

# Geographic Variations in Advanced Stage Cervical Cancer in California

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# California Cancer Registry

- Statewide population based surveillance system
- Has collected data in California on incident cancers since 1988
- Covers the entire population of the state through regional population registries

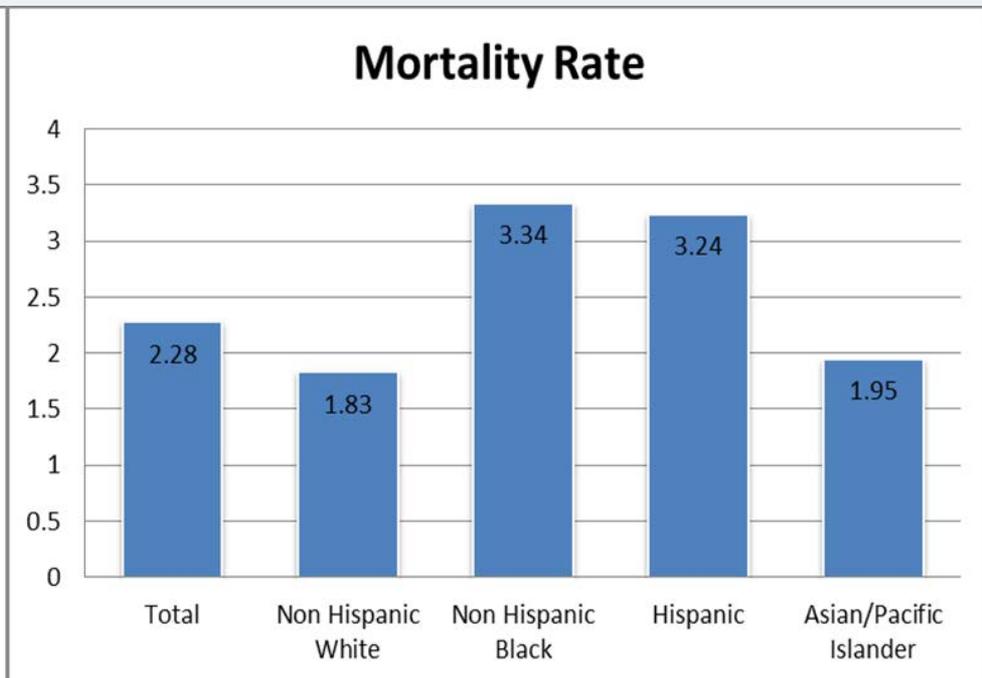
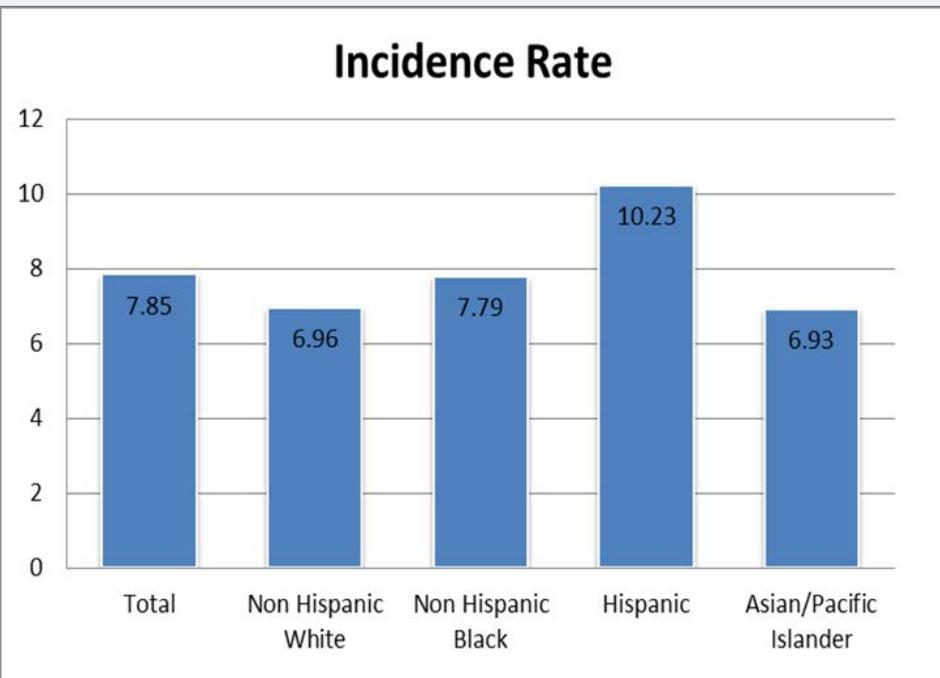
# Objectives

1. Map the proportion of cervical cancer cases diagnosed at an advanced stage by Medical Service Study Area (MSSA)
2. Use logistic regression to explore the relationship of insurance type and demographic factors to diagnosis of cervical cancer at an advanced stage while controlling for age
3. Availability of screening resources

# Background

- Human Papilloma Virus (HPV)
  - Almost all cervical cancers are related to HPV
  - Vaccine available since 2006
- Other risk factors:
  - Smoking, diet, poverty, HIV, immunosuppression
- Cervical cancer screening: Pap tests
  - Begin at age 21
  - Every 3 years for women 21 to 29
  - Ages 30 to 65: every 5 years if co-tested with a HPV test
  - Over 65 do not need testing
  - Survival related to stage: 93% localized vs. 19% distant (5 year survival)

- Incidence and mortality: decreased 50% past 30 years in the United States.
- Still, women are diagnosed with cervical cancer and die from it.
  - 1,405 California women will be diagnosed in 2014
  - 430 will die from it
- Disparities:

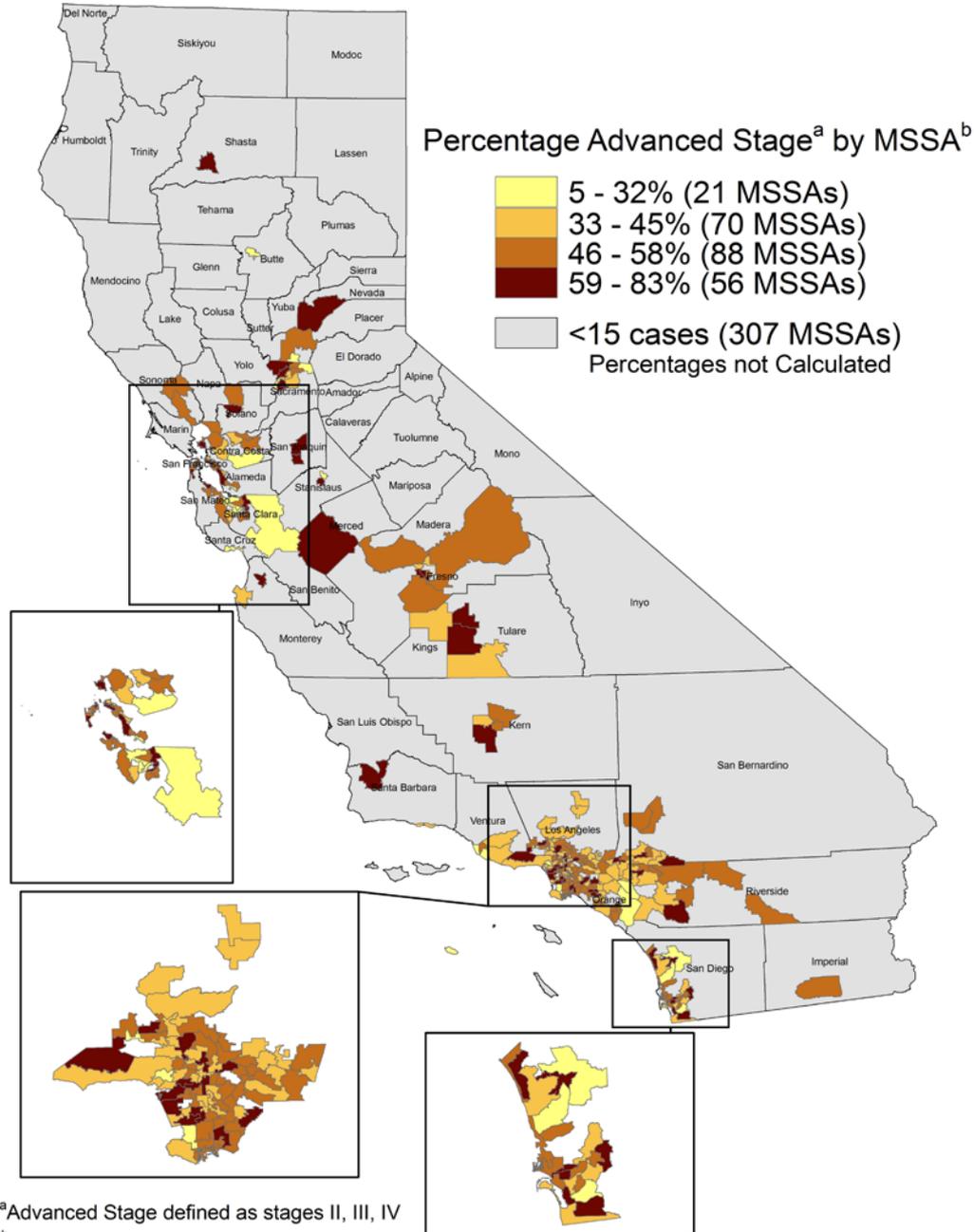


# Objective 1: Create Map

## Methodology:

- Cancer Registry data from 2007 to 2011
  - 7,336 incident cases in 487 MSSAs (Medical Service Study Area)
  - Removed unknown stage, age <18, suppressed MSSAs with <15 cases
  - 235 MSSAs and 5,144 cases are represented in the map
- Map shows the percentage advanced stage in each MSSA
  - Advanced stage defined as stage II, III, and IV
  - Percentages calculated by dividing the number of stage II, III, and IV cases by the total cases in each MSSA.

# Advanced Stage Cervical Cancer in California, 2007-2011



# MSSAs with the Highest Percentages of Late Stage

<b>%Late Stage</b>	<b>COUNTY</b>	<b>MSSA Name</b>	<b>Below 100% Poverty</b>	<b>Below 200% Poverty</b>	<b>Hispanic</b>	<b>White</b>	<b>Black</b>	<b>Asian</b>	<b>Designation</b>
83%	Los Angeles	Exposition Park/Leimert Park	35%	64%	64%	5%	26%	3%	Health Professional, Primary Care, and RN shortage area
78%	Sacramento	Florin/Fruitridge/Oak Park/Parkway/South Sacramento	26%	56%	37%	23%	13%	19%	Primary Care and RN shortage area
76%	Solano	Fairfield	12%	29%	25%	38%	16%	13%	No designation
72%	San Joaquin	Lathrop/Manteca	10%	29%	36%	47%	4%	7%	RN shortage area
71%	Los Angeles	Gardena Southeast/Harbor Gateway Central/Lawndale South/Moneta/Redondo Beach North/Torrance North	11%	30%	34%	25%	11%	26%	Primary Care shortage area

# Objective 2: Predictors of Advanced stage

Characteristic	Stage I (n=3,367)	Stage II, III, IV (n=3,254)
<b>Age</b>		
mean $\pm$ SD (yr)	47 $\pm$ 13	54 $\pm$ 15
Range	26-99	26-98
<b>Race (%)</b>		
Asian/Pacific Islander	45%	55%
Hispanic	52%	48%
Non-Hispanic Black	42%	58%
Non-Hispanic White	52%	48%
Other/Unknown	66%	34%
<b>SES</b>		
1 (Low)	46%	54%
2	50%	50%
3	51%	49%
4	55%	45%
5 (high)	57%	43%
<b>Insurance Type</b>		
Private/Government	60%	40%
Medicare	35%	65%
Medicaid/Low Income	43%	57%
Not Insured	48%	52%
Unknown Source	51%	49%
<b>Rural/Urban</b>		
Urban	51%	49%
Rural	51%	49%

# Results

	OR	95% CI
<b>Race</b>		
Non-Hispanic White	ref	
Asian/Pacific Islander	1.18	1.002-1.38*
Non-Hispanic Black	1.24	0.99-1.56
Hispanic	0.89	0.79-1.001
Other/Unknown	0.61	0.38-0.95*
<b>Insurance Type</b>		
Private/Government	ref	
Medicare	1.24	1.01-1.53*
Medicaid/Low Income	1.70	1.37-2.06*
Not Insured	1.22	0.77-1.97
Unknown	0.96	0.62-1.51
<b>Age by Insurance Type</b>		
Private/Government	1.05	1.04-1.06*
Medicare	1.01	0.99-1.02
Medicaid/Low Income	1.03	1.02-1.04*
Not Insured	1.03	1.01-1.06*
Unknown	1.02	1.001-1.04*

**\*Significant at  $\alpha = .05$**

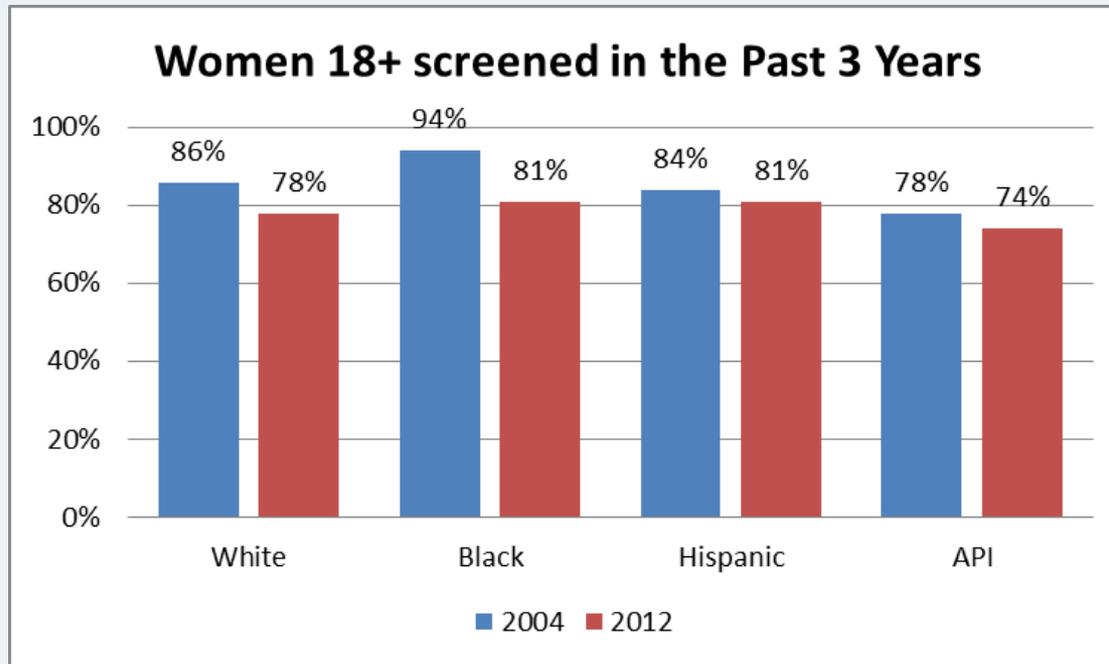
# Objective 3: Screening Resources

- Programs that provide cervical cancer screening to low income women
  - Every Woman Counts (EWC)
  - Family PACT (Planning, Access, Care, and Treatment)
  - FQHCs (Federally Qualified Health Centers)
  - Medi-Cal/Medicare

% Late Stage	COUNTY	MSSA Name	EWC Providers within 5 miles of zip code	Family PACT Providers in zip code	FQHC Providers in zip code
83%	Los Angeles	Exposition Park/Leimert Park	17	5	1
78%	Sacramento	Florin/Fruitridge/Oak Park/Parkway/South Sacramento	12	2	4
76%	Solano	Fairfield	1	4	2
72%	San Joaquin	Lathrop/Manteca	3	4	1
71%	Los Angeles	Gardena Southeast/Harbor Gateway Central/Lawndale South/Moneta/Redondo Beach North/Torrance North	4	6	3

# Screening

- Healthy People 2020 set a target screening rate of 93%
  - Medi-Cal Managed Care: 69.7%



# Conclusion

- Many areas in the state have high proportions of disease diagnosed at advanced stages
- Insurance type and race are associated with the likelihood of a diagnosis beyond Stage I
- Poverty appears to be a barrier to early screening
- Good primary and secondary prevention exists and should be targeted to regions with high proportions
- Some women are missed

# Future Research

- Explore the length of time each woman had the insurance type
- Cultural barriers to screening
- Investigate late stage MSSAs, talk to county health officers
- Compare High and Low MSSAs with similar demographics
- Look at changes going forward with ACA implementation
- See how California compares to other states

# Acknowledgements

## **Preceptor**

Rosemary Cress, DrPH

## **Faculty Advisor**

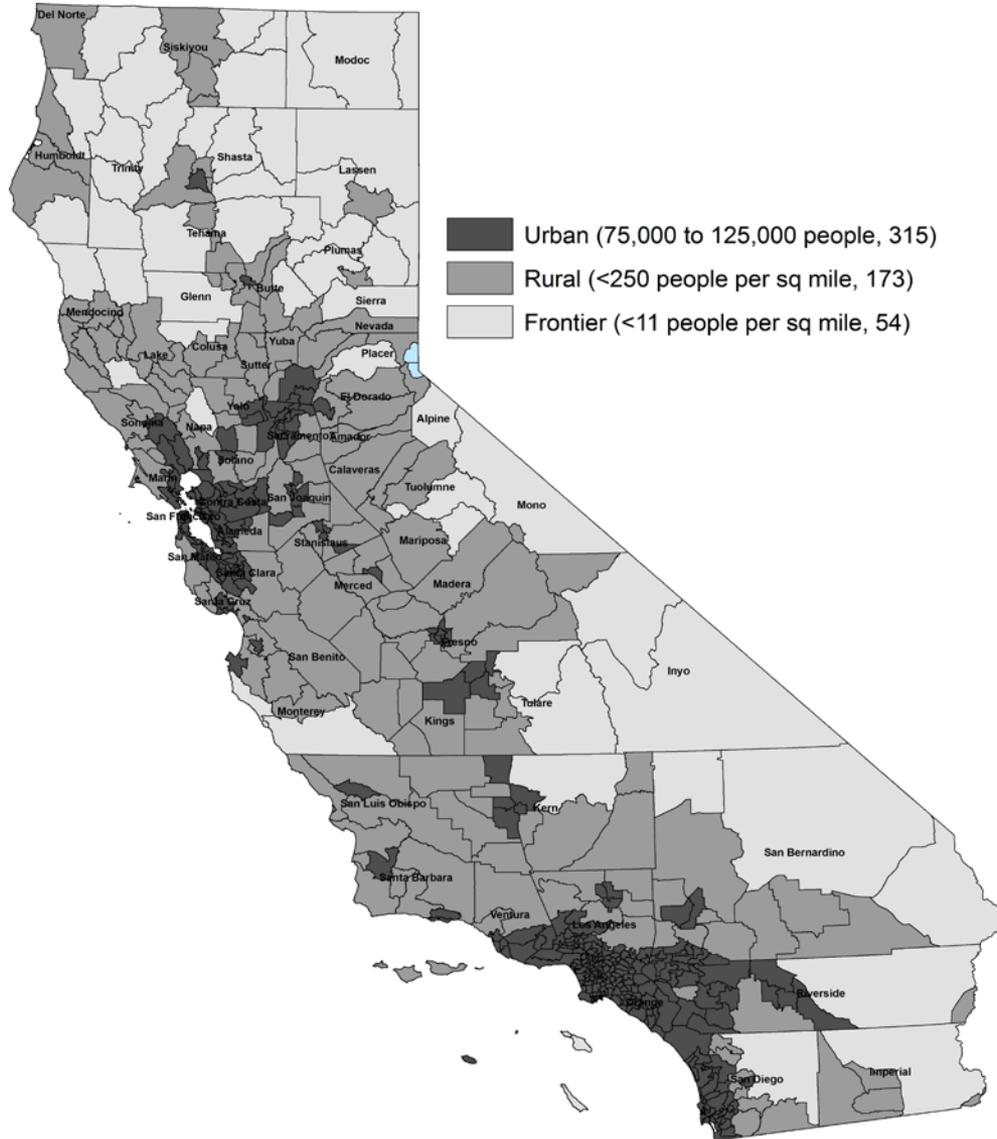
Phil Kass, DVM, MPVM, MS, PhD

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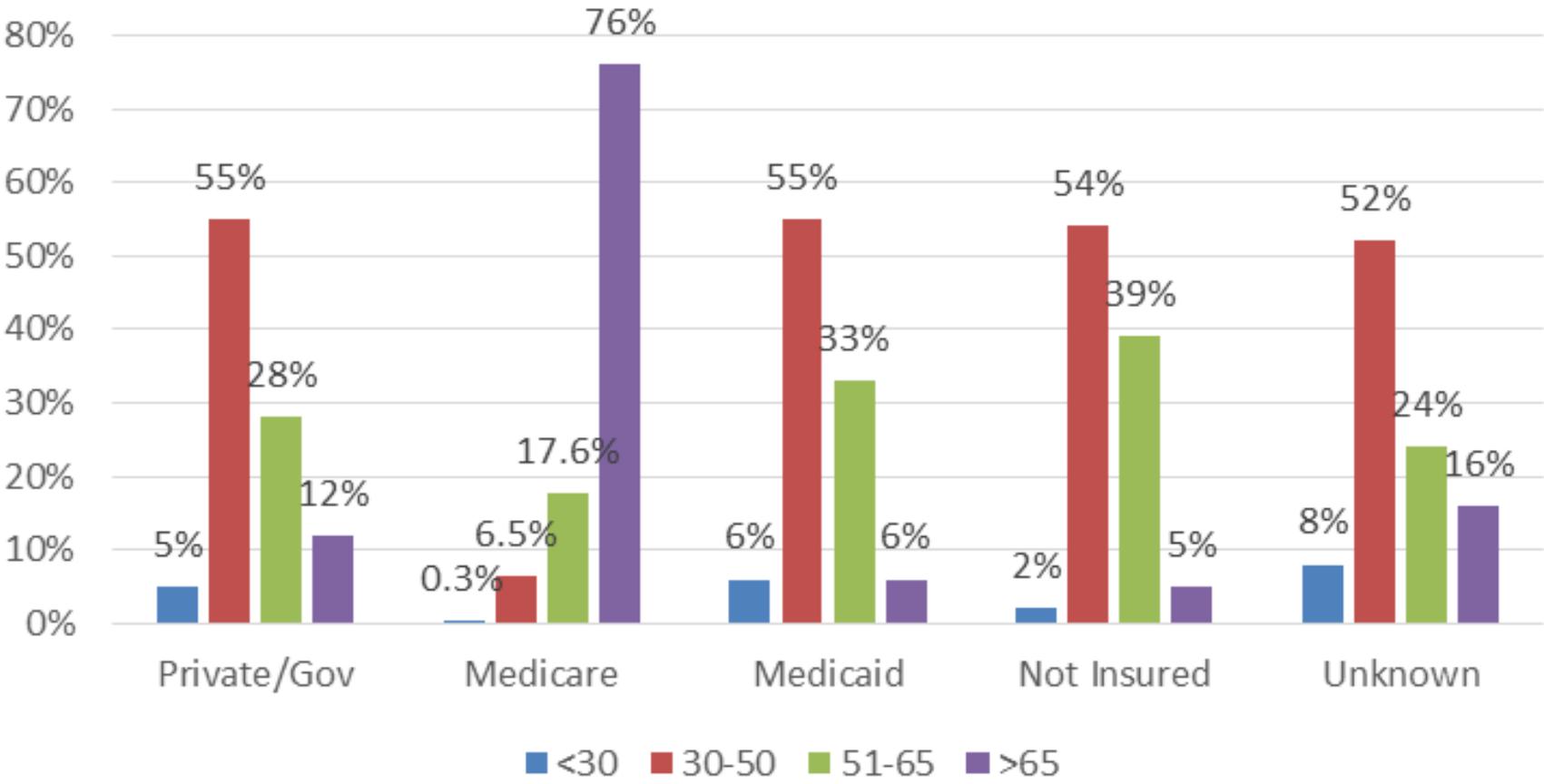
Thank you!

# California Medical Service Study Areas (MSSAs)



		<b>Known Stage (n=6,733)</b>	<b>Unknown Stage (n=601)</b>
<b>Age</b>			
	<26	2%	3%
	26-30	5%	5%
	31-35	9%	6%
	36-40	13%	9%
	41-45	14%	9%
	46-50	13%	11%
	51-55	11%	10%
	56-60	10%	10%
	61-65	7%	9%
	>65	16%	27%
<b>Race</b>			
	Asian/Pacific Islander	14%	9%
	Hispanic	38%	12%
	Non-Hispanic Black	6%	38%
	Non-Hispanic White	41%	36%
	Other/Unknown	2%	4%
<b>SES Quin-Yang quintiles</b>			
	1 (Low)	26%	30%
	2	22%	22%
	3	20%	22%
	4	18%	15%
	5 (High)	14%	11%
<b>Payer</b>			
	Private/Government	50%	13%
	Medicare	10%	27%
	Medicaid/Low Income	33%	7%
	Not Insured	4%	21%
	Unknown Source	3%	31%
<b>Rural/Urban</b>			
	Urban	88%	88%
	Rural	12%	12%

# Age Distribution of Payer Types



# MSSAs with Highest and Lowest Percentages

% Late Stage	County	MSSA Name	100% Poverty	200% Poverty	% NH White	% Hispanic	% NH Black	%Asian
83%	LA	Exposition Park/Leimert Park	35%	64%	6%	60%	29%	4%
78%	Sacramento	Florin/Fruitridge/Oak Park	26%	56%	26%	37%	12%	19%
5%	LA	West LA/Westwood	15%	25%	70%	8%	3%	16%
11%	Alameda	Fremont West/Irvington	7%	21%	31%	25%	4%	35%



Florin



Westwood

# Interaction between Age and Insurance Type

