

# Prostate Cancer Screening and Treatment in California: A Close-Up of Geographic Variation

Geographic Variation Series. This Close-Up paper is part of a set of reports that examines the different rates at which certain health care procedures are delivered in communities across the state.<sup>1</sup> The first series of reports uses data from 2005 through 2009 and includes heart surgery, childbirth, joint replacement, hysterectomy, mastectomy, carotid endarterectomy, gall bladder removal, and weight loss surgery. The second series uses data from 2005 through 2010 and includes treatments for breast cancer, prostate cancer, and spinal conditions. The data are based on patients' place of residence and show that procedure rates across the state can vary widely, even in contiguous communities.

Unlike earlier studies of such variation, which have relied on Medicare patient data, this project included data not only for Medicare beneficiaries (both fee-for-service and managed care) but also for patients of a broader age range enrolled in commercial plans and Medicaid, and the uninsured. The data account for age, sex, income, education, health insurance status, race, and other factors. Further information about this set of reports can be found in a research summary paper, "All Over the Map: Elective Procedure Rates in California Vary Widely," www.chcf.org/variation.

# ABOUT ONE IN SIX AMERICAN MEN WILL be diagnosed with prostate cancer at some point

in their lives. Most prostate cancers diagnosed in the United States are localized, meaning confined to the prostate itself. However, these localized prostate cancers are not all the same and have different risks of spreading to other parts of the body and causing harm, including death. Studies suggest that treatment is most likely to help men with higher-risk prostate cancers but may be of little benefit to men with lower-risk disease. Unfortunately, the tests currently available to help doctors estimate the degree of risk from a localized prostate cancer are not always accurate. (For a discussion of the data and analysis used in this study, see Study Methodology later in this paper.)

# **PSA Screening and Biopsy**

The prostate-specific antigen (PSA) test is a blood test that measures levels of a protein, made by the prostate, that can increase when a man develops prostate cancer. The PSA test is the only way to detect prostate cancer before symptoms develop and before it can be detected during a digital rectal exam (DRE). PSA levels can rise for reasons other than cancer, such as an enlarged prostate or a prostate or urinary tract infection, so the test is not always accurate and on its own is not enough to diagnose prostate cancer. About 12% of men who undergo PSA screening have an abnormal result, but most are false positives, which is a high reading but with no cancer in the prostate. The PSA test also produces false negatives about 15% of the time, which is a failure to detect cancer in the prostate.

If a man's PSA level is abnormal, his doctor may recommend another PSA test or a prostate biopsy to determine whether he has cancer. A prostate biopsy can be uncomfortable and cause shortterm, minor complications such as blood in the urine. Serious infections — sometimes requiring hospitalization — affect up to 2% of men who undergo the procedure. Death as a result of infections and other complications of biopsy is rare. If prostate cancer cells are found in the biopsy samples, the patient and physician need to decide whether to treat the cancer immediately, and how to do so, or to pursue active surveillance rather than treatment.

Medical experts do not agree about whether men should undergo regular PSA screening tests. Some experts think the PSA is valuable because it is CLOSE-UP

the only way to detect cancer early; they cite national data showing that death rates from prostate cancer have steadily declined after the introduction of PSA screening. However, others are concerned that widespread PSA screening is leading to overdiagnosis of prostate cancer (detecting cancers that would not cause harm if they were not discovered or were discovered later). Some experts now believe that as many as half of men who are currently diagnosed with localized prostate cancer do not need treatment, as their cancers are not likely to cause symptoms or death if left undiagnosed or untreated.

# **Treatment Options**

There are three common treatment choices for men diagnosed with localized prostate cancer:<sup>2</sup>

- No treatment, but most often the cancer is monitored (called "active surveillance") to see whether and how it progresses<sup>3</sup>
- Prostatectomy, or surgical removal of the prostate
- Radiation, which kills cancer cells through targeted, intense energy

For a patient to make the choice that is best for him, he needs to understand whether his prostate cancer is low- or high-risk. Doctors estimate risk by studying the results of a man's PSA test, biopsy results, and a DRE. In addition, factors such as the patient's age, overall health, and personal preferences are important to consider in making a treatment choice. As for any elective treatment, a patient's own values and level of comfort with uncertainty in outcomes should be considered alongside the clinician's recommendations. Men with localized prostate cancer should consider their feelings about the potential benefits and harms involved, and the cost, time, and energy required for each treatment, and for no treatment.

# No Treatment

If their cancer is identified as low-risk — usually meaning small and slow-growing — some patients choose to forego any treatment unless and until it becomes medically necessary. Most of these patients undergo active surveillance, which involves the physician monitoring the tumor in order to detect any progression of the disease. (See sidebar.)

### **Active Surveillance**

Most patients who choose to forego a prostatectomy or radiation therapy following a diagnosis of localized prostate cancer undergo active surveillance of the disease. This involves having regular follow-up PSA tests, DREs, and prostate biopsies to determine whether a prostate tumor remains small and slow-growing or shows signs of becoming larger and more aggressive. Experts differ about how frequently these tests should take place, but the goal is to detect the earliest sign of cancer progression so that a patient can decide whether to pursue treatment.

Active surveillance is an option for men with low-risk localized cancer who want to avoid or delay treatment (and the resulting side effects) unless and until it is necessary. If the cancer remains slow-growing and never causes problems, they can avoid treatment entirely. However, active surveillance has drawbacks. Men who choose this option must cope with the anxiety of knowing they have cancer that might progress. They also experience the stress of undergoing periodic follow-up tests, including biopsies that can be painful and cause unpleasant and potentially dangerous side effects. And because no test is perfect, there is always a slight chance that untreated prostate cancer could eventually spread beyond the point of cure.

# Radical Prostatectomy

Surgery to treat prostate cancer, called radical prostatectomy, involves removing the entire prostate gland. Currently, the most common type of surgery to remove the prostate is robotic-assisted laparoscopic prostatectomy, in which a surgeon manipulates a robotic device that is inserted through small incisions in the patient's abdomen. It is unclear whether robotic surgery leads to improved outcomes compared to the older, open surgical methods still used in a minority of surgeries.

Studies suggest that the benefits of radical prostatectomy depend on how aggressive the prostate cancer is. Most prostate cancers are either low- or medium-risk. A recently published American study that compared surgery with no treatment found that, at the 10-year mark following diagnosis:<sup>4</sup>

- For men with low-risk localized prostate cancer, surgery did not reduce the chance of death from the cancer or its spread to the bones.
- However, for men with higher-risk localized prostate cancer, surgery did reduce the chance of death from the cancer and also its spread to the bones.

It should be noted, however, that the results of this study are limited by the length of the follow-up period. Most men in their 50s or 60s could reasonably expect to live another 25 to 35 years, and the study does not provide evidence about how surgery versus active surveillance would compare over this longer period.

Long-term side effects of prostate surgery are common, including incontinence, urine leakage, bowel problems, and erectile dysfunction. However, serious complications, such as pneumonia or a blood clot in the legs or lungs, are rare from prostate surgery, as is death.

# **Radiation Therapy**

Radiation therapy kills cancer cells using focused, intense energy. The two main types of radiation therapy for early-stage prostate cancer are external beam radiation and brachytherapy, sometimes called radiation seeds or implants. For high-risk cancers, these approaches may be combined.

External beam radiation aims radiation at the tumor to kill cancer cells. Current approaches, such as intensity modulated radiation therapy, proton beam therapy, and stereotactic body radiation, target the tumor while attempting to minimize damage to surrounding tissues.

There are two types of brachytherapy. In low-dose, or seed brachytherapy, small radioactive "seeds" are surgically implanted in the prostate gland. The seeds deliver radiation directly to the cancer and usually stay in place for the rest of a man's life, even after the radiation is no longer emitted. In high-dose brachytherapy, radiation is delivered to the prostate via catheters that are removed after treatment is complete. As yet there is no good evidence that any one of these radiation treatments is better than another because sufficient studies of the question have not been completed and published.

Long-lasting side effects of radiation therapy are common, including bloody stools, rectal pain, and other bowel problems; urinary obstruction, pain, irritation, and other urinary difficulties; and erectile dysfunction.

# **Geographic Variation in Treatment Rates**

Patients in several California communities undergo radical prostatectomy, external beam radiation, brachytherapy, and procedures to detect prostate cancer at rates notably higher or lower than the state rate.<sup>5</sup> See Figure 1 on page 4.





### DATA VARIATION ANALYSES

#### Brachytherapy for Prostate Cancer (featured in the map above)

- Men living in Tracy HSA (Stockton HRR) are at least 18 times as likely to receive brachytherapy for prostate cancer as men in Oceanside HSA (San Diego HRR).
- Men living in Indio HSA (San Diego HRR) are at least 15 times as likely to receive brachytherapy for prostate cancer as men in La Jolla HSA (San Diego HRR).

#### **External Beam Radiation**

- Men living in Vallejo HSA (San Francisco HRR) are at least 3.2 times as likely to undergo external beam radiation for prostate cancer as men living in Sonoma HSA (Santa Rosa HRR).
- Men living in Fairfield HSA (Contra Costa HRR) are at least 2.6 times as likely to undergo external beam radiation for prostate cancer as men living in Ridgecrest HSA (San Bernardino HRR).

#### **PSA Screening for Prostate Cancer (Medicare Recipients)**

- Men over age 68 living in Colusa HSA (Sacramento HRR) are at least 2.6 times as likely to receive a PSA test to screen for prostate cancer as men over 68 living in Napa HSA (Napa HRR).
- Men over age 68 living in Lompoc HSA (Santa Barbara HRR) are at least 2.4 times as likely to receive a PSA test to screen for prostate cancer as men over 68 living in Fairfield HSA (Contra Costa HRR).

#### **Biopsy for Prostate Cancer (Medicare Recipients)**

- Men over age 68 living in Salinas HSA (Salinas HRR) are at least 2.8 times as likely to undergo biopsy for prostate cancer as men over 68 living in San Pablo HSA (San Francisco HRR).
- Men over age 68 living in Hollister HSA (San Jose HRR) are at least 2.4 times as likely to undergo biopsy for prostate cancer as men over 68 living in Auburn HSA (Sacramento HRR).

#### **Radical Prostatectomy**

- Men living in Monterey Park HSA (Los Angeles HRR) are at least twice as likely to undergo radical prostatectomy as men living in Vacaville HSA (Contra Costa HRR).
- Men living in Tarzana HSA (Los Angeles HRR) are at least 1.8 times as likely to undergo radical prostatectomy as men living in Fort Bragg HSA (Napa HRR).

#### **No Treatment**

- Men living in Willits HSA (Napa HRR) are at least three times as likely to forego any treatment for prostate cancer as men living in Bakersfield HSA (Bakersfield HRR).
- Men living in Novato HSA (San Francisco HRR) are at least 2.5 times as likely to forego any treatment for prostate cancer as men living in South Lake Tahoe HSA (Sacramento HRR).

DEFINITIONS: For purposes of data analysis, a patient's community of residence is identified by a **hospital service area (HSA)**, which designates a local health care market for community-based inpatient care. An HSA can include more than one city or town. **Hospital referral region (HRR)** designates a health care market for tertiary medical care, which is based on where patients receive major cardiovascular surgery and neurosurgery. Each HRR includes at least one HSA with a hospital or hospitals that perform major cardiovascular procedures or neurosurgery.

In two of eight HSAs in Contra Costa HRR, men age 40 to 64 were at least 1.5 times as likely to undergo external beam radiation for prostate cancer compared with the state rate. In those two HSAs, men aged 65 and older were slightly more likely than the state average to undergo the treatment. See Figure 2.

**Note regarding Figures 2 through 4:** The black vertical line at the top of each bar displays the range of confidence intervals. This range is used when comparing HSA rates to each other and to the state rate.





In all but 3 of 12 HSAs in San Diego HRR, men of all ages were less likely to receive brachytherapy treatment for prostate cancer compared with the state average. In Indio HSA, men of all ages were at least twice, and as much as five times, as likely to receive brachytherapy treatment compared with the state average. See Figure 3.



Figure 3. Brachytherapy Radiation for Prostate Cancer, Selected HSAs in San Diego HRR Compared to State Rate by Patient Age Group, 2005–2010

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In most HSAs in Napa HRR, men were more likely than the state average to get no treatment, and less likely than the state average to undergo radical prostatectomy. See Figure 4.



Figure 4. Prostate Cancer Treatments, HSAs in Napa HRR Compared to State Rate, Age 40+, 2005-2010

**Note regarding Figures 5 through 10:** Each dot represents the rate for a procedure in a single California HSA. Dots at the top and bottom of the graphs represent the extremes in rates. The narrower the graph, the greater the variation in rates across HSAs.



### Figure 5. Screening PSA Test for Prostate Cancer, Age 68+, by HSA, 2005–2010

### Figure 6. Biopsy for Prostate Cancer, Age 68+, by HSA, 2005-2010

| Highest Rates                   | PER<br>100,000 |
|---------------------------------|----------------|
| King City (Salinas HRR)         | 40             |
| Salinas (Salinas HRR)           | 33             |
| Hollister (San Jose HRR)        | 33             |
| Lakewood (Los Angeles HRR)      | 31             |
| Gilroy (San Jose HRR)           | 30             |
| Loma Linda (San Bernardino HRR) | 26             |
| San Ramon (Contra Costa HRR)    | 26             |
| Encino (Los Angeles HRR)        | 25             |
| Lompoc (Santa Barbara HRR)      | 24             |
| Tracy (Stockton HRR)            | 23             |
| State Bate                      | 16             |



### Figure 7. Radical Prostatectomy, Age 40+, by HSA, 2005-2010

| Highest Rates                      | PER<br>100,000 |
|------------------------------------|----------------|
| Avalon (Los Angeles HRR)           | 179            |
| Monterey Park (Los Angeles HRR)    | 154            |
| Tarzana (Los Angeles HRR)          | 143            |
| Big Bear Lake (San Bernardino HRR) | 141            |
| Greenville (Chico HRR)             | 137            |
| Lompoc (Santa Barbara HRR)         | 137            |
| Fullerton (Orange HRR)             | 136            |
| Templeton (San Luis Obispo HRR)    | 134            |
| Lynwood (Los Angeles HRR)          | 134            |
| West Covina (Los Angeles HRR)      | 131            |
| State Rate                         | 97             |



#### Figure 8. External Beam Radiation for Prostate Cancer, Age 40+, by HSA, 2005-2010



### Figure 9. Brachytherapy for Prostate Cancer, Age 40+, by HSA, 2005–2010

| Highest Rates                     | PER<br>100,000 |
|-----------------------------------|----------------|
| Tracy (Stockton HRR)              | 120            |
| Indio (San Diego HRR)             | 117            |
| Weaverville (Redding HRR)         | 117            |
| Fall River Mills (Redding HRR)    | 111            |
| Fairfield (Contra Costa HRR)      | 90             |
| South Lake Tahoe (Sacramento HRR) | 90             |
| King City (Salinas HRR)           | 86             |
| Gilroy (San Jose HRR)             | 79             |
| Santa Cruz (Santa Cruz HRR)       | 73             |
| Willits (Napa HRR)                | 72             |
| State Rate                        | 25             |
|                                   |                |



# Figure 10. No Treatment, for Prostate Cancer, Age 40+, by HSA, 2005-2010

| Highest Rates                     | PER<br>100,000 |
|-----------------------------------|----------------|
| Willits (Napa HRR)                | 156            |
| Greenville (Chico HRR)            | 145            |
| Garberville (Napa HRR)            | 143            |
| Chester (Chico HRR)               | 132            |
| Novato (San Francisco HRR)        | 118            |
| Greenbrae (San Francisco HRR)     | 116            |
| Avalon (Los Angeles HRR)          | 116            |
| Gridley (Sacramento HRR)          | 111            |
| Lakeport (Napa HRR)               | 104            |
| Fort Bragg (Napa HRR)             | 101            |
| Lowest Rates                      |                |
| Fairfield (Contra Costa HRR)      | 34             |
| Bakersfield (Bakersfield HRR)     | 31             |
| El Centro (San Diego HRR)         | 27             |
| Coalinga (Fresno HRR)             | 20             |
| South Lake Tahoe (Sacramento HRR) | 14             |
| State Rate                        | 60             |



#### Table 1. Prostate Cancer Screening and Treatments, by California Hospital Service Area (HSA), 2005–2010

HOW TO USE THIS TABLE: In Alameda HSA, for example, residents undergo PSA test screening at between 48% and 64% of the state rate. That means they are at least 36% less likely than the average Californian to undergo the test.

Notes: An HSA can include both the city for which it is named as well as surrounding areas. Confidence intervals describe a range and are listed in parentheses. For example, 57% - 70% indicates that, with 95% confidence, the range of possible values spans from 57% to 70% of the state rate. Blank cells indicate insufficient data. Color codes are for reader convenience only. Values above the state rate are assigned a color code based on the low end of the confidence range; values below the state rate are assigned a color code based on the high end of the confidence range.



Less than 50%
 200% to 249%
 120% to 149%
 250% to 299%
 150% to 199%
 300%+

|               | PSA Screening          | PSA Screening Biopsy Prostatector |                        |                        | External Beam          | Brachytherapy          | No Treatmen |
|---------------|------------------------|-----------------------------------|------------------------|------------------------|------------------------|------------------------|-------------|
|               | Compared to state rate | Compared to state rate            | Compared to state rate | Compared to state rate | Compared to state rate | Compared to state rate |             |
|               | of 340 per 100,000     | of 16 per 100,000                 | of 97 per 100,000      | of 67 per 100,000      | of 25 per 100,000      | of 60 per 100,000      |             |
| California    | 100%                   | 100%                              | 100%                   | 100%                   | 100%                   | 100%                   |             |
| Alameda       | 55%                    | 54%                               | 97%                    | 78%                    | 191%                   | 115%                   |             |
|               | (48%–64%)              | (27%–107%)                        | (76%–124%)             | (56%–108%)             | (134%–271%)            | (86%–153%)             |             |
| Anaheim       | 108%                   | 107%                              | 114%                   | 79%                    | 70%                    | 90%                    |             |
|               | (104%–113%)            | (88%–130%)                        | (103%–126%)            | (68%–91%)              | (54%–90%)              | (79%–104%)             |             |
| Antioch       | 92%                    | 80%                               | 80%                    | 120%                   | 110%                   | 95%                    |             |
|               | (85%–99%)              | (56%–113%)                        | (69%–94%)              | (102%–141%)            | (84%–144%)             | (79%–115%)             |             |
| Apple Valley  | 95%                    | 75%                               | 134%                   | 129%                   | 56%                    | 84%                    |             |
|               | (87%–103%)             | (49%–115%)                        | (113%–158%)            | (105%–158%)            | (34%–94%)              | (66%–107%)             |             |
| Arcadia       | 120%                   | 95%                               | 113%                   | 89%                    | 88%                    | 112%                   |             |
|               | (115%–127%)            | (73%–123%)                        | (99%–129%)             | (74%–107%)             | (67%–117%)             | (95%–132%)             |             |
| Arcata        | <b>89%</b>             | 85%                               | 108%                   | 136%                   | 96%                    | 78%                    |             |
|               | (81%–98%)              | (54%–133%)                        | (79%–147%)             | (100%–185%)            | (52%–178%)             | (49%–123%)             |             |
| Arroyo Grande | 113%                   | 47%                               | 128%                   | 68%                    | 31 %                   | 108%                   |             |
|               | (107%–120%)            | (30%–73%)                         | (108%–152%)            | (50%–93%)              | (15%–62%)              | (82%–142%)             |             |
| Auburn        | 99%                    | 38%                               | 70%                    | 125%                   | 150%                   | 75%                    |             |
|               | (93%–105%)             | (24%–63%)                         | (58%–84%)              | (105%–149%)            | (116%–195%)            | (59%–96%)              |             |
| Avalon        | 81%<br>(55%–113%)      |                                   | 185%<br>(91%–373%)     | 113%<br>(36%–355%)     |                        | 193%<br>(86%–434%)     |             |
| Bakersfield   | 124%                   | 87%                               | 77%                    | 103%                   | 218%                   | 52%                    |             |
|               | (120%–128%)            | (72%–105%)                        | (69%–86%)              | (92%–115%)             | (188%–253%)            | (45%–60%)              |             |
| Banning       | 123%                   | 97%                               | 87%                    | 78%                    | 164%                   | 101%                   |             |
|               | (114%–133%)            | (61%–152%)                        | (69%–110%)             | (60%–101%)             | (120%–225%)            | (78%–130%)             |             |
| Barstow       | 95%                    | 60%                               | 114%                   | 107%                   | 44%                    | 84%                    |             |
|               | (85%–106%)             | (31%–116%)                        | (84%–154%)             | (75%–153%)             | (16%–119%)             | (57%–125%)             |             |
| Bellflower    | 109%                   | 120%                              | 122%                   | 74%                    | 56%                    | 128%                   |             |
|               | (100%–118%)            | (85%–170%)                        | (104%–144%)            | (57%–95%)              | (36%–87%)              | (105%–154%)            |             |
| Berkeley      | 64%                    | 76%                               | 67%                    | 134%                   | <b>93%</b>             | 121%                   |             |
|               | (58%–71%)              | (52%–112%)                        | (56%–80%)              | (111%–161%)            | (68%–127%)             | (100%–148%)            |             |
| Big Bear Lake | 104%                   | 127%                              | 146%                   | 85%                    | 103%                   | 118%                   |             |
|               | (90%–119%)             | (72%–223%)                        | (113%–187%)            | (59%–123%)             | (59%–180%)             | (80%–176%)             |             |
| Brawley       | 93%<br>(84%–103%)      | 136%<br>(91%–203%)                | 119%<br>(82%–171%)     | 108%<br>(75%–156%)     |                        | 75%<br>(47%–120%)      |             |
| Burbank       | 106%                   | 99%                               | 115%                   | 85%                    | 37%                    | 126%                   |             |
|               | (101%–111%)            | (81%–121%)                        | (103%–127%)            | (73%–99%)              | (26%–52%)              | (111%–143%)            |             |
| Burlingame    | 78%                    | 72%                               | 59%                    | 133%                   | 287%                   | 107%                   |             |
|               | (72%–85%)              | (50%–104%)                        | (47%–74%)              | (110%–161%)            | (231%–357%)            | (86%–134%)             |             |
| Camarillo     | 112%                   | 74%                               | 83%                    | 112%                   | 69%                    | 64%                    |             |
|               | (106%–119%)            | (53%–103%)                        | (69%–101%)             | (89%–142%)             | (41%–116%)             | (47%–87%)              |             |

|               | PSA Screening          | Biopsy                 | Prostatectomy          | External Beam          | Brachytherapy          | No Treatment           |
|---------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|               | Compared to state rate |
|               | of 340 per 100,000     | of 16 per 100,000      | of 97 per 100,000      | of 67 per 100,000      | of 25 per 100,000      | of 60 per 100,000      |
| Canoga Park   | 96%                    | 95%                    | 121%                   | 73%                    | <b>27%</b>             | 103%                   |
|               | (91%–101%)             | (77%–118%)             | (108%–135%)            | (61%–88%)              | (17%–43%)              | (88%–121%)             |
| Carmichael    | 86%                    | 93%                    | 84%                    | 132%                   | 115%                   | 87%                    |
|               | (81%–91%)              | (73%–119%)             | (74%–96%)              | (115%–151%)            | (92%–145%)             | (74%–103%)             |
| Castro Valley | 88%                    | 63%                    | 72%                    | 97%                    | 170%                   | 98%                    |
|               | (80%–96%)              | (37%–106%)             | (59%–89%)              | (79%–120%)             | (129%–225%)            | (79%–123%)             |
| Chester       | 100%                   | 86%                    | 92%                    | 155%                   | 199%                   | 220%                   |
|               | (85%–116%)             | (38%–190%)             | (51%–164%)             | (93%–260%)             | (86%–464%)             | (136%–355%)            |
| Chico         | 95%                    | 74%                    | 95%                    | 100%                   | 88%                    | 149%                   |
|               | (90%–99%)              | (57%–95%)              | (79%–113%)             | (82%–121%)             | (62%–125%)             | (122%–182%)            |
| Chino         | 93%                    | 80%                    | 107%                   | 105%                   | 78%                    | 84%                    |
|               | (83%–103%)             | (48%–133%)             | (91%–125%)             | (85%–130%)             | (51%–120%)             | (65%–107%)             |
| Chula Vista   | 71%                    | 53%                    | 122%                   | 109%                   | 37%                    | 87%                    |
|               | (67%–74%)              | (40%–70%)              | (108%–138%)            | (94%–127%)             | (26%–54%)              | (73%–103%)             |
| Clearlake     | 77%                    | 78%                    | 51%                    | 68%                    | 215%                   | 136%                   |
|               | (68%–86%)              | (48%–128%)             | (32%–79%)              | (45%–102%)             | (141%–328%)            | (98%–188%)             |
| Coalinga      | 102%<br>(82%–124%)     |                        | 75%<br>(43%–131%)      | 69%<br>(36%–134%)      | 163%<br>(76%–352%)     | 33%<br>(14%–81%)       |
| Colusa        | 154%<br>(140%–168%)    | 99%<br>(52%-190%)      | 48%<br>(22%–109%)      | 133%<br>(79%–222%)     |                        | 130%<br>(75%–225%)     |
| Concord       | 99%                    | 95%                    | 84%                    | 162%                   | 73%                    | 87%                    |
|               | (91%–107%)             | (64%-141%)             | (70%–101%)             | (138%–190%)            | (50%–109%)             | (69%–110%)             |
| Corcoran      | 98%<br>(77%–122%)      |                        | 66%<br>(38%–113%)      | 74%<br>(43%–128%)      | 92%<br>(33%–255%)      | 105%<br>(67%–165%)     |
| Corona        | 103%                   | 75%                    | 93%                    | 86%                    | <b>79%</b>             | 105%                   |
|               | (94%–111%)             | (48%–117%)             | (81%–107%)             | (71%–104%)             | (57%–109%)             | (88%–126%)             |
| Coronado      | 78%<br>(68%–89%)       | 47%<br>(21%-105%)      | 82%<br>(59%–116%)      | 93%<br>(58%–149%)      |                        | 110%<br>(71%–169%)     |
| Covina        | 119%                   | 118%                   | 124%                   | 90%                    | 101%                   | 102%                   |
|               | (109%–128%)            | (80%–173%)             | (104%–147%)            | (70%–115%)             | (70%–146%)             | (81%–130%)             |
| Culver City   | 96%                    | 129%                   | 104%                   | 118%                   | 46%                    | 146%                   |
|               | (86%–107%)             | (83%–202%)             | (81%–134%)             | (85%–162%)             | (22%–98%)              | (111%–192%)            |
| Daly City     | 60%                    | 65%                    | 58%                    | 155%                   | 221%                   | 114%                   |
|               | (54%–67%)              | (42%-100%)             | (47%–71%)              | (131%–183%)            | (175%–279%)            | (93%–141%)             |
| Davis         | 67%                    | 61%                    | 85%                    | 117%                   | 125%                   | 73%                    |
|               | (60%–75%)              | (34%–107%)             | (68%–107%)             | (90%–151%)             | (83%–190%)             | (53%–100%)             |
| Deer Park     | 86%                    | 72%                    | 72%                    | 130%                   | 255%                   | 107%                   |
|               | (76%–97%)              | (39%–133%)             | (51%–103%)             | (94%–180%)             | (173%–376%)            | (73%–156%)             |
| Delano        | 124%                   | 46%                    | 43%                    | 99%                    | 141%                   | 57%                    |
|               | (112%–135%)            | (21%-102%)             | (26%–69%)              | (69%–141%)             | (85%–235%)             | (37%–87%)              |
| Dinuba        | 111%                   | 96%                    | 69%                    | 159%                   | 151%                   | 56%                    |
|               | (98%–125%)             | (48%–191%)             | (40%–120%)             | (105%–240%)            | (67%–342%)             | (26%–118%)             |
| Downey        | 117%                   | 101%                   | 104%                   | 93%                    | 28%                    | 130%                   |
|               | (109%–124%)            | (72%–141%)             | (88%–123%)             | (76%–114%)             | (16%–48%)              | (111%–154%)            |
| Duarte        | 109%                   | <b>79%</b>             | 91%                    | 84%                    | 136%                   | 81%                    |
|               | (93%–127%)             | (33%–187%)             | (64%–129%)             | (52%–136%)             | (74%–252%)             | (50%–132%)             |
| El Centro     | 90%                    | 122%                   | 94%                    | 140%                   | 36%                    | 44%                    |
|               | (85%–96%)              | (97%–154%)             | (73%–120%)             | (110%–177%)            | (18%–73%)              | (29%–66%)              |

|                  | PSA Screening          | Biopsy                 | Prostatectomy          | External Beam          | Brachytherapy          | No Treatment           |
|------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                  | Compared to state rate |
|                  | of 340 per 100,000     | of 16 per 100,000      | of 97 per 100,000      | of 67 per 100,000      | of 25 per 100,000      | of 60 per 100,000      |
| Encinitas        | 98%                    | 56%                    | 85%                    | 106%                   | 13%                    | 84%                    |
|                  | (91%–104%)             | (37%–85%)              | (73%–98%)              | (87%–129%)             | (7%–27%)               | (66%–106%)             |
| Encino           | 118%<br>(104%–133%)    | 156%<br>(102%–237%)    | 98%<br>(74%–131%)      | 45%<br>(24%–84%)       |                        | 123%<br>(83%–183%)     |
| Escondido        | 104%                   | 78%                    | 97%                    | 105%                   | 25%                    | 84%                    |
|                  | (98%–110%)             | (57%–105%)             | (86%–110%)             | (90%–122%)             | (16%–40%)              | (70%–102%)             |
| Eureka           | 66%                    | 70%                    | 81%                    | 126%                   | 109%                   | 130%                   |
|                  | (60%–72%)              | (47%–104%)             | (61%–107%)             | (98%–161%)             | (69%–171%)             | (97%–173%)             |
| Fairfield        | 51%                    | 41%                    | 79%                    | 191%                   | 361%                   | 56%                    |
|                  | (46%–57%)              | (25%–68%)              | (64%–97%)              | (160%–227%)            | (282%–462%)            | (42%–74%)              |
| Fall River Mills | 80%                    | 138%                   | 124%                   | 96%                    | 443%                   | 128%                   |
|                  | (67%–95%)              | (72%–263%)             | (78%–198%)             | (55%–169%)             | (247%–793%)            | (71%–229%)             |
| Fallbrook        | 117%                   | 131%                   | 121%                   | 103%                   | 62%                    | 129%                   |
|                  | (107%–126%)            | (90%–188%)             | (98%–151%)             | (79%–135%)             | (34%–113%)             | (98%–170%)             |
| Folsom           | 104%                   | 94%                    | 74%                    | 137%                   | 93%                    | 64 %                   |
|                  | (92%–117%)             | (52%-169%)             | (59%–94%)              | (107%–177%)            | (60%–145%)             | (45 %–90 %)            |
| Fontana          | 96%                    | 74%                    | 121%                   | 89%                    | 64%                    | 90%                    |
|                  | (85%–107%)             | (40%–138%)             | (103%–142%)            | (71%–111%)             | (41%–101%)             | (71%–114%)             |
| Fort Bragg       | 98%                    | 100%                   | 41%                    | 47%                    | 273%                   | 168%                   |
|                  | (88%–108%)             | (61%–163%)             | (24%–69%)              | (27%–82%)              | (175%–426%)            | (120%–236%)            |
| Fortuna          | 74%                    | 63%                    | 78%                    | 119%                   | 134%                   | 137%                   |
|                  | (66%–83%)              | (37%–109%)             | (53%–115%)             | (83%–169%)             | (77%–234%)             | (96%–196%)             |
| Fountain Valley  | 119%                   | 114%                   | 102%                   | 69%                    | 81%                    | 90%                    |
|                  | (113%–124%)            | (91%–143%)             | (88%–118%)             | (56%–85%)              | (60%–111%)             | (74%–109%)             |
| Fremont          | 73%                    | 53%                    | 81%                    | 106%                   | 152%                   | 122%                   |
|                  | (69%–78%)              | (37%–75%)              | (70%–94%)              | (91%–125%)             | (120%–191%)            | (103%–145%)            |
| Fresno           | 122%                   | 101%                   | 98%                    | 108%                   | 120%                   | 97%                    |
|                  | (119%–124%)            | (89%–114%)             | (90%–108%)             | (97%–119%)             | (102%–142%)            | (86%–109%)             |
| Fullerton        | 93%                    | 112%                   | 141%                   | 77%                    | 40%                    | 100%                   |
|                  | (88%–97%)              | (92%–137%)             | (128%–155%)            | (66%–90%)              | (29%–56%)              | (86%–116%)             |
| Garberville      | 107%                   | 133%                   | 95%                    | 150%                   | 215%                   | 237%                   |
|                  | (90%–125%)             | (63%–276%)             | (54%–167%)             | (92%–244%)             | (107%–434%)            | (152%–369%)            |
| Garden Grove     | 127%                   | 98%                    | 93%                    | 47%                    | 51%                    | 77%                    |
|                  | (118%–136%)            | (66%–145%)             | (73%–118%)             | (32%–69%)              | (27%–97%)              | (57%–105%)             |
| Gardena          | 113%                   | 106%                   | 100%                   | 107%                   | 43%                    | 125%                   |
|                  | (99%–127%)             | (59%–190%)             | (73%–135%)             | (77%–149%)             | (18%–103%)             | (90%–171%)             |
| Gilroy           | 79%                    | 185%                   | 118%                   | 98%                    | 316%                   | 115%                   |
|                  | (69%–91%)              | (121%-282%)            | (94%–148%)             | (72%–133%)             | (235%–425%)            | (84%–158%)             |
| Glendale         | 114%                   | 97%                    | 120%                   | 104%                   | 64%                    | 126%                   |
|                  | (110%–119%)            | (81%–115%)             | (109%–132%)            | (91%–119%)             | (50%–84%)              | (113%–142%)            |
| Glendora         | 104%                   | 84%                    | 123%                   | 87%                    | 107%                   | 102%                   |
|                  | (94%–114%)             | (51%–136%)             | (103%–146%)            | (67%–113%)             | (75%–152%)             | (81%–129%)             |
| Granada Hills    | 106%                   | 146%                   | 125%                   | 99%                    | 36%                    | 92%                    |
|                  | (95%–118%)             | (97%–217%)             | (102%–153%)            | (74%–133%)             | (17%–76%)              | (67%–126%)             |
| Grass Valley     | 116%                   | 72%                    | 74%                    | 109%                   | 175%                   | 138%                   |
|                  | (111%–121%)            | (55%–95%)              | (60%–91%)              | (85%–140%)             | (116%–265%)            | (109%–176%)            |
| Greenbrae        | 85%                    | 100%                   | 90%                    | 97%                    | 101%                   | 193%                   |
|                  | (80%–89%)              | (80%–125%)             | (80%–101%)             | (83%–112%)             | (81%–125%)             | (170%–219%)            |

|                  | PSA Screening          | <b>Biopsy</b>          | Prostatectomy          | External Beam          | Brachytherapy          | No Treatment           |
|------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                  | Compared to state rate |
|                  | of 340 per 100,000     | of 16 per 100,000      | of 97 per 100,000      | of 67 per 100,000      | of 25 per 100,000      | of 60 per 100,000      |
| Greenville       | 71%<br>(49%–99%)       |                        | 142%<br>(58%–346%)     | i                      |                        | 240%<br>(105%–550%)    |
| Gridley          | 107%<br>(93%–122%)     | 118%<br>(62%–225%)     | 116%<br>(75%–180%)     | 69%<br>(34%–139%)      |                        | 183%<br>(111%–303%)    |
| Hanford          | 94%                    | 110%                   | 80%                    | 75%                    | 107%                   | 57%                    |
|                  | (88%–100%)             | (83%–146%)             | (64%–99%)              | (58%–98%)              | (72%–159%)             | (42%–77%)              |
| Harbor City      | 102%                   | 95%                    | 132%                   | 112%                   | 42%                    | 124%                   |
|                  | (94%–109%)             | (68%–133%)             | (116%–151%)            | (95%–132%)             | (27%–63%)              | (105%–146%)            |
| Hawthorne        | 99%                    | 86%                    | 128%                   | 90%                    | 35%                    | 143%                   |
|                  | (87%–113%)             | (45%–164%)             | (104%–156%)            | (68%–120%)             | (17%–75%)              | (114%–180%)            |
| Hayward          | 89%                    | 101%                   | 80%                    | 107%                   | 183%                   | 129%                   |
|                  | (81%–98%)              | (67%–152%)             | (66%–98%)              | (87%–131%)             | (139%–241%)            | (105%–158%)            |
| Healdsburg       | 95%                    | 77%                    | 68%                    | 52%                    | 187%                   | 134%                   |
|                  | (84%–107%)             | (43%–139%)             | (49%–93%)              | (32%–84%)              | (121%–289%)            | (96%–187%)             |
| Hemet            | 96%                    | 111%                   | 92%                    | 87%                    | 115%                   | 87%                    |
|                  | (90%–103%)             | (84%–146%)             | (80%–107%)             | (73%–102%)             | (90%–147%)             | (73%–105%)             |
| Hollister        | 74%                    | 205%                   | 87%                    | 159%                   | 174%                   | 97%                    |
|                  | (66%–82%)              | (152%–275%)            | (65%–118%)             | (121%–208%)            | (111%–273%)            | (68%–139%)             |
| Huntington Beach | 109%                   | 77%                    | 118%                   | 67%                    | 68%                    | 99%                    |
|                  | (102%–116%)            | (55%–107%)             | (103%–134%)            | (53%–84%)              | (48%–96%)              | (80%–121%)             |
| Indio            | 109%                   | 72%                    | 124%                   | 157%                   | 467%                   | 90%                    |
|                  | (102%–117%)            | (47%–110%)             | (100%–153%)            | (129%–190%)            | (374%–583%)            | (68%–120%)             |
| Inglewood        | 96%                    | 89%                    | 117%                   | 101%                   | 60%                    | 124%                   |
|                  | (89%–103%)             | (65%–122%)             | (103%–133%)            | (85%–120%)             | (42%-85%)              | (106%–144%)            |
| Irvine           | 103%                   | 70%                    | 107%                   | 74%                    | 31 %                   | 71%                    |
|                  | (93%–113%)             | (42%–116%)             | (91%–127%)             | (55%–99%)              | (16%–60%)              | (53%–96%)              |
| Jackson          | 125%                   | 96%                    | 84%                    | 127%                   | 48%                    | 64 %                   |
|                  | (117%–133%)            | (66%–139%)             | (68%–105%)             | (101%–160%)            | (27%–83%)              | (46 %–91 %)            |
| Joshua Tree      | 93%                    | 66%                    | 82%                    | 76%                    | 181%                   | 57%                    |
|                  | (85%–102%)             | (39%–112%)             | (62%–108%)             | (57%–102%)             | (125%–264%)            | (39%–84%)              |
| King City        | 120%                   | 250%                   | 114%                   | 123%                   | 344%                   | 106%                   |
|                  | (103%–139%)            | (145%–424%)            | (64%–204%)             | (64%–234%)             | (161%–732%)            | (54%–209%)             |
| La Jolla         | 95%                    | 77%                    | <b>97%</b>             | 120%                   | 14%                    | 81%                    |
|                  | (90%–100%)             | (59%–102%)             | (85%–111%)             | (102%–141%)            | (8%–25%)               | (66%–99%)              |
| La Mesa          | 93 %                   | 81%                    | 100%                   | 113%                   | 23%                    | 90%                    |
|                  | (89%–97%)              | (64%–102%)             | (91%–110%)             | (101%–127%)            | (17%–33%)              | (78%–103%)             |
| Laguna Hills     | 136%                   | 98%                    | 113%                   | 60%                    | 104%                   | 74%                    |
|                  | (129%–143%)            | (73%–130%)             | (99%–129%)             | (48%–75%)              | (77%–139%)             | (59%–92%)              |
| Lake Isabella    | 135%                   | 48%                    | 89%                    | 53%                    | 288%                   | 60%                    |
|                  | (119%–151%)            | (15%–148%)             | (50%–157%)             | (27%–102%)             | (168%–495%)            | (33%–109%)             |
| Lakeport         | 81 %                   | 102%                   | 51%                    | 54%                    | 229%                   | 172%                   |
|                  | (73 %–89%)             | (69%–151%)             | (34%–77%)              | (36%–81%)              | (159%–330%)            | (132%–225%)            |
| Lakewood         | 122%                   | 192%                   | 112%                   | 111%                   | 46%                    | 120%                   |
|                  | (105%–140%)            | (109%–334%)            | (82%–154%)             | (74%–164%)             | (19%–111%)             | (85%–169%)             |
| Lancaster        | 91%                    | 111%                   | 110%                   | 49%                    | 28%                    | 116%                   |
|                  | (86%–96%)              | (88%–140%)             | (99%–123%)             | (41%–59%)              | (19%–41%)              | (102%–132%)            |
| Lindsay          | 102%                   | 113%                   | 72%                    | 188%                   | 161%                   | 96%                    |
|                  | (88%–117%)             | (59%–215%)             | (37%–140%)             | (119%–296%)            | (66%–396%)             | (51%–181%)             |

|               | PSA Screening          | Biopsy                 | Prostatectomy          | External Beam          | Brachytherapy          | No Treatment           |
|---------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|               | Compared to state rate |
|               | of 340 per 100,000     | of 16 per 100,000      | of 97 per 100,000      | ot 67 per 100,000      | ot 25 per 100,000      | ot 60 per 100,000      |
| Livermore     | 94%                    | 72%                    | 91%                    | 82%                    | 183%                   | 94%                    |
|               | (84%–104%)             | (41%–126%)             | (75%–111%)             | (62%–107%)             | (137%–245%)            | (72%–122%)             |
| Lodi          | 95%                    | 90%                    | 97%                    | 132%                   | 104%                   | 88%                    |
|               | (90%–101%)             | (68%–119%)             | (82%–113%)             | (112%–155%)            | (78%–140%)             | (71%–108%)             |
| Loma Linda    | 81%                    | 163%                   | 126%                   | 123%                   | 88%                    | 103%                   |
|               | (71%–92%)              | (106%–248%)            | (102%–156%)            | (97%–157%)             | (55%–140%)             | (78%–137%)             |
| Lompoc        | 147%                   | 150%                   | 141%                   | 133%                   | 253%                   | 126%                   |
|               | (138%–155%)            | (111%–202%)            | (111%–179%)            | (98%–179%)             | (163%–391%)            | (92%–172%)             |
| Long Beach    | 97%                    | 137%                   | 107%                   | 98%                    | 64 %                   | 105%                   |
|               | (92%–101%)             | (116%–161%)            | (98%–117%)             | (87%–110%)             | (51 %–80 %)            | (94%–117%)             |
| Los Alamitos  | 125%                   | 126%                   | 132%                   | 93%                    | 70%                    | 97%                    |
|               | (118%–132%)            | (96%–167%)             | (114%–153%)            | (74%–115%)             | (48%–102%)             | (77%–121%)             |
| Los Angeles   | 111%                   | 112%                   | 119%                   | 101%                   | 31%                    | 140%                   |
|               | (109%–114%)            | (101%–124%)            | (110%–128%)            | (93%–111%)             | (25%–39%)              | (129%–152%)            |
| Los Banos     | 131%                   | 51%                    | 60%                    | 52%                    | 100%                   | 90%                    |
|               | (120%–142%)            | (24%–107%)             | (36%–99%)              | (31%–89%)              | (51%–197%)             | (56%–145%)             |
| Lynwood       | 105%                   | 92%                    | 138%                   | 123%                   | 33%                    | 159%                   |
|               | (97%–113%)             | (64%–132%)             | (119%–159%)            | (104%–145%)            | (20%–55%)              | (138%–183%)            |
| Madera        | 146%                   | 53%                    | 104%                   | 86%                    | 151%                   | 106%                   |
|               | (138%–155%)            | (31%–92%)              | (82%–132%)             | (64%–116%)             | (102%–222%)            | (79%–144%)             |
| Manteca       | 113%                   | 112%                   | 72%                    | 101%                   | 231%                   | 85%                    |
|               | (104%–122%)            | (74%–169%)             | (56%–92%)              | (78%–131%)             | (170%–314%)            | (64%–112%)             |
| Martinez      | 80%                    | 33%                    | 105%                   | 118%                   | 54%                    | 87%                    |
|               | (69%–93%)              | (11%–101%)             | (83%–133%)             | (90%–156%)             | (28%–106%)             | (62%–121%)             |
| Marysville    | 100%                   | 88%                    | 77%                    | 143%                   | 111%                   | 68%                    |
|               | (92%–107%)             | (60%–128%)             | (57%–103%)             | (112%–183%)            | (70%–177%)             | (46%–102%)             |
| Merced        | 122%                   | 99%                    | 69%                    | 78%                    | 89%                    | 87%                    |
|               | (118%–127%)            | (80%–122%)             | (57%–84%)              | (64%–96%)              | (64%–123%)             | (68%–109%)             |
| Mission Hills | 99%                    | 80%                    | 131%                   | 111%                   | 34%                    | 103%                   |
|               | (90%–108%)             | (49%–128%)             | (110%–156%)            | (89%–139%)             | (17%–66%)              | (82%–130%)             |
| Mission Viejo | 127%                   | 96%                    | 116%                   | 75%                    | 123%                   | 76%                    |
|               | (121%–134%)            | (74%–126%)             | (104%–130%)            | (62%–90%)              | (99%–154%)             | (63%–91%)              |
| Modesto       | 89%                    | 73%                    | 83%                    | 151%                   | 47%                    | 94%                    |
|               | (85%–93%)              | (58%–93%)              | (74%–93%)              | (136%–167%)            | (36%–62%)              | (82%–108%)             |
| Montebello    | 116%                   | 98%                    | 96%                    | 94%                    | 25%                    | 108%                   |
|               | (107%–125%)            | (66%–146%)             | (78%–119%)             | (74%–120%)             | (12%–52%)              | (87%–136%)             |
| Monterey      | 110%                   | 121%                   | 65%                    | 162%                   | 94%                    | 96%                    |
|               | (106%–114%)            | (101%–145%)            | (55%–79%)              | (139%–189%)            | (70%–127%)             | (77%–119%)             |
| Monterey Park | 139%                   | 101%                   | 158%                   | 115%                   | 79%                    | 140%                   |
|               | (130%–148%)            | (68%–148%)             | (124%–201%)            | (85%–155%)             | (44%–143%)             | (106%–185%)            |
| Morgan Hill   | 90%                    | 28%                    | 88%                    | 126%                   | 238%                   | 85%                    |
|               | (79%–102%)             | (9%–85%)               | (68%–115%)             | (94%–171%)             | (167%–338%)            | (58%–125%)             |
| Mount Shasta  | 104%                   | 114%                   | 101%                   | 126%                   | 133 <i>%</i>           | 108%                   |
|               | (94%–114%)             | (73%–177%)             | (71%–144%)             | (88%–179%)             | (76%–232%)             | (69%–169%)             |
| Mountain View | 74%                    | 94%                    | 93%                    | 97%                    | 188%                   | 139%                   |
|               | (70%–78%)              | (75%–118%)             | (81%–107%)             | (82%–115%)             | (149%–238%)            | (117%–165%)            |
| Napa          | 49%                    | 86%                    | 103%                   | 169%                   | 172%                   | 111%                   |
|               | (44%–54%)              | (62%–119%)             | (86%–122%)             | (143%–200%)            | (131%–227%)            | (91%–137%)             |

|               | PSA Screening          | Biopsy                 | Prostatectomy          | External Beam          | Brachytherapy          | No Treatment           |
|---------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|               | Compared to state rate |
|               | of 340 per 100,000     | of 16 per 100,000      | of 97 per 100,000      | of 67 per 100,000      | of 25 per 100,000      | of 60 per 100,000      |
| National City | 98%                    | 90%                    | 95%                    | 130%                   | 51%                    | 76%                    |
|               | (87%–109%)             | (50%–162%)             | (69%–132%)             | (95%–176%)             | (21%–123%)             | (50%–117%)             |
| Newport Beach | 103%                   | 88%                    | 116%                   | 70%                    | 45%                    | 90%                    |
|               | (99%–108%)             | (72%–107%)             | (105%–127%)            | (60%–82%)              | (34%–60%)              | (78%–104%)             |
| Northridge    | 116%                   | 119%                   | 123%                   | 98%                    | 28%                    | 123%                   |
|               | (109%–124%)            | (90%–157%)             | (108%–140%)            | (81%–118%)             | (16%–48%)              | (103%–146%)            |
| Norwalk       | 105%                   | 135%                   | 113%                   | 89%                    | 26%                    | 123%                   |
|               | (94%–118%)             | (84%–216%)             | (90%–142%)             | (66%–121%)             | (11%–63%)              | (97%–155%)             |
| Novato        | 93%                    | 117%                   | 106%                   | 87%                    | 98%                    | 196%                   |
|               | (84%–103%)             | (79%–172%)             | (88%–129%)             | (67%–113%)             | (67%–142%)             | (159%–241%)            |
| Oakdale       | 92%                    | 88%                    | 90%                    | 152%                   | 43%                    | 76%                    |
|               | (80%–105%)             | (46%–169%)             | (65%–124%)             | (113%–206%)            | (18%–105%)             | (48%–120%)             |
| Oakland       | 77%                    | 92%                    | 82%                    | 121%                   | 150%                   | 117%                   |
|               | (73%–81%)              | (74%–113%)             | (72%–92%)              | (106%–138%)            | (121%–186%)            | (103%–135%)            |
| Oceanside     | 95%                    | 56%                    | 84%                    | 114%                   | 13%                    | 79%                    |
|               | (91%–99%)              | (43%–72%)              | (75%–94%)              | (101%–128%)            | (8%–21%)               | (68%–92%)              |
| Ojai          | 129%                   | 108%                   | 106%                   | 46%                    | 127%                   | 69%                    |
|               | (115%–144%)            | (61%–189%)             | (78%–145%)             | (25%–83%)              | (69%–233%)             | (42%–113%)             |
| Orange        | 111%                   | 105%                   | 113%                   | 56%                    | 82%                    | 76%                    |
|               | (105%–118%)            | (79%–140%)             | (96%–132%)             | (42%–73%)              | (53%–127%)             | (60%–97%)              |
| Oroville      | 99%                    | 102%                   | 112%                   | 88%                    | 198%                   | 149%                   |
|               | (93%–105%)             | (76%–138%)             | (89%–142%)             | (66%–118%)             | (131%–299%)            | (116%–192%)            |
| Oxnard        | 103%                   | 103%                   | 96%                    | 96%                    | 54%                    | 81%                    |
|               | (98%–108%)             | (81%–132%)             | (81%–113%)             | (79%–117%)             | (34%–85%)              | (64%–103%)             |
| Palm Springs  | 120%                   | 56%                    | 61%                    | 105%                   | 184%                   | 71%                    |
|               | (114%–127%)            | (38%–83%)              | (50%–74%)              | (89%–125%)             | (147%–230%)            | (57%–89%)              |
| Panorama City | 111%                   | 104%                   | 134%                   | 104%                   | 38%                    | 124%                   |
|               | (102%–119%)            | (71%–152%)             | (113%–158%)            | (85%–127%)             | (21%–68%)              | (103%–150%)            |
| Paradise      | 110%                   | 104%                   | 98%                    | 117%                   | 67%                    | 137%                   |
|               | (103%–116%)            | (77%–139%)             | (77%–125%)             | (91%–151%)             | (38%–119%)             | (105%–178%)            |
| Paramount     | 94%                    | 137%                   | 76%                    | 121%                   | <b>39%</b>             | 126%                   |
|               | (77%–112%)             | (65%–284%)             | (50%–116%)             | (81%–181%)             | (13%–124%)             | (88%–179%)             |
| Pasadena      | 103%                   | 72%                    | 122%                   | 102%                   | 68%                    | 119%                   |
|               | (97%–109%)             | (54%–94%)              | (109%–137%)            | (87%–119%)             | (51%–90%)              | (103%–138%)            |
| Petaluma      | 102%                   | 44%                    | 63%                    | 47%                    | 133%                   | 142%                   |
|               | (93%–111%)             | (23%–83%)              | (49%–79%)              | (33%–66%)              | (96%–184%)             | (114%–176%)            |
| Pinole        | 77%                    | 63%                    | 64%                    | 132%                   | 148%                   | 84%                    |
|               | (68%–87%)              | (34%–116%)             | (51%–81%)              | (107%–162%)            | (107%–205%)            | (64%–110%)             |
| Pittsburg     | 88%                    | 45%                    | 87%                    | 141%                   | 114%                   | 93%                    |
|               | (76%–100%)             | (19%–108%)             | (67%–113%)             | (113%–176%)            | (72%–179%)             | (68%–126%)             |
| Placerville   | 127%                   | 110%                   | 99%                    | 147%                   | 153%                   | 66%                    |
|               | (122%–133%)            | (85%–143%)             | (85%–116%)             | (125%–172%)            | (116%–203%)            | (52%–84%)              |
| Pleasanton    | 111%                   | 85%                    | 85%                    | 91%                    | 191%                   | 94%                    |
|               | (102%–120%)            | (55%–131%)             | (71%–101%)             | (72%–114%)             | (148%–245%)            | (74%–119%)             |
| Pomona        | 115%                   | 78%                    | 118%                   | 103%                   | 68%                    | 111%                   |
|               | (109%–121%)            | (56%–108%)             | (105%–133%)            | (89%–120%)             | (50%–91%)              | (95%–129%)             |
| Porterville   | 135%                   | 125%                   | 69%                    | 199%                   | 101%                   | 100%                   |
|               | (127%–142%)            | (92%–169%)             | (51%–93%)              | (159%–249%)            | (60%–171%)             | (74%–136%)             |

|                 | PSA Screening          | <b>Biopsy</b>          | <b>Prostatectomy</b>   | External Beam          | Brachytherapy          | No Treatment           |
|-----------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                 | Compared to state rate |
|                 | of 340 per 100,000     | of 16 per 100,000      | of 97 per 100,000      | of 67 per 100,000      | of 25 per 100,000      | of 60 per 100,000      |
| Poway           | 100%                   | 46%                    | 103%                   | 97%                    | 14%                    | 70%                    |
|                 | (94%–106%)             | (30%–69%)              | (91%–117%)             | (82%–115%)             | (7%–26%)               | (56%–87%)              |
| Rancho Mirage   | 135%                   | 93%                    | 76%                    | 97%                    | 209%                   | 63 %                   |
|                 | (131%–139%)            | (78%–110%)             | (67%–87%)              | (85%–112%)             | (175%–249%)            | (52 %–75 %)            |
| Red Bluff       | 99%                    | 114%                   | 119%                   | 63%                    | 166%                   | 114%                   |
|                 | (92%–107%)             | (79%–163%)             | (91%–158%)             | (42%–96%)              | (106%–259%)            | (78%–165%)             |
| Redding         | 88%                    | 103%                   | 112%                   | 115%                   | 243%                   | 72%                    |
|                 | (84%–91%)              | (86%–123%)             | (97%–129%)             | (99%–135%)             | (195%–302%)            | (58%–90%)              |
| Redlands        | 91%                    | 62%                    | 87%                    | 85%                    | 147%                   | 73%                    |
|                 | (84%–99%)              | (39%–98%)              | (74%–102%)             | (70%–104%)             | (113%–191%)            | (57%–92%)              |
| Redwood City    | <b>79%</b>             | 85%                    | 81%                    | 147%                   | 176%                   | 107%                   |
|                 | (74%–84%)              | (64%–114%)             | (70%–94%)              | (127%–170%)            | (144%–216%)            | (89%–128%)             |
| Ridgecrest      | 81%                    | 100%                   | 112%                   | 32%                    | 96%                    | 113%                   |
|                 | (74%–90%)              | (67%–150%)             | (79%–158%)             | (17%–62%)              | (35%–265%)             | (74%–174%)             |
| Riverside       | 90%                    | 101%                   | 98%                    | 109%                   | 85%                    | 83%                    |
|                 | (86%–95%)              | (82%–125%)             | (89%–109%)             | (97%–123%)             | (68%–105%)             | (73%–95%)              |
| Roseville       | 100%                   | 79%                    | 84%                    | 145%                   | 130%                   | 82%                    |
|                 | (95%–105%)             | (61%–102%)             | (74%–95%)              | (127%–166%)            | (105%–160%)            | (69%–98%)              |
| Sacramento      | 82%                    | 61%                    | 94%                    | 114%                   | 98%                    | 92%                    |
|                 | (79%–85%)              | (51%–73%)              | (87%–103%)             | (104%–125%)            | (84%–116%)             | (82%–102%)             |
| Salinas         | 108%                   | 209%                   | 80%                    | 186%                   | 115%                   | 120%                   |
|                 | (103%–113%)            | (178%–245%)            | (65%–99%)              | (155%–222%)            | (83%–159%)             | (98%–148%)             |
| San Andreas     | 111%                   | 129%                   | 79%                    | 99%                    | 81%                    | 89%                    |
|                 | (103%–118%)            | (95%–174%)             | (62%–99%)              | (77%–127%)             | (52%–127%)             | (65%–121%)             |
| San Bernardino  | 101%                   | 124%                   | 125%                   | 94%                    | 94%                    | 102%                   |
|                 | (95%–108%)             | (97%–160%)             | (112%–139%)            | (81%–108%)             | (74%–120%)             | (89%–118%)             |
| San Clemente    | 136%                   | 100%                   | 112%                   | 95%                    | 92%                    | 91%                    |
|                 | (126%–145%)            | (68%–145%)             | (94%–133%)             | (73%–123%)             | (63%–135%)             | (69%–121%)             |
| San Diego       | 88%                    | 74%                    | 104%                   | 106%                   | 21%                    | 98%                    |
|                 | (85%–90%)              | (63%–86%)              | (96%–112%)             | (97%–116%)             | (16%–27%)              | (89%–109%)             |
| San Dimas       | 113%                   | 99%                    | 89%                    | <b>70%</b>             | 99%                    | 114%                   |
|                 | (98%–128%)             | (49%–196%)             | (68%–116%)             | (45%–107%)             | (56%–175%)             | (80%–163%)             |
| San Francisco   | 68%                    | 75%                    | 61%                    | 122%                   | 220%                   | 121%                   |
|                 | (65%–70%)              | (63%–88%)              | (54%–68%)              | (109%–137%)            | (186%–261%)            | (107%–137%)            |
| San Gabriel     | 129%                   | 106%                   | 112%                   | 95%                    | 89%                    | 105%                   |
|                 | (123%–135%)            | (81%–138%)             | (95%–132%)             | (77%–117%)             | (63%–127%)             | (86%–128%)             |
| San Jose        | 85%                    | 76%                    | <b>77%</b>             | 140%                   | 242%                   | 100%                   |
|                 | (83%–87%)              | (66%–87%)              | (71%–84%)              | (128%–154%)            | (211%–277%)            | (90%–112%)             |
| San Leandro     | 94%                    | 90%                    | 82%                    | 127%                   | 152%                   | 99%                    |
|                 | (86%–103%)             | (58%–137%)             | (66%–101%)             | (103%–156%)            | (111%–209%)            | (78%–125%)             |
| San Luis Obispo | 115%                   | 80%                    | 118%                   | 68%                    | 20%                    | 91%                    |
|                 | (110%–121%)            | (60%–106%)             | (102%–137%)            | (54%–87%)              | (10%–39%)              | (72%–115%)             |
| San Mateo       | 76%                    | 79%                    | 56%                    | 153%                   | 262%                   | 127%                   |
|                 | (70%–81%)              | (58%–107%)             | (46%–69%)              | (131%–179%)            | (215%–320%)            | (106%–153%)            |
| San Pablo       | 68%                    | 29%                    | 74%                    | 136%                   | 147%                   | 126%                   |
|                 | (60%–77%)              | (13%–64%)              | (60%–91%)              | (115%–162%)            | (109%–199%)            | (104%–153%)            |
| San Pedro       | 113%                   | 98%                    | 105%                   | 88%                    | 26%                    | 102%                   |
|                 | (103%–124%)            | (62%-154%)             | (87%–128%)             | (68%–113%)             | (13%–53%)              | (79%–132%)             |

|                     | PSA Screening          | <b>Biopsy</b>          | Prostatectomy          | External Beam          | Brachytherapy          | No Treatment           |
|---------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                     | Compared to state rate |
|                     | of 340 per 100,000     | of 16 per 100,000      | of 97 per 100,000      | of 67 per 100,000      | of 25 per 100,000      | of 60 per 100,000      |
| San Ramon           | 83%                    | 162%                   | 109%                   | 114%                   | 178%                   | 111%                   |
|                     | (70%–97%)              | (97%–269%)             | (86%–137%)             | (82%–158%)             | (121%–261%)            | (79%–158%)             |
| Santa Ana           | 104%                   | 126%                   | 114%                   | 67%                    | 66%                    | 73%                    |
|                     | (98%–110%)             | (99%–161%)             | (100%–130%)            | (54%–82%)              | (45%–94%)              | (59%–89%)              |
| Santa Barbara       | 120%                   | 88%                    | 95%                    | 65%                    | 187%                   | 81 %                   |
|                     | (115%–124%)            | (70%–111%)             | (83%–108%)             | (54%–79%)              | (153%–227%)            | (68%–97%)              |
| Santa Cruz          | 86%                    | 91%                    | 99%                    | 121%                   | 293%                   | 127%                   |
|                     | (81%–91%)              | (71%–117%)             | (86%–115%)             | (100%–146%)            | (230%–373%)            | (105%–153%)            |
| Santa Maria         | 113%                   | 86%                    | 129%                   | 103%                   | 108%                   | 62%                    |
|                     | (108%–118%)            | (66%–112%)             | (109%–153%)            | (80%–131%)             | (68%–173%)             | (46%–86%)              |
| Santa Monica        | 99%                    | 111%                   | 113%                   | 87%                    | 23%                    | 147%                   |
|                     | (95%–103%)             | (94%–131%)             | (102%–125%)            | (75%–101%)             | (16%–33%)              | (130%–166%)            |
| Santa Paula         | 108%                   | 63%                    | 129%                   | 79%                    | 111%                   | 83%                    |
|                     | (98%–119%)             | (33%–121%)             | (99%–170%)             | (54%–118%)             | (57%–214%)             | (55%–125%)             |
| Santa Rosa          | 73%                    | 83%                    | 63%                    | 47%                    | 146%                   | 144%                   |
|                     | (69%–77%)              | (66%–104%)             | (55%–72%)              | (39%–56%)              | (122%–176%)            | (127%–163%)            |
| Sebastopol          | 74%                    | 44%                    | 73%                    | 43%                    | 97%                    | 149%                   |
|                     | (64%–84%)              | (20%–98%)              | (56%–94%)              | (28%–67%)              | (62%–154%)             | (115%–193%)            |
| Selma               | 82%                    | 93%                    | 128%                   | 105%                   | 102%                   | 106%                   |
|                     | (73%–92%)              | (56%–154%)             | (96%–170%)             | (72%–154%)             | (52%–198%)             | (72%–155%)             |
| Simi Valley         | 103%                   | 140%                   | 113%                   | 51%                    | 32%                    | 89%                    |
|                     | (95%–111%)             | (105%–187%)            | (97%–131%)             | (37%–69%)              | (16%–64%)              | (69%–115%)             |
| Solvang             | 130%                   | 83%                    | 102%                   | 72%                    | 245%                   | 57%                    |
|                     | (118%–143%)            | (45%–153%)             | (72%–145%)             | (42%–122%)             | (156%–383%)            | (31%–104%)             |
| Sonoma              | 75%                    | 37%                    | 61%                    | 33%                    | 223%                   | 156%                   |
|                     | (66%–85%)              | (18%–77%)              | (45%–83%)              | (20%–54%)              | (159%–311%)            | (121%–200%)            |
| Sonora              | 84%                    | 125%                   | 81%                    | 102%                   | 147%                   | 99%                    |
|                     | (78%–89%)              | (97%–160%)             | (65%–101%)             | (82%–128%)             | (106%–206%)            | (77%–126%)             |
| South El Monte      | 135%                   | 111%                   | 113%                   | 42%                    | 60%                    | 110%                   |
|                     | (115%–155%)            | (46%–263%)             | (76%–169%)             | (20%–90%)              | (19%–188%)             | (69%–174%)             |
| South Laguna        | <b>112%</b>            | 92%                    | 112%                   | 88%                    | 90%                    | 99%                    |
|                     | (105%–118%)            | (69%–122%)             | (99%–127%)             | (72%–107%)             | (69%–119%)             | (81%–120%)             |
| South Lake Tahoe    | 99%<br>(90%–109%)      | 76%<br>(45%–128%)      | 82%<br>(49%–137%)      |                        | 359%<br>(115%–1124%)   | 24%<br>(9%–63%)        |
| South San Francisco | 64 %                   | 71%                    | 53%                    | 188%                   | 194%                   | 123%                   |
|                     | (54 % - 74 %)          | (37%–136%)             | (38%–73%)              | (151%–235%)            | (138%–272%)            | (92%–163%)             |
| Stanford            | 68%                    | 74%                    | 87%                    | 144%                   | 55%                    | 99%                    |
|                     | (63%–73%)              | (53%–103%)             | (74%–103%)             | (121%–171%)            | (39%–79%)              | (80%–121%)             |
| Stockton            | 85 %                   | 73%                    | 94%                    | 142%                   | 130%                   | 115%                   |
|                     | (81 %–89 %)            | (57%–93%)              | (83%–107%)             | (126%–160%)            | (105%–161%)            | (101%–132%)            |
| Sun City            | 113%                   | 109%                   | 90%                    | 117%                   | 85%                    | 103%                   |
|                     | (103%–122%)            | (74%–159%)             | (74%–109%)             | (97%–143%)             | (59%–123%)             | (83%–129%)             |
| Tarzana             | 132%                   | 73%                    | 147%                   | 69%                    | 12%                    | 113%                   |
|                     | (122%–143%)            | (48%–112%)             | (125%–174%)            | (50%–96%)              | (4%–36%)               | (88%–145%)             |
| Templeton           | 103%                   | 123%                   | 138%                   | 68%                    | 20%                    | <b>77%</b>             |
|                     | (97%–109%)             | (96%–157%)             | (118%–162%)            | (52%-89%)              | (9%–42%)               | (57%–104%)             |
| Thousand Oaks       | 104%                   | 114%                   | 119%                   | 57%                    | 52%                    | 86%                    |
|                     | (99%–110%)             | (93%–139%)             | (98%–144%)             | (41%-77%)              | (28%–97%)              | (65%–114%)             |

|                   | PSA Screening          | <b>Biopsy</b>          | Prostatectomy          | External Beam          | Brachytherapy          | No Treatment           |
|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                   | Compared to state rate |
|                   | of 340 per 100,000     | of 16 per 100,000      | of 97 per 100,000      | of 67 per 100,000      | of 25 per 100,000      | of 60 per 100,000      |
| Torrance          | 102%                   | 109%                   | 122%                   | 112%                   | 22%                    | 124%                   |
|                   | (98%–106%)             | (93%–127%)             | (112%–133%)            | (100%–126%)            | (16%–31%)              | (111%–139%)            |
| Тгасу             | 98%                    | 147%                   | 77%                    | 79%                    | 479%                   | 75%                    |
|                   | (88%–108%)             | (98%–218%)             | (61%–98%)              | (58%–106%)             | (382%–601%)            | (56%–101%)             |
| Tulare            | 128%                   | 119%                   | 129%                   | 80%                    | 119%                   | 58%                    |
|                   | (120%–136%)            | (83%–170%)             | (102%–163%)            | (56%–113%)             | (71%–199%)             | (37%–89%)              |
| Turlock           | 107%                   | 92%                    | 64%                    | 128%                   | 25%                    | 83%                    |
|                   | (100%–114%)            | (65%–131%)             | (50%–82%)              | (104%–158%)            | (12%-53%)              | (63%–110%)             |
| Ukiah             | 85%                    | 118%                   | 60%                    | 53%                    | 262%                   | 152%                   |
|                   | (78%–93%)              | (82%–168%)             | (41%–88%)              | (35%–80%)              | (185%–371%)            | (113%–204%)            |
| Upland            | 113%                   | 98%                    | 105%                   | 100%                   | 61%                    | 108%                   |
|                   | (107%–119%)            | (74%–130%)             | (95%–117%)             | (88%–115%)             | (46%–80%)              | (94%–123%)             |
| Vacaville         | 78%                    | 42%                    | 48%                    | 161%                   | 243%                   | 60%                    |
|                   | (69%–86%)              | (22%–80%)              | (37%–62%)              | (132%–195%)            | (184%–320%)            | (45%–80%)              |
| Valencia          | 105%                   | 94%                    | 113%                   | 68%                    | 36%                    | 83%                    |
|                   | (98%–112%)             | (69%–126%)             | (101%–126%)            | (56%-82%)              | (25%–53%)              | (69%–99%)              |
| Vallejo           | 55%                    | 71%                    | 59%                    | 204%                   | 162%                   | 77%                    |
|                   | (49%–61%)              | (46%–110%)             | (49%–72%)              | (174%–239%)            | (123%–215%)            | (62%–97%)              |
| Van Nuys          | 116%                   | 116%                   | 133%                   | 66%                    | 37%                    | 116%                   |
|                   | (109%–122%)            | (90%–149%)             | (117%–152%)            | (54%-82%)              | (23%–58%)              | (99%–137%)             |
| Ventura           | 119%                   | 99%                    | 100%                   | 85%                    | 75%                    | 81%                    |
|                   | (113%–126%)            | (74%–132%)             | (85%–118%)             | (68%–105%)             | (50%–111%)             | (64%–103%)             |
| Victorville       | 94%                    | 86%                    | 110%                   | 106%                   | 52%                    | 87%                    |
|                   | (88%–101%)             | (61%–121%)             | (96%–125%)             | (90%–125%)             | (35%–76%)              | (73%–104%)             |
| Visalia           | 100%                   | 87%                    | 99%                    | 83%                    | 89%                    | 63%                    |
|                   | (95%–104%)             | (69%–110%)             | (84%–116%)             | (67%–103%)             | (63%–127%)             | (49%–81%)              |
| Walnut Creek      | 97%                    | 102%                   | 83%                    | 151%                   | 120%                   | 99%                    |
|                   | (93%–101%)             | (84%–122%)             | (75%–92%)              | (134%–169%)            | (99%–146%)             | (86%–114%)             |
| Watsonville       | 96%                    | 107%                   | 119%                   | 139%                   | 148%                   | 129%                   |
|                   | (89%–104%)             | (77%–150%)             | (91%–156%)             | (101%–190%)            | (89%–246%)             | (91%–183%)             |
| Weaverville       | 42%<br>(30%–58%)       | 63%<br>(20%–192%)      | 61%<br>(30%–124%)      |                        | 466%<br>(247%–881%)    |                        |
| West Covina       | 113%                   | 135%                   | 135%                   | 80%                    | 67%                    | 104%                   |
|                   | (107%–120%)            | (106%–173%)            | (119%–153%)            | (66%–96%)              | (48%–93%)              | (88%–123%)             |
| Whittier          | 113%                   | 125%                   | 114%                   | 96%                    | 34%                    | 106%                   |
|                   | (108%–118%)            | (102%–153%)            | (101%–130%)            | (82%–113%)             | (23%–49%)              | (90%–124%)             |
| Wildomar/Murrieta | 90%                    | 106%                   | 99%                    | 144%                   | 98%                    | 92%                    |
|                   | (84%–96%)              | (82%–138%)             | (86%–114%)             | (123%–168%)            | (73%–133%)             | (77%–110%)             |
| Willits           | 97%                    | 119%                   | 57%                    | 75%                    | 289%                   | 255%                   |
|                   | (86%–108%)             | (71%–201%)             | (32%–102%)             | (46%–124%)             | (180%–463%)            | (182%–356%)            |
| Woodland          | 74%                    | 64%                    | 99%                    | 174%                   | 151%                   | 56%                    |
|                   | (66%–83%)              | (36%–112%)             | (79%–124%)             | (141%–213%)            | (103%–222%)            | (39%–81%)              |
| Yuba City         | 115%                   | 113%                   | 67%                    | 139%                   | 74%                    | 92%                    |
|                   | (108%–121%)            | (87%–148%)             | (51%–89%)              | (112%–173%)            | (47%–118%)             | (67%–125%)             |

# STUDY METHODOLOGY FOR PROSTATE CANCER SCREENING AND TREATMENT MEASURES

Procedures chosen for this study were based on data from the California Cancer Registry (CCR) and Medicare claims data. Radical prostatectomy, external beam radiation, and brachytherapy data were obtained from CCR. Data from CCR were analyzed in collaboration with the Cancer Prevention Institute of California. CCR collects data on cancer patients' "first course of treatment," which is a documented, planned first course of therapy; it includes all treatment the patient receives from this planned course of therapy before the disease progresses or the treatment fails. In cases where there is no documentation of a patient treatment plan, CCR looks at the therapy the patient actually receives during the first year after diagnosis. Treatment rates from CCR data were adjusted to account for race/ethnicity, age, education, income, and insurance status of the population of each area, as well as the SEER stage, clinical stage, and Gleason score of cancers diagnosed in each area, and the prostate cancer incidence rate in the area. These factors were statistically "held constant" across areas.

Data on PSA testing and prostate biopsy were obtained from the Centers for Medicare and Medicaid Services. The Medicare claims data contained information about medical care provided to a 20% sample of all men resident in California and covered by traditional Medicare (i.e., not in a Medicare Advantage plan). To study screening PSA tests for each year between 2005 and 2010, the researchers for this study selected men from this group who were 68 or older on January 1 of the given year, were alive the entire year, and who had no history of prostate cancer, prostatectomy, androgen deprivation therapy, or elevated PSA in the prior three years. The study then counted the number of men in the group who received a PSA test during the year and for whom the data did not contain diagnosis or procedure codes suggesting that the PSA test might have been performed for non-screening purposes (men who received more than one qualifying exam during the year were counted only once).<sup>6</sup> Men were assigned to geographic areas based on their reported residence ZIP code, and rates of screening PSA were computed for each area, pooling data from 2005 to 2010, by

dividing the total number of screening PSA exams observed by the number of person-years in the overall cohort.

A similar approach was taken to study prostate biopsies. For each year between 2005 and 2010, the study selected men from this group who were 68 or older on January 1 of the given year, were alive the entire year, and who had no history of prostate cancer, prostatectomy, or androgen deprivation therapy in the prior three years. The study then counted the number of men in the group who received a needle biopsy of the prostate during the year. To compute biopsy rates for each area, the study pooled the data from 2005 to 2010 and divided the total number of prostate biopsies observed by the number of person-years in the overall cohort.

Both screening PSA and prostate biopsy rates from the Medicare data were adjusted to account for variations in the age, race/ethnicity, and Medicaid enrollment of men in the cohort in each area, and for area population income and education rates. Statistical techniques were used to "hold constant" these factors across areas.

The analysis of treatments for diagnosed prostate cancer relied on CCR data between 2005 and 2010, which captures all cancers diagnosed in California and records the first course of treatment prescribed. For this analysis, the study identified men age 40 and over, resident in California, and diagnosed with a new case of malignant prostate cancer. For each cancer, the study identified the treatment used based on codes in the registry data. Men who received no noted surgery, radiation, chemotherapy, or hormone therapy were classified as having received no treatment. Each man with a new cancer was assigned to a geographic area based on his recorded residence ZIP code, and the study computed rates of use of each treatment of interest for each area over 2005 to 2010 as the number of cancers receiving the given treatment divided by the number of person-years among men age 40 and over in the area during that time.

### **ABOUT THE AUTHORS**

The Informed Medical Decisions Foundation and Shannon Brownlee, MS, senior vice president at the Lown Institute, senior fellow at New America Foundation, and instructor at The Dartmouth Institute for Health Policy and Clinical Practice.

### ABOUT THE FOUNDATION

The California HealthCare Foundation works as a catalyst to fulfill the promise of better health care for all Californians. We support ideas and innovations that improve quality, increase efficiency, and lower the costs of care. For more information, visit us online at www.chcf.org.

### **ENDNOTES**

- 1. Laurence Baker, PhD, Stanford University, developed the research for this report in collaboration with Maryann O'Sullivan, JD, independent health policy consultant, and the California HealthCare Foundation. Sam Wainwright, former research assistant to the New America Health Policy Program, performed analysis and interpretation of the estimates, in consultation with Frances Tompkins, consultant, O'Sullivan, Baker, and Brownlee. Ann MacDonald of the Informed Medical Decisions Foundation provided expert assessment of evidence. Lance Lang, MD, chaired an advisory committee of clinicians in various specialties who were also consulted in the production of this report to review the analysis and to ensure the accuracy of medical content. For a complete list of advisory committee members, see the research summary, "All Over the Map: Elective Procedure Rates in California Vary Widely," www.chcf.org/variation. Kristen Bronner, managing editor, Dartmouth Atlas, assisted with illustrations.
- 2. For the preparation of this report, an evidence review regarding treatment options was conducted by the Informed Medical Decisions Foundation. The following additional sources were consulted during preparation of this report:
  - Regarding PSA screening: Gerald L. Andriole et al.,
    "Prostate Cancer Screening in the Randomized Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial: Mortality Results After 13 Years of Follow-up,"

Journal of the National Cancer Institute 104, no. 2 (2012): 125–32; Roger Chou et al., "Screening for Prostate Cancer: A Review of the Evidence for the U.S. Preventive Services Task Force," Annals of Internal Medicine 155, no. 11 (2011): 762–71; Virginia A. Moyer, "Screening for Prostate Cancer: U.S. Preventive Services Task Force Recommendation Statement," Annals of Internal Medicine 157, no. 2 (2012): 120–34; Fritz H. Schroder et al., "Prostate Cancer Mortality at 11 Years of Follow-Up," New England Journal of Medicine 366, no. 11 (2012): 981–90.

- Regarding prostate cancer treatment options: Anna Bill-Axelson et al., "Radical Prostatectomy Versus Watchful Waiting in Early Prostate Cancer," New England Journal of Medicine 364, no. 18 (2011): 1708–17; Marc A. Dall'era et al., "Active Surveillance for Prostate Cancer: A Systematic Review of the Literature," European Urology 62, no. 6 (December 2012): 976–83; Adam S. Kibel et al., "Survival Among Men with Clinically Localized Prostate Cancer Treated with Radical Prostatectomy or Radiation Therapy in the Prostate Specific Antigen Era," Journal of Urology 187, no. 4 (2012): 1259–65; Timothy J. Wilt et al., "Radical Prostatectomy Versus Observation for Localized Prostate Cancer," New England Journal of Medicine 367, no. 3 (2012): 203–13.
- 3. The California Cancer Registry evidence reviewed for this paper does not indicate whether a patient, diagnosed with localized prostate cancer but who did not undergo a prostatectomy or radiation therapy, underwent "active surveillance" by his physician.
- 4. Wilt et al., "Radical Prostatectomy."
- 5. State averages should not be interpreted as the correct or "right" rate for elective procedures; they are used as a comparator for analysis, not as a benchmark. There is no recommended baseline rate for elective procedures.
- 6. This approach to identifying men receiving screening PSA tests follows that of Louise C. Walter et al., "PSA Screening Among Elderly Men with Limited Life Expectancies," *Journal of the American Medical Association* 206, no. 19 (November 15, 2006): 2336–42.