

Introduction

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YaleNewHaven**Health**
Smilow Cancer Hospital

Yale CANCER
CENTER
A Comprehensive Cancer Center Designated
by the National Cancer Institute



Yale SCHOOL OF MEDICINE

Disclosures: Roy S. Herbst, MD, PhD

Consulting

Abbvie Pharmaceuticals; ARMO Biosciences; AstraZeneca; Bayer HealthCare Pharmaceuticals Inc.; Bolt Biotherapeutics; Bristol-Myers Squibb; Candel Therapeutics, Inc.; Checkpoint Therapeutics ; Cybrexa Therapeutics; DynamiCure Biotechnology, LLC ; eFFECTOR Therapeutics, Inc.; Eli Lilly and Company; EMD Serono; Foundation Medicine, Inc.; Genentech/Roche; Genmab; Gilead; Halozyme Therapeutics; Heat Biologics; HiberCell, Inc.; I-Mab Biopharma; Immune-Onc Therapeutics, Immunocore; Infinity Pharmaceuticals; Johnson and Johnson ; Loxo Oncology; Merck and Company; Mirati Therapeutics; Nektar; Neon Therapeutics; NextCure; Novartis; Ocean Biomedical, Inc.; Oncocyte Corp.; Oncternal Therapeutics; Pfizer; Refactor Health, Inc.; Ribbon Therapeutics; Sanofi; Seattle Genetics; Shire PLC; Spectrum Pharmaceuticals; STCube Pharmaceuticals, Inc; Symphogen; Takeda; Tesaro; Tocagen; Ventana Medical Systems, Inc.; WindMIL Therapeutics; Xencor, Inc

Research Support

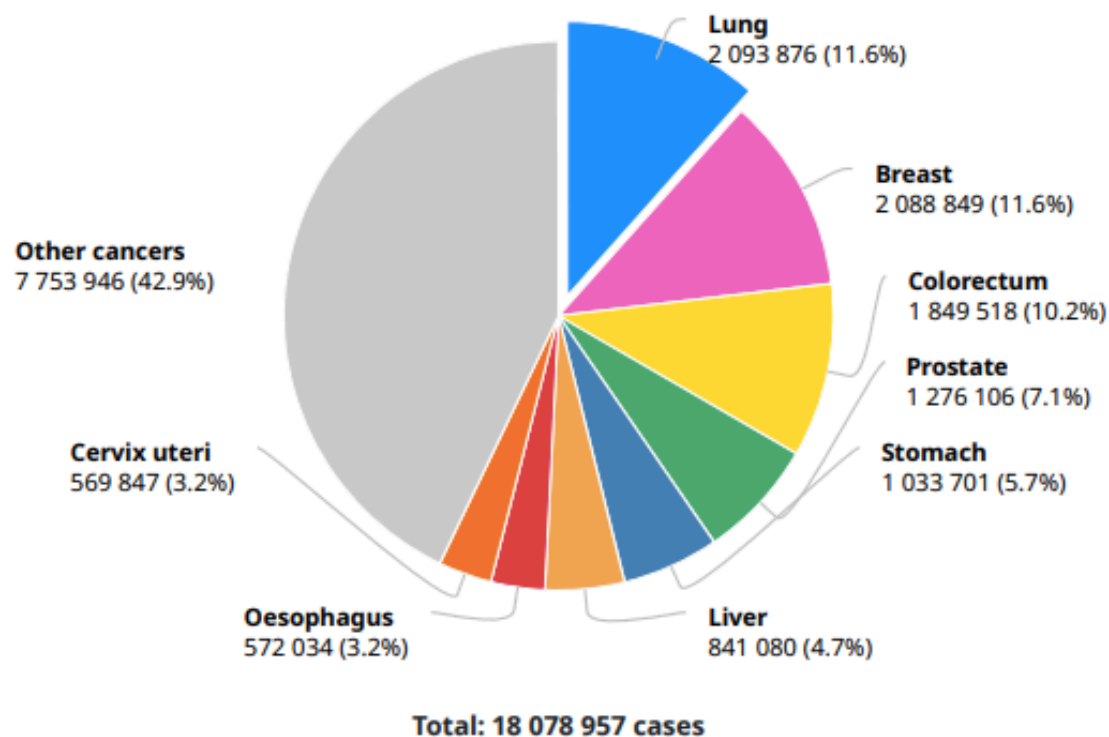
AstraZeneca; Eli Lilly and Company; Genentech/Roche; Merck and Company

Board Member (non-executive/ independent)

Junshi Pharmaceuticals; Immunocore Holdings Limited

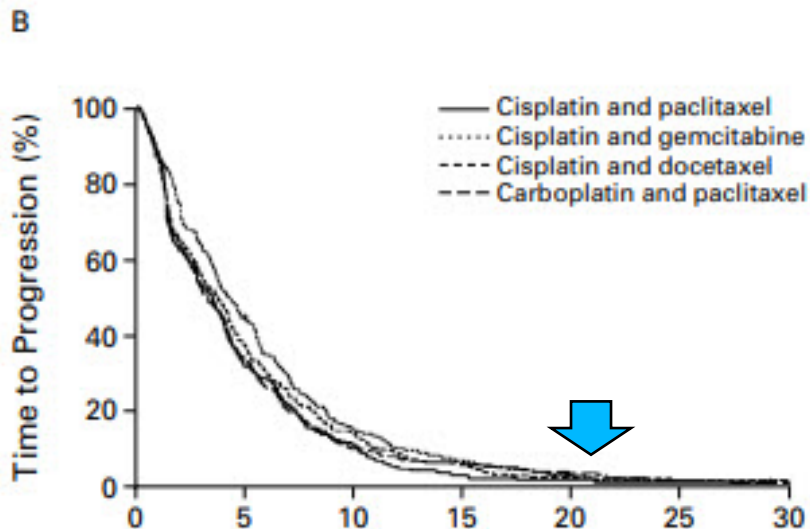
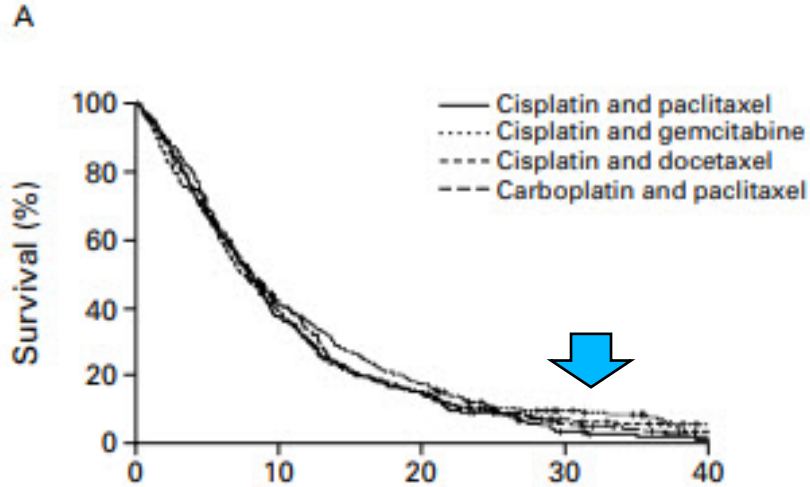
The Burden of Lung Cancer

Number of new cases in 2018, both sexes, all ages



- The Leading Cause of Cancer Death in Most Countries ¹
 - 2.09 M new cases (11.6%),
1.76 M deaths (18.4%)¹
- US Lung Cancer: ²
 - 228,820 new cases
 - 135,720 deaths
- 84% of lung cancer is NSCLC (~15% small cell) ^{2,3}
 - Of NSCLC: 40% Adenocarcinoma, 30% Squamous cell carcinoma
 - >50% presents as metastatic disease

Status of Metastatic Lung Cancer Therapy in the late 1990's



The New England Journal of Medicine

COMPARISON OF FOUR CHEMOTHERAPY REGIMENS FOR ADVANCED NON-SMALL-CELL LUNG CANCER

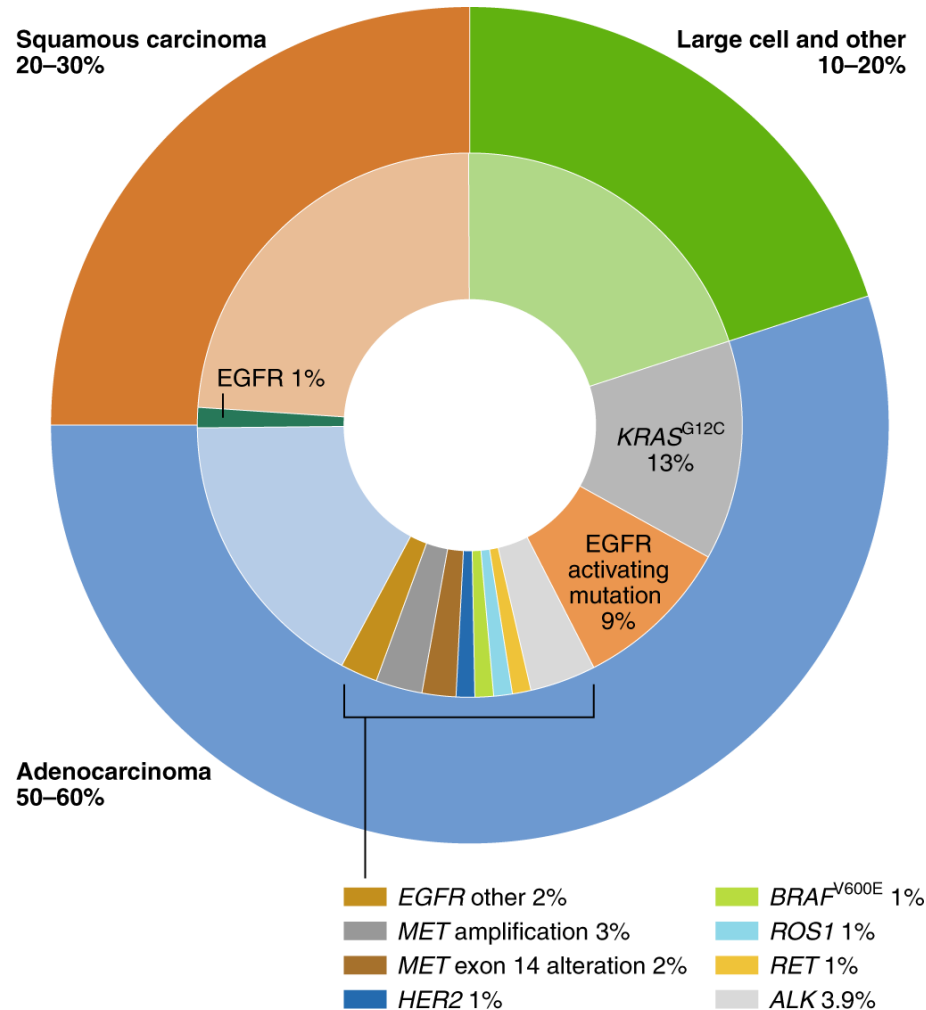
JOAN H. SCHILLER, M.D., DAVID HARRINGTON, PH.D., CHANDRA P. BELANI, M.D., COREY LANGER, M.D.,
ALAN SANDLER, M.D., JAMES KROOK, M.D., JUNMING ZHU, PH.D., AND DAVID H. JOHNSON, M.D.,
FOR THE EASTERN COOPERATIVE ONCOLOGY GROUP

A Paradigm Shift was Needed

- Platinum Chemotherapy Improved Survival
- All doublets with similar efficacy (ie taxol vs gemcitabine)
- No predictive factors identified
- All chemotherapy regimens with significant toxicity

Causes of Lung Cancer

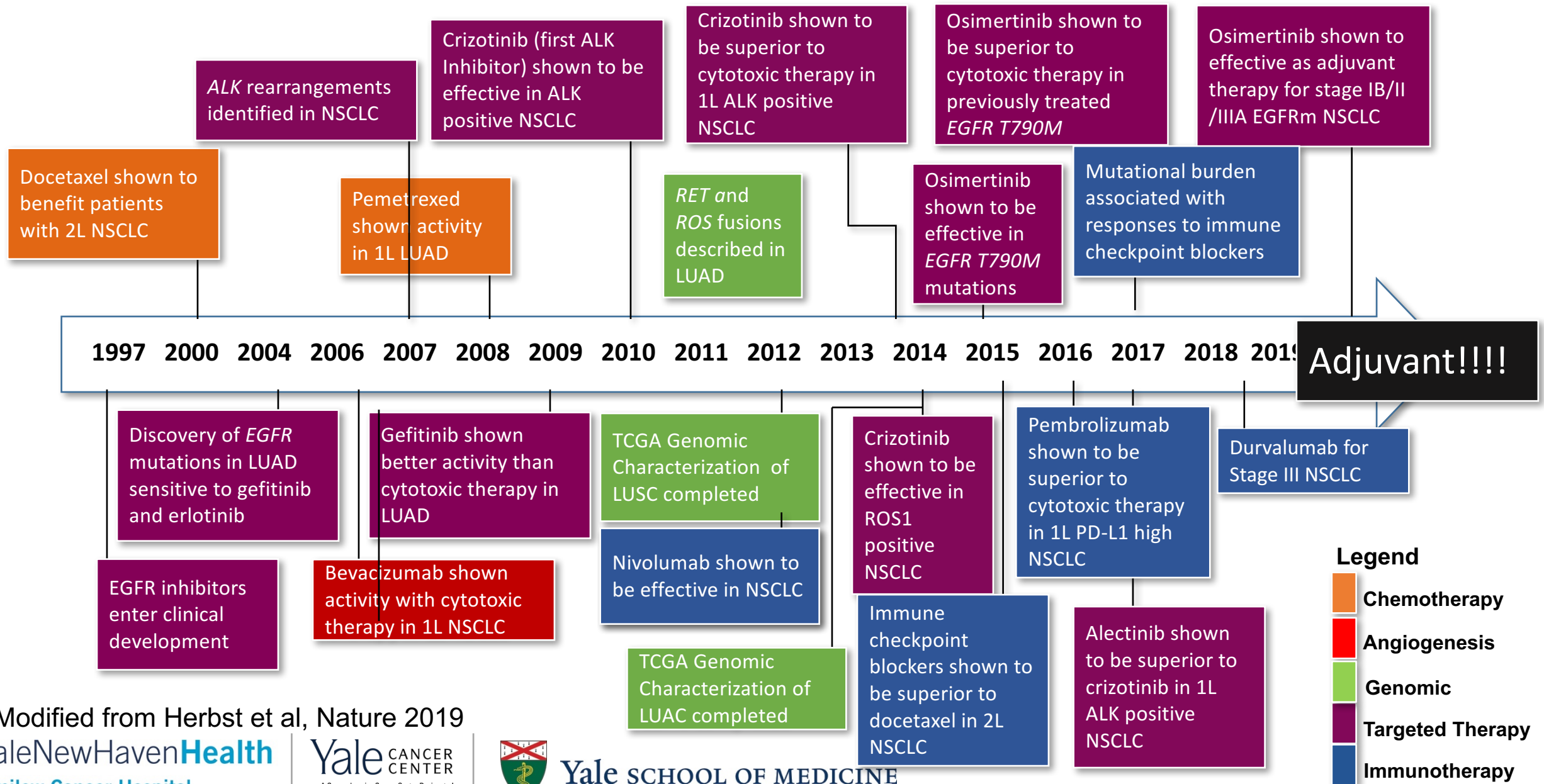
Tobacco use is the single largest preventable cause of cancer, leading to 30% of all cancer-related deaths and 80% of lung cancer



Potentially Actionable Genetic Alterations:

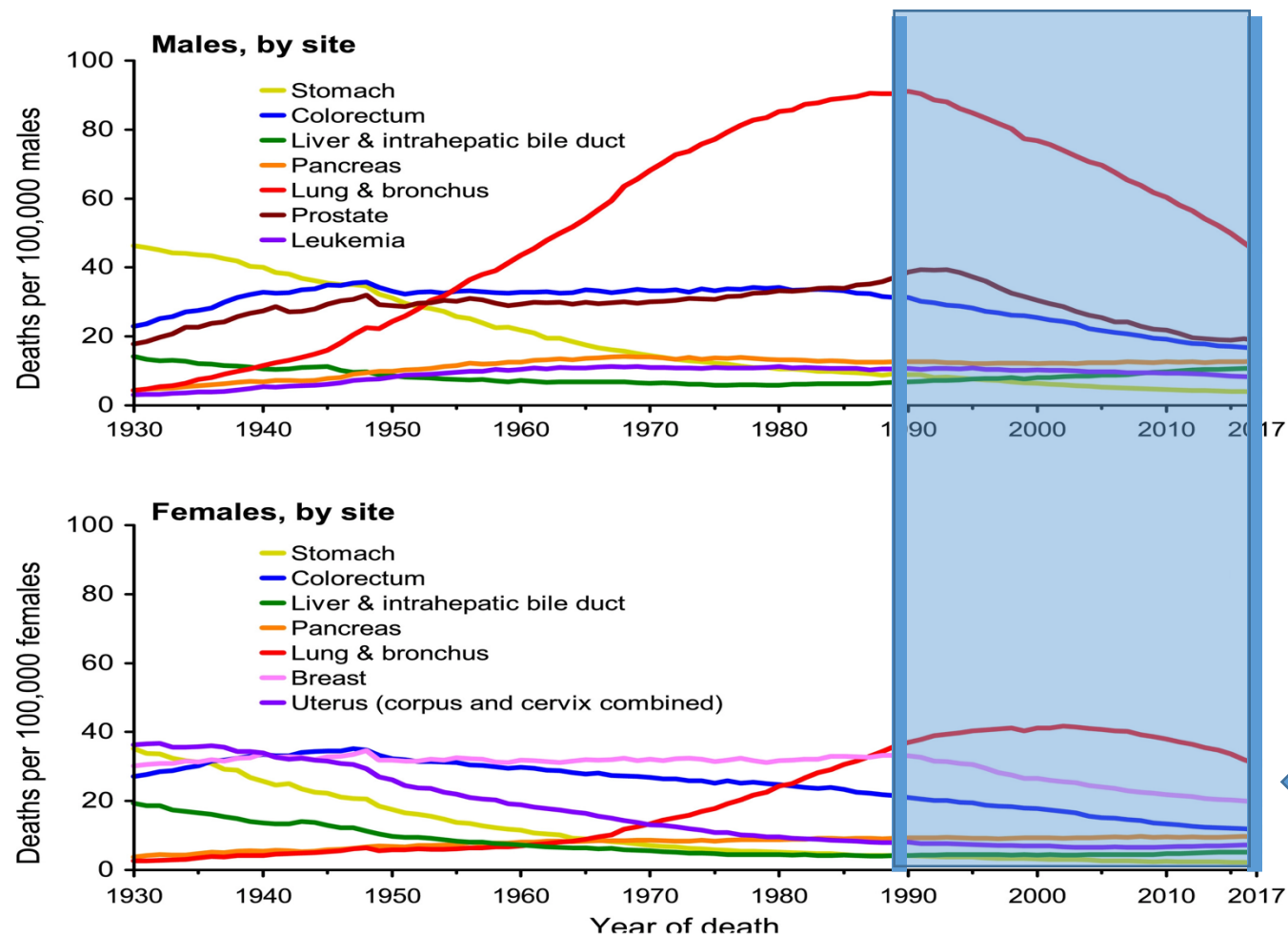
10% EGFR
<8% ALK
7% MET
3% ERBB2/3
2% ROS
1% RET
1% NTRK
1% BRAF
12% Kras G12C

A New Era for NSCLC Treatment!



Modified from Herbst et al, Nature 2019

Lung Cancer Mortality



Mortality rates has declined by 51% since 1990 for men (26% since 2002 in women) due to reductions in smoking

		Average annual percent change
Males	Incidence (2011-15)	-2.6
	Mortality (2012-16)	-4.3
Females	Incidence (2011-15)	-1.2
	Mortality (2012-16)	-3.1

Incidence: age standardized, delay-adjusted rate
Mortality: age-standardized rate



Progress in lung cancer in the last 20+ years with a focus on work from Yale

Focus on Immunotherapy

