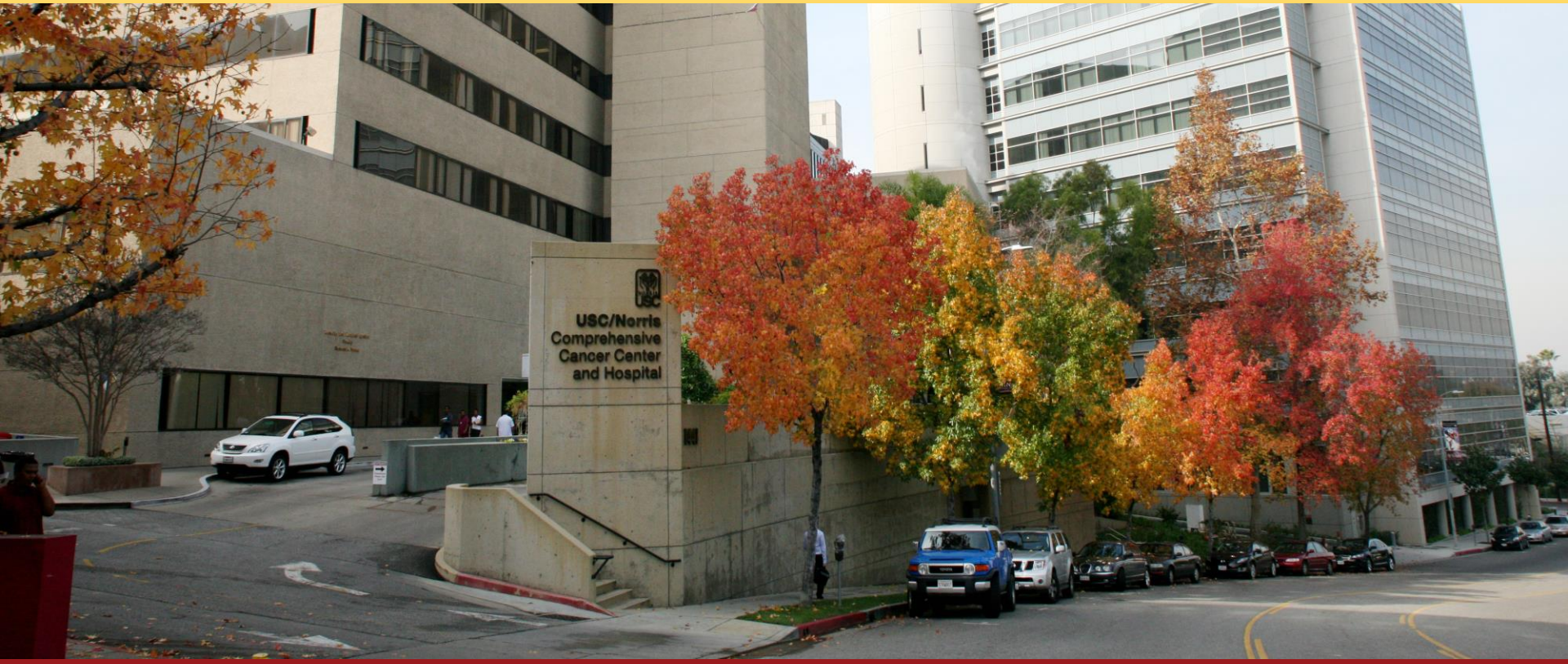
Evaluating Real World Mutational Differences Between Hispanics and Asians in NSCLC at a Large Academic Institution in Los Angeles

Jorge J. Nieva M.D.
USC/Norris Comprehensive Cancer Center



Disclosures

- Consulting: *Aadi Biosciences, Astra Zeneca, Bristol Myers Squibb, Fujirebio, G1 Therapeutics, Genentech, Mindmed, Naveris, Takeda, Western Oncolytics, Ypsomed*
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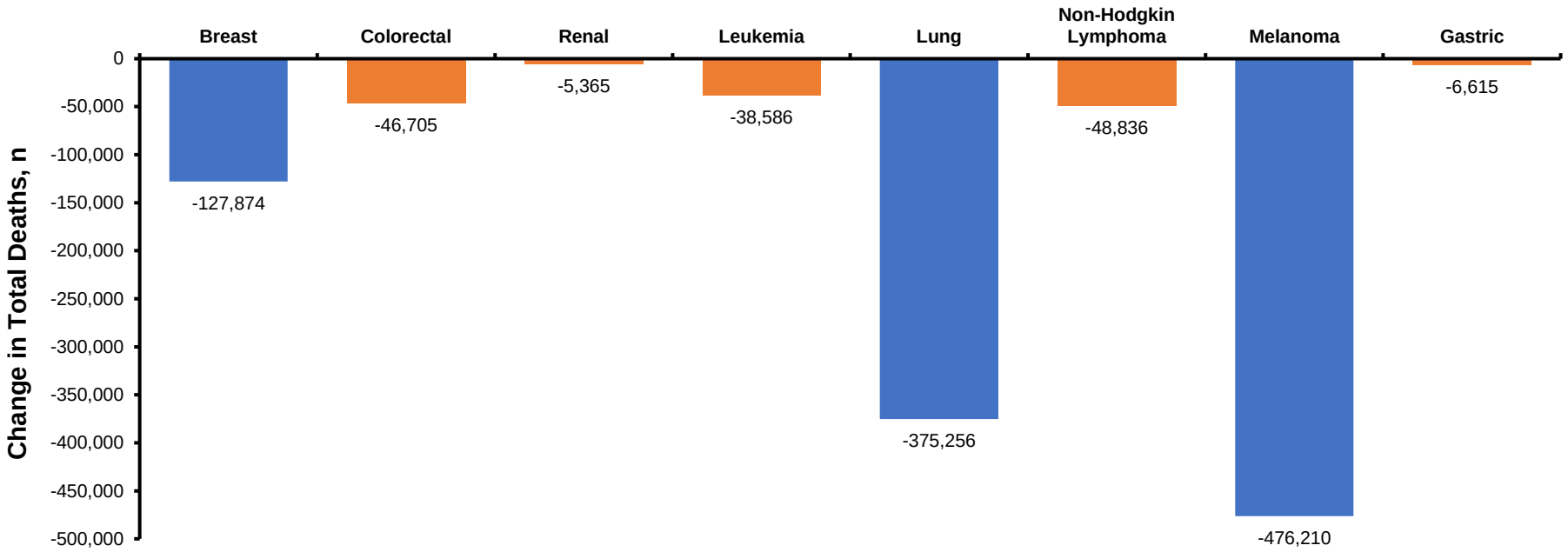
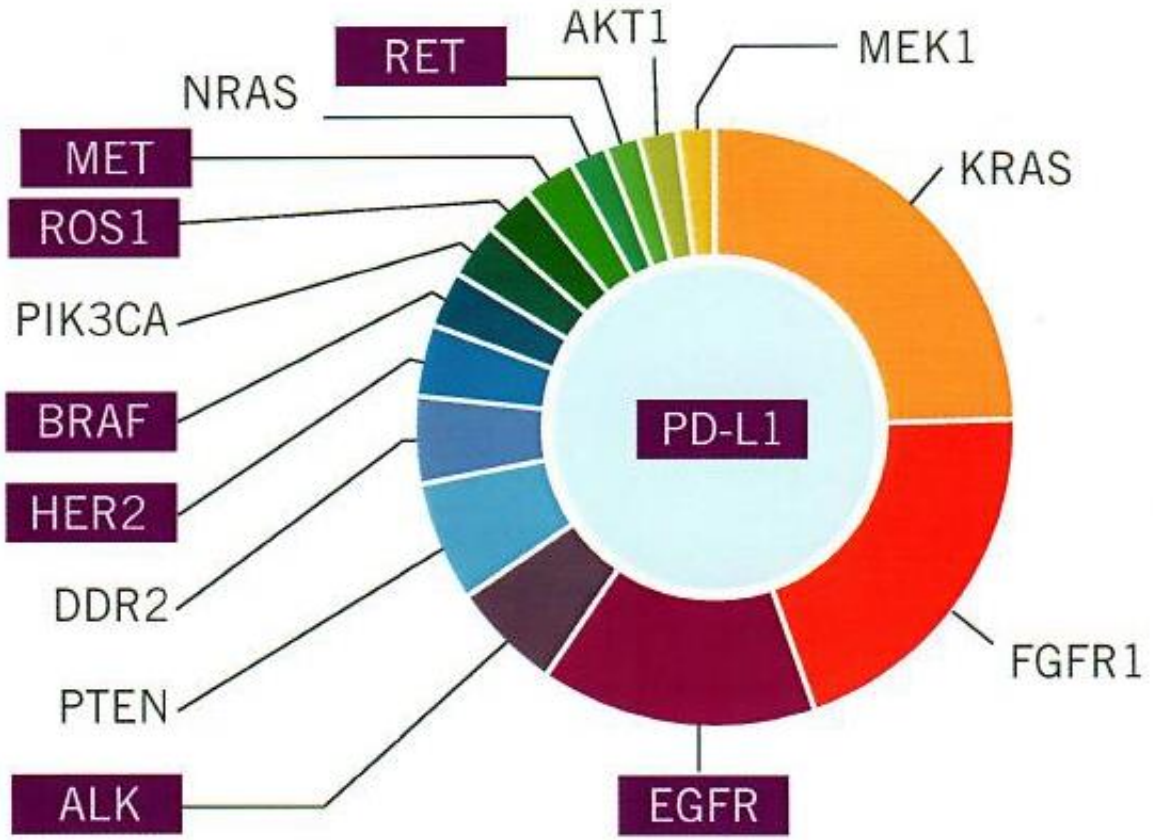
- Bing Xia

New Medicines Are Associated With Reduced Mortality Across Many Forms of Cancer, Including Lung Cancer[1]

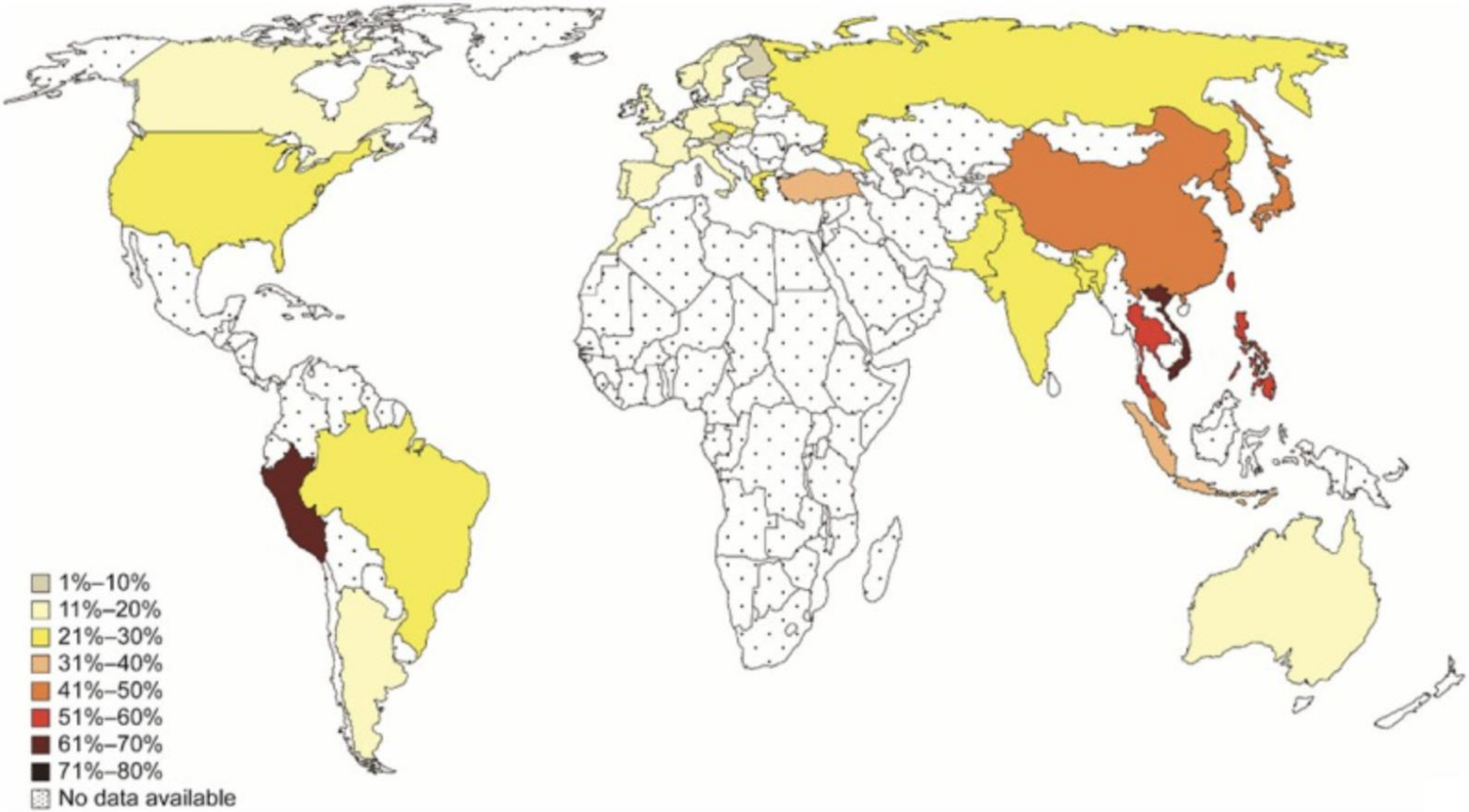
Change in Total Deaths Associated With New Cancer Medications in the US, 2000-2016[a,b]



Every Cancer is Unique



Incidence of EGFR mutations in lung cancer



Midha et al. Am J Cancer Res. 2015; 5(9): 2892–2911

Smoking and EGFR mutation by geography

Region	Never-smokers	Ever-Smokers
North America	47%	14%
Asia Pacific	64%	33%
Europe	35%	8%
India	35%	14%

Midha et al. Am J Cancer Res. 2015; 5(9): 2892–2911

EGFR in Latin America

Country	EGFR Incidence
Peru	37%
USA Latinos	23%
Mexico	18%
Venezuela	10%
Bolivia	8%

Lopez- Chavez et al J Glob Oncol. 2016 Oct; 2(5): 259–267

Our Goal

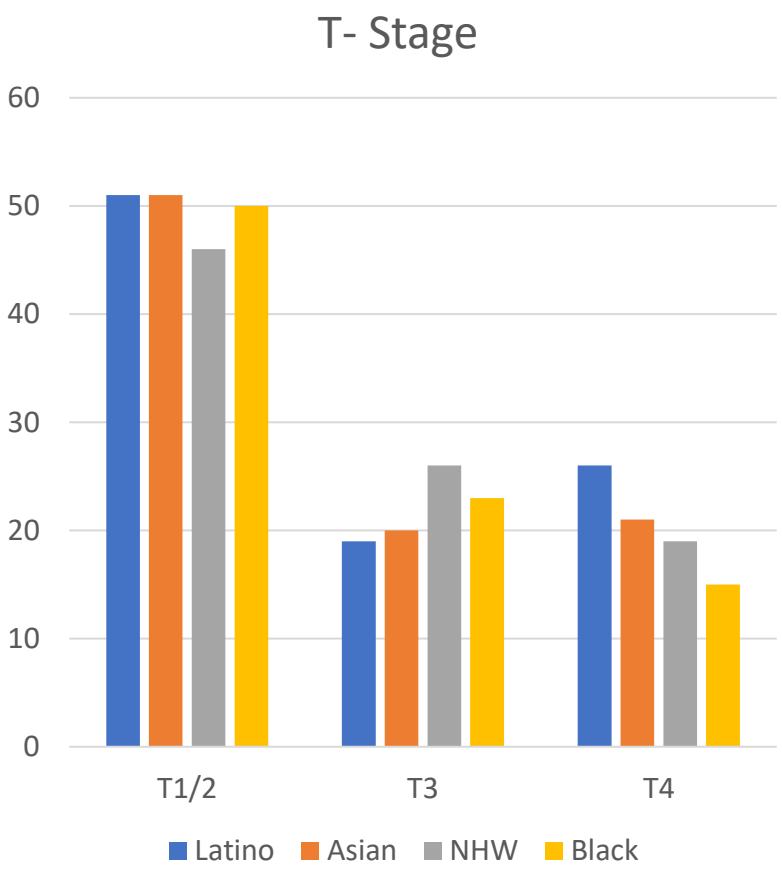
- To characterize differences in Asians and Latinos with respect to outcomes with common genetic abnormalities treated in the same health system
- Compare outcomes between patients getting care at Keck Medicine (private health system) and LAC+USC medical Center (public health system)

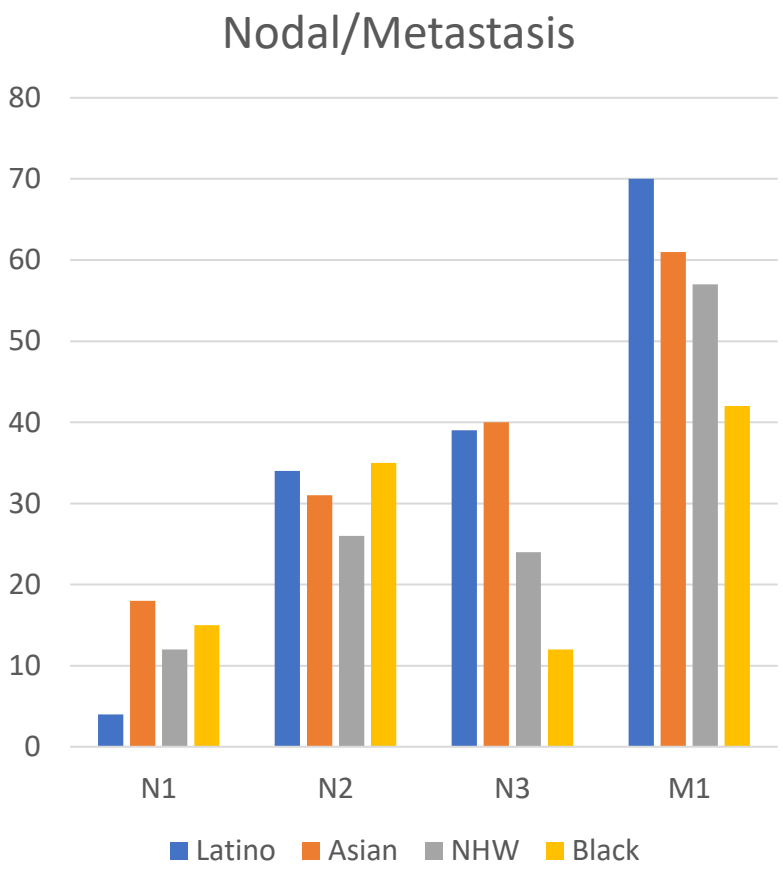
Patient Characteristics

	Hispanic (N = 90; 22.9%)		*Asian (N = 142; 36.1%)*		*Black (N = 26; 6.6%)*		*White (N = 113; 28.8%)*		*Other (N = 22; 5.6%)*	
Characteristic	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Sex										
Male	45	50.0	67	47.2	16	61.5	53	46.9	12	54.6
Female	45	50.0	75	52.8	10	38.5	60	53.1	10	45.5
Age										
Median Age	62		65		64		66		65	
Range	25-87		31-89		50-83		26-91		44-80	
Smoking History										
Former/Current	41	45.6	58	40.9	7	26.9	79	69.9	15	68.2
Non-Smoker	49	54.4	84	59.2	19	73.1	34	30.1	7	31.8

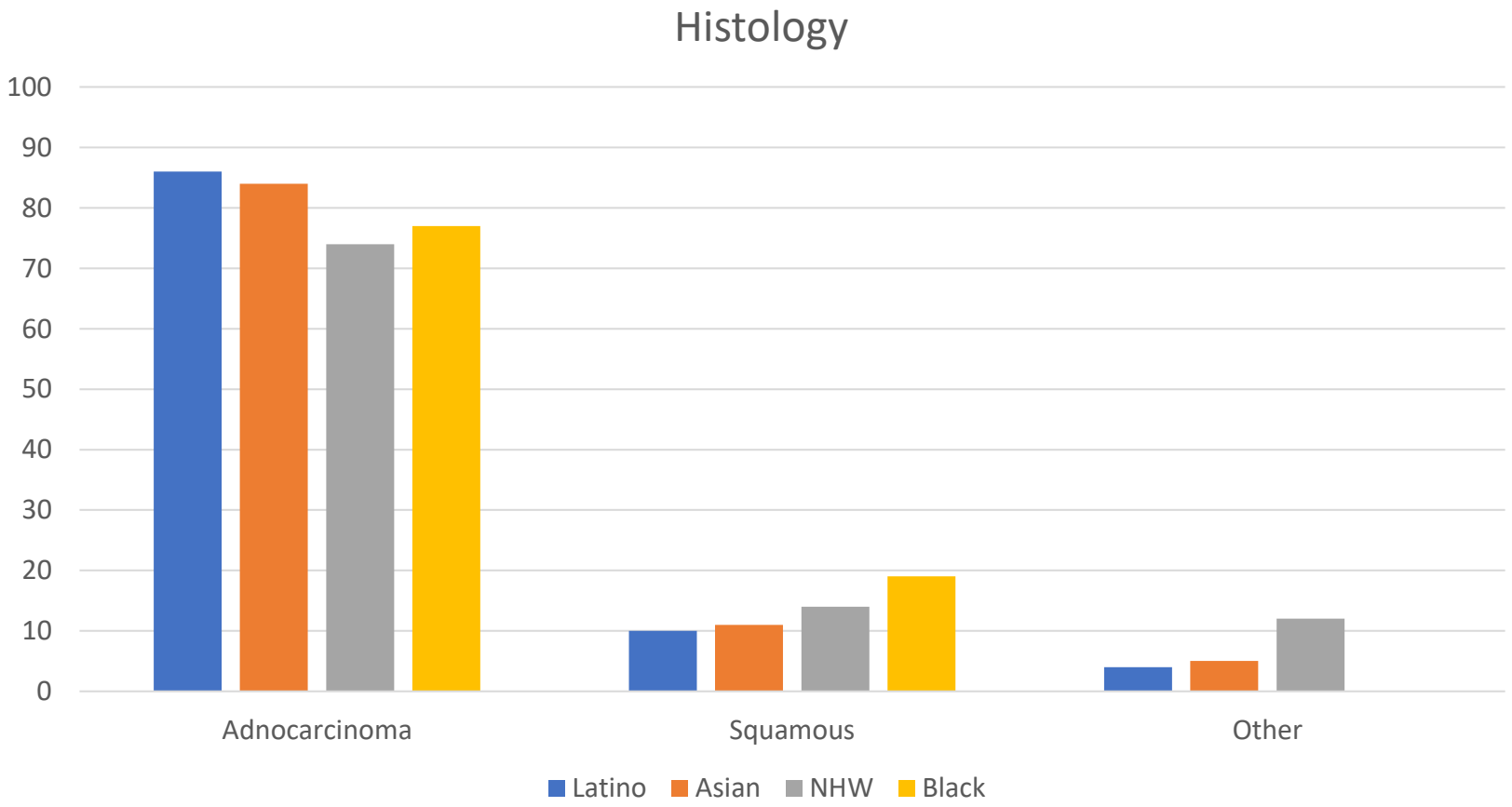
Initial Stage

Latino 90; Asian 142; NHW 113; Black 26

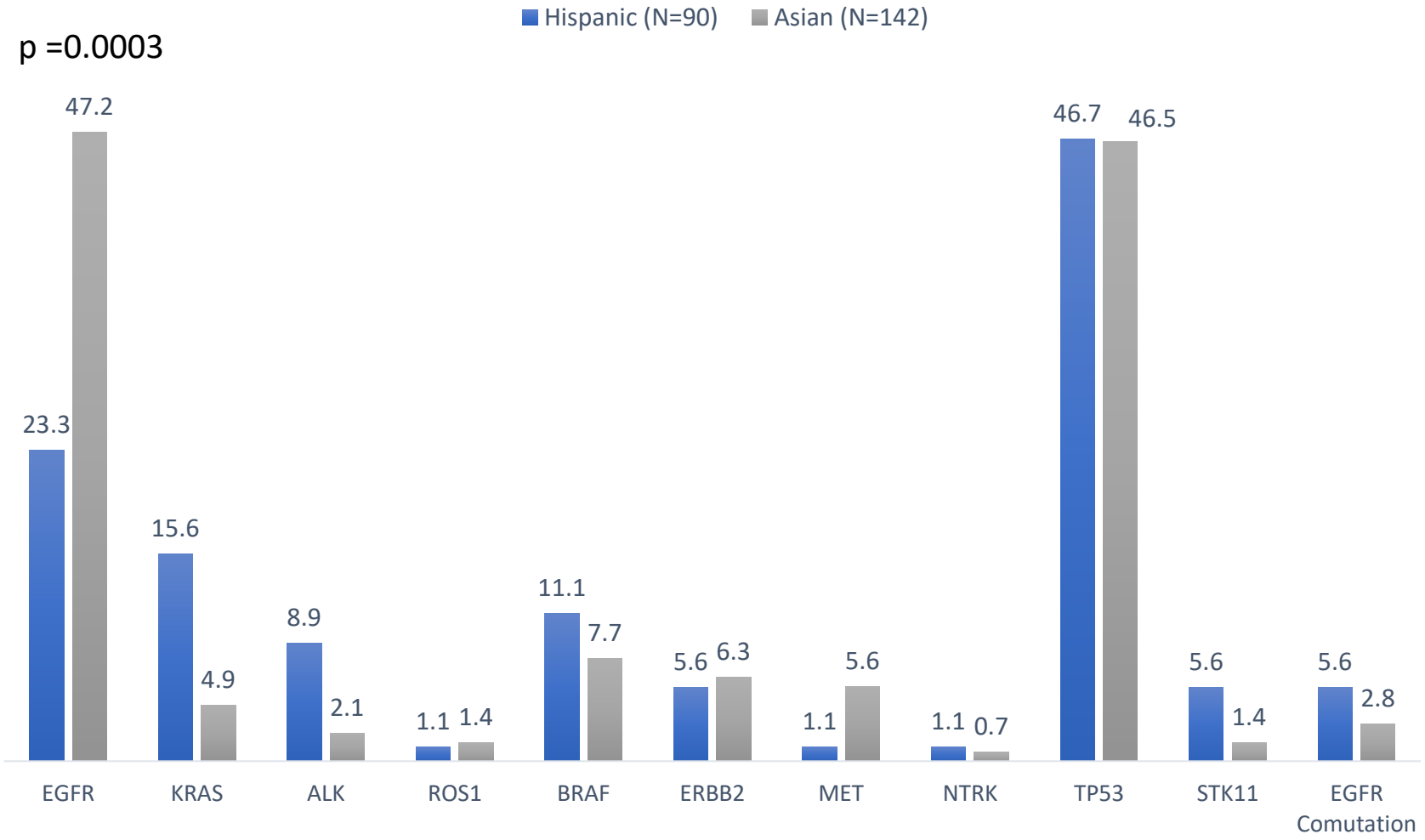




Histology


Histology
100
90
80
70
60
50
40
30
20
10
0
Adnocarcinoma
Squamous
Other
Latino
Asian
NHW
Black

Tumor Mutations By Race



Logistic Regression controlling for site of treatment, age at diagnosis, gender, tobacco

Dependent Variable		Odds Ratio	95% CI
KRAS	Ethnicity (Hispanic vs. Asian)	4.42	1.653-12.83
	Site of Treatment (LAC vs. Norris)	0.54	0.1794-1.530
	Age at Initial Diagnosis	1.02	0.9825-1.062
	Gender (Male vs. Female)	1.46	0.4935-4.557
	Smoking (Never vs. Current/Former)	2.20	0.7555-6.885
EGFR	Ethnicity (Hispanic vs. Asian)	0.31	0.1616-0.5868
	Site of Treatment (LAC vs. Norris)	1.45	0.7700-2.763
	Age at Initial Diagnosis	1.01	0.9829-1.028
	Gender (Male vs. Female)	0.51	0.2676-0.9701
	Smoking (Never vs. Current/Former)	0.35	0.1756-0.6645
ALK	Ethnicity (Hispanic vs. Asian)	3.59	0.9185-17.79
	Site of Treatment (LAC vs. Norris)	1.32	0.3412-5.607
	Age at Initial Diagnosis	0.96	0.9195-1.009
	Gender (Male vs. Female)	1.94	0.5034-7.741
	Smoking (Never vs. Current/Former)	0.41	0.0892-1.764

Impact of Tobacco use

Ever Smoking rates:

Latino Men – 64%

Asian Men – 70%

Latino Women – 27%

Asian Women – 15%

Smokers	Latino Men	Asian Men	Latino Women	Asian Women
EGFR Mutation	6/29 (21%)	13/47 (28%)	2/12 (16%)	4/11 (36%)
KRAS Mutation	6/29 (21%)	4/47 (9%)	4/12 (33%)	0/11 (0%)

KRAS Mutation Frequency

	Hispanic (N = 14)			*Asian (N = 6)*		
	Total No. (%)	**Current/ Former Smoker**	**TP53 Co-Mutation**	**Total No. (%)**	**Current/ Former Smoker**	**TP53 Co-Mutation**
KRAS Mutation Type						
G12C	6 (42.9)	5	4	1 (16.7)	1	1
G12D	2 (14.3)	1	1	1 (16.7)	1	1
G12V	1 (7.1)	0	1	2 (33.3)	1	1
G12A	1 (7.1)	1	0	0 (0.0)	-	-
G12R	1 (7.1)	1	1	0 (0.0)	-	-
G13C	1 (7.1)	1	1	0 (0.0)	-	-
G13D	1 (7.1)	1	0	0 (0.0)	-	-
Q61H	0 (0.0)	-	-	1 (16.7)	1	0
D33E	0 (0.0)	-	-	1 (16.7)	0	0
Amplification	1 (7.1)	0	0	0 (0.0)	-	-
	14	10	8	6	4	3

Rest of World KRAS data

Group	Patients	Kras +	G12C+
Asians (14 studies)	11496	1292 (11%)	262 (20%)
Latinos (5 studies)	955	156 (16%)	64 (41%)

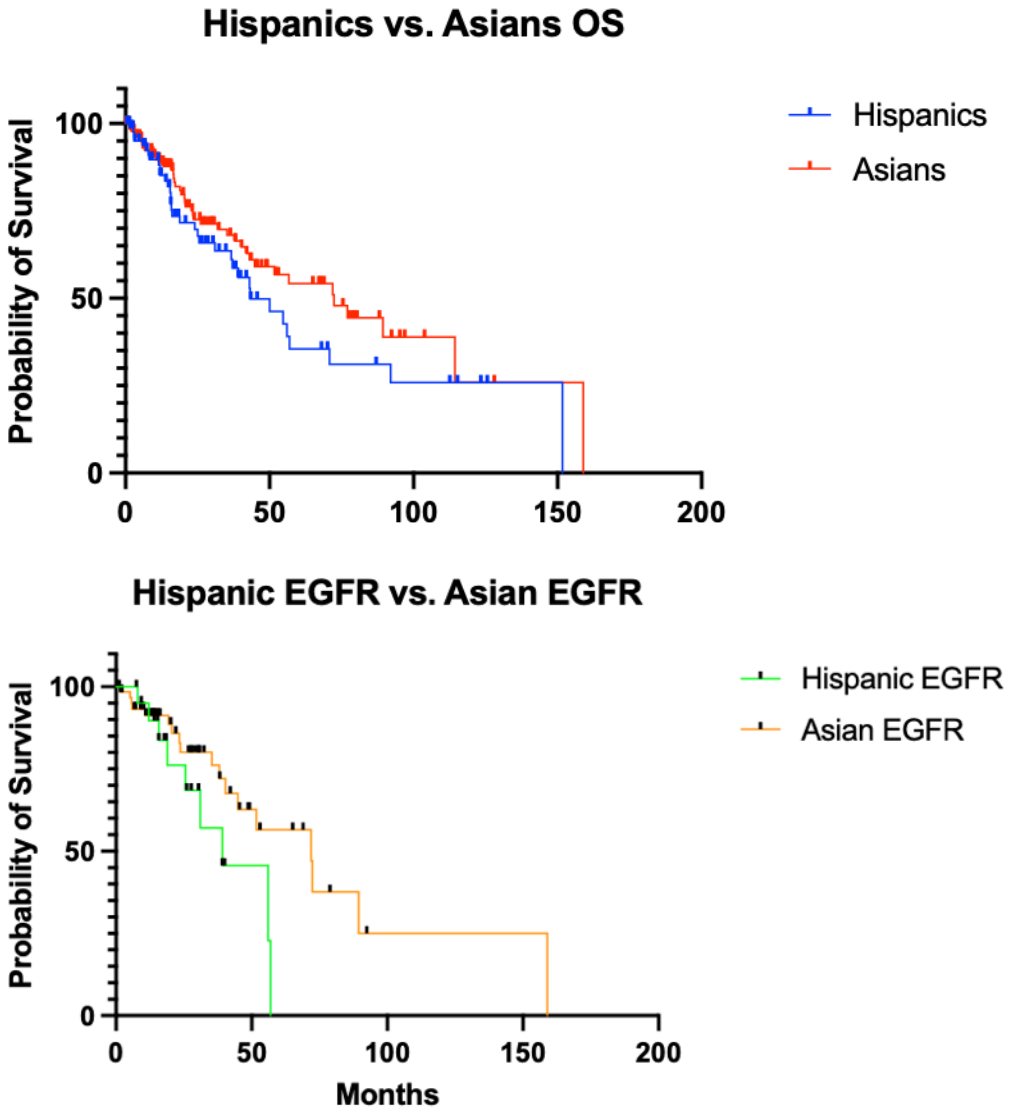
Hsu (Los Angles)	Hsu (Los Angeles)
Li (China)	Recondo (Argentina)
Gao (China)	Bacchi (Brazil)
Jia (China)	Gimbrone (PR, Peru, FL)
Xu (China)	Zheng (PR)
Li (China)	
Wang (China)	
Xie (China)	
Cai (China)	
Tam (Hong Kong)	
Suzuki (Japan)	
Soung (Korea)	
Bae (Korea)	
Dang (Vietnam)	

ALK rearrangements

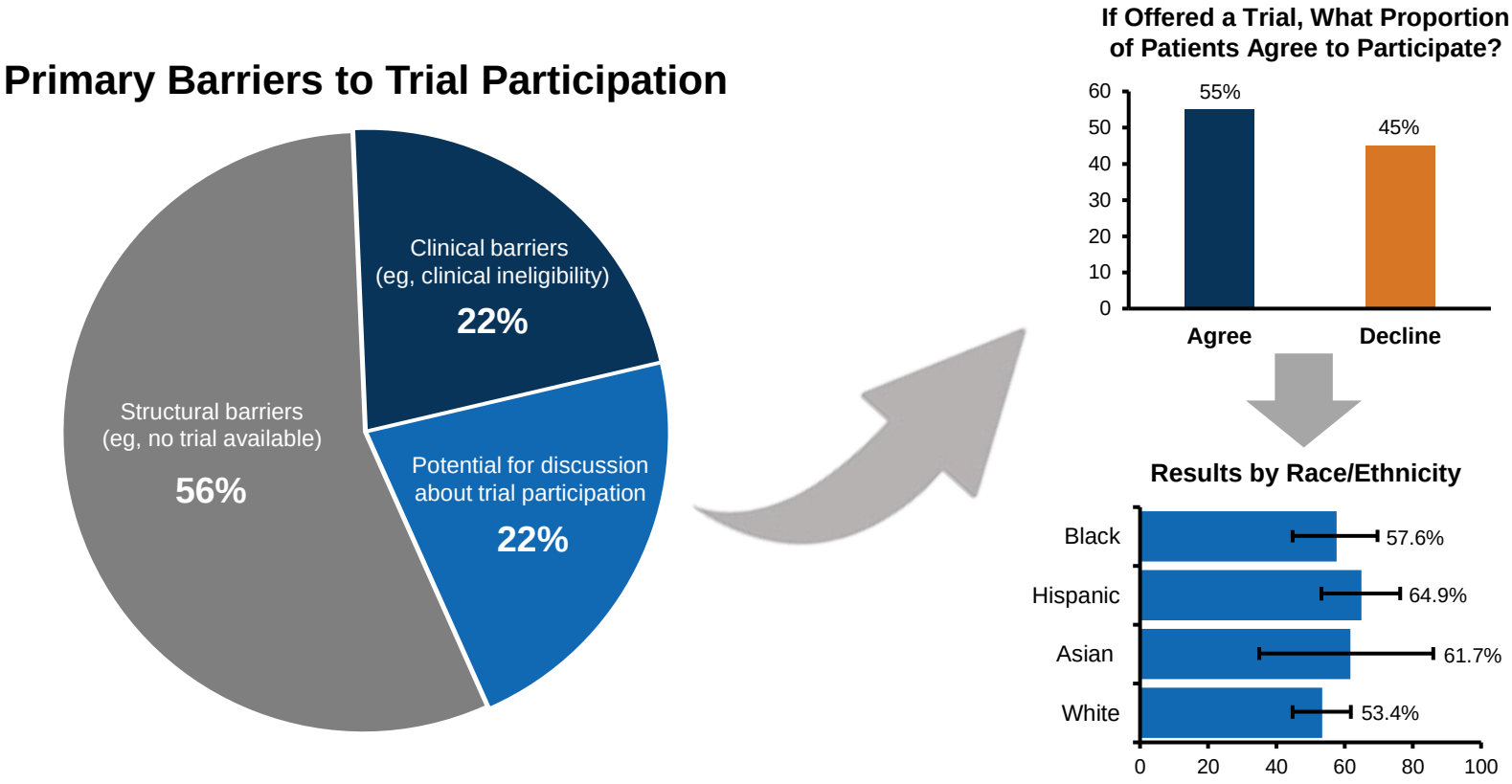
- Latinos
- 8/90 in our study (9 %)
- Prior literature (5 studies)
  - 690/10249 (6%)
    - 10.8% in Peru
    - 7.6% in Mexico
    - 9.5% in Costa Rica
    - 3.9% in Puerto Rico
    - 4.1% in Columbia

- Asians
- 8/142 in our study (6%)
- Prior literature (14 studies)
  - 357/6712 (5%)

Asian patients had better survival than Latinos, largely driven by better outcomes in the EGFR cohorts

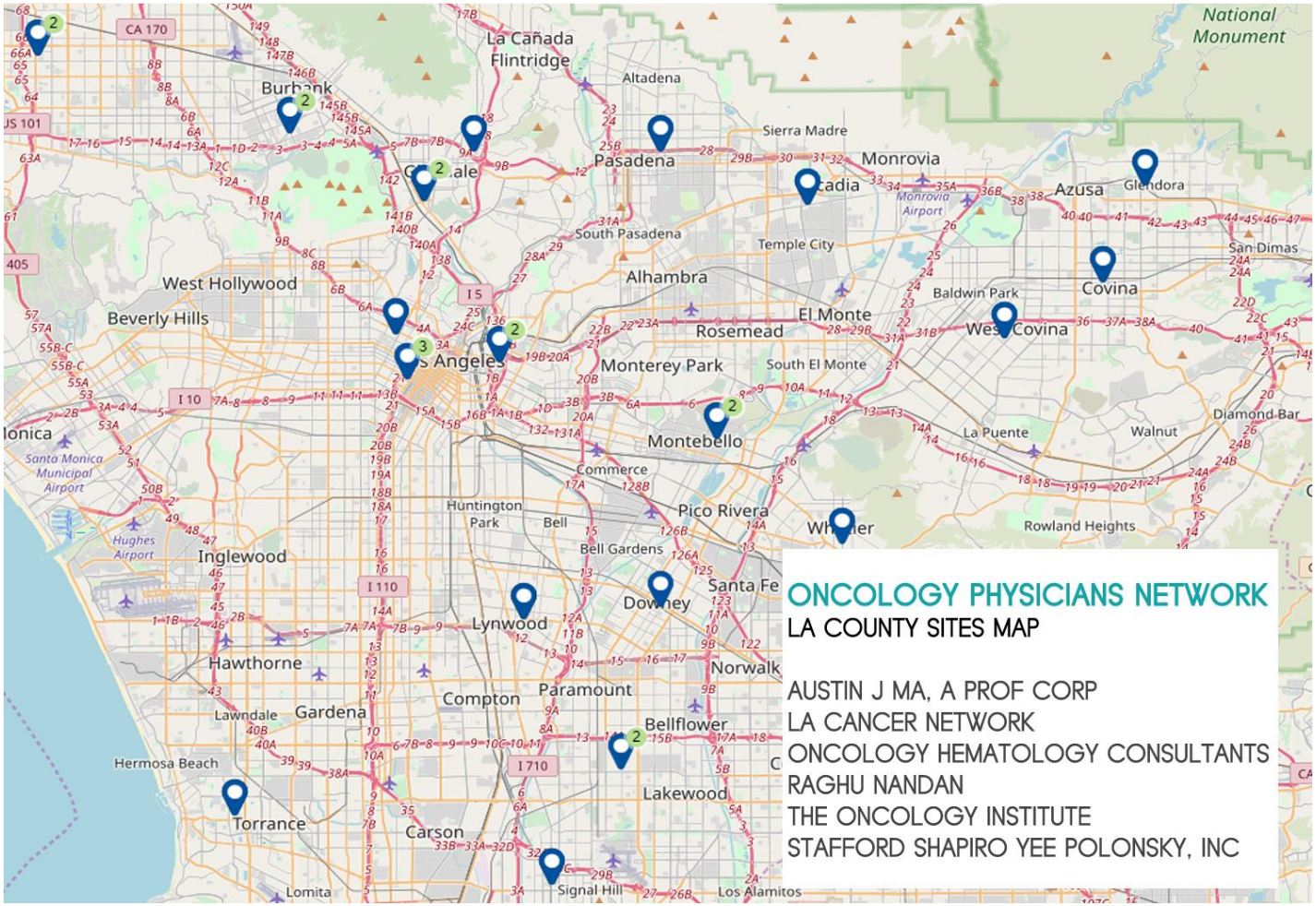


Real Barriers to Clinical Trial Participation[1]



1. Osarogiagbon RU et al. *Am Soc Clin Oncol Educ Book*. 2021;41:1-13.

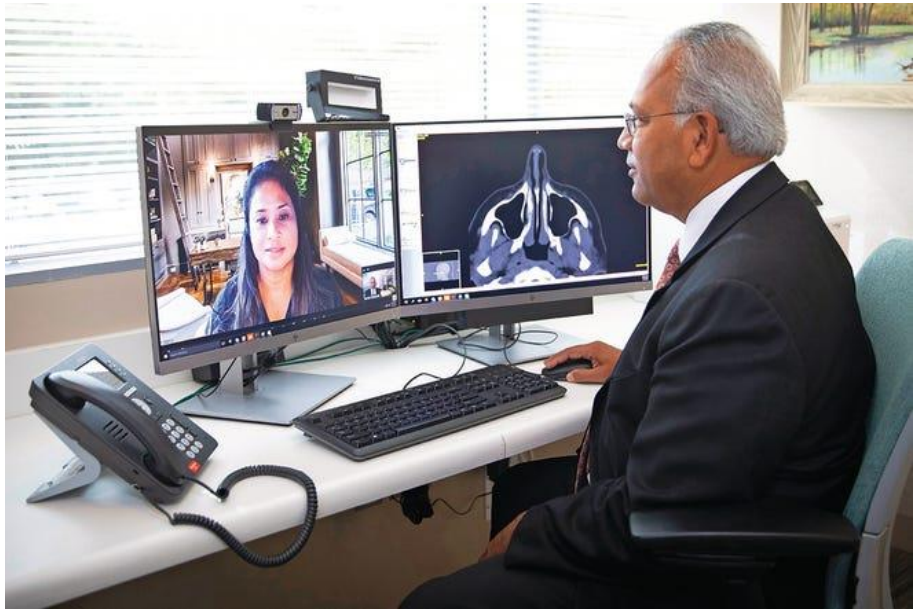
Getting Clinical Trials to More Patients



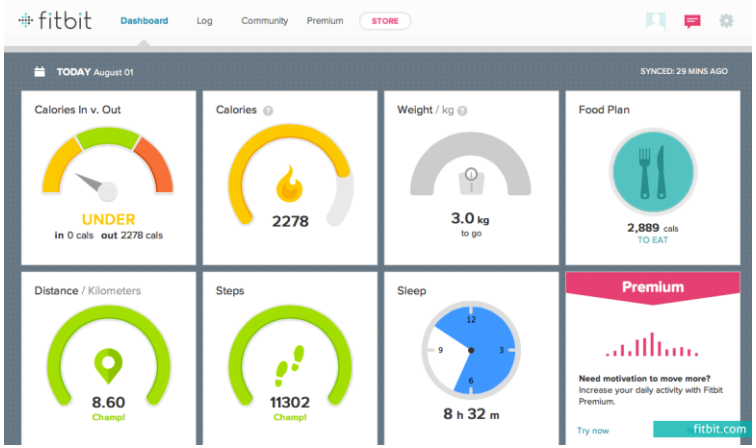
Telemedicine

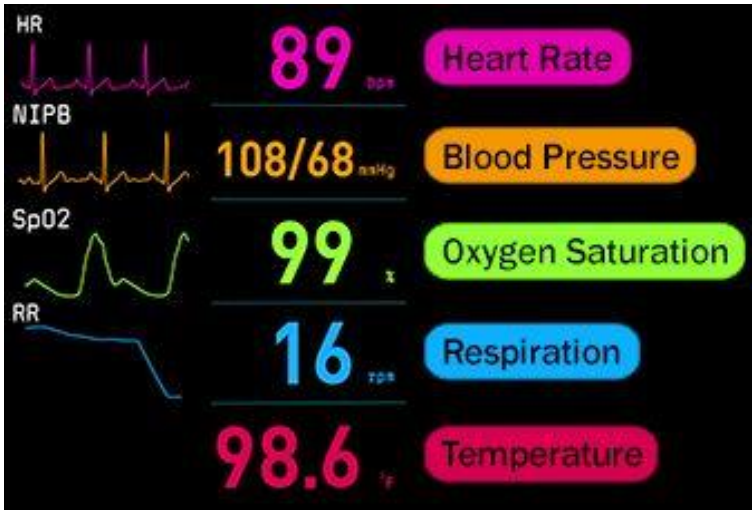
Physical examination of the face

Telemedicine



Physical examination of the face





Conclusions

- 45% of Latino patients and 61% of Asian patients in Los Angeles will have a mutation that should be treated with a targeted agent in 1st line rather than chemo I/O
  - (EGFR, ALK, ROS1, ERBB2, NTRK)
- NGS should be made routinely available without prior authorization for all lung cancer patients at all levels of the healthcare system
- Asian smokers while somewhat resistant to KRAS mutations, especially G12C, more commonly develop EGFR mutations than other groups
- Clinical trial portfolios for lung cancer in regions with high numbers of Asian and Latino patients should emphasize targeted therapies
- More research is needed to understand differences in outcomes between different ethnic and racial groups

Time for Questions