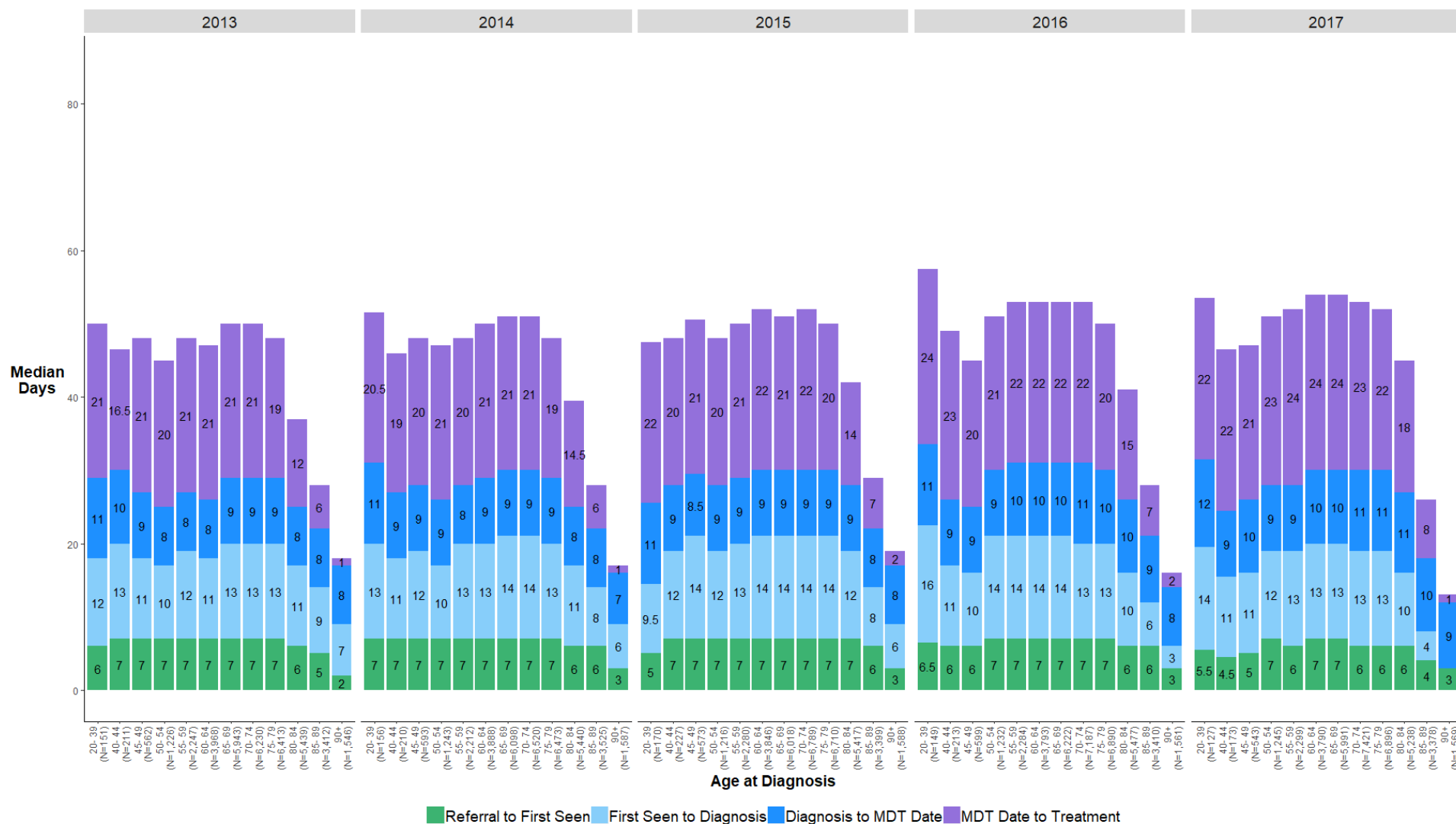
Lung cancer: patient counts, by age at diagnosis (2013-2017)



Lung cancer: distribution of patients, by age at diagnosis (2013-2017)

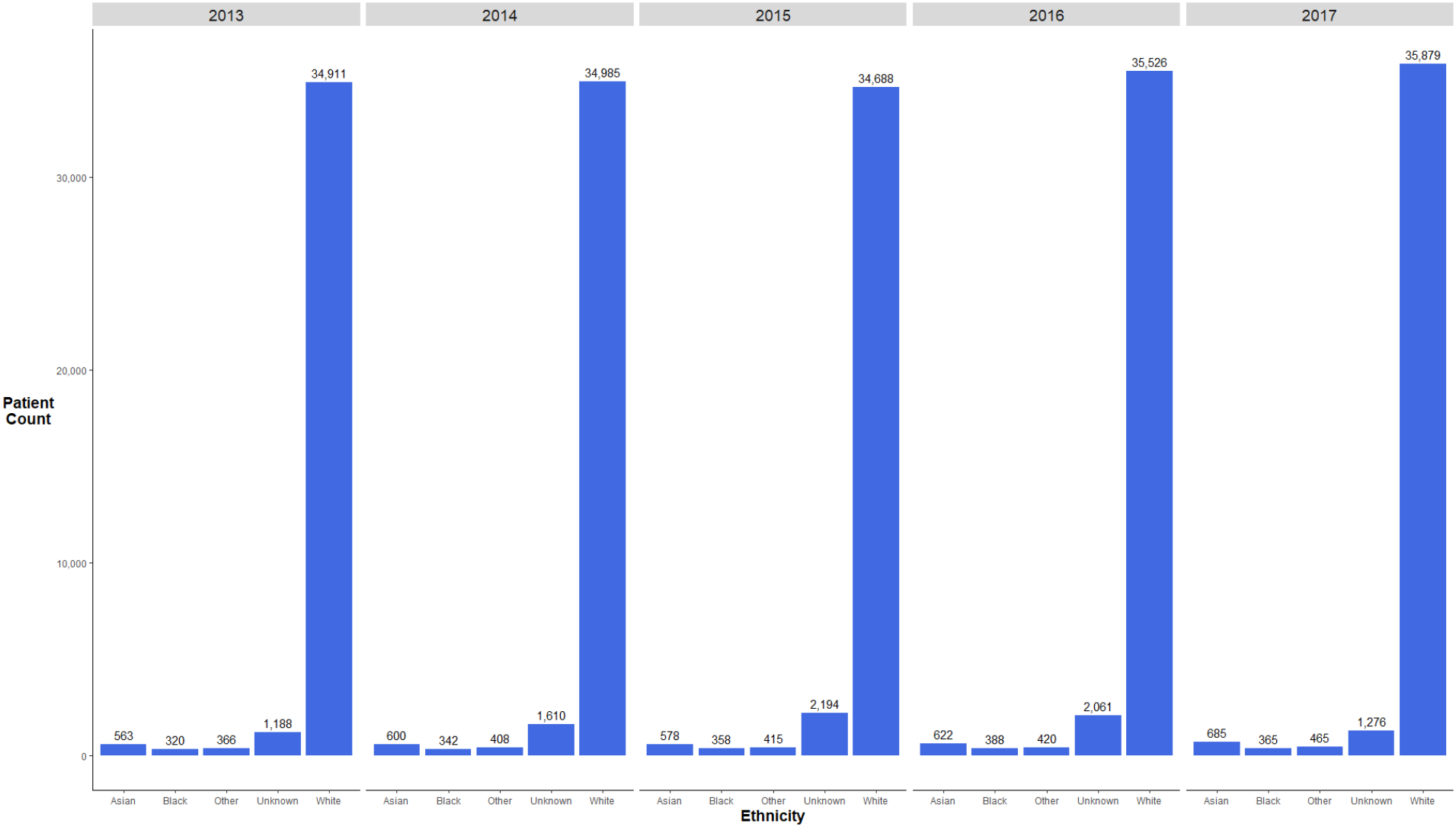


Lung cancer: median days from referral to treatment, by age at diagnosis (2013-2017)

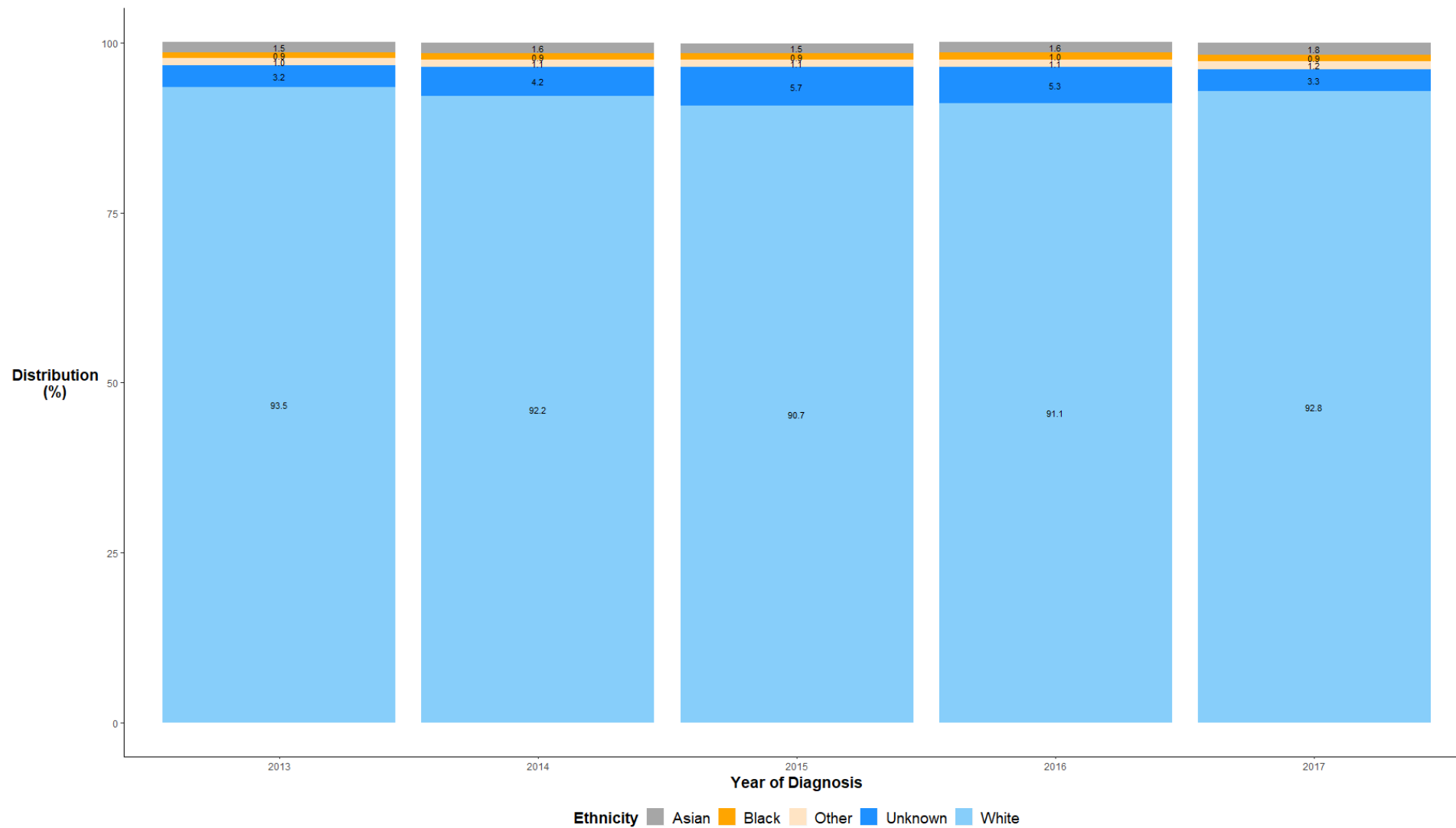


Ethnicity

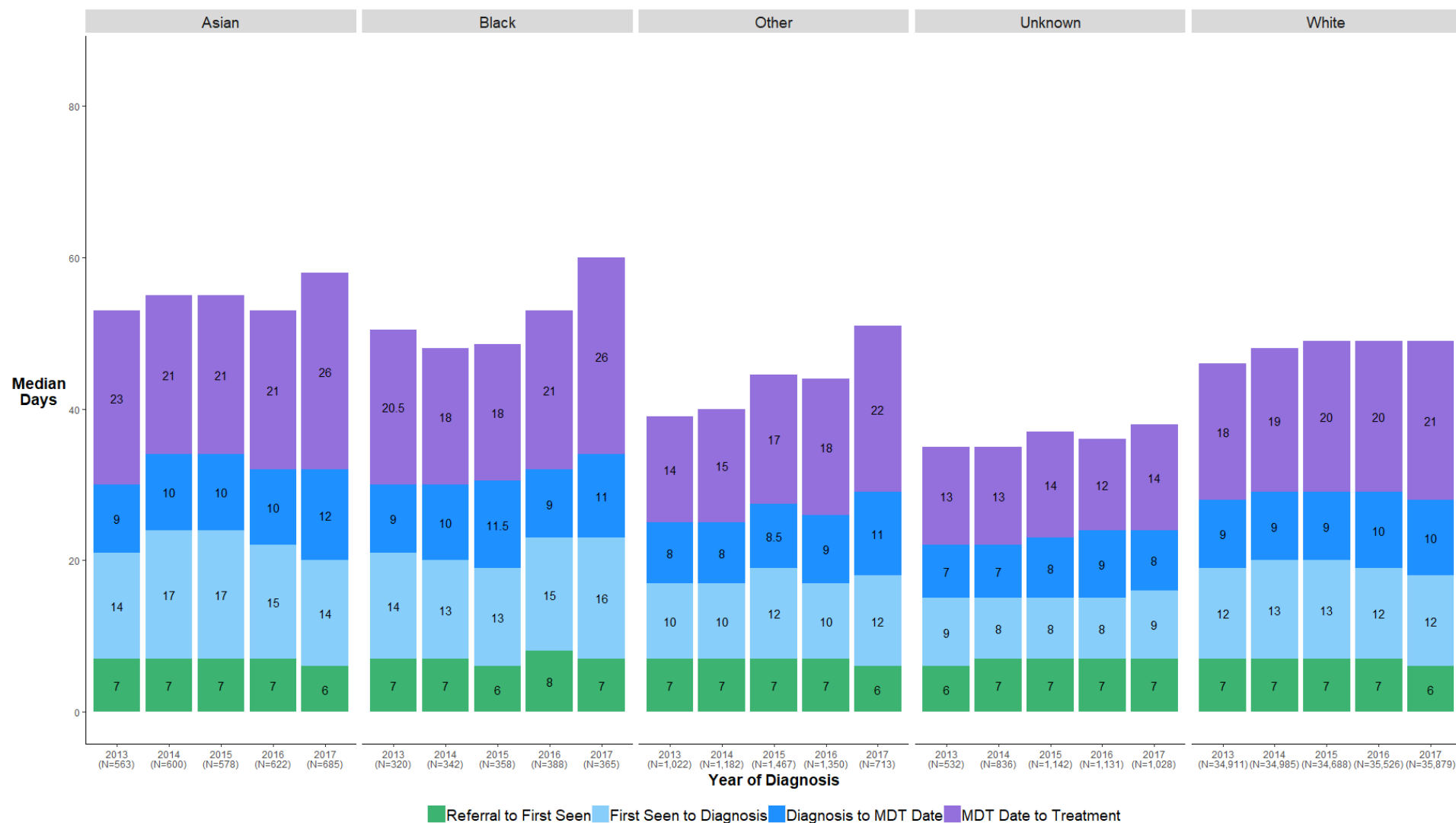
Lung cancer: patient counts, by ethnicity (2013-2017)



Lung cancer: distribution of patients, by ethnicity (2013-2017)

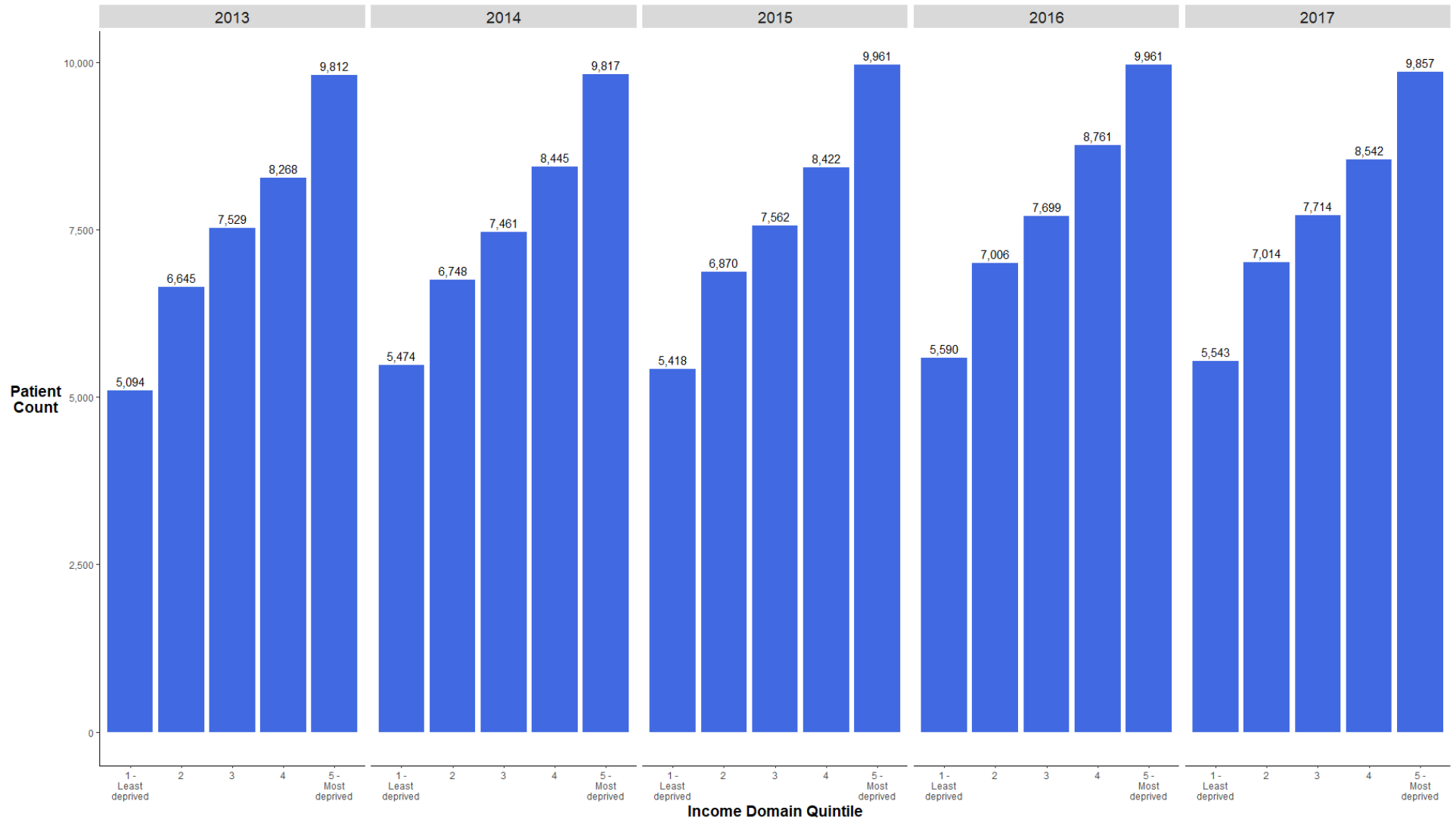


Lung cancer: median days from referral to treatment, by ethnicity (2013-2017)

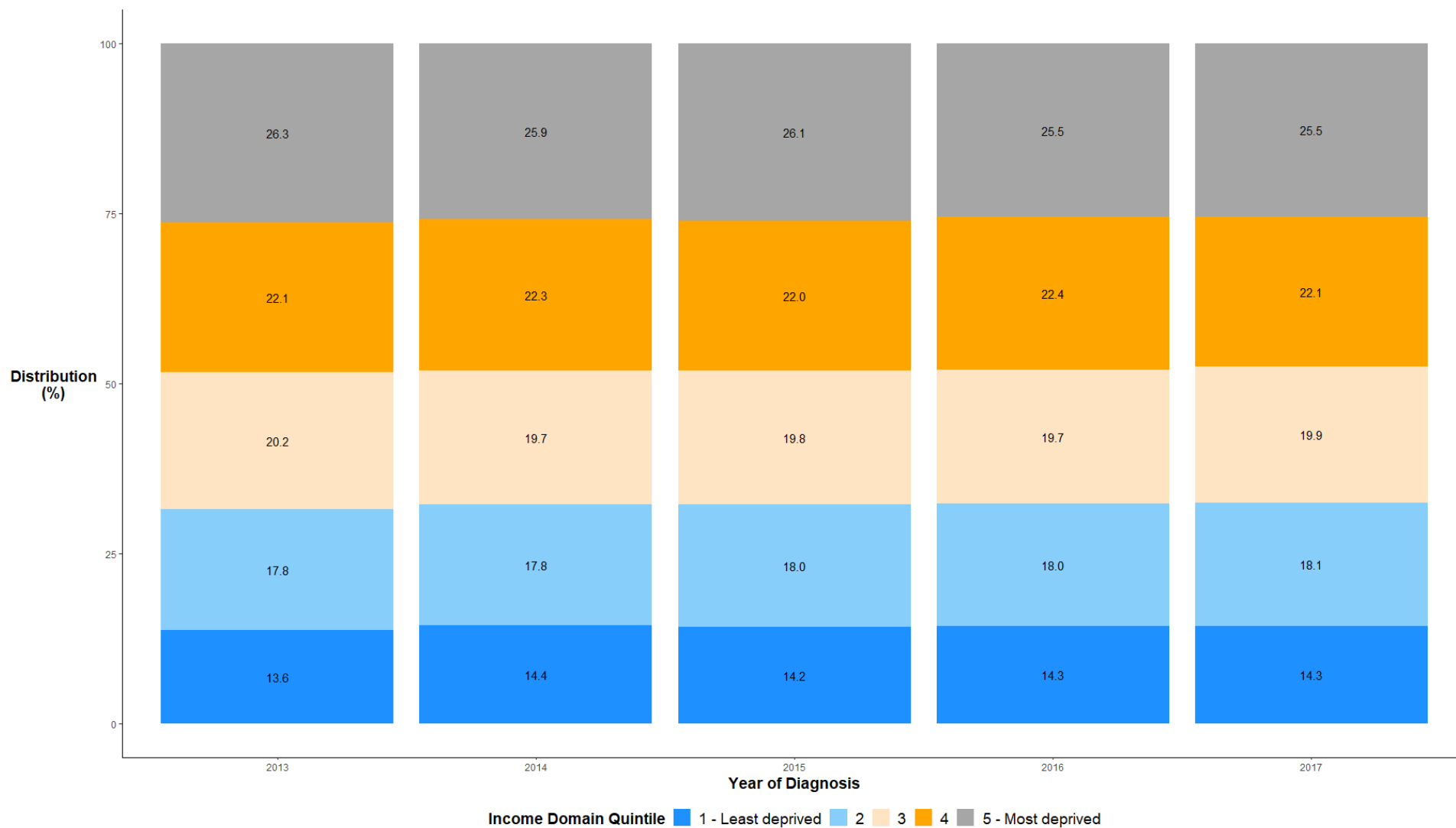


Income Domain Quintile

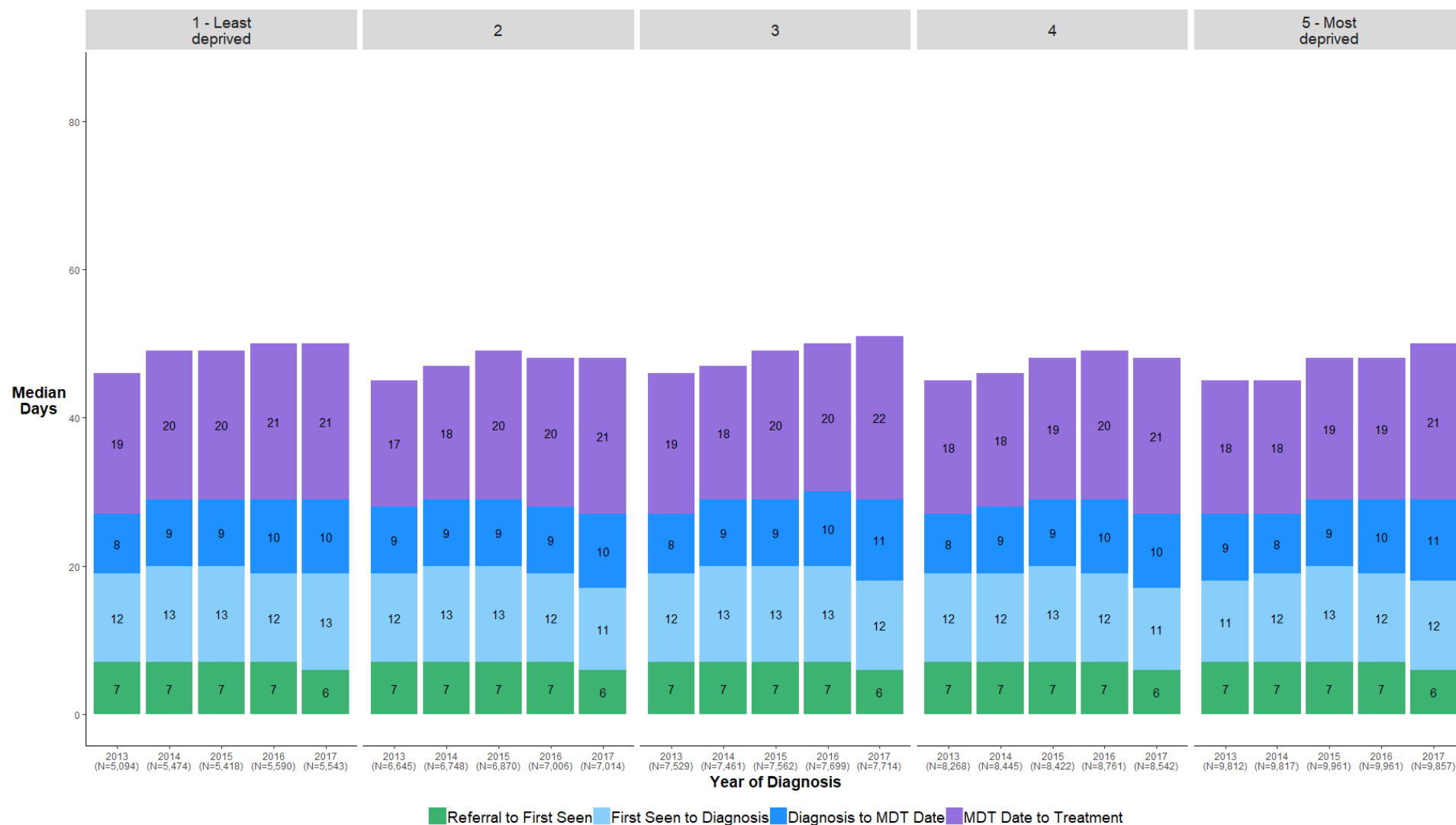
Lung cancer: patient counts, by income domain quintile (2013-2017)



Lung cancer: distribution of patients, by income domain quintile (2013-2017)



Lung cancer: median days from referral to treatment, by income domain quintile (2013-2017)



Data tables and significance testing

Lung cancer: statistical significance, by Cancer Alliance (2017)

Statistical significance testing has been carried out on all variables for 2017 data, except for the route to diagnosis variable which has been carried out for 2016 data.

Region	Cancer Alliance	Median Days (Confidence Intervals)			
		Referral to First Seen	First Seen to Diagnosis	Diagnosis to MDT Date	MDT Date to Treatment
England (Reference)	England	6 (6-6)	12 (11-12)	10 (10-11)	21 (21-21)
North	Cheshire and Merseyside	5 (4-5)	10 (9-12)	10 (9-11)	21 (21-22)
	Greater Manchester	5 (4-5)	12 (11-13)	8 (8-9)	21 (20-22)
	Humber, Coast and Vale	7 (6-7)	14 (13-15)	13 (12-14)	20.5 (18-22)
	Lancashire and South Cumbria	5 (4-6)	10.5 (9-12)	10 (9-11)	21 (19-22)
	North East and Cumbria	7 (7-8)	9 (8-10)	11 (10-12)	21 (20-22)
	South Yorkshire, Bassetlaw, North Derbyshire and Hardwick	6 (5-6)	8 (7-9)	10.5 (9-11)	15 (15-17)
	West Yorkshire and Harrogate	7 (7-8)	14 (12-15)	9 (9-11)	20 (18-21)
London	North Central and North East London	6 (5-6)	15 (14-18)	12 (11-13)	22 (21-24)
	North West and South West London	6 (5-7)	14 (13-15)	9 (8-11)	21 (20-22)
	South East London	9 (8-10)	21 (15-23)	15 (14-16)	28 (24-31)
Midlands and East	East Midlands	6 (6-6)	11 (10-12)	10 (10-11)	17 (15-19)
	East of England	7 (7-7)	12 (11-13)	10 (9-10)	21 (20-22)
	West Midlands	7 (6-7)	13 (12-14)	11 (10-11)	24 (22-25)
South	Kent and Medway	6 (6-7)	14 (13-15)	10 (9-12)	27 (26-29)
	Peninsula	7 (6-7)	10 (8-11)	13 (12-13)	22 (21-23)
	Somerset, Wiltshire, Avon and Gloucestershire	7 (6-7)	9 (8-11)	8 (8-9)	23 (21-26)
	Surrey and Sussex	6 (5-6)	12.5 (11-13)	12 (11-13)	23 (22-25)
	Thames Valley	5 (5-6)	11 (10-13)	9 (9-11)	21 (20-22)
	Wessex	6 (6-7)	9 (8-11)	10 (9-12)	22 (21-23)

- Statistically significant results are denoted in blue

Lung cancer: statistical significance testing (2017)

Factor	Category	Median Days (Confidence Intervals)			
		Referral to First Seen	First Seen to Diagnosis	Diagnosis to MDT Date	MDT Date to Treatment
Route to diagnosis (2016)	TWW (Reference)	9 (8-9)	14 (14-14)	9 (9-9)	20 (20-20)
	Emergency presentation	0 (0-0)	5 (4-5)	8 (8-8)	7 (7-7)
	GP referral	6 (5-6)	17 (16-19)	13 (12-13)	28 (28-29)
	Inpatient elective	0 (0-0)	9 (8-11)	8 (7-9)	21 (19-23)
	Other outpatient	5 (4-6)	23 (22-25)	13 (12-13)	29 (28-30)
	Screening	- -	- -	- -	- -
Stage at diagnosis	1 (Reference)	7 (7-7)	27 (26-28)	20 (20-21)	34 (33-35)
	2	7 (7-8)	20 (19-21)	14 (14-15)	32 (30-33)
	3	7 (7-7)	13 (12-13)	9 (9-9)	23 (22-24)
	4	5 (5-5)	8 (7-8)	8 (8-9)	14 (14-14)
	Unk/Oth	4 (1-6)	4 (3-7)	13 (12-15)	10 (7-13)
Sex	Male (Reference)	6 (6-6)	12 (11-12)	10 (10-11)	21 (21-22)
	Female	6 (6-6)	12 (12-12)	10 (10-11)	21 (21-21)
Age at diagnosis (years)	20- 39	5.5 (2-8)	14 (10-19)	12 (10-15)	22 (17-29)
	40- 44	4.5 (2-6)	11 (8-14)	9 (7-11)	22 (18-28)
	45- 49	5 (4-7)	11 (9-13)	10 (8-11)	21 (19-24)
	50- 54	7 (6-7)	12 (11-13)	9 (9-10)	23 (21-25)
	55- 59	6 (6-7)	13 (11-14)	9 (9-10)	24 (22-25)
	60- 64 (Reference)	7 (6-7)	13 (13-14)	10 (9-10)	24 (23-25)
	65- 69	7 (7-7)	13 (13-14)	10 (10-10)	24 (23-25)
	70- 74	6 (6-7)	13 (13-14)	11 (10-11)	23 (22-24)
	75- 79	6 (6-7)	13 (12-13)	11 (11-12)	22 (21-23)
	80- 84	6 (6-7)	10 (9-11)	11 (11-12)	18 (16-19)
	85- 89	4 (4-5)	4 (3-5)	10 (10-11)	8 (7-9)
	90+	3 (1-4)	0 (0-1)	9 (9-10)	1 (1-2)
Ethnicity	White (Reference)	6 (6-6)	12 (11-12)	10 (10-11)	21 (21-21)
	Asian	6 (5-7)	14 (12-15)	12 (10-13)	26 (22-28)
	Black	7 (5-7)	16 (13-21)	11 (8-13)	26 (21-28)
	Other	6 (4-7)	12 (10-15)	11 (9-12)	22 (21-26)
	Unknown	7 (7-8)	9 (8-11)	8 (8-9)	14 (14-16)
Income Domain Quintile	1 - Least deprived (Reference)	6 (6-7)	13 (12-13)	10 (10-11)	21 (21-22)
	2	6 (6-7)	11 (11-12)	10 (9-10)	21 (20-21)
	3	6 (6-7)	12 (11-12)	11 (10-11)	22 (21-22)
	4	6 (6-7)	11 (11-12)	10 (10-11)	21 (21-22)
	5 - Most deprived	6 (6-6)	12 (11-13)	11 (10-11)	21 (21-21)

- Statistically significant results are denoted in blue