

SUPPLEMENTARY MATERIALS

Supplementary Table 1. Multivariable adjusted* odds ratio (OR) and 95% confidence intervals (CI) estimates for characteristics associated with later stage† at cancer diagnosis among adolescent and young adults with 9 common cancers, 2005-2014, California

| Characteristics | Stage II-IV (vs I) | Stage III-IV (vs I-II) |
|---|--------------------|------------------------|
| | OR (95% CI) | OR (95% CI) |
| Age at diagnosis, years | | |
| 15-19 | Reference | Reference |
| 20-24 | 1.05 (0.93, 1.18) | 1.05 (0.94, 1.18) |
| 25-29 | 1.00 (0.89, 1.12) | 1.03 (0.92, 1.15) |
| 30-34 | 0.98 (0.87, 1.10) | 0.99 (0.89, 1.11) |
| 35-39 | 1.00 (0.89, 1.12) | 0.98 (0.88, 1.10) |
| Sex | | |
| Male | Reference | Reference |
| Female | 0.71 (0.65, 0.76) | 0.68 (0.63, 0.73) |
| Year of diagnosis | | |
| Mar 2005 - Dec 2009 | Reference | Reference |
| Jan 2010 - Dec 2014 | 0.89 (0.85, 0.93) | 0.90 (0.86, 0.94) |
| Comorbidity | | |
| 0 | Reference | Reference |
| 1 | 1.20 (1.10,1.31) | 1.17 (1.08,1.28) |
| >1 | 1.74 (1.42,2.13) | 2.23 (1.87,2.65) |
| Missing | 0.84 (0.80,0.89) | 0.86 (0.82,0.91) |
| Marital status | | |
| Married | Reference | Reference |
| Not Married | 1.05 (1.00, 1.10) | 1.03 (0.98, 1.09) |
| Unknown | 0.85 (0.76, 0.95) | 0.75 (0.66, 0.84) |
| Facility type | | |
| NCI-designated | Reference | Reference |
| Non NCI-designated | 0.65 (0.62, 0.69) | 0.67 (0.64, 0.71) |
| Race/ethnicity | | |
| Non-Hispanic white | Reference | Reference |
| Non-Hispanic black | 1.30 (1.16, 1.46) | 1.37 (1.24, 1.52) |
| Hispanic | 1.19 (1.12, 1.26) | 1.08 (1.02, 1.14) |
| Asian/Pacific Islander | 1.02 (0.95, 1.10) | 0.98 (0.91, 1.05) |
| American Indian/Alaskan Native | 0.96 (0.72, 1.26) | 0.93 (0.70, 1.23) |
| Other/Unknown | 0.58 (0.49, 0.69) | 0.53 (0.42, 0.65) |
| Urban/ rural residence | | |
| Urban | Reference | Reference |
| Rural | 1.02 (0.94,1.09) | 0.97 (0.91,1.05) |
| Neighborhood socioeconomic status (quintiles) | | |
| 5 (highest) | Reference | Reference |

| | | |
|------------------------|-------------------|-------------------|
| 4 | 1.09 (1.02, 1.16) | 1.07 (0.99, 1.15) |
| 3 | 1.25 (1.16, 1.34) | 1.20 (1.11, 1.29) |
| 2 | 1.30 (1.20, 1.40) | 1.29 (1.20, 1.39) |
| 1 (lowest) | 1.36 (1.25, 1.47) | 1.39 (1.28, 1.51) |
| Health insurance | | |
| Private/ military | Reference | Reference |
| Continuous Medicaid | 1.48 (1.38, 1.60) | 1.39 (1.30, 1.50) |
| Discontinuous Medicaid | 1.89 (1.68, 2.12) | 1.74 (1.57, 1.94) |
| Medicaid at diagnosis | 2.31 (2.12, 2.52) | 2.09 (1.94, 2.25) |
| Other public | 1.01 (0.85, 1.21) | 1.24 (1.05, 1.47) |
| Uninsured | 1.28 (1.13, 1.46) | 1.31 (1.15, 1.49) |
| Unknown | 1.17 (1.00, 1.36) | 1.08 (0.91, 1.28) |

*Adjusted for all variables in the Table and cancer type.

†Unknown stage was imputed into AJCC stage categories based on 5-year survival for each cancer type: melanoma was grouped into stage I; Hodgkin lymphoma, non-Hodgkin lymphoma and testicular cancer were grouped into stage II; breast, cervical, colorectal and thyroid cancer were grouped into Stage III; and ovarian cancer was grouped into stage IV.

Supplementary Table 2. Multivariable adjusted* odds ratio (OR) and 95% confidence intervals (CI) estimates for characteristics associated with later stage at cancer diagnosis among adolescent and young adults with 9 common cancers, 2005-2014, California

| Characteristics | Stage II (vs I) | Stage III (vs I) | Stage IV (vs I) |
|---|-------------------|-------------------|-------------------|
| | OR (95% CI) | OR (95% CI) | OR (95% CI) |
| Age at diagnosis, years | | | |
| 15-19 | Reference | Reference | Reference |
| 20-24 | 0.97 (0.83, 1.12) | 0.99 (0.85, 1.16) | 1.05 (0.86, 1.27) |
| 25-29 | 0.91 (0.78, 1.05) | 0.89 (0.77, 1.03) | 1.15 (0.96, 1.38) |
| 30-34 | 0.91 (0.79, 1.05) | 0.89 (0.77, 1.03) | 1.11 (0.92, 1.32) |
| 35-39 | 0.94 (0.82, 1.09) | 0.89 (0.77, 1.03) | 1.12 (0.94, 1.34) |
| Sex | | | |
| Male | Reference | Reference | Reference |
| Female | 0.84 (0.77, 0.92) | 0.61 (0.55, 0.67) | 0.65 (0.59, 0.72) |
| Year of diagnosis | | | |
| Mar 2005 - Dec 2009 | Reference | Reference | Reference |
| Jan 2010 - Dec 2014 | 0.96 (0.91, 1.02) | 0.95 (0.89, 1.00) | 0.98 (0.91, 1.06) |
| Comorbidity | | | |
| 0 | Reference | Reference | Reference |
| 1 | 1.15 (1.03, 1.29) | 1.25 (1.12, 1.40) | 1.26 (1.10, 1.44) |
| >1 | 1.03 (0.77, 1.36) | 1.78 (1.37, 2.26) | 3.02 (2.34, 3.90) |
| Missing | 0.82 (0.77, 0.87) | 0.72 (0.67, 0.78) | 0.68 (0.62, 0.75) |
| Marital status | | | |
| Married | Reference | Reference | Reference |
| Not Married | 1.06 (1.00, 1.13) | 1.02 (0.95, 1.09) | 1.12 (1.03, 1.22) |
| Unknown | 0.88 (0.77, 1.02) | 0.59 (0.50, 0.69) | 0.74 (0.60, 0.91) |
| Facility type | | | |
| NCI-designated | Reference | Reference | Reference |
| Non NCI-designated | 0.69 (0.64, 0.74) | 0.60 (0.56, 0.64) | 0.52 (0.47, 0.57) |
| Race/ethnicity | | | |
| Non-Hispanic white | Reference | Reference | Reference |
| Non-Hispanic black | 1.13 (0.99, 1.30) | 1.42 (1.24, 1.64) | 1.55 (1.32, 1.82) |
| Hispanic | 1.23 (1.14, 1.32) | 1.24 (1.15, 1.34) | 1.21 (1.10, 1.34) |
| Asian/Pacific Islander | 1.06 (0.97, 1.16) | 0.97 (0.88, 1.08) | 1.03 (0.91, 1.16) |
| American Indian/Alaskan | 1.01 (0.71, 1.45) | 0.99 (0.70, 1.42) | 0.77 (0.46, 1.28) |
| Native | | | |
| Other/Unknown | 0.48 (0.37, 0.63) | 0.32 (0.23, 0.46) | 0.28 (0.18, 0.46) |
| Urban/ rural residence | | | |
| Urban | Reference | Reference | Reference |
| Rural | 1.02 (0.93, 1.12) | 1.04 (0.94, 1.14) | 0.87 (0.77, 0.99) |
| Neighborhood socioeconomic status (quintiles) | | | |
| 5 (highest) | Reference | Reference | Reference |
| 4 | 1.10 (1.01, 1.20) | 1.13 (1.03, 1.24) | 1.10 (0.98, 1.24) |
| 3 | 1.25 (1.14, 1.36) | 1.34 (1.22, 1.48) | 1.29 (1.14, 1.46) |

| | | | |
|-------------------------|-------------------|-------------------|-------------------|
| 2 | 1.22 (1.11, 1.34) | 1.46 (1.32, 1.61) | 1.32 (1.16, 1.51) |
| 1 (lowest) | 1.21 (1.09, 1.34) | 1.58 (1.42, 1.76) | 1.41 (1.23, 1.61) |
| Health insurance | | | |
| Private/ military | Reference | Reference | Reference |
| Continuous Medicaid | 1.34 (1.22, 1.47) | 1.52 (1.38, 1.68) | 1.80 (1.60, 2.03) |
| Discontinuous Medicaid | 1.63 (1.40, 1.89) | 1.98 (1.72, 2.29) | 2.61 (2.19, 3.12) |
| Medicaid at diagnosis | 1.89 (1.71, 2.10) | 2.58 (2.34, 2.86) | 3.82 (3.38, 4.31) |
| Other public | 0.82 (0.65, 1.04) | 1.09 (0.88, 1.36) | 1.14 (0.85, 1.52) |
| Uninsured | 1.15 (0.97, 1.36) | 1.24 (1.05, 1.47) | 1.52 (1.22, 1.91) |
| Unknown | 0.57 (0.44, 0.74) | 0.57 (0.42, 0.77) | 0.93 (0.67, 1.29) |

*Adjusted for all variables in the Table and cancer type.

Supplementary Table 3 Multivariable adjusted* odds ratio (OR) and 95% confidence intervals (CI) estimates for characteristics associated with later stage at cancer diagnosis among adolescent and young adults with 9 common cancers and Medicaid health insurance, 2005-2014, California

| Characteristics | Stage II-IV (vs I) | Stage III-IV (vs I-II) |
|---|--------------------|------------------------|
| | OR (95% CI) | OR (95% CI) |
| Age at diagnosis, y | | |
| 15-19 | Reference | Reference |
| 20-24 | 1.12 (0.91, 1.37) | 1.14 (0.95, 1.37) |
| 25-29 | 1.06 (0.88, 1.29) | 1.19 (1.00, 1.42) |
| 30-34 | 1.10 (0.91, 1.33) | 1.15 (0.96, 1.37) |
| 35-39 | 1.09 (0.90, 1.32) | 1.13 (0.95, 1.35) |
| Sex | | |
| Male | Reference | Reference |
| Female | 0.71 (0.60, 0.84) | 0.63 (0.55, 0.72) |
| Year of diagnosis | | |
| Mar 2005 - Dec 2009 | Reference | Reference |
| Jan 2010 - Dec 2014 | 0.90 (0.82, 0.99) | 0.96 (0.89, 1.05) |
| Comorbidity | | |
| 0 | Reference | Reference |
| 1 | 1.30 (1.10, 1.54) | 1.28 (1.11, 1.47) |
| >1 | 1.72 (1.28, 2.31) | 2.09 (1.63, 2.69) |
| Missing | 0.81 (0.72, 0.90) | 0.86 (0.78, 0.95) |
| Marital status | | |
| Married | Reference | Reference |
| Not Married | 1.06 (0.96, 1.18) | 1.11 (1.01, 1.22) |
| Unknown | 0.79 (0.61, 1.02) | 0.66 (0.51, 0.86) |
| Facility type | | |
| NCI-designated | Reference | Reference |
| Non NCI-designated | 0.71 (0.64, 0.78) | 0.74 (0.67, 0.81) |
| Race/ethnicity | | |
| Non-Hispanic white | Reference | Reference |
| Non-Hispanic black | 1.29 (1.06, 1.57) | 1.43 (1.21, 1.68) |
| Hispanic | 1.14 (1.02, 1.28) | 1.07 (0.97, 1.19) |
| Asian/Pacific Islander | 0.99 (0.82, 1.20) | 1.06 (0.90, 1.25) |
| American Indian/Alaskan Native | 0.92 (0.58, 1.48) | 0.61 (0.38, 0.98) |
| Other/Unknown | 0.32 (0.18, 0.57) | 0.28 (0.14, 0.59) |
| Urban/ rural residence | | |
| Urban | Reference | Reference |
| Rural | 0.95 (0.84, 1.09) | 0.94 (0.83, 1.06) |
| Neighborhood socioeconomic status (quintiles) | | |
| 5 (highest) | Reference | Reference |
| 4 | 0.89 (0.72, 1.10) | 0.98 (0.81, 1.19) |
| 3 | 1.04 (0.85, 1.28) | 1.10 (0.92, 1.32) |

| | | |
|------------------------|-------------------|-------------------|
| 2 | 1.12 (0.92, 1.36) | 1.24 (1.04, 1.48) |
| 1 (lowest) | 1.21 (1.00, 1.46) | 1.29 (1.08, 1.54) |
| Health insurance | | |
| Continuous Medicaid | Reference | Reference |
| Discontinuous Medicaid | 1.28 (1.12, 1.46) | 1.20 (1.06, 1.36) |
| Medicaid at diagnosis | 1.63 (1.47, 1.81) | 1.49 (1.36, 1.64) |

*Adjusted for all variables in the Table and cancer type.

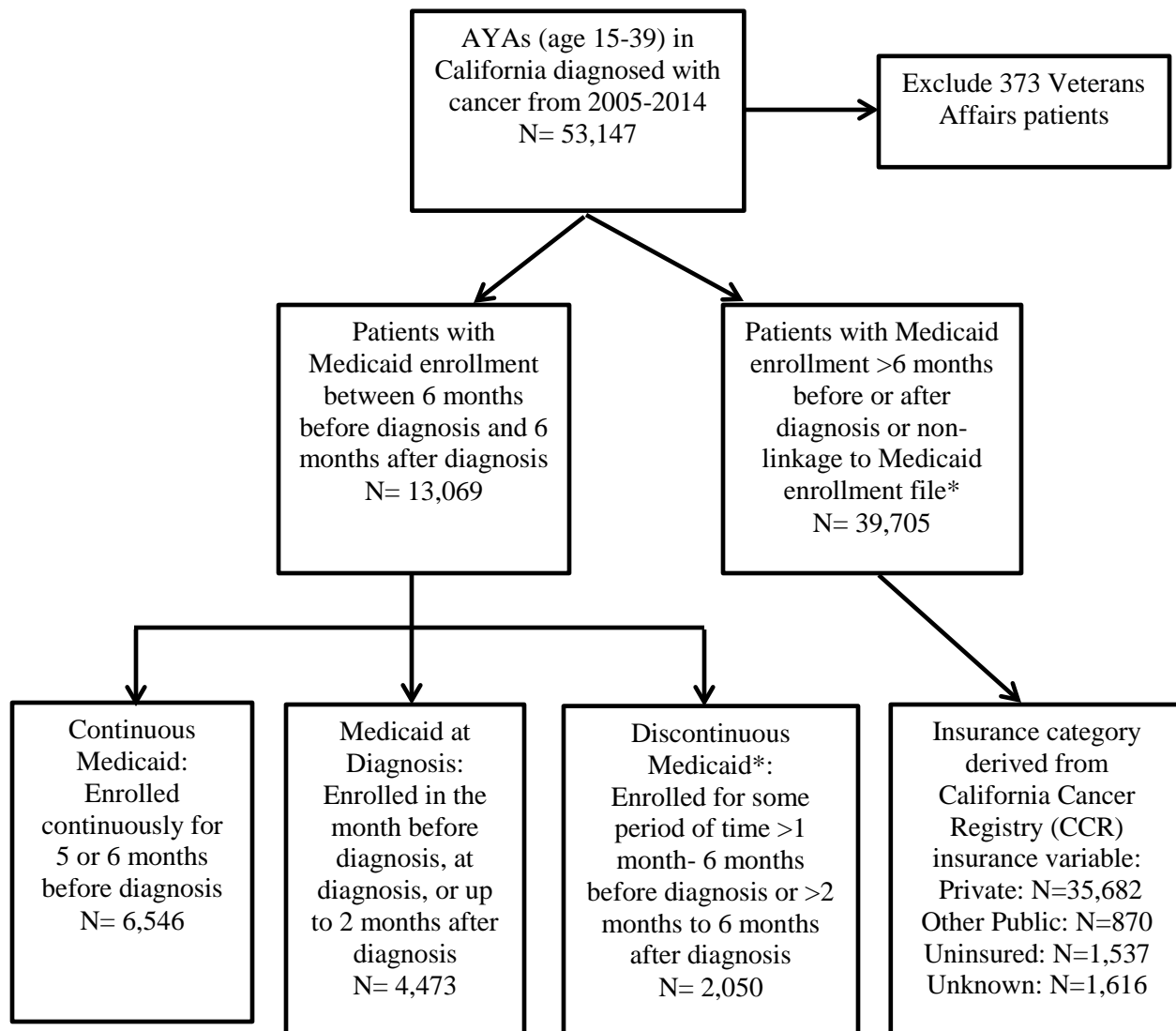
Supplementary Table 4. Multivariable adjusted* odds ratio (OR) and 95% confidence interval (CI) estimates for associations between health insurance type and stage† at cancer diagnosis among adolescent and young adults, by cancer type, 2005-2014, California

| Health Insurance Type | Stage II-IV (vs I) | Stage III-IV (vs I-II) |
|-----------------------------|--------------------|------------------------|
| | OR (95% CI) | OR (95% CI) |
| Breast | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 1.67 (1.41, 1.97) | 1.57 (1.38, 1.80) |
| Discontinuous Medicaid | 2.14 (1.58, 2.91) | 1.86 (1.51, 2.30) |
| Medicaid at diagnosis | 1.78 (1.50, 2.11) | 1.70 (1.48, 1.94) |
| Other public | 1.51 (0.84, 2.72) | 2.18 (1.39, 3.43) |
| Uninsured | 1.36 (0.88, 2.09) | 1.64 (1.15, 2.32) |
| Unknown | 1.18 (0.67, 2.09) | 2.74 (1.72, 4.39) |
| Thyroid | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 1.15 (0.81, 1.64) | 0.77 (0.47, 1.27) |
| Discontinuous Medicaid | 1.46 (0.78, 2.73) | 1.54 (0.72, 3.32) |
| Medicaid at diagnosis | 2.03 (1.14, 3.63) | 1.91 (0.90, 4.05) |
| Other public | 1.04 (0.41, 2.64) | 0.68 (0.16, 2.86) |
| Uninsured | 1.00 (0.48, 2.11) | 0.79 (0.28, 2.20) |
| Unknown | 3.61 (2.10, 6.24) | 4.72 (2.61, 8.55) |
| Melanoma | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 1.85 (1.40, 2.45) | 1.65 (1.19, 2.29) |
| Discontinuous Medicaid | 2.40 (1.48, 3.89) | 1.88 (1.08, 3.26) |
| Medicaid at diagnosis | 4.14 (2.92, 5.86) | 4.41 (3.08, 6.33) |
| Other public | 2.58 (1.52, 4.39) | 2.22 (1.22, 4.02) |
| Uninsured | 1.32 (0.88, 1.98) | 1.43 (0.89, 2.30) |
| Unknown | 0.52 (0.33, 0.81) | 0.35 (0.17, 0.74) |
| Testicular | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 1.51 (1.26, 1.80) | 1.57 (1.26, 1.95) |
| Discontinuous Medicaid | 1.96 (1.56, 2.47) | 1.95 (1.48, 2.56) |
| Medicaid at diagnosis | 2.97 (2.51, 3.52) | 3.87 (3.21, 4.67) |
| Other public | 0.74 (0.55, 1.01) | 0.79 (0.52, 1.19) |
| Uninsured | 1.01 (0.81, 1.25) | 1.07 (0.81, 1.42) |
| Unknown | 1.30 (0.92, 1.83) | 0.52 (0.27, 1.03) |
| Non-Hodgkin lymphoma | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 1.40 (1.13, 1.75) | 1.23 (1.01, 1.51) |
| Discontinuous Medicaid | 1.76 (1.29, 2.41) | 1.45 (1.10, 1.92) |
| Medicaid at diagnosis | 1.45 (1.16, 1.80) | 1.69 (1.38, 2.06) |
| Other public | 1.02 (0.64, 1.62) | 0.93 (0.59, 1.47) |

| | | |
|-------------------------|-------------------|-------------------|
| Uninsured | 1.28 (0.87, 1.89) | 0.95 (0.65, 1.40) |
| Unknown | 2.34 (1.57, 3.49) | 0.80 (0.52, 1.24) |
| Hodgkin lymphoma | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 0.96 (0.67, 1.38) | 1.14 (0.91, 1.42) |
| Discontinuous Medicaid | 1.35 (0.77, 2.35) | 1.63 (1.19, 2.23) |
| Medicaid at diagnosis | 1.73 (1.14, 2.63) | 1.68 (1.35, 2.09) |
| Other public | 0.73 (0.42, 1.29) | 1.56 (1.05, 2.32) |
| Uninsured | 2.48 (1.19, 5.16) | 1.37 (0.98, 1.92) |
| Unknown | 0.73 (0.39, 1.38) | 0.56 (0.33, 0.96) |
| Cervical | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 1.59 (1.31, 1.93) | 1.47 (1.20, 1.80) |
| Discontinuous Medicaid | 2.00 (1.51, 2.63) | 1.75 (1.31, 2.33) |
| Medicaid at diagnosis | 2.77 (2.20, 3.48) | 2.20 (1.74, 2.78) |
| Other public | 1.59 (0.87, 2.89) | 1.62 (0.87, 3.01) |
| Uninsured | 2.80 (1.70, 4.59) | 1.90 (1.14, 3.16) |
| Unknown | 3.41 (2.02, 5.77) | 4.46 (2.62, 7.58) |
| Colorectal | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 1.27 (0.94, 1.71) | 1.11 (0.89, 1.38) |
| Discontinuous Medicaid | 1.72 (1.00, 2.94) | 1.56 (1.06, 2.28) |
| Medicaid at diagnosis | 3.56 (2.25, 5.63) | 1.79 (1.40, 2.31) |
| Other public | 1.27 (0.59, 2.74) | 1.16 (0.68, 1.99) |
| Uninsured | 1.13 (0.66, 1.92) | 1.08 (0.73, 1.60) |
| Unknown | 1.00 (0.46, 2.18) | 1.99 (1.03, 3.86) |
| Ovarian | | |
| Private/Military | Reference | Reference |
| Continuous Medicaid | 1.43 (1.06, 1.94) | 1.45 (1.07, 1.97) |
| Discontinuous Medicaid | 1.57 (0.99, 2.50) | 1.51 (0.95, 2.40) |
| Medicaid at diagnosis | 2.47 (1.75, 3.49) | 2.25 (1.60, 3.16) |
| Other public | 0.59 (0.30, 1.18) | 0.67 (0.33, 1.36) |
| Uninsured | 1.75 (1.07, 2.85) | 2.07 (1.27, 3.37) |
| Unknown | 1.27 (0.50, 3.25) | 1.65 (0.65, 4.23) |

*Each cancer site considered separately and adjusted for age group, sex, comorbidity, marital status, facility type, race/ethnicity, urban/rural residence, neighborhood socioeconomic status and year of diagnosis.

†Unknown stage was imputed into AJCC stage categories based on 5-year survival for each cancer type: melanoma was grouped into stage I; Hodgkin lymphoma, non-Hodgkin lymphoma and testicular cancer were grouped into stage II; breast, cervical, colorectal and thyroid cancer were grouped into Stage III; and ovarian cancer was grouped into stage IV.



Supplementary Figure 1: Classification of health insurance among adolescents and young adults (AYAs) diagnosed with 9 common cancers. *Discontinuous Medicaid includes 32 patients with Medicaid insurance recorded in the CCR but non-linkage to Medicaid enrollment file.