

The Past, Present and Future of the Cancer Burden in the United States: 1975-2020

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National Center for Chronic Disease Prevention and Health Promotion

Division of Cancer Prevention and Control



Objectives

- ❑ Characterize the increasing burden of cancer from 1975-2009
- ❑ Project cases and deaths through 2020
- ❑ Use of projections to inform cancer control
- ❑ Limitations

Data

- ❑ SEER -9 incidence data
 - 1975-2009
- ❑ Mortality data Nation Center for Health Statistics
 - 1975-2009
- ❑ US Census Bureau
 - Population estimates (SEER)
 - Population projections 2010-2020

Objectives

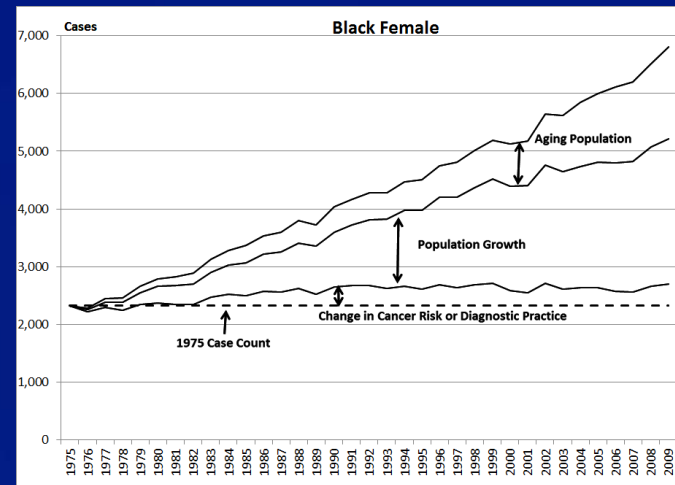
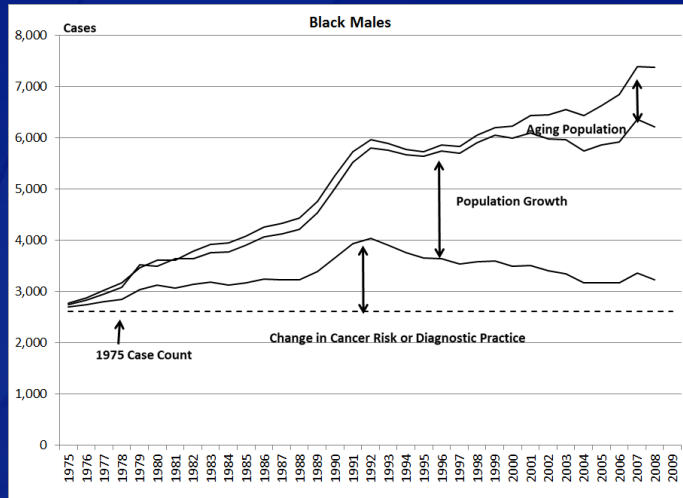
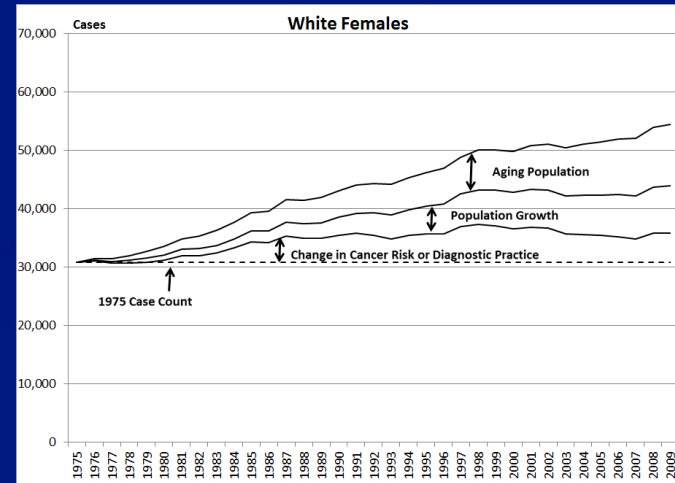
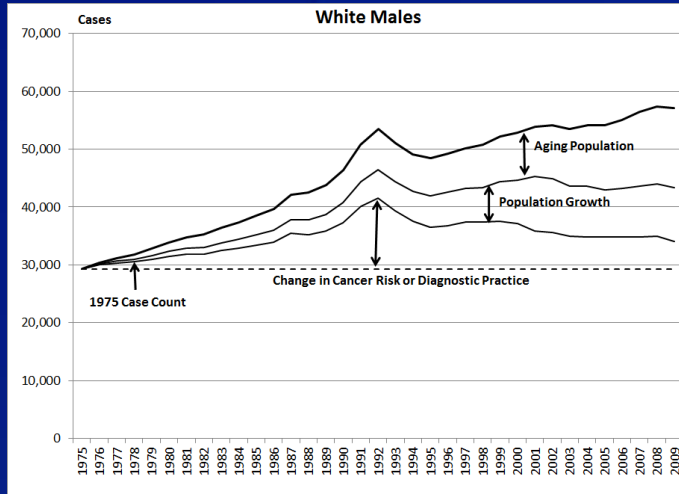
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Methods

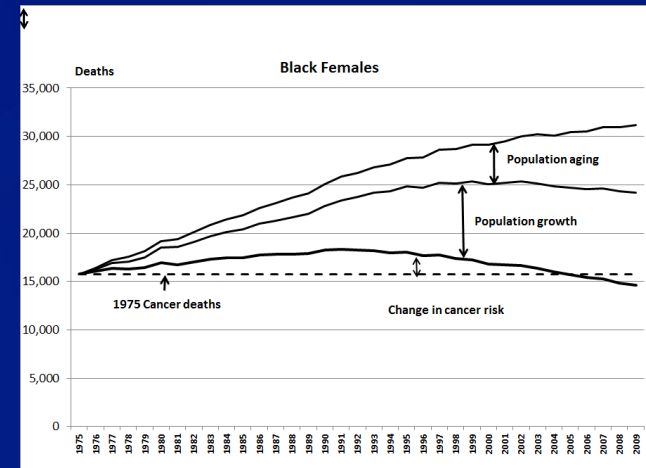
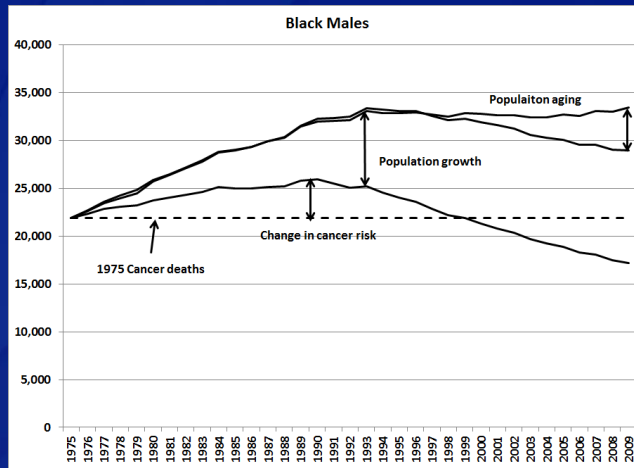
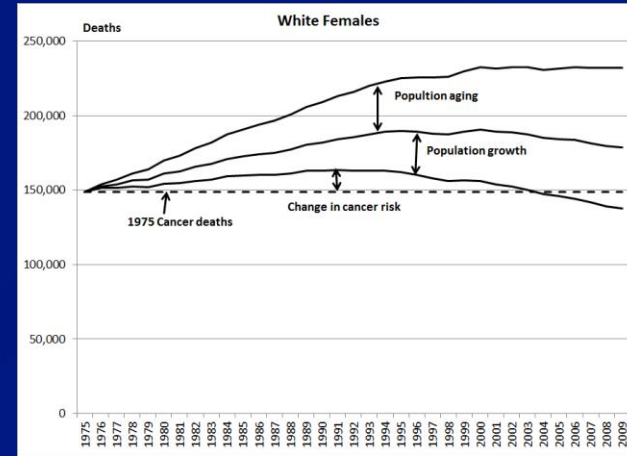
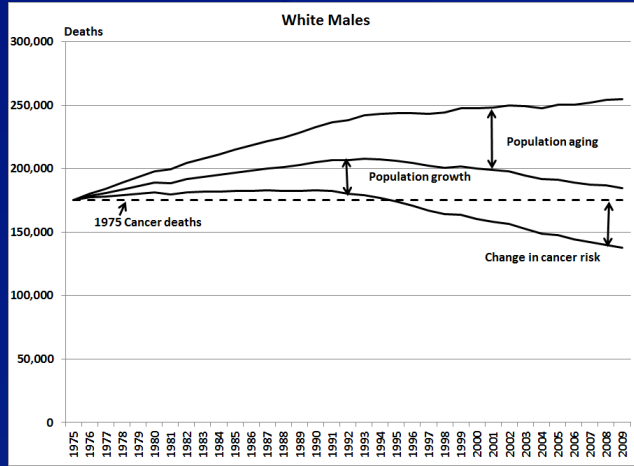
characterize the cancer burden from 1975-2009

- ❑ Method: 1999 Canadian Cancer Statistics
- ❑ Estimate 3 sets of counts by race (black, white) and gender
 - Baseline 1975
 - Population Risk (*~ age-adjusted rate*)
 - Population Growth
 - Population Aging

Cancer Incidence 1975-2009 (SEER-9)



Cancer Deaths 1975-2009



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Methods

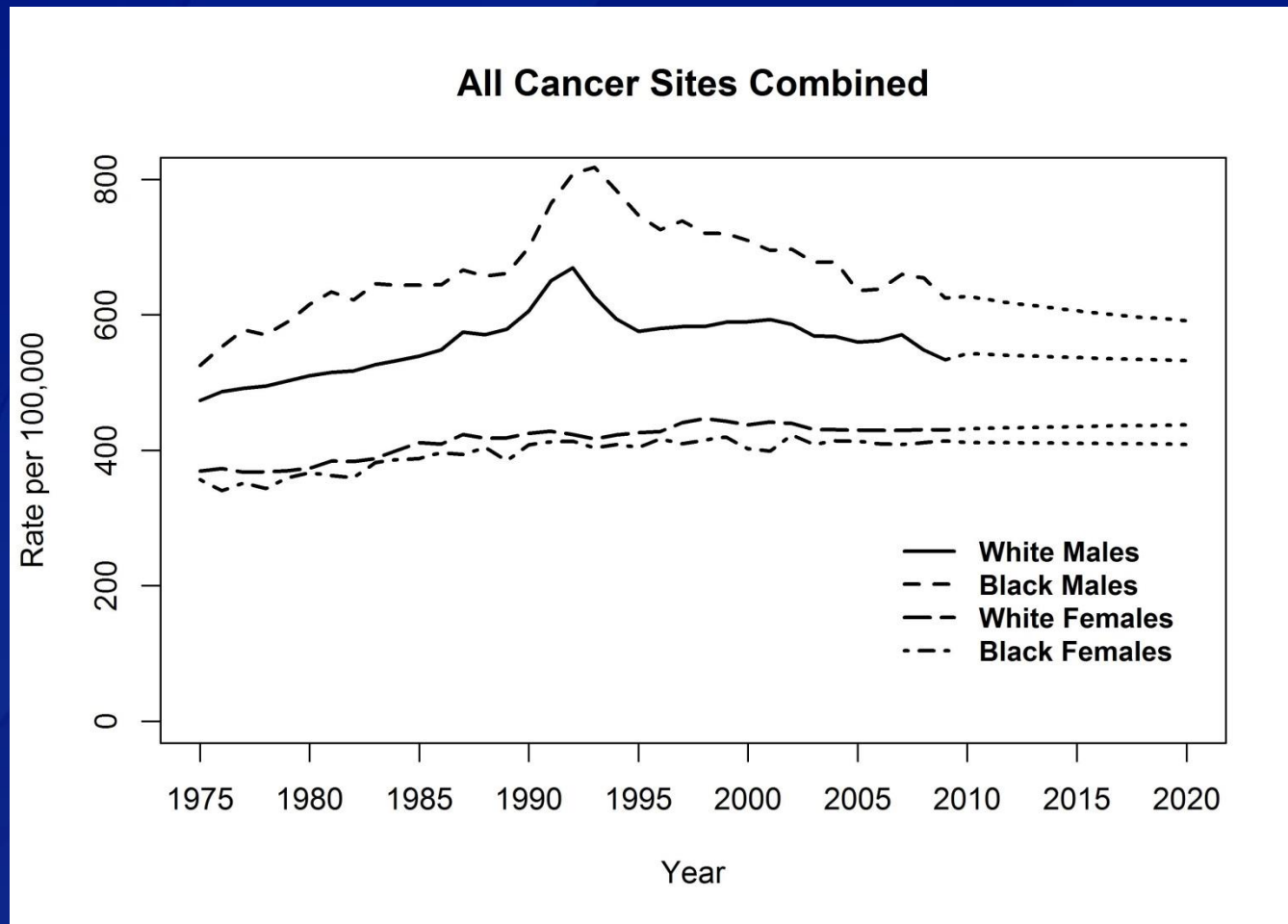
project the cancer burden

- ❑ All sites and top 25 cancers; men and women; all races, white and black
- ❑ Trends in US cancer mortality data : all sites, top 23 cancers; men and women; all races, white and black
- ❑ US Census Population projections (2010-2050)
- ❑ NORDPRED software free from the Cancer Registry of Norway website
<http://www.kreftregisteret.no/software/nordpred>

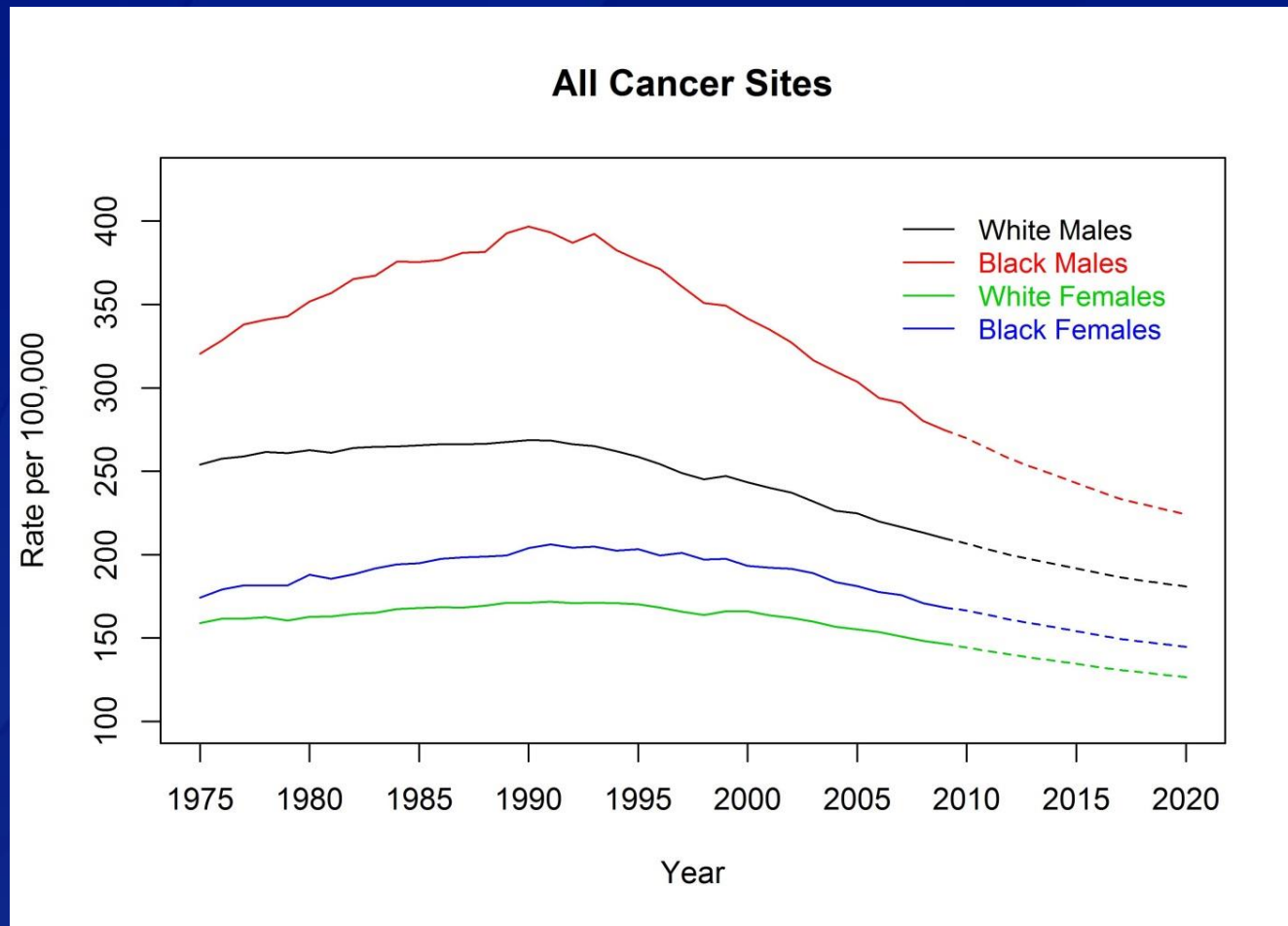
Age, Period, Birth Cohort Models

R_{ap}	$= (A_a + P_p + C_c + D_p)^5$
Age	(0-4, 5-9, 10-14.....80-84, 85+)
Period	(1980-84....2005-09)
	Power link function
	Goodness of fit test to select # periods
	Prostate and female breast – used most recent 5 year (2005-09)

Trends in Observed and Projected Age-adjusted Incidence Rates (1975-2020)

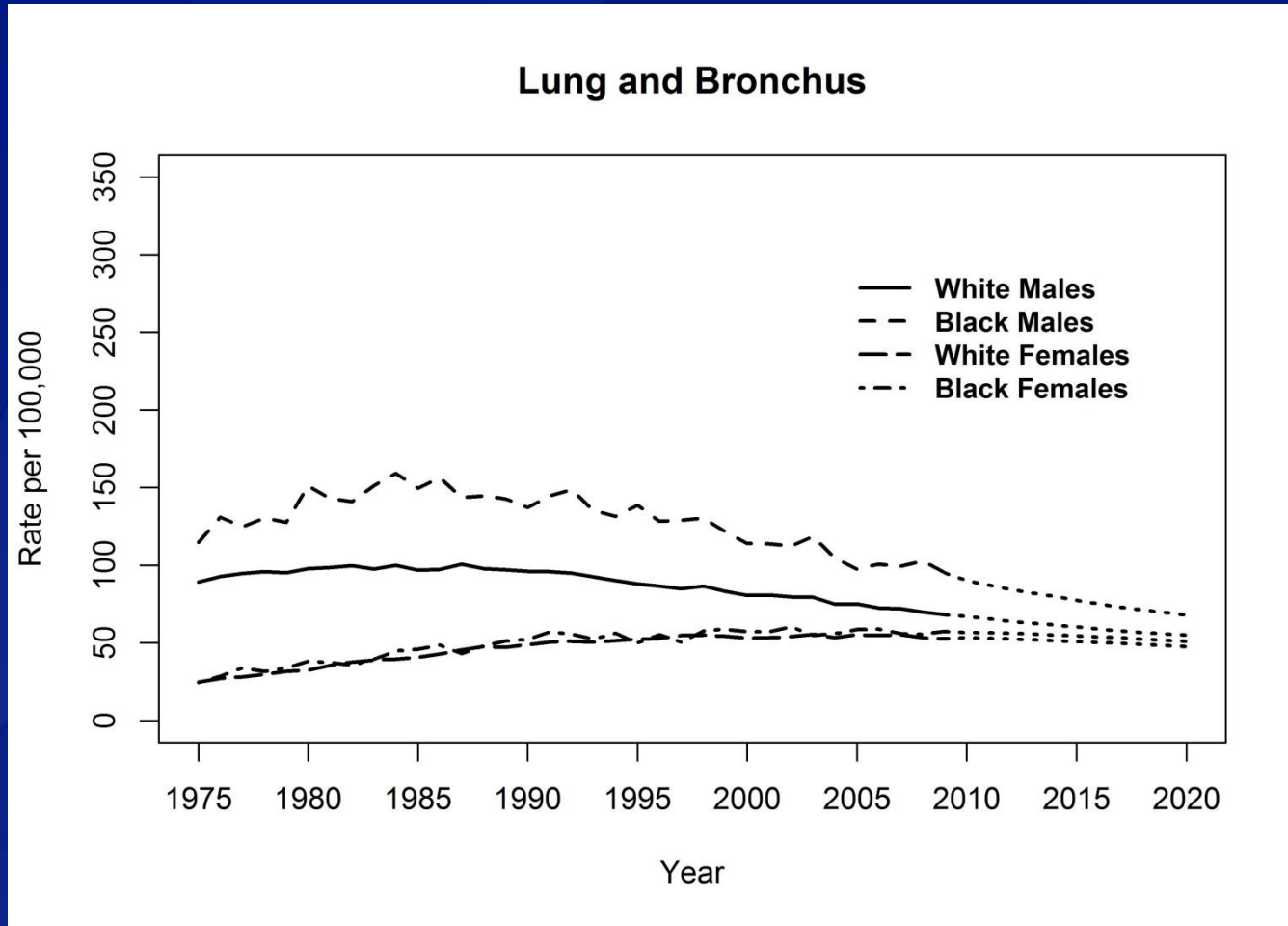


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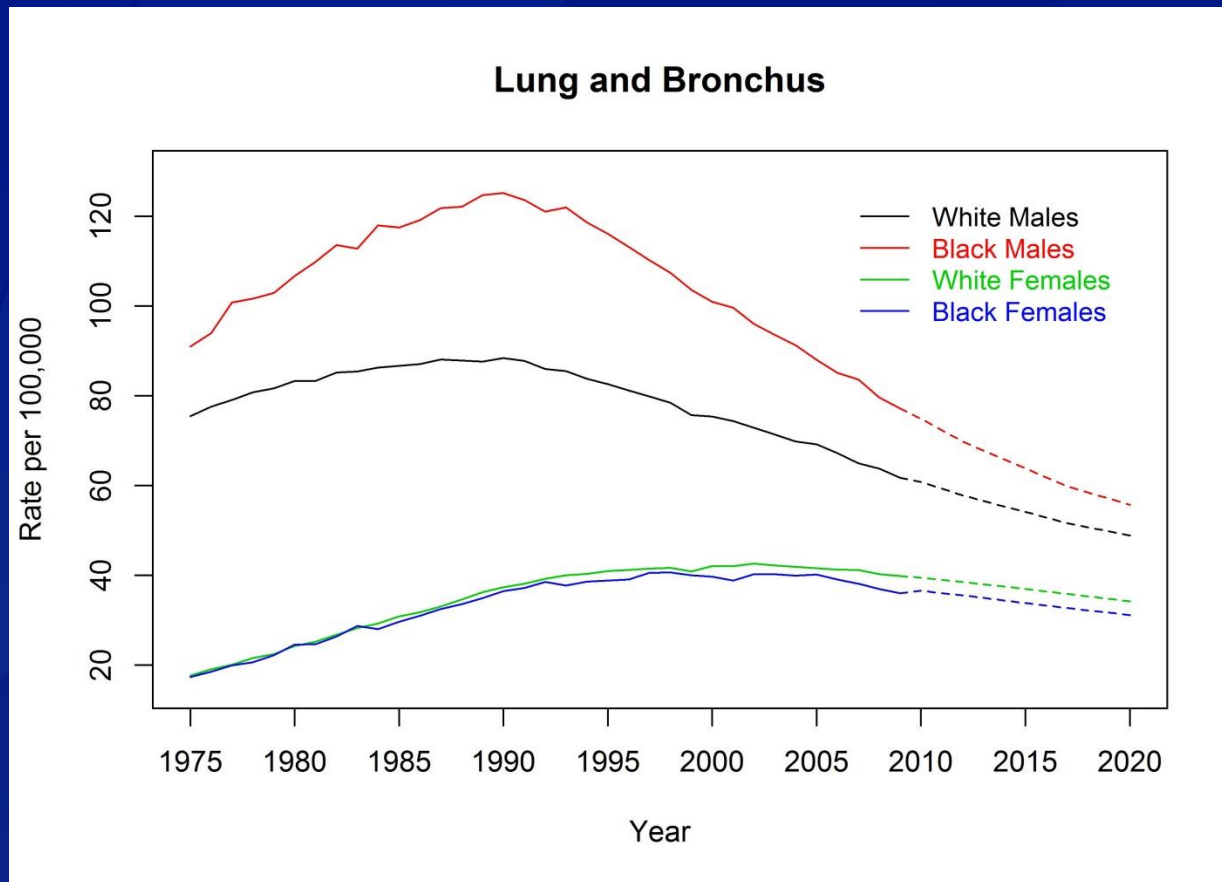


Tobacco Related Cancers

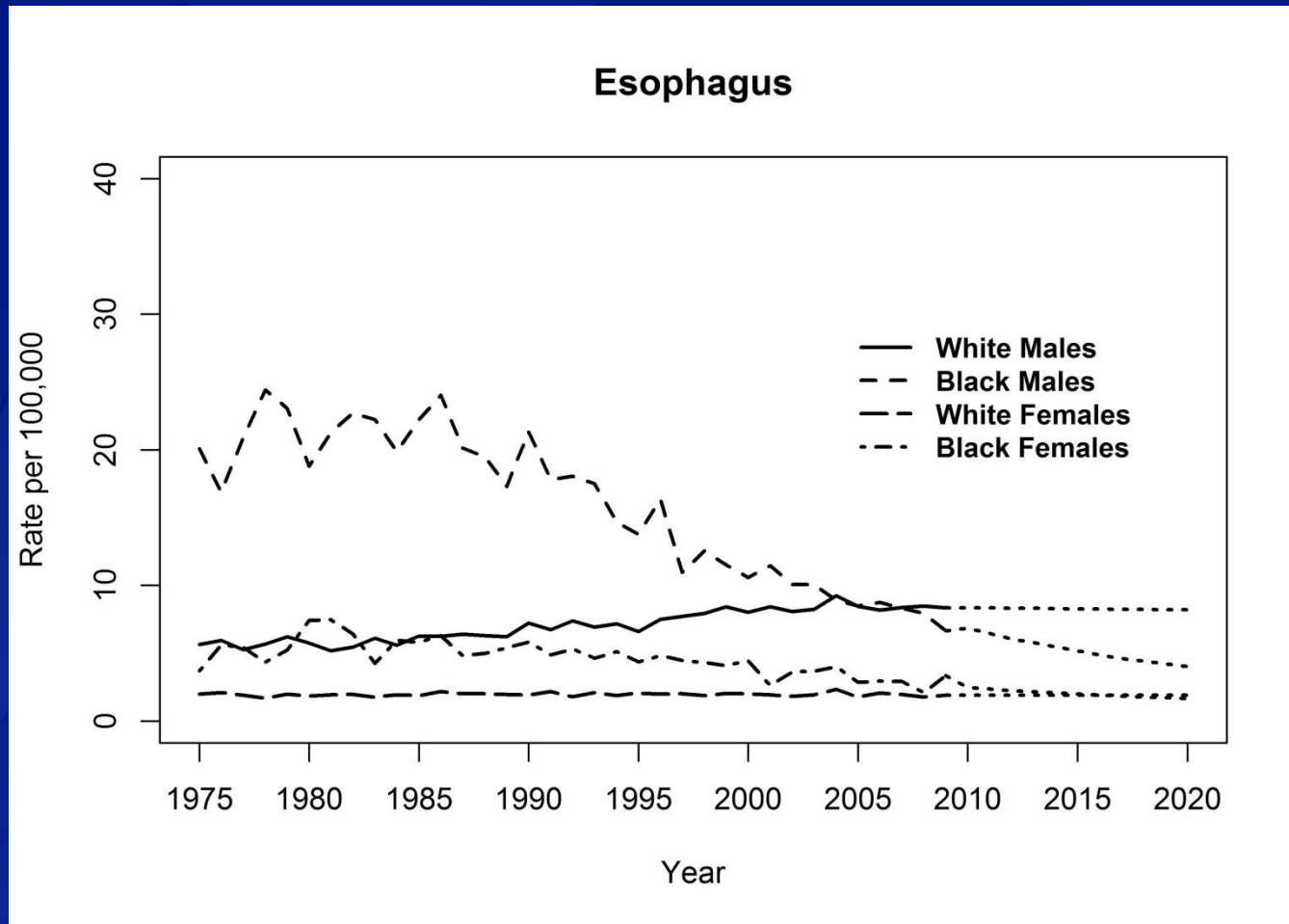
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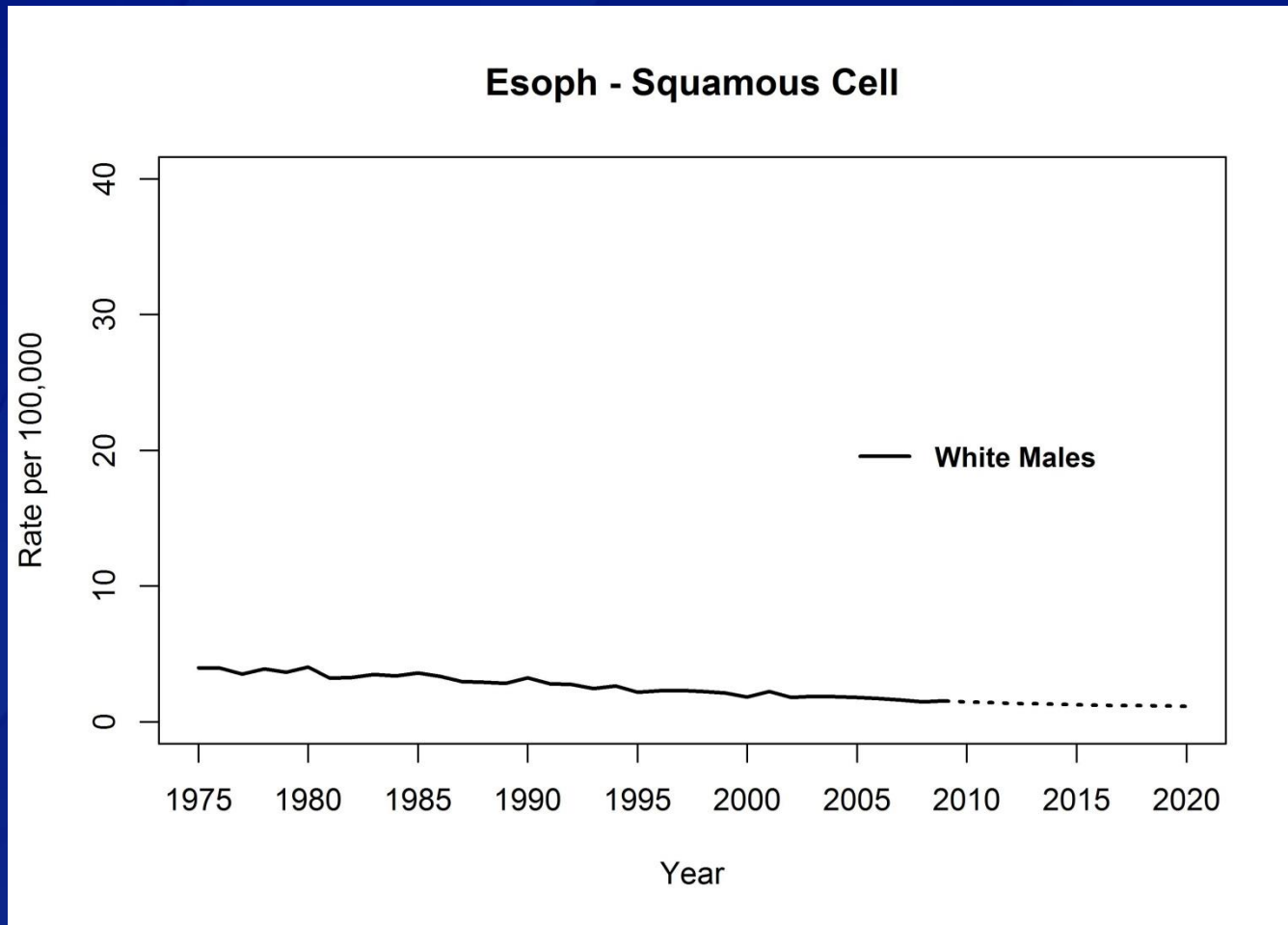
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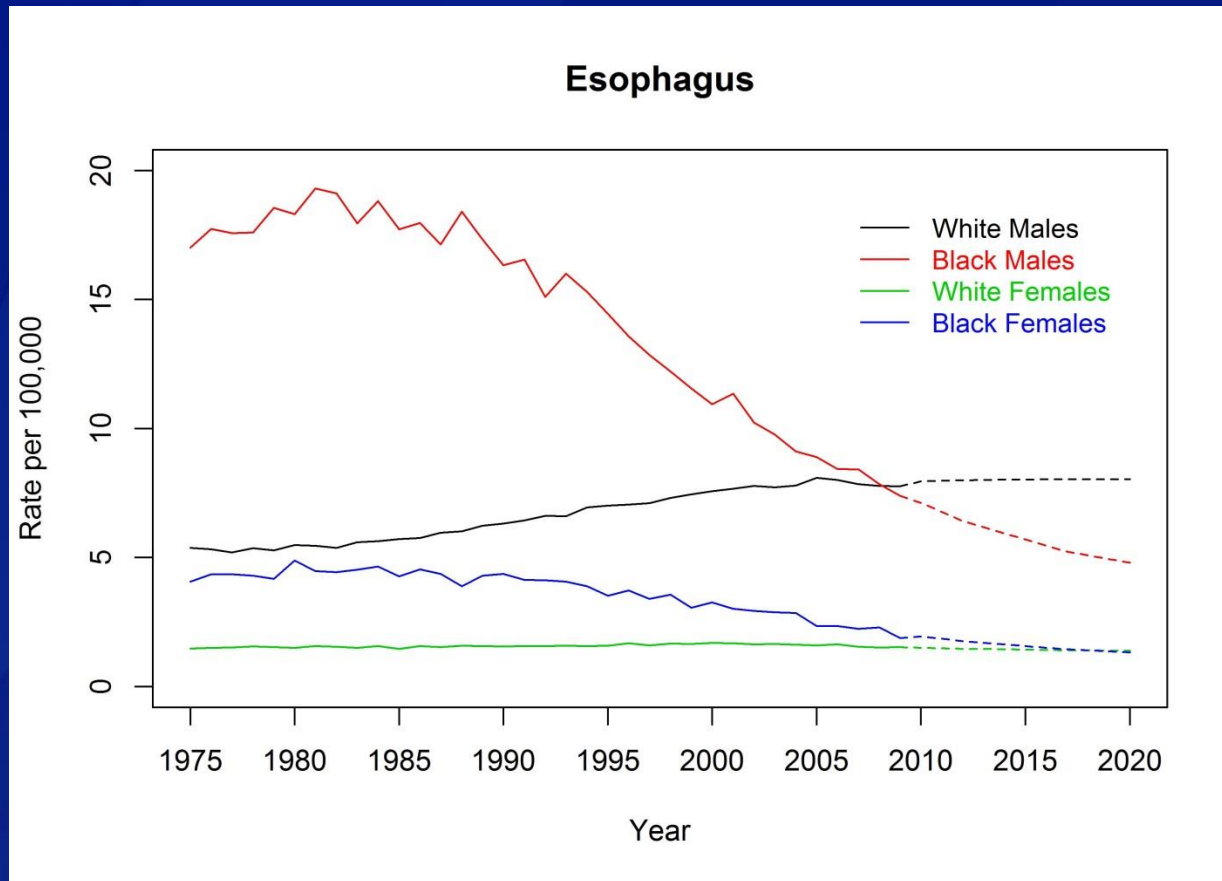
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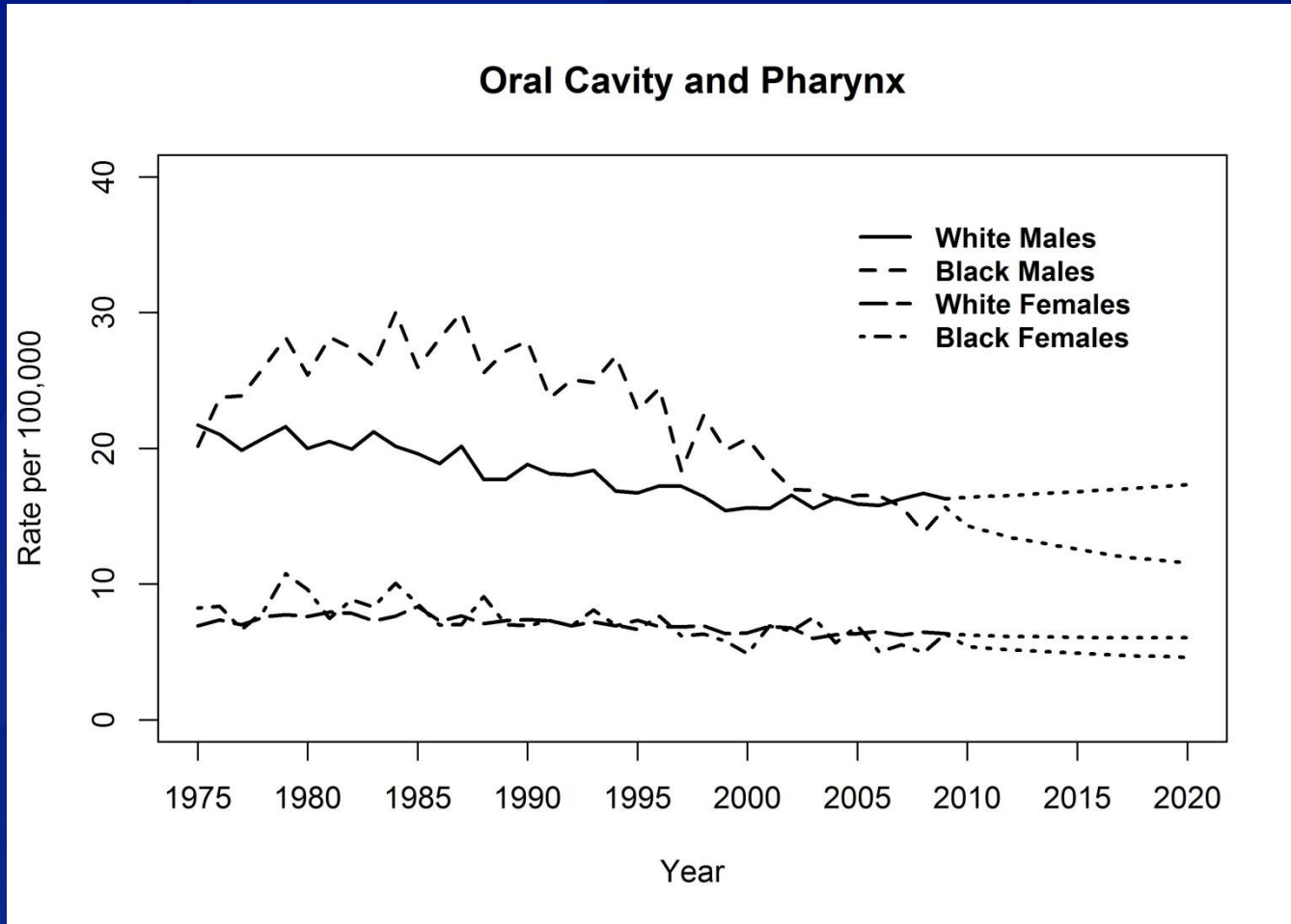
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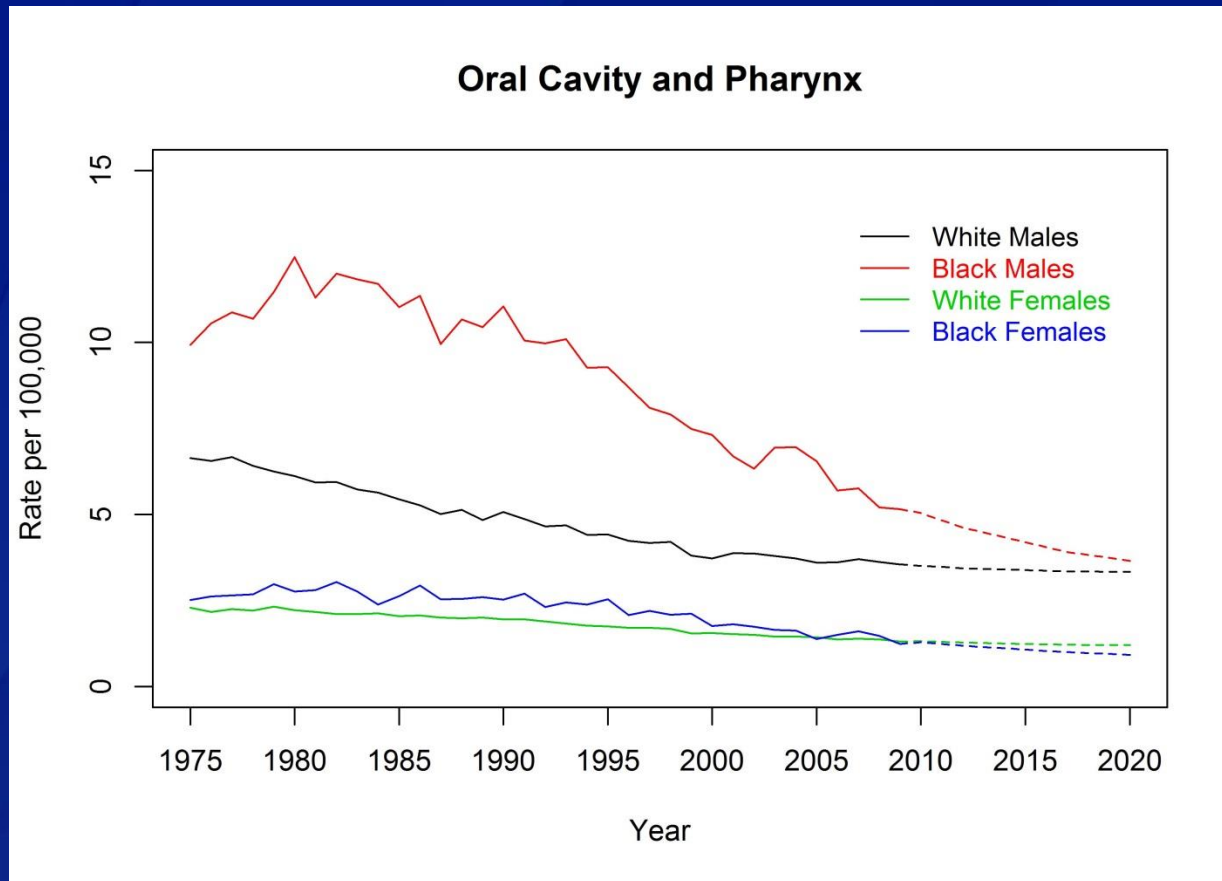
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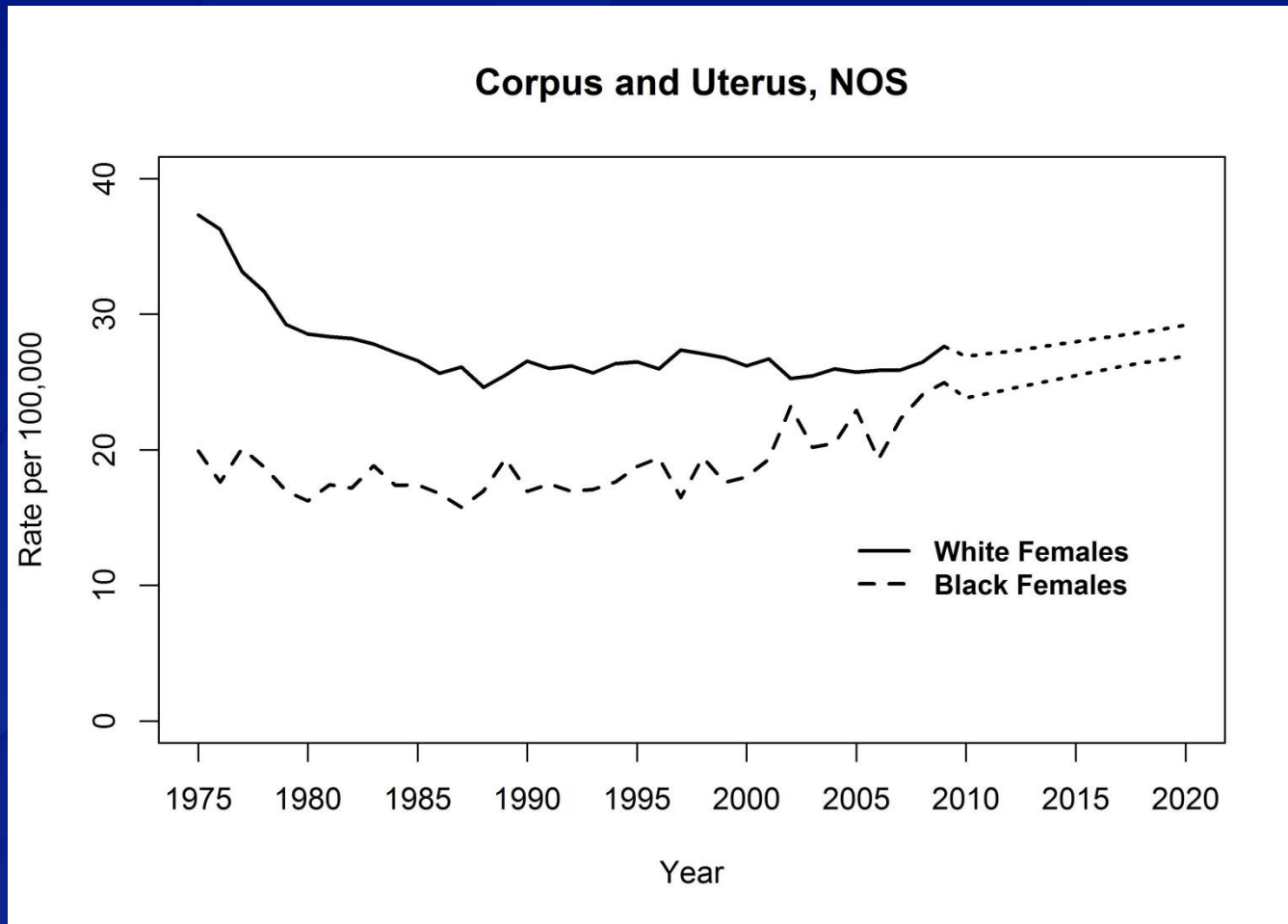


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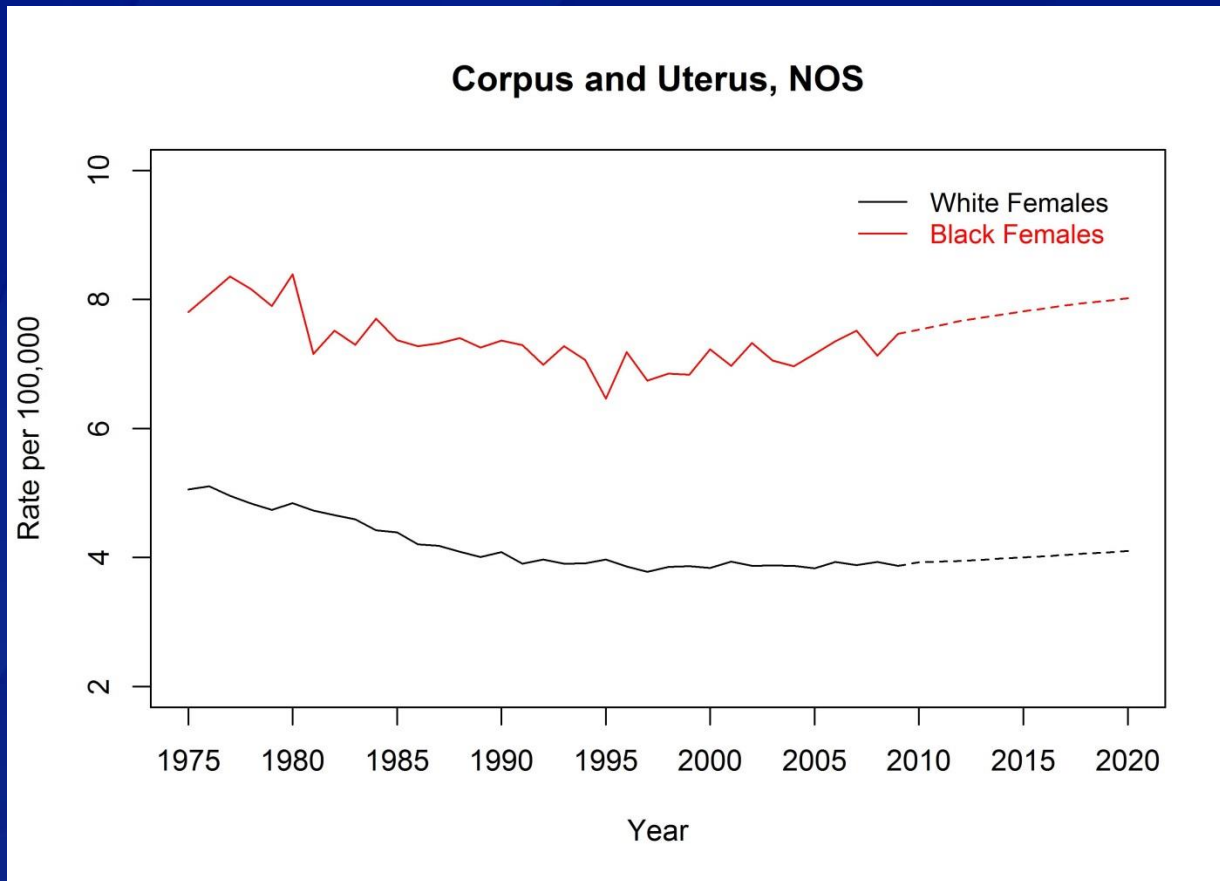


Weight/Physical Activity Related Cancers

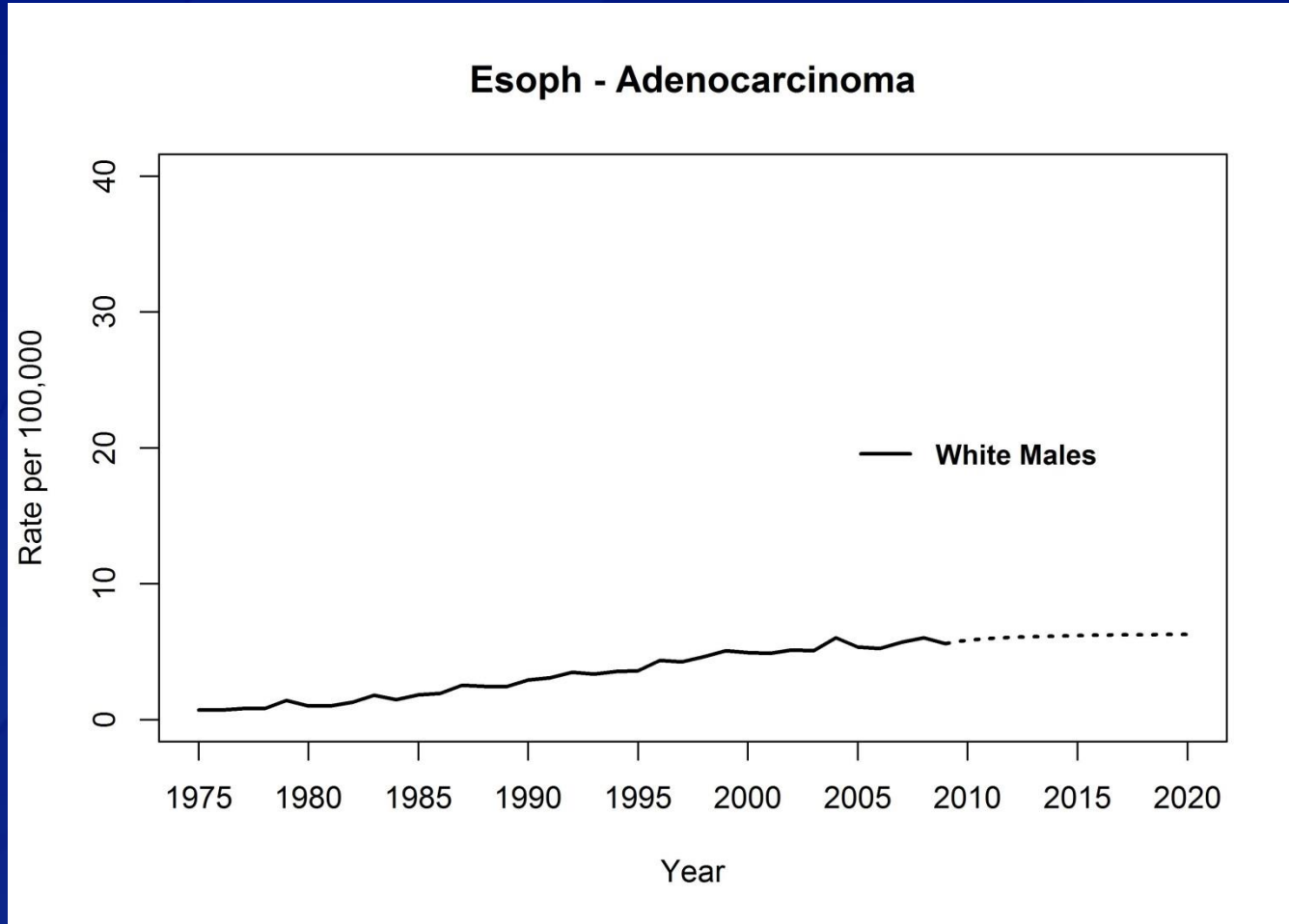
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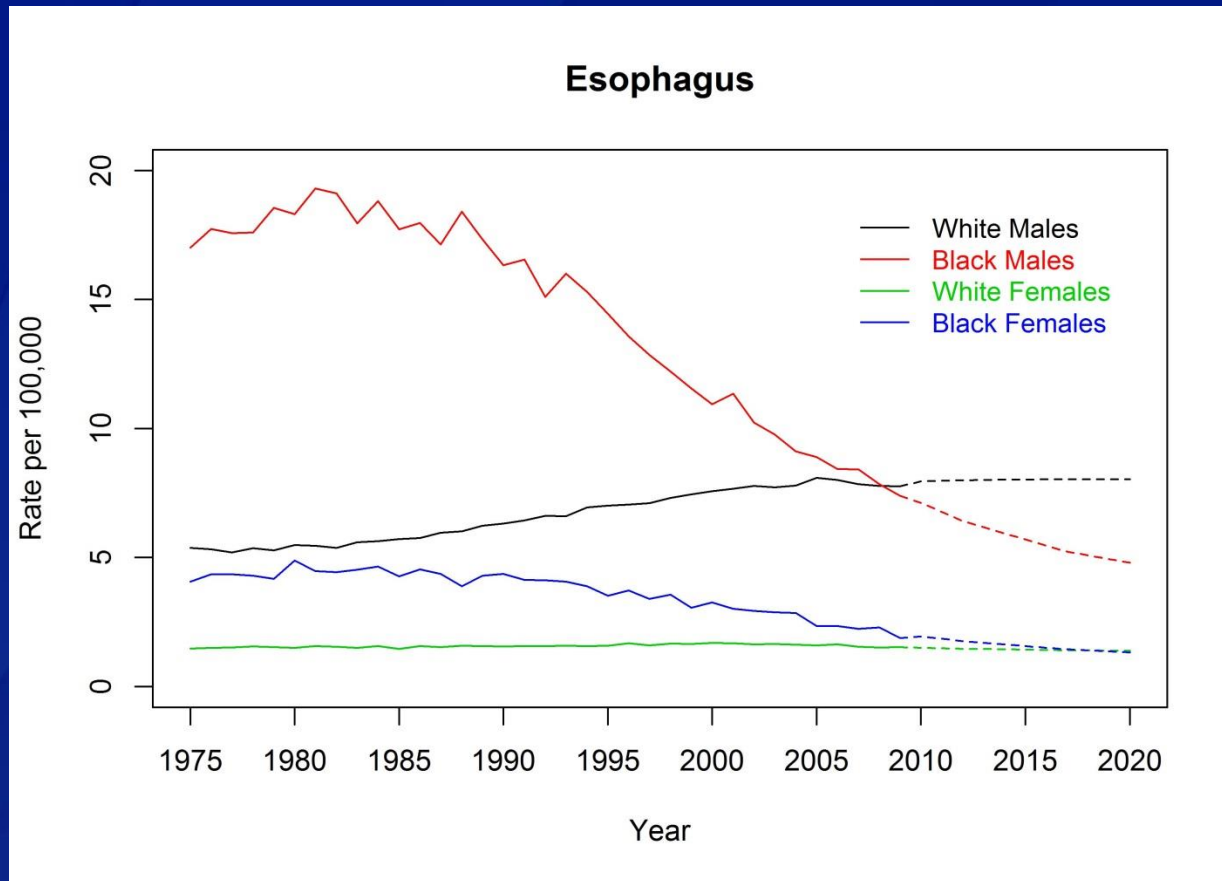
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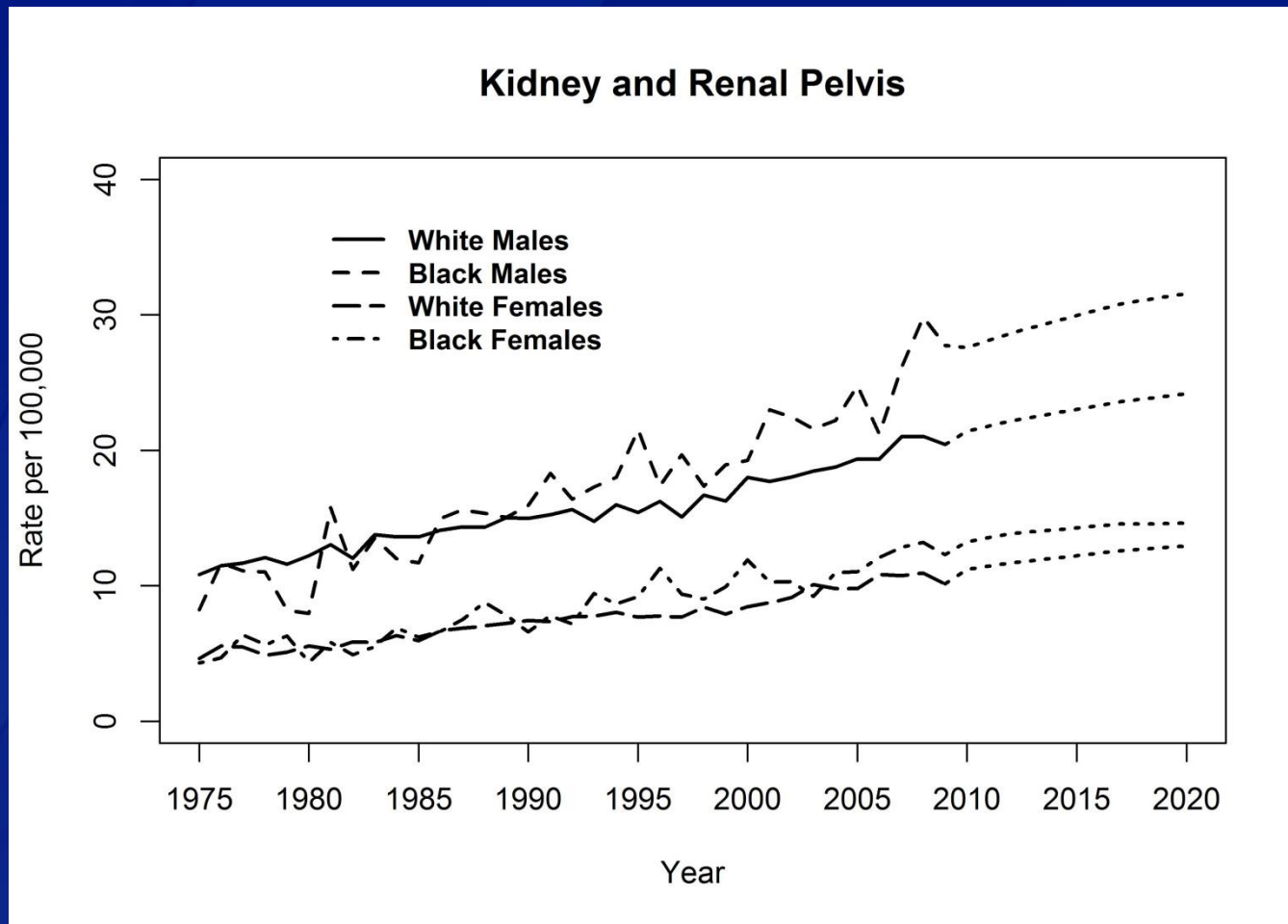
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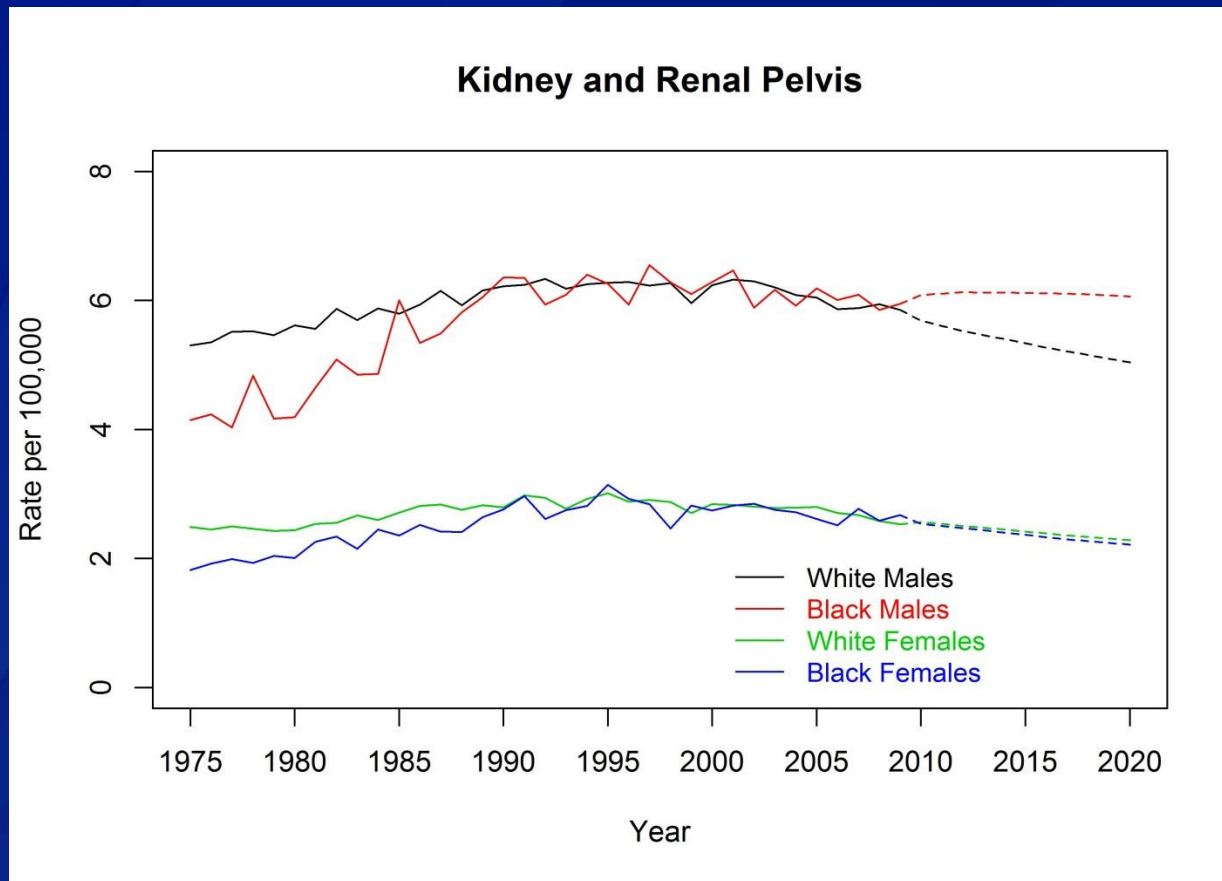
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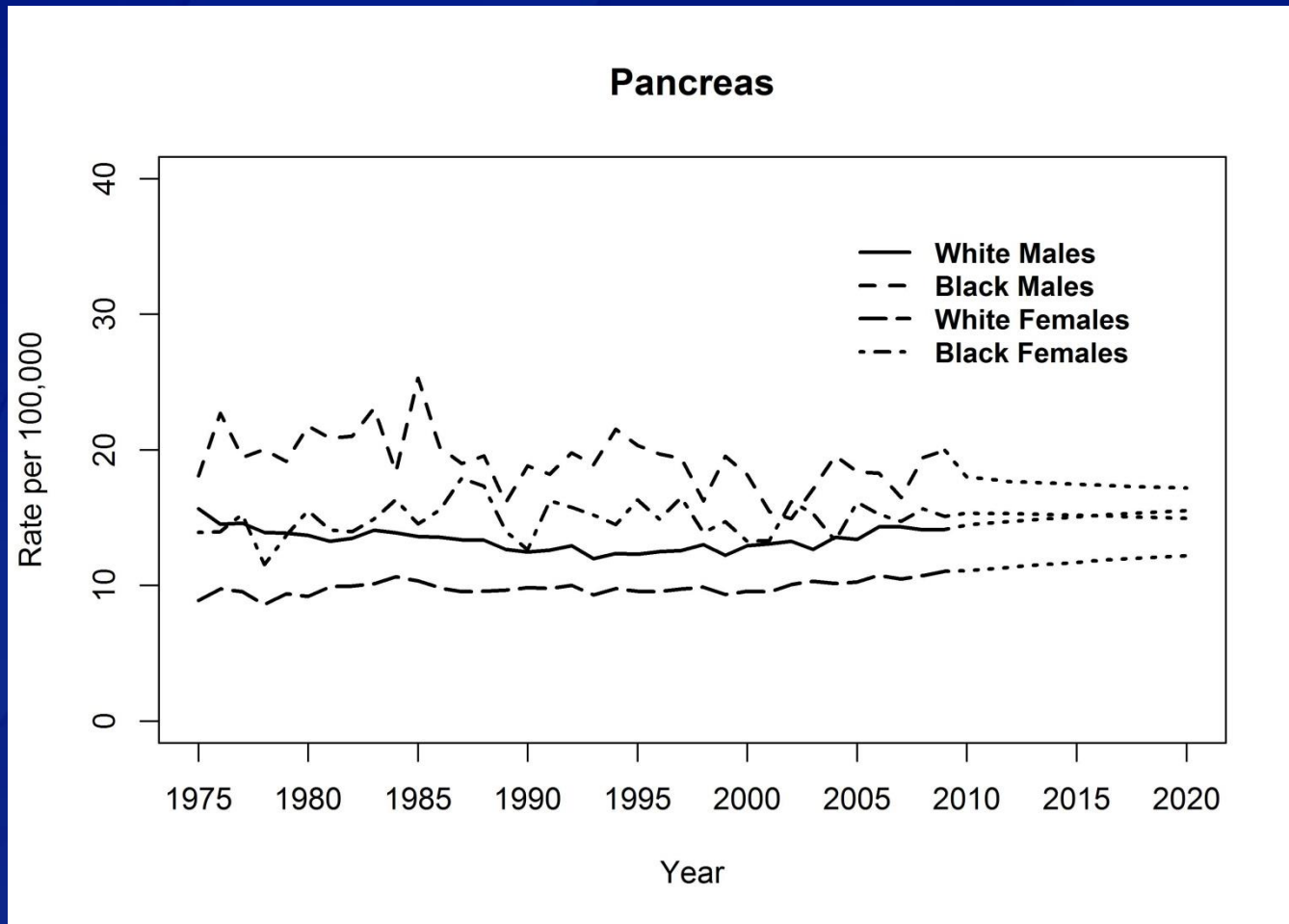
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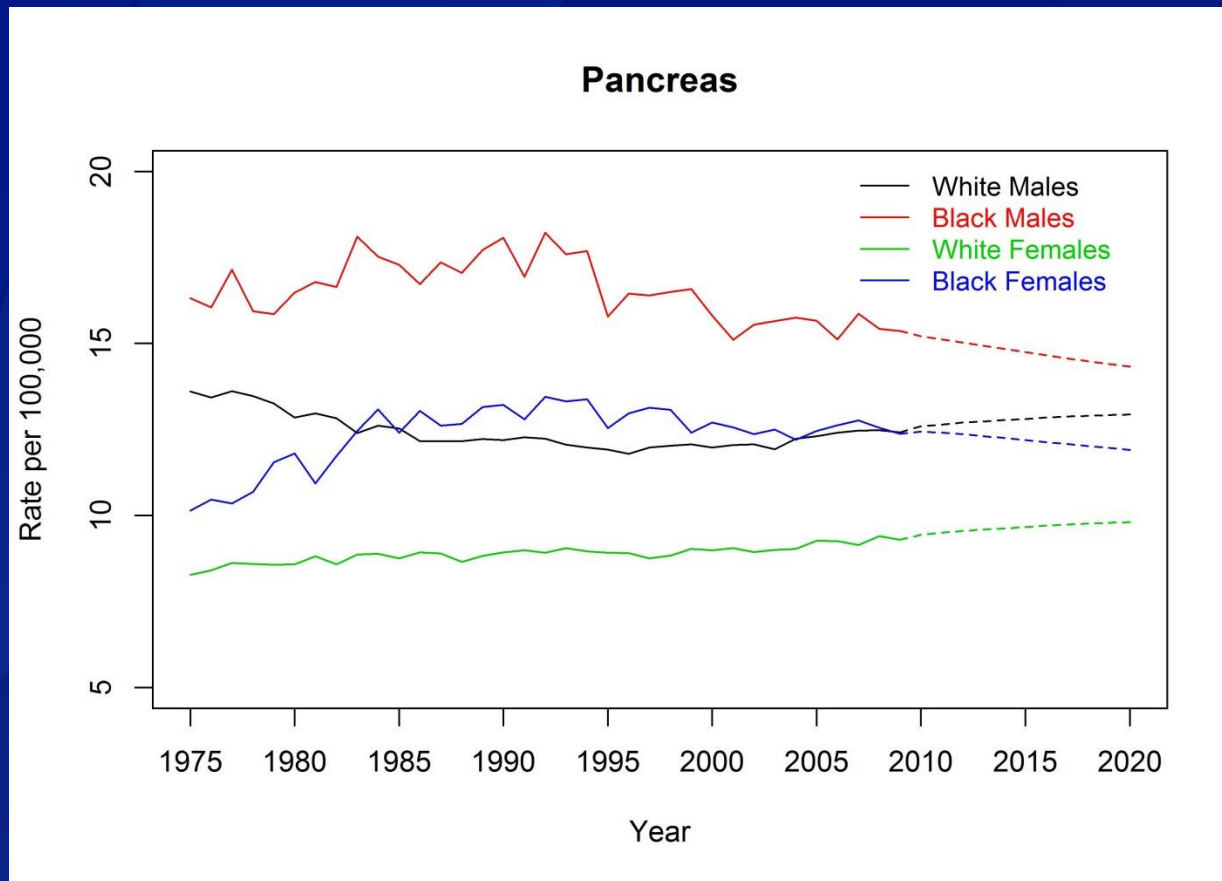
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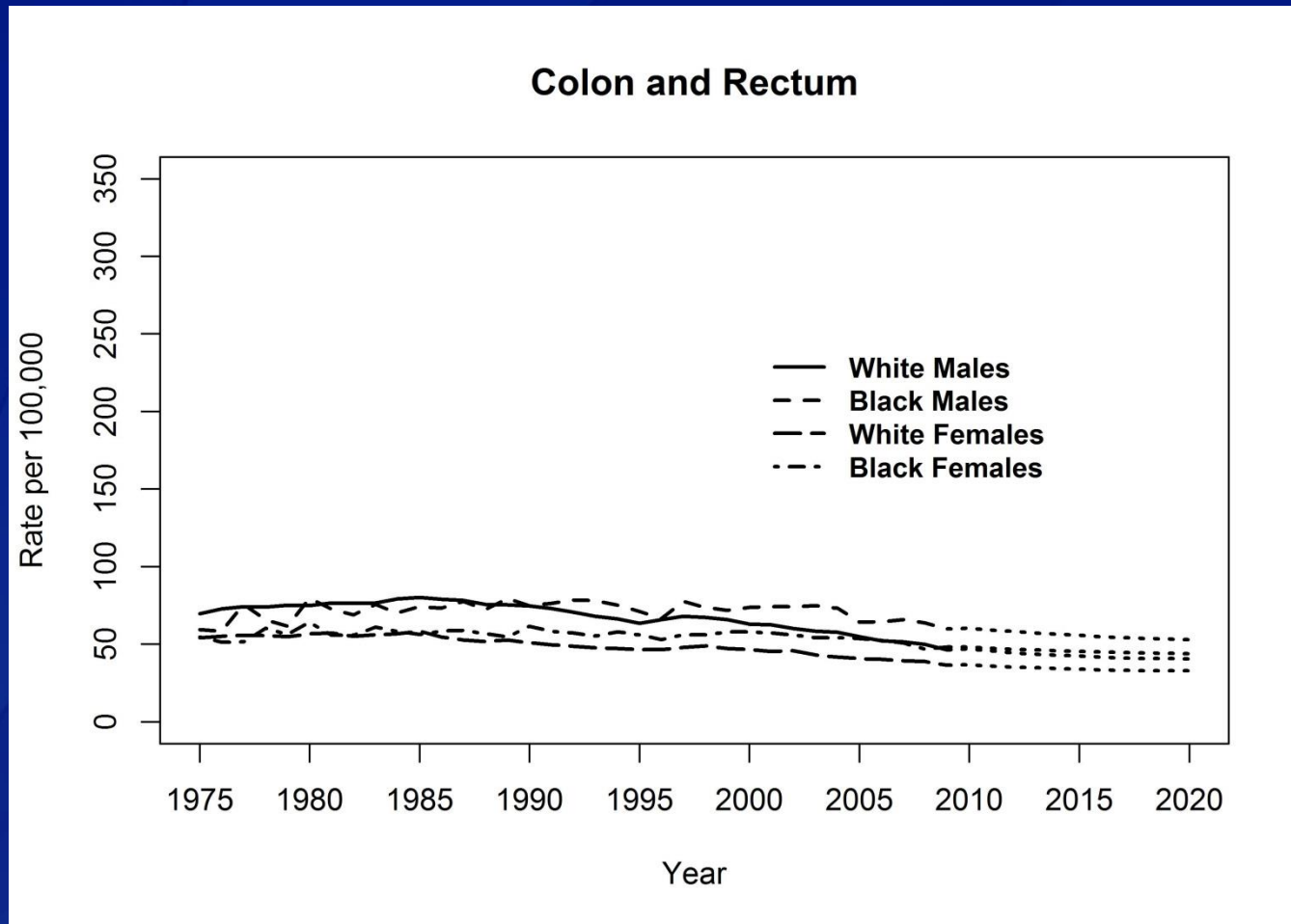


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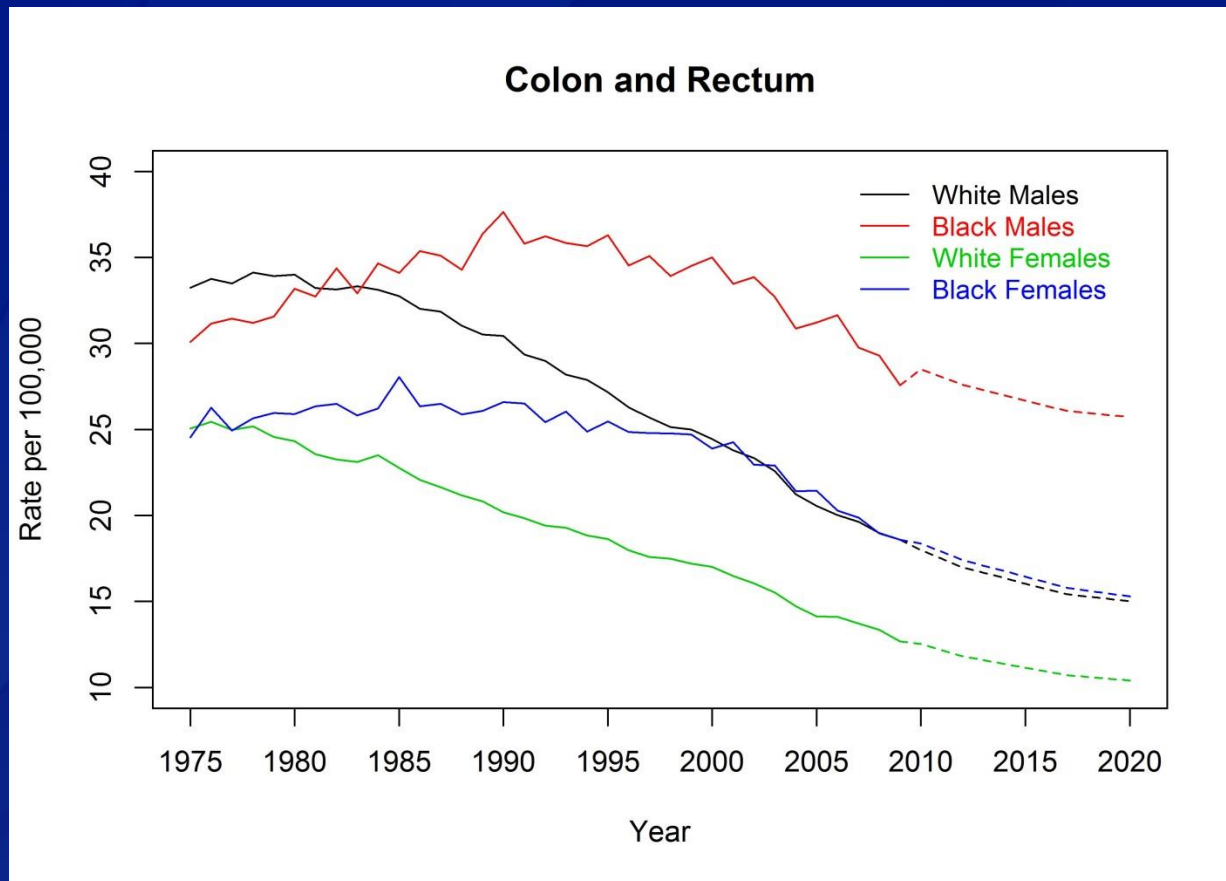


Surveillance Related and Screen Detectable Cancers

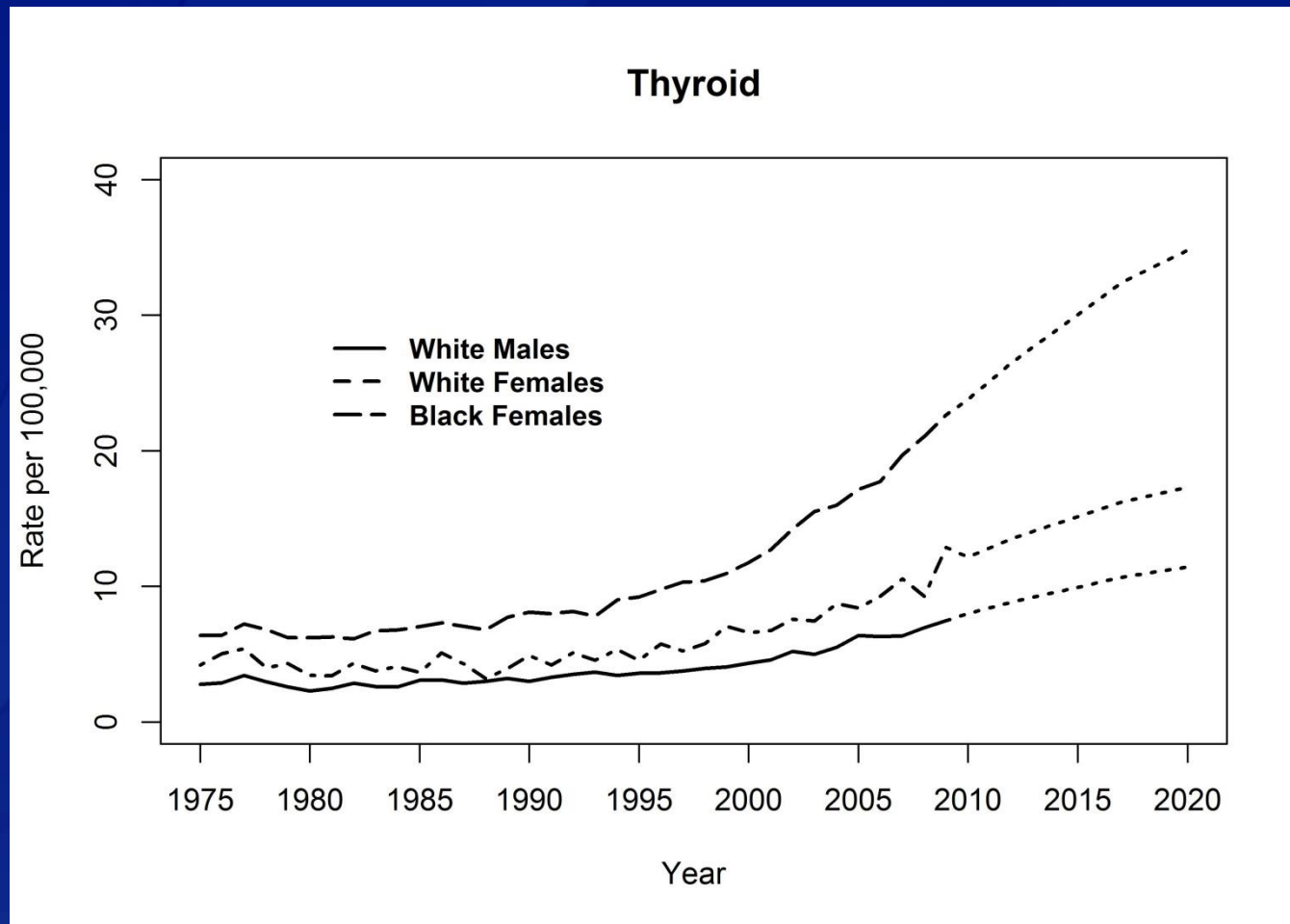
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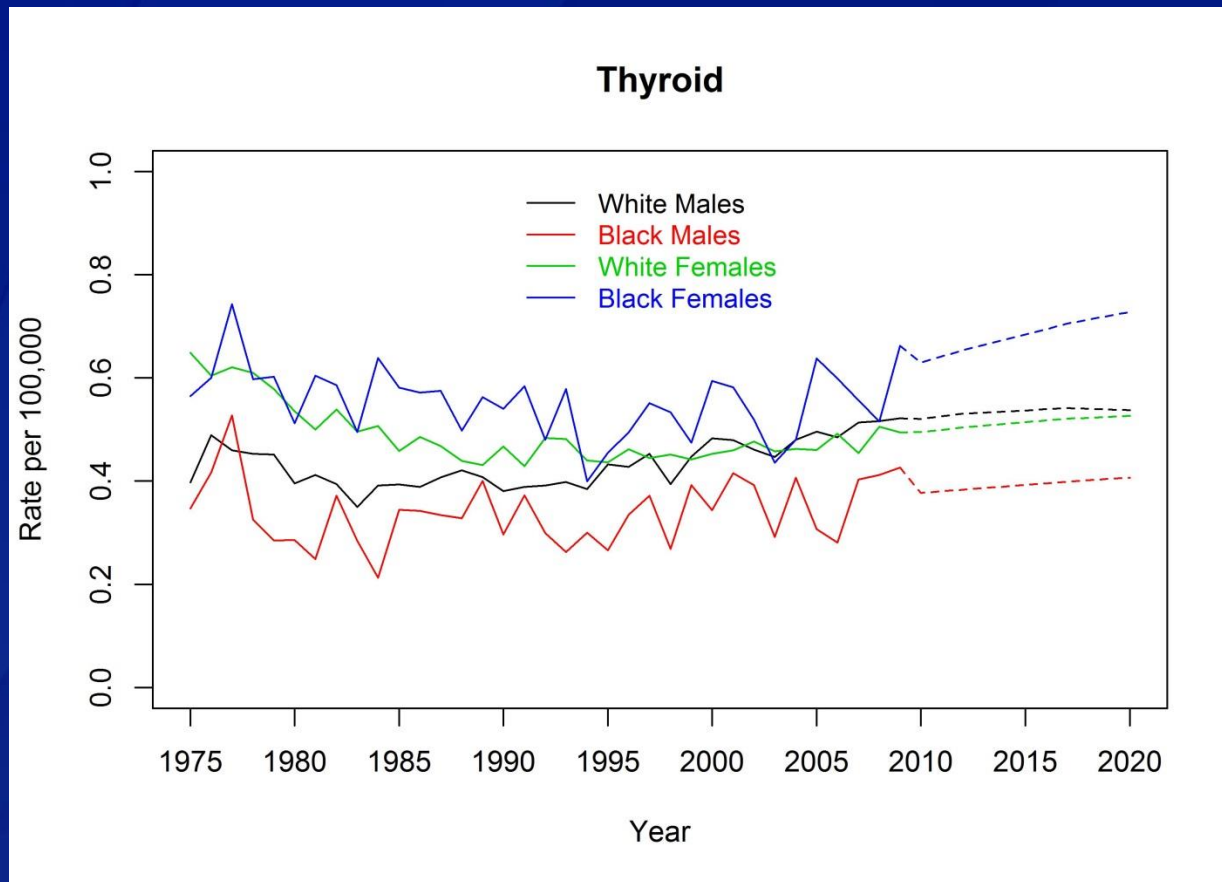
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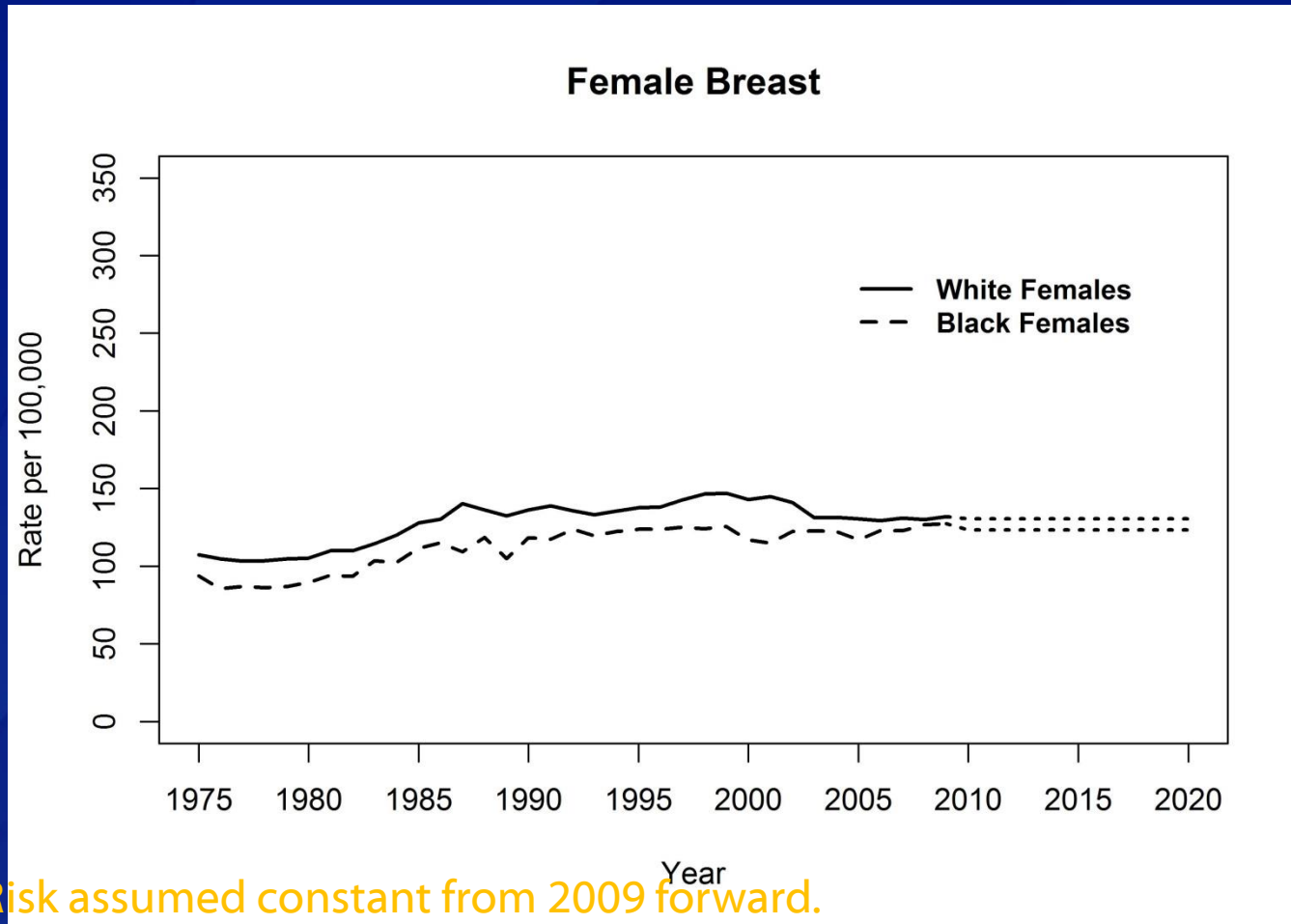
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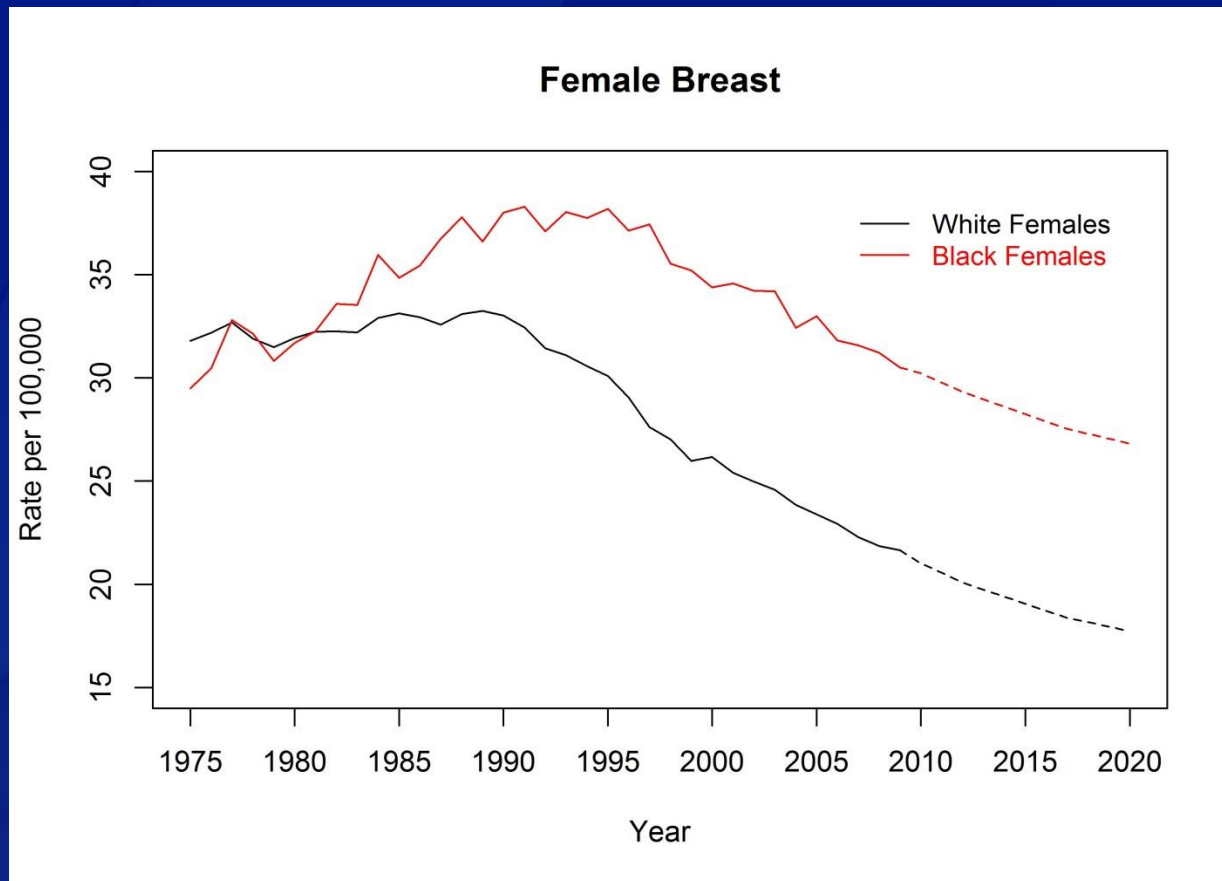
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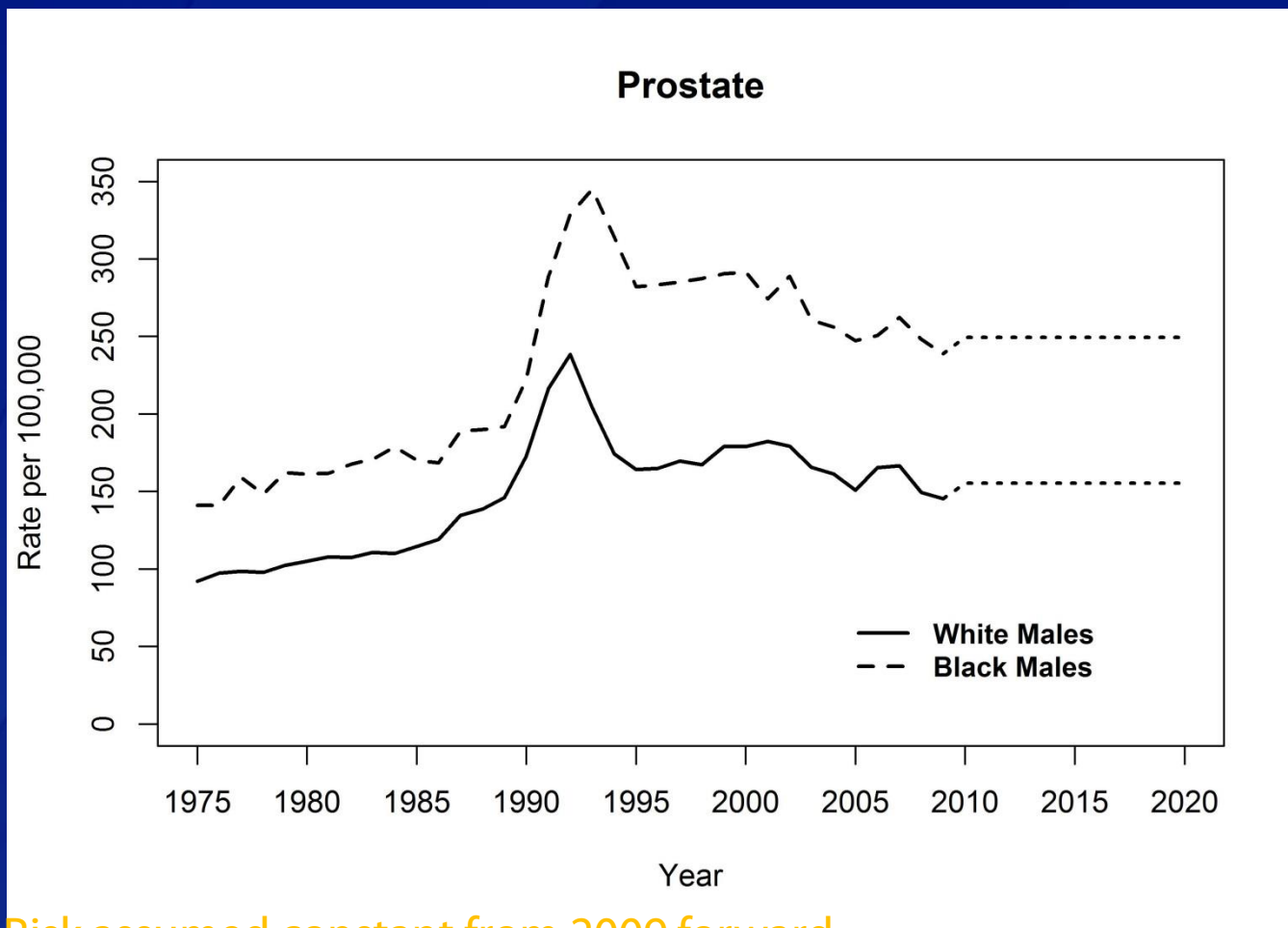
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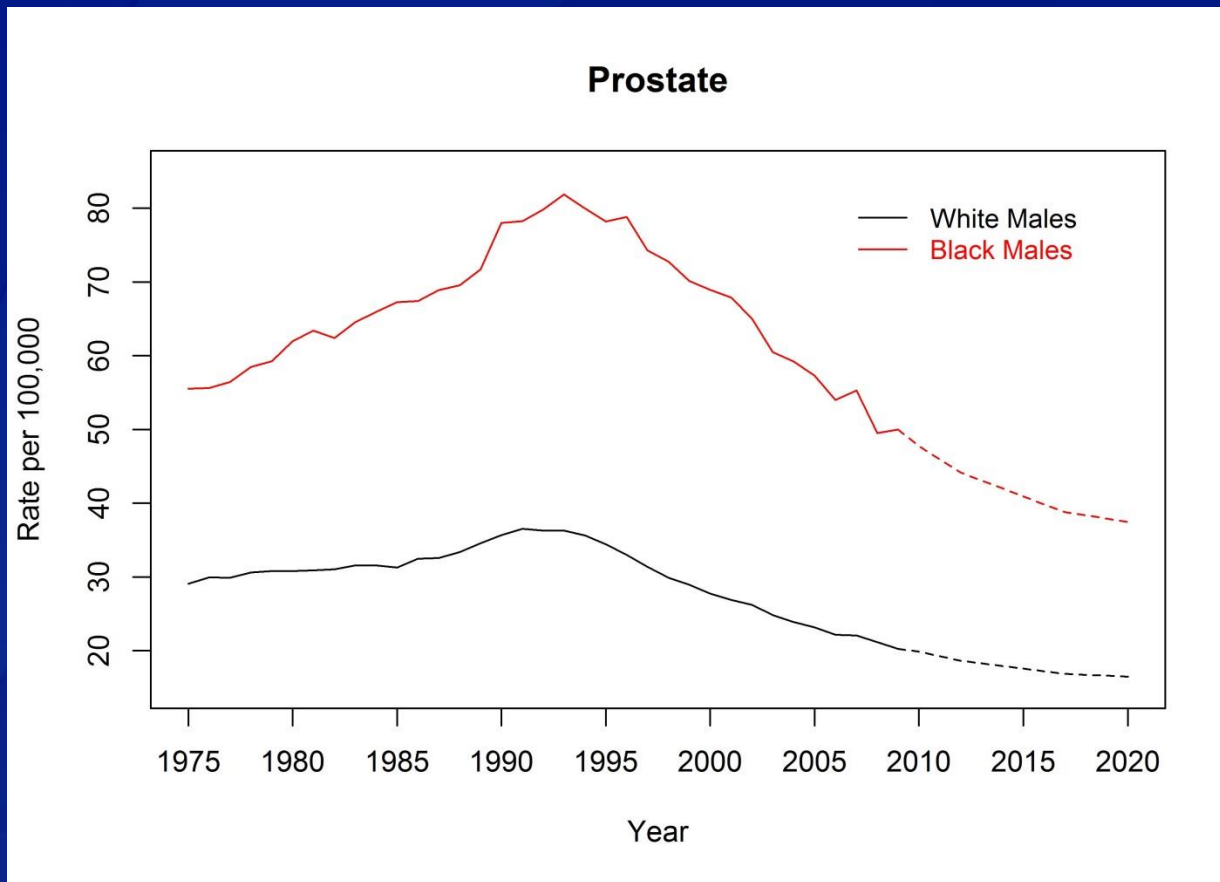


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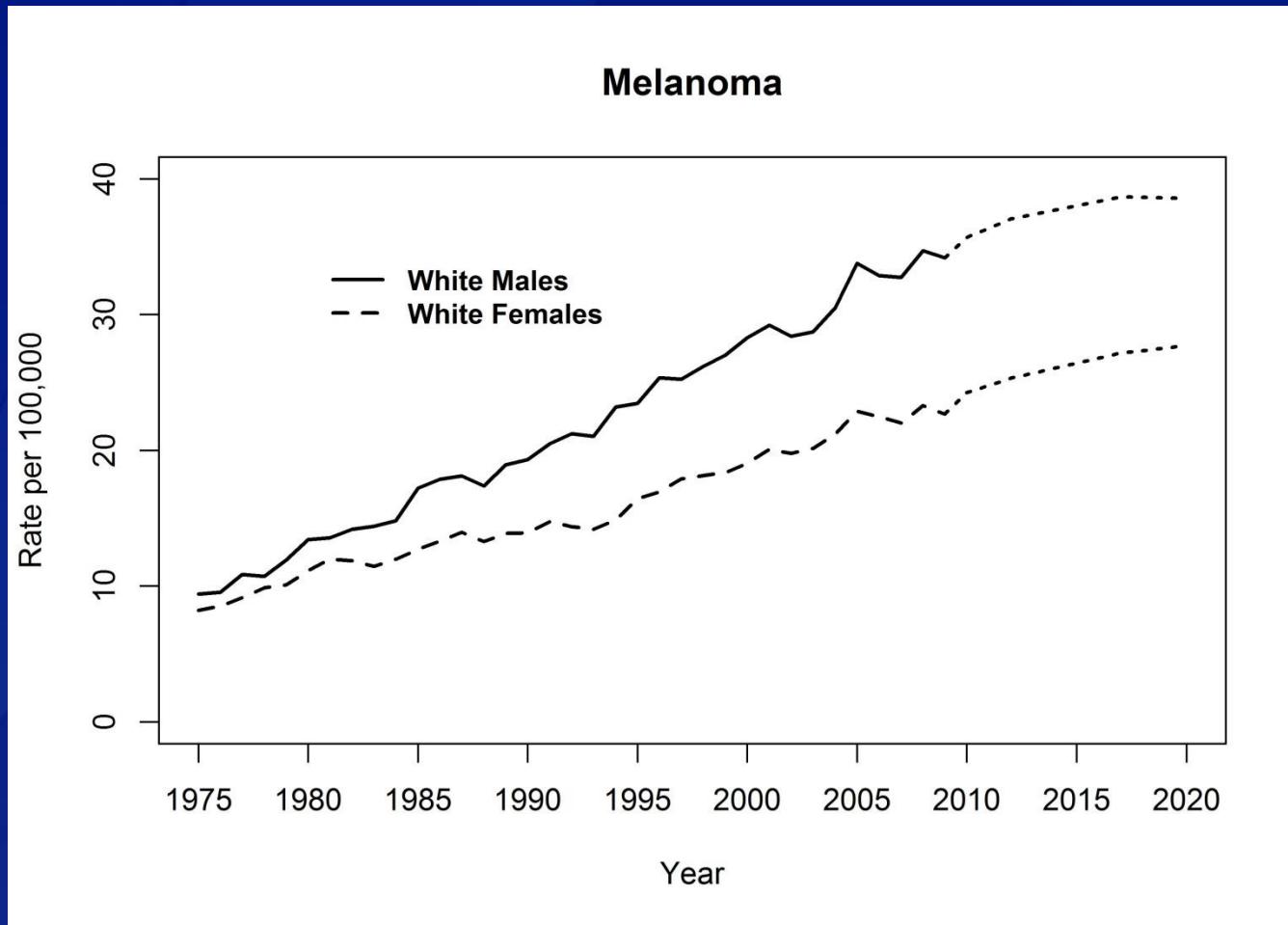


Risk assumed constant from 2009 forward.

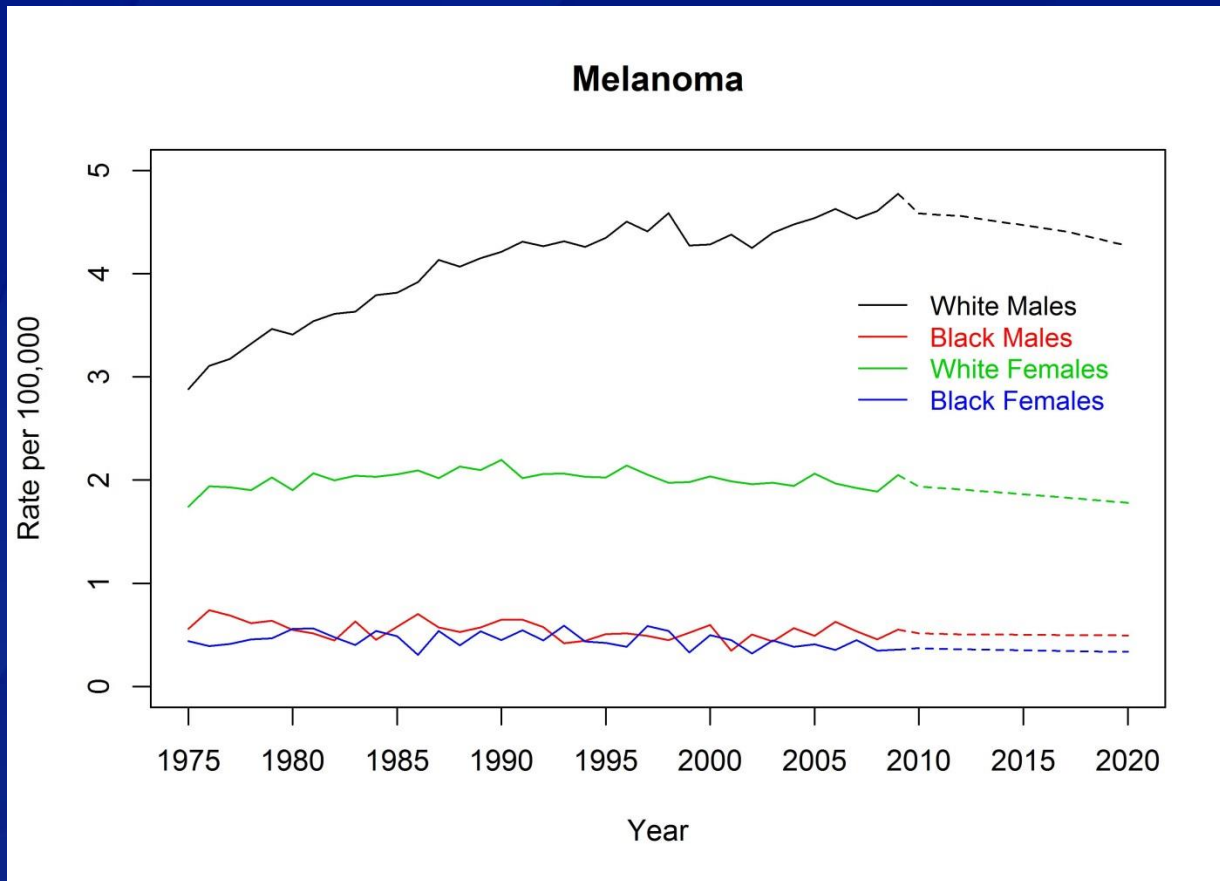
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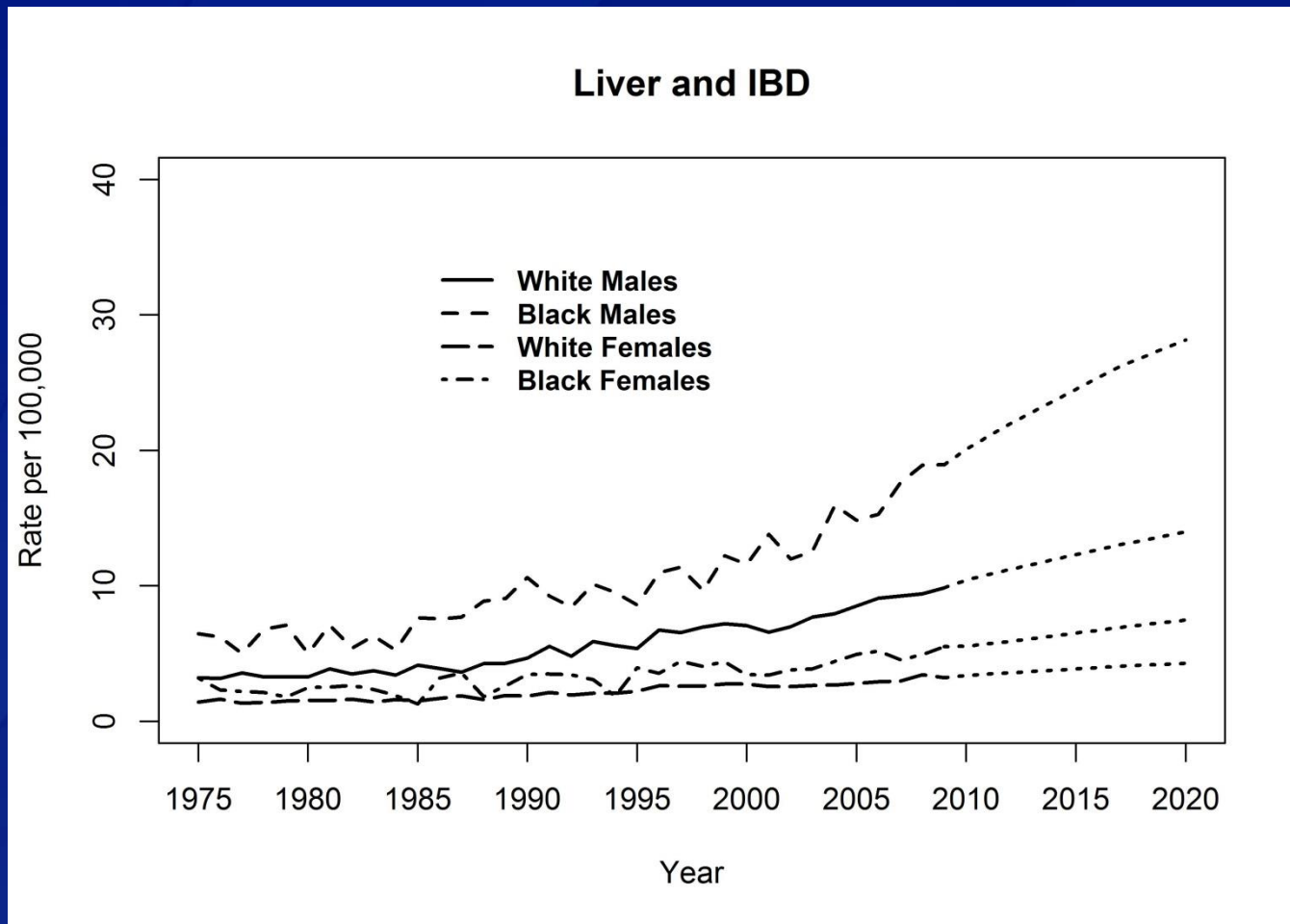


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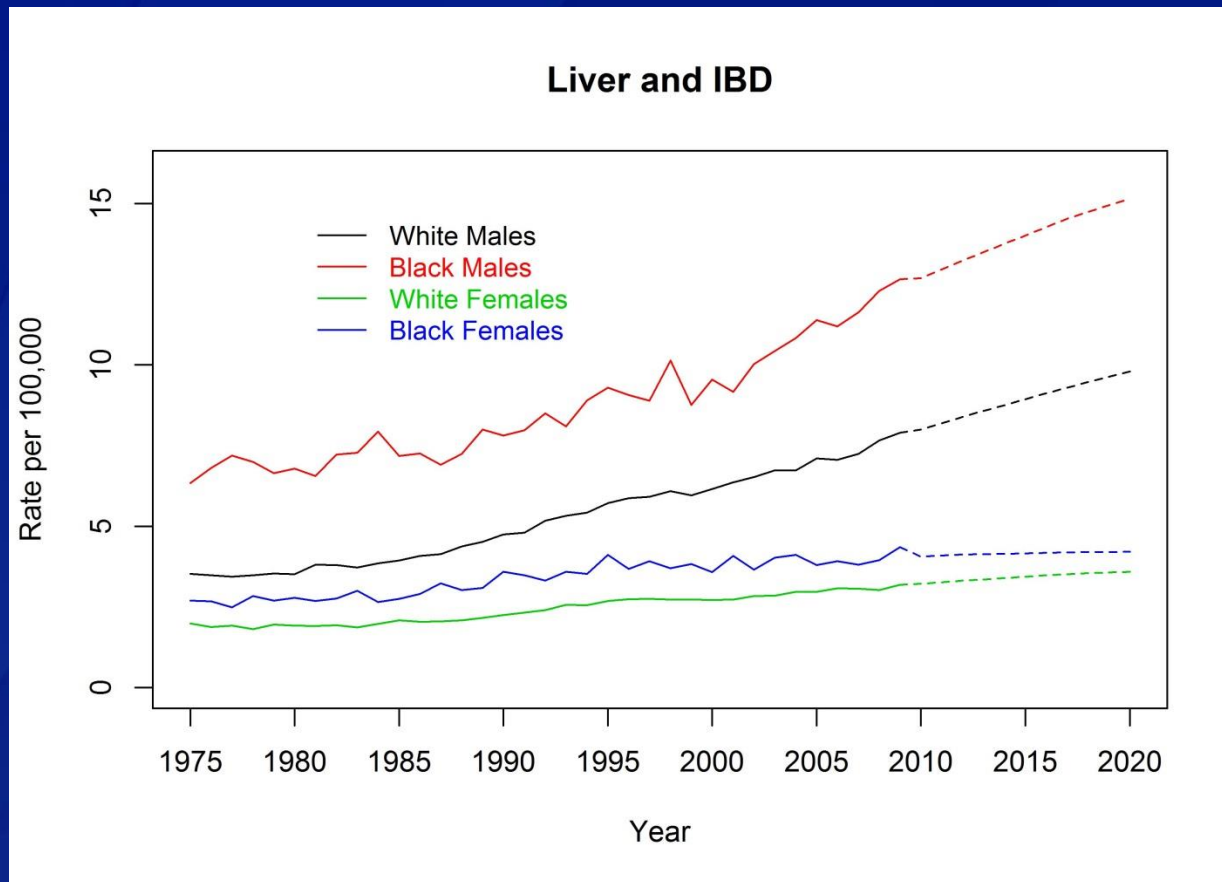


Infectious Etiology

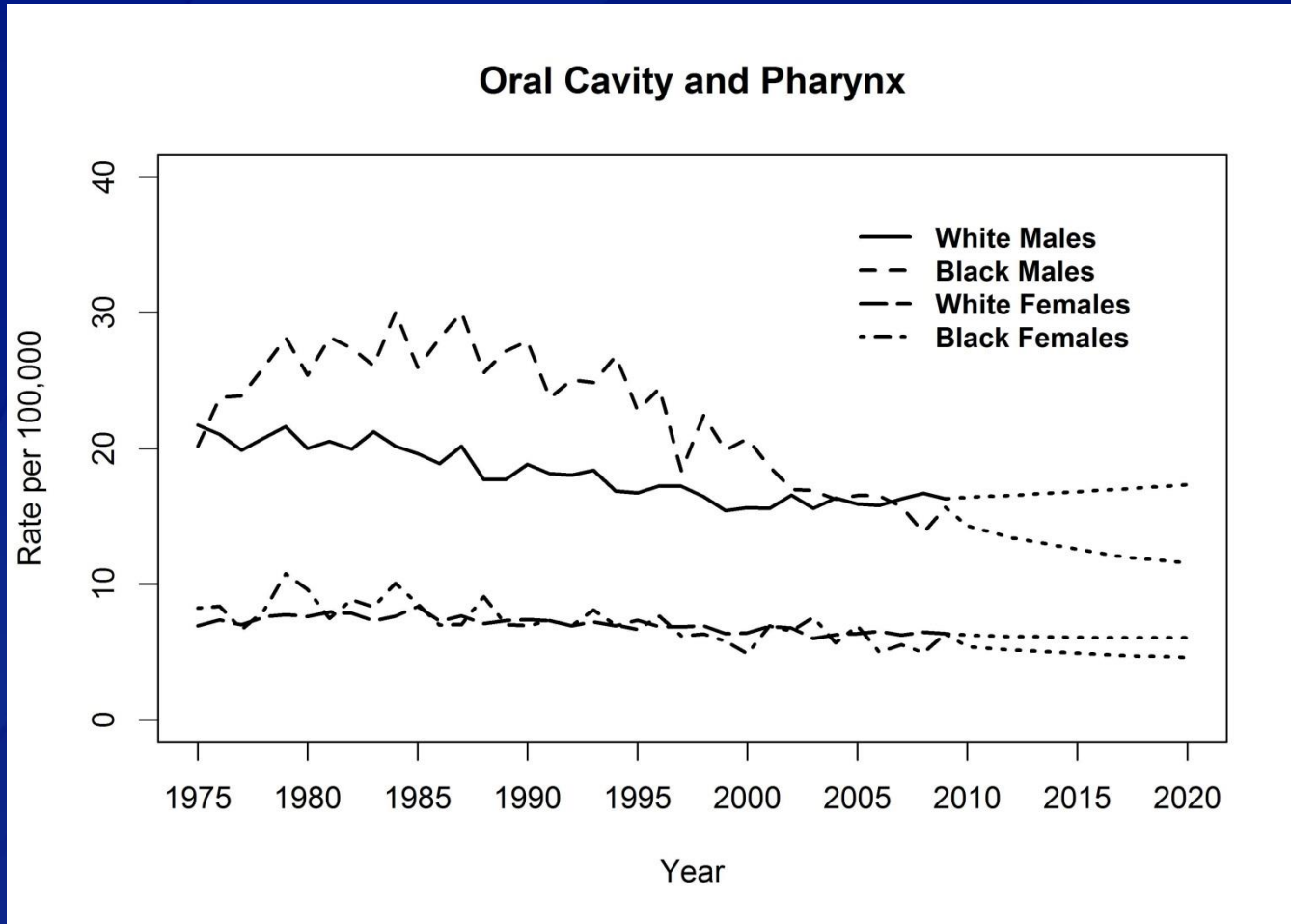
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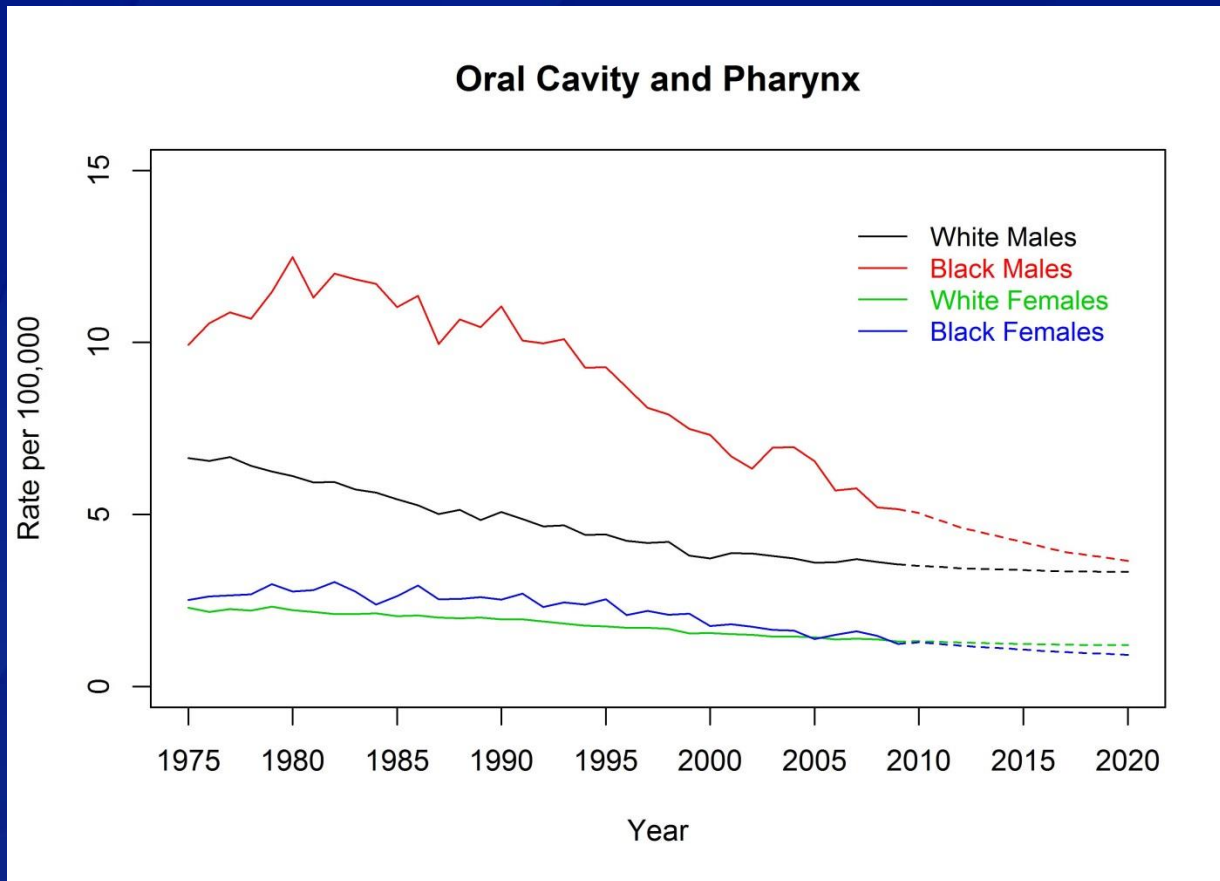
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- ❑ **Uses of projections to inform cancer control**
- ❑ Limitations

Targeting and Evaluating Primary Prevention Strategies



Predicted cancer incident counts (2010 and 2020)

Males	2010	2020	Overall % Change and due to		
			Cancer Site	No.	No.
All Cancer Sites	813,566	1,009,416	24.1	-3.2	27.3
Colon and Rectum	72,275	81,318	12.5	-13.3	25.8
Kidney and Renal Pelvis	32,998	46,330	40.4	16.1	24.3
Larynx	8,298	8,657	4.3	-22.5	26.8
Liver and IBD	20,269	32,781	61.7	38.4	23.3
Lung and Bronchus	98,785	103,636	4.9	-25.4	30.3
Melanoma	44,301	57,594	30.0	6.5	23.5
Mesothelioma	2,339	2,369	1.3	-29.8	31.1
Pancreas	21,619	29,637	37.1	9.2	27.9
Prostate	251,933	329,901	30.9	0.0	30.9
Thyroid	11,476	19,073	66.2	49.6	16.6

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Predicted cancer incident counts (2010 and 2020)

Females	2010	2020	Overall % Change and due to		
			Cancer Site	No.	No.
All Cancer Sites Combined	755,671	911,584	20.6	1.2	19.4
Cervix Uteri	10,253	10,041	-2.1	-13.4	11.4
Colon and Rectum	70,568	76,880	8.9	-11.7	20.7
Corpus and Uterus, NOS	48,301	63,119	30.7	10.3	20.4
Female Breast	227,267	267,693	17.8	0.0	17.8
Kidney and Renal Pelvis	20,162	28,154	39.6	18.7	20.9
Liver and IBD	7,884	12,180	54.5	32.4	22.1
Lung and Bronchus	94,330	106,067	12.4	-13.0	25.4
Melanoma	32,984	43,008	30.4	15.7	14.7
Ovary	22,363	24,393	9.1	-9.6	18.7
Pancreas	21,540	29,035	34.8	11.9	22.9
Thyroid	36,151	60,015	66.0	54.9	11.1

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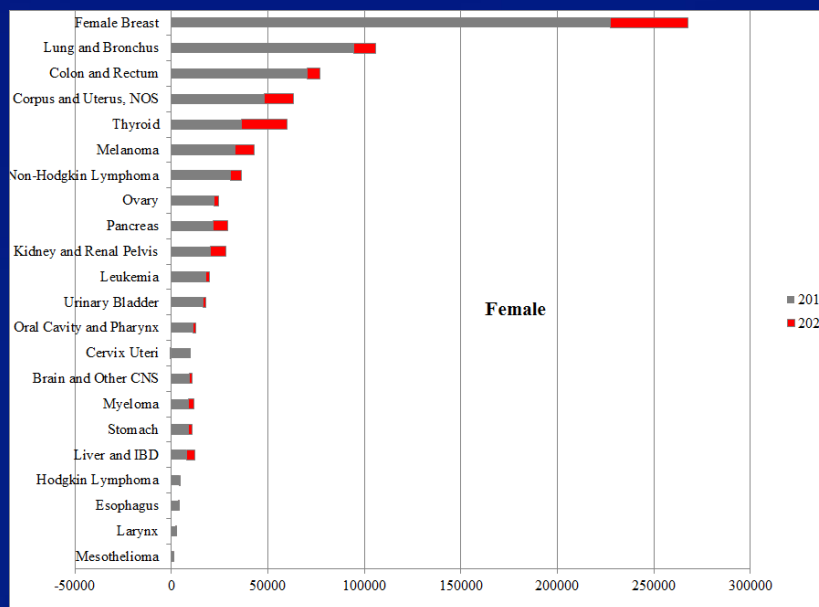
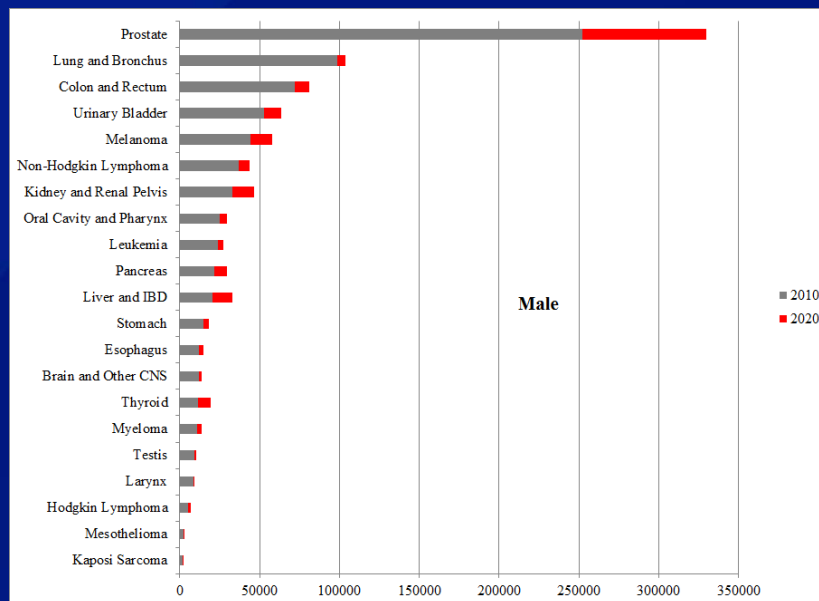
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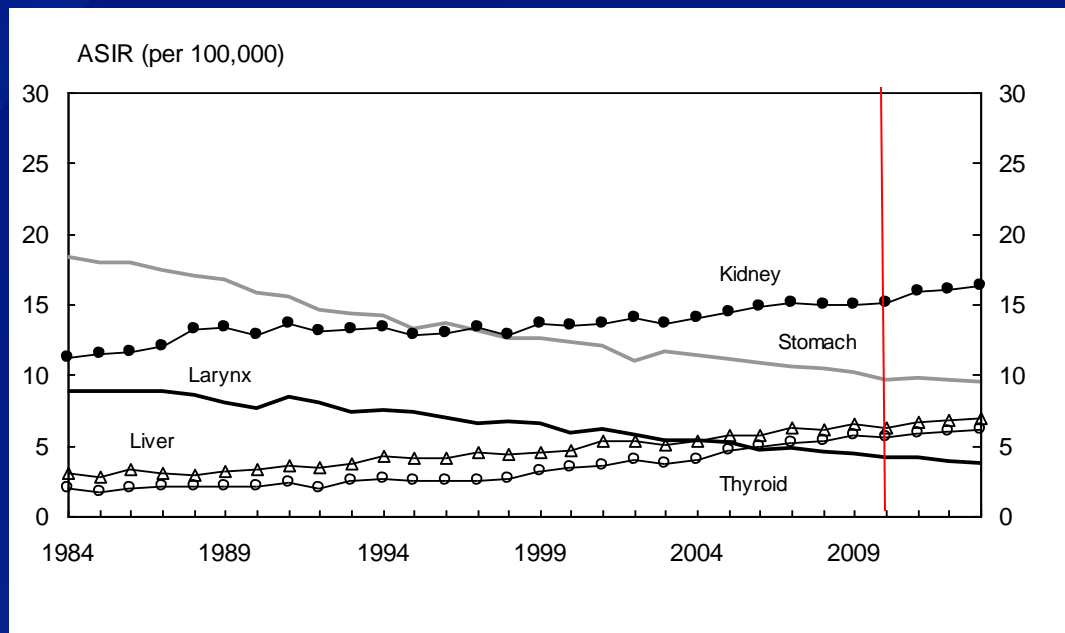
Resource Planning



Short Term Projections

Age-standardized incidence rates (ASIR) for selected* cancers, males, Canada, 1984–2013

- 2013 Canadian Cancer Statistics
- 20 years



**Evaluating Health People 2020 Goals:
reducing cancer mortality**

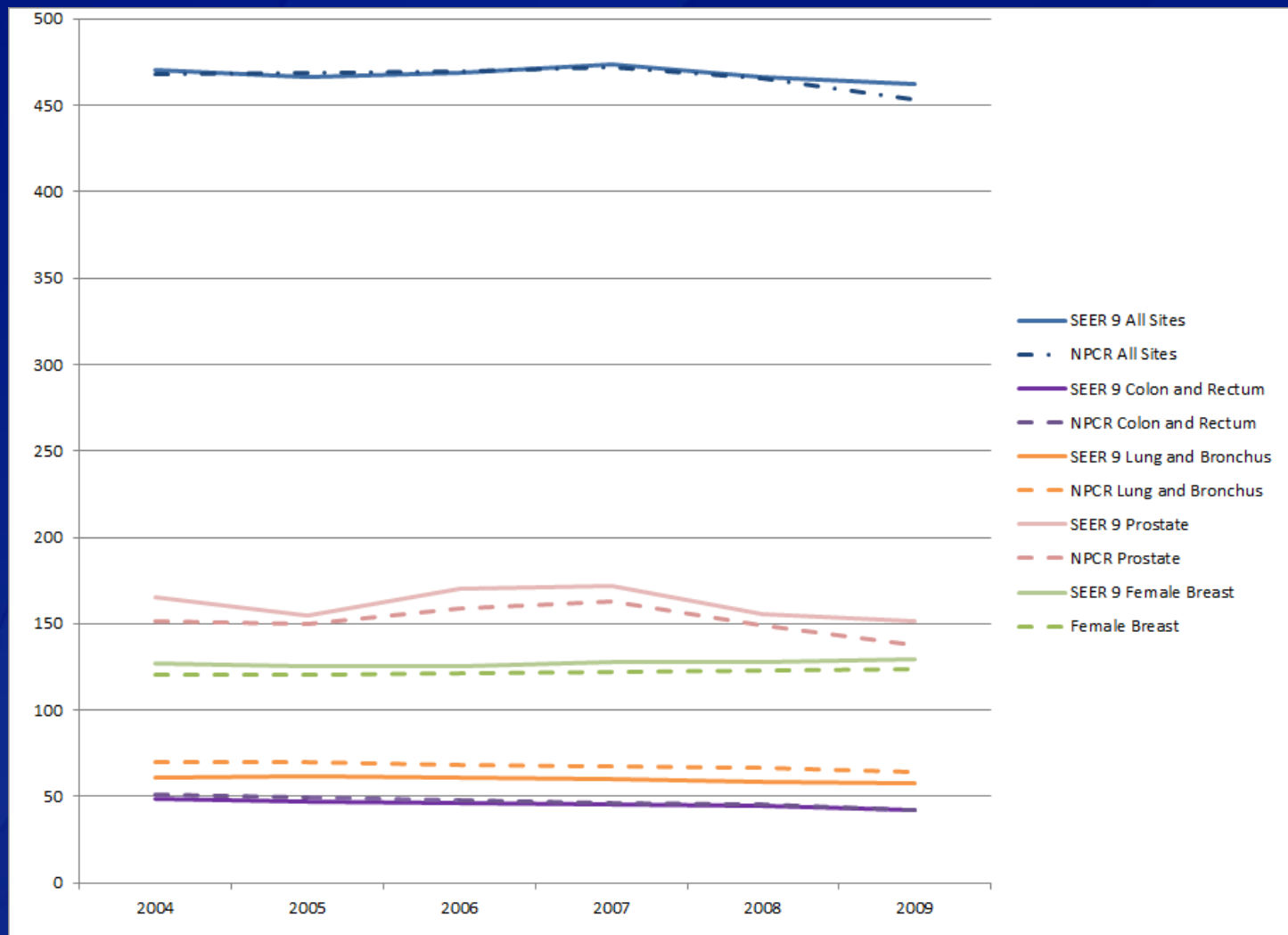
Evaluate Progress Toward Meeting HP 2020 objectives

HP 2020 objective	Site	2007	2020	% change	HP2020	Year HP objectives met
C-1	All Cancer Sites Combined	179.3	151.4	-15.6	161.4	2015
C-2	Lung and Bronchus	50.6	39.8	-21.3	45.5	2013
C-3	Female Breast	23.0	18.5	-19.6	20.7	2013
C-4	Cervix Uteri	2.4	2.1	-12.5	2.2	2011
C-5	Colon and Rectum	17.1	13.1	-23.4	14.5	2013
C-6	Oral Cavity and Pharynx	2.5	2.1	-16.0	2.3	2011
C-7	Prostate	24,2	17.8	-26.4	21.8	2010
C-8	Melanoma	2.7	2,5	-7.4	2,4	-

Objectives

- ❑ Characterize the increasing burden of cancer from 1975-2009
- ❑ Project cases and deaths through 2020
- ❑ Uses of projections to inform cancer control
- ❑ **Limitations**

Are Trends in SEER-9 Comparable to NPCR Trends (2003-2009)



Conclusions

- ❑ Incident cases will increase 20+% between 2010 and 2020 while risk (i.e., AARs) will stabilize for most of the population
- ❑ Tobacco related case counts will stabilize in men and continue to increase in women while AARs decrease
- ❑ Weight related and other cancer case counts and AARs will go up (i.e., melanoma, thyroid, liver)
- ❑ HP2020 cancer mortality objectives on track with exception of melanoma

Thank You

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*The findings and conclusions in this presentation
are those of the presenter and do not necessarily represent
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