



CALIFORNIA
HEALTH BENEFITS REVIEW PROGRAM

**Analysis of Assembly Bill 72:
Health Care Coverage:
Acupuncture**

A Report to the 2011-2012 California Legislature
March 18, 2011

CHBRP 11-03



The California Health Benefits Review Program (CHBRP) responds to requests from the State Legislature to provide independent analyses of the medical, financial, and public health impacts of proposed health insurance benefit mandates and proposed repeals of health insurance benefit mandates. CHBRP was established in 2002 by statute (California Health and Safety Code, Section 127660, et seq). The program was reauthorized in 2006 and again in 2009. CHBRP's authorizing statute defines legislation proposing to mandate or proposing to repeal an existing health insurance benefit as a proposal that would mandate or repeal a requirement that a health care service plan or health insurer (1) permit covered individuals to obtain health care treatment or services from a particular type of health care provider; (2) offer or provide coverage for the screening, diagnosis, or treatment of a particular disease or condition; or (3) offer or provide coverage of a particular type of health care treatment or service, or of medical equipment, medical supplies, or drugs used in connection with a health care treatment or service.

A small analytic staff in the University of California's Office of the President supports a task force of faculty and staff from several campuses of the University of California, as well as Loma Linda University, the University of Southern California, and Stanford University, to complete each analysis within a 60-day period, usually before the Legislature begins formal consideration of a mandate or repeal bill. A certified, independent actuary helps estimate the financial impacts, and a strict conflict-of-interest policy ensures that the analyses are undertaken without financial or other interests that could bias the results. A National Advisory Council, drawn from experts from outside the state of California and designed to provide balanced representation among groups with an interest in health insurance benefit mandates or repeals, reviews draft studies to ensure their quality before they are transmitted to the Legislature. Each report summarizes scientific evidence relevant to the proposed mandate, or proposed mandate repeal, but does not make recommendations, deferring policy decision making to the Legislature. The State funds this work through a small annual assessment on health plans and insurers in California. All CHBRP reports and information about current requests from the California Legislature are available at the CHBRP Web site, www.chbrp.org/

A Report to the 2011-2012 California State Legislature

Analysis of Assembly Bill 72: Health Care Coverage: Acupuncture

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PREFACE

This report provides an analysis of the medical, financial, and public health impacts of Assembly Bill 72. In response to a request from the California Assembly Committee on Health on January 14, 2011, the California Health Benefits Review Program (CHBRP) undertook this analysis pursuant to the program's authorizing statute.

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CHBRP gratefully acknowledges all of these contributions but assumes full responsibility for all of the report and its contents. Please direct any questions concerning this report to:

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EXECUTIVE SUMMARY

California Health Benefits Review Program Analysis of Assembly Bill 72

The California Assembly Committee on Health requested on January 14, 2011, that the California Health Benefits Review Program (CHBRP) conduct an evidence-based assessment of the medical, financial, and public health impacts of Assembly Bill (AB) 72, a bill that would require coverage of services provided by acupuncturists. In response to this request, CHBRP undertook this analysis pursuant to the provisions of the program's authorizing statute.¹

Analysis of AB 72

Approximately 21.9 million Californians (59%) have health insurance that may be subject to a health benefit mandate law passed at the state level.² Of the rest of the state's population, a portion is uninsured (and so has no health insurance subject to any benefit mandate) and another portion has health insurance subject to other state law or only to federal laws.

Uniquely, California has a bifurcated system of regulation for health insurance subject to state-level benefit mandates. The California Department of Managed Health Care (DMHC)³ regulates health care service plans, which offer benefit coverage to their enrollees through health plan contracts. The California Department of Insurance (CDI) regulates health insurers⁴, which offer benefit coverage to their enrollees through health insurance policies.

DMHC-regulated plans and CDI-regulated policies sold in the group markets would be subject to AB 72. Therefore, the mandate would affect the health insurance of approximately 15.1 million Californians (40%).

AB 72 is a mandate to reimburse for acupuncture care—that is, it requires coverage for treatments delivered by a particular profession, in this case, acupuncturists. It applies to every health care service plan that provides coverage for hospital, medical, or surgical expenses and to every issuer of health insurance.⁵ Although acupuncture can be used to treat dental pain, the bill

¹ CHBRP's authorizing statute is available at http://www.chbrp.org/documents/authorizing_statute.pdf.

² CHBRP's estimates are available at http://www.chbrp.org/other_publications/index.php.

³ The DMHC was established in 2000 to enforce the Knox-Keene Health Care Service Plan of 1975; see Health and Safety Code, Section 1340.

⁴ The CDI licenses "disability insurers." Disability insurers may offer forms of insurance that are not health insurance. This report considers only the impact of the benefit mandate on health insurance policies, as defined in Insurance Code, Section 106(b) or subdivision (a) of Section 10198.6.

⁵ Health care service plans, commonly referred to as health maintenance organizations, are regulated and licensed by the California Department of Managed Health Care (DMHC), as provided in the Knox-Keene Health Care Services Plan Act of 1975. The Knox-Keene Health Care Services Plan Act is codified in the California Health and Safety Code. Health insurance policies are regulated by the California Department of Insurance and are subject to the California Insurance Code.

mandate does not apply to specialized health care plans, such as dental plans. The bill amends Section 1373.10 of the Health and Safety Code and Section 10127.3 of the Insurance Code, and it expands a current mandate to offer coverage into a mandate to provide coverage, and removes exceptions. The bill also mandates coverage for expenses incurred as a result of treatment by holders of a license to practice acupuncture, as defined by Section 4938 of the Business and Professions Code. Further, the bill would apply to group contracts or policies, while the market for individually purchased health insurance would not be affected by this bill. And finally, the bill stipulates that the coverage for acupuncture shall be under terms and conditions as may be agreed upon by the health plan and group contractholder or health insurer and group policyholder.

A number of other states have had legislative activity around coverage for acupuncture. The State of Washington has had mandated coverage of acupuncture since 1994 when a law was passed that mandated coverage for all licensed health care practitioners for all in-state based insurance. The other states that have some sort of acupuncture/provider access mandate include Florida, Maine, Montana, Nevada, New Mexico, Oregon, Rhode Island, Texas, Virginia, and Washington State.

Medical Effectiveness

Numerous studies of the effectiveness of acupuncture have been conducted. CHBRP's analysis focuses on the evidence from the strongest and most current studies of the effectiveness of acupuncture. It emphasizes evidence regarding musculoskeletal and neurological conditions, because they are the types of conditions for which persons in the United States most frequently use acupuncture.

The search was limited to studies published in English from May 2007 to the present. The time frame for the search was truncated because CHBRP conducted a search of the literature published through May 2007 on the effectiveness of acupuncture for a report it issued in June 2007 on AB 54, an identical bill regarding coverage for acupuncture. The studies identified for the prior review are also included in this report.

This literature review analyzes evidence of the effectiveness of needling, a practice unique to acupuncture that is typically covered by health plans that provide acupuncture benefits. Studies of both manual acupuncture and electroacupuncture needling are included.

Many of the randomized controlled trials (RCTs) included in the meta-analyses and systematic reviews that CHBRP assessed are of low quality. In many cases, the sample sizes are too small and limit the ability to reliably assess the evidence of the effectiveness of acupuncture. Only recently have researchers begun conducting large, well-designed RCTs on acupuncture.

This report summarizes findings from RCTs that studied four types of comparisons: (1) acupuncture versus no treatment; (2) acupuncture versus sham acupuncture (i.e., needling or

pricking points on the body that are not traditional⁶ acupuncture points); (3) acupuncture versus other treatments; and (4) acupuncture plus other treatments versus other treatments alone (i.e., acupuncture as an adjuvant treatment). Findings from studies that compare acupuncture to no treatment are included as well as studies that compare acupuncture to sham acupuncture, because experts disagree as to which type of study is best. Studies that compare acupuncture to no treatment probably overstate the effects of acupuncture, because they do not control for placebo effects, such as patients' and providers' expectations regarding treatment. For this reason, researchers often attempt to control for placebo effects by comparing acupuncture to sham acupuncture. However, such studies may understate the effects of acupuncture, because there is considerable evidence that sham acupuncture is not an inert placebo (i.e., sham acupuncture may also induce a physiological response).

Needle acupuncture versus no treatment

- The preponderance of evidence suggests that needle acupuncture is *more effective* than no treatment in reducing pain and improving the functioning of persons with back pain, peripheral joint osteoarthritis, migraine headache, and tension-type headache.
- The preponderance of evidence suggests that needle acupuncture *may increase* abstinence from smoking relative to no treatment.
- There is *insufficient evidence* to determine whether needle acupuncture is an effective treatment for neck pain.

Needle acupuncture versus sham acupuncture

- The preponderance of evidence suggests that needle acupuncture is *more effective* than sham acupuncture for treatment of temporomandibular joint dysfunction, postoperative nausea and vomiting, and tension-type headaches (reduction in frequency).
- The preponderance of evidence suggests that needle acupuncture is *not more effective* than sham acupuncture for treatment of neck pain, rheumatoid arthritis, migraine headaches, stroke, alcohol dependence, cocaine addiction, and smoking cessation.
- The evidence of the effectiveness of needle acupuncture relative to sham acupuncture is *ambiguous*⁷ for treatment of fibromyalgia, peripheral joint osteoarthritis, and shoulder pain.
- There is *insufficient evidence* to determine whether needle acupuncture is more effective than sham acupuncture for treatment of epilepsy, chemotherapy-induced nausea and vomiting, lateral elbow pain, and vascular dementia.

⁶ For the purposes of this report CHBRP refers to traditional acupuncture points as those points along the meridian, or path, in which “qi” is believed to flow according to Traditional Chinese Medicine.

⁷ The evidence is presented as “ambiguous/conflicting” if none of the studies of an outcome have strong research designs and/or if their findings vary widely with regard to the direction, statistical significance, and clinical significance/size of the effect.

Needle acupuncture versus other treatments

- The preponderance of evidence suggests that acupuncture is *more effective* than other treatments for back pain (immediately post-treatment only), peripheral joint osteoarthritis pain (when compared to osteoarthritis education), and for migraine headaches (reduction in frequency but not in intensity).
- The preponderance of evidence suggests that needle acupuncture is *as effective as* other treatments for postoperative nausea and vomiting.
- The evidence of the effectiveness of needle acupuncture relative to other treatments is *ambiguous* for shoulder pain and smoking cessation.
- There is *insufficient evidence* to determine whether needle acupuncture is more effective than other treatments for alcohol dependence, epilepsy, lateral elbow pain, and tension-type headaches.

Needle acupuncture plus other treatments versus other treatments alone (i.e., acupuncture needling used as an adjuvant treatment)

- The preponderance of evidence suggests that needle acupuncture is an *effective* adjuvant treatment for back pain, chemotherapy-induced nausea and vomiting and an *effective* adjuvant to exercise for treatment of shoulder pain.
- The preponderance of evidence suggests that needle acupuncture is *not an effective* adjuvant treatment for peripheral joint osteoarthritis, rheumatoid arthritis, and cocaine dependence.

Benefit Coverage, Utilization, and Cost Impacts

AB 72 would require Knox-Keene licensed health plans and policies sold in the group market to provide coverage for acupuncture services. This section presents the current, or baseline, costs and coverage related to acupuncture (needling) for adults, and then details the estimated utilization, cost, and coverage impacts of AB 72 if it were to pass into law.

- According to CHBRP's estimates, there are 21.9 million (Table 1) insured Californians currently enrolled in health plans subject to the California Health and Safety Code or insured by health insurance policies subject to the California Insurance Code and, therefore, subject to AB 72. The affected population includes 14.4 million adults aged 18 years and older.
- Currently, 87.2% of insured Californians subject to the mandate have coverage for acupuncture. This mandate impacts those who currently do not have coverage (12.8%). Privately insured individuals with acupuncture coverage generally have benefit limits, including a maximum number of annual visits. In addition, cost-sharing requirements vary by health plan.

- Before July 2009, Medi-Cal Managed Care Plans provided acupuncture services at no charge to members, but with a limit of two visits per month. In July 2009 the coverage was reduced and Medi-Cal currently provides acupuncture benefits to a low number of enrollees, which includes persons who live in a licensed nursing home, pregnant women, people who were ordered a course of acupuncture treatment prior to July 2009, and children (who have a very low rate of acupuncture utilization). Based on DHCS interpretation, Medi-Cal Managed Care would not be subject to this bill.
- Approximately 2.4% of Californians used acupuncture treatments in 2002, according to the 2003 California Health Interview Survey Complementary and Alternative Medicine Supplement (CHIS-CAM). This utilization was higher than the 2002 national average (1.1%) according to the 2002 National Health Interview Survey (NHIS) data. The CHIS-CAM has not been repeated since 2002 so more recent data on California-specific utilization is not available. Consequently, using other sources and estimates, CHBRP estimates that the utilization in California has risen at a rate consistent with the Western region, resulting in an increased baseline utilization of 3.1% in 2007.
- It is estimated that there would be a negligible change in utilization due to the mandate as both the 2002 and 2007 NHIS surveys showed only small differences in utilization of alternative medical systems between the privately insured and the uninsured (2002: 3.0% and 3.1% respectively, 2007: 3.9% and 4.0% respectively). Cultural acceptance of acupuncture may be a more important factor in utilization than financial barriers.
- Total net annual expenditures are estimated to increase by \$7.45 million or 0.0078%.
- There is an estimated increase in premiums of \$54.9 million. Total premiums for private employers purchasing group health insurance are estimated to increase by \$31.7 million, or 0.0601%, and enrollee contributions toward premiums for group insurance are estimated to increase by \$11.5 million, or 0.0757%.
- Total employer premium expenditures for CalPERS HMOs are estimated to increase by \$11.7 million, or 0.3380%. Of the amount CalPERS would pay in additional total premium, about 58% or \$6.8 million would be the cost borne by the General Fund for CalPERS HMO members who are state employees or their dependents.
- No change is estimated for MRMIB Plan premiums⁸ and Medi-Cal Managed Care Plan premiums as this mandate would not apply to these programs.⁹
- Prior to the mandate, enrollees without coverage for acupuncture incurred an estimated \$67.4 million in out-of-pocket expenses. Postmandate, that \$67.4 million in out-of-pocket expenses would be shifted to health plans and insurers. However, enrollees would incur an additional \$20.0 million in copayments for the newly covered benefits.

⁸ MRMIB plans would not be considered “group plans.” Personal communication with J. Symkowick, MRMIB, February 2011.

⁹ DHCS does not consider Medi-Cal Managed Care plans, “group plans” because beneficiaries do not contract with Medi-Cal managed care plans. Personal communication with C. Macklin, DHCS, March 2011.

- Increases in insurance premiums vary by market segment. Increases as measured by percentage change in per member per month (PMPM) premiums are estimated to range from 0.0010% to 0.0834% for the various group markets (Table 6). Increases as measured by PMPM premiums are estimated to range from \$0.0034 to \$0.2924. In the large-group market, the increase in premiums is estimated to range from \$0.0658 in CDI large-group plans to \$0.2533 PMPM in DMHC large-group plans. For members with small-group insurance policies, health insurance premiums are estimated to increase by approximately \$0.0034 in CDI to \$0.2924 PMPM in DMHC small-group plans. For CalPERS, the estimated increase is \$1.47 PMPM. It is estimated that there would be no increase in the premiums for MRMIB Plans and Medi-Cal Managed Care Plans since the agencies have stated that AB 72 would not apply to their programs.
- The majority of cost effectiveness studies on acupuncture have been conducted in Europe, predominantly the UK, Germany, and Denmark. These studies have found that acupuncture is cost effective in treating patients with allergic rhinitis, chronic headache, chronic neck pain, dysmenorrhea, low back pain, musculoskeletal system disorders, and osteoarthritis. A small number of U.S.-based studies exist. In a general adult population, it has been concluded that acupuncture is cost-effective in improving substance abuse and may be cost saving in the treatment of carpal tunnel syndrome. A 2008 study used managed claims care data in a cross sectional study of the influence of acupuncture utilization on the utilization of other healthcare services in a U.S. setting. The authors found that enrollees that had utilized acupuncture services were statistically less likely to use primary care, all outpatient services, pathology services, all surgery, and gastrointestinal.

Public Health Impacts

- The CHBRP *Public Health Impacts* analysis addresses three common conditions for which acupuncture is used: low back pain, neck pain, and migraine or severe headache. Only a small fraction of the population uses acupuncture for these or other conditions.
- The primary health outcomes associated with acupuncture treatment for musculoskeletal and neurological disorders are reduced pain and improved functionality. Although acupuncture needling has been found to be effective for some conditions, AB 72 is not expected to result in an overall increase in utilization in the short term, and thus is not expected to have measurable impact on the public's health in the 1-year time frame used in this analysis. It is possible that in the longer term, passage of AB 72, along with a potential increase in cultural acceptance of acupuncture as a treatment option, would contribute to an increase in utilization of acupuncture, and therefore, improved health outcomes for persons who do not respond to other treatments.
- Women report higher prevalence of low back pain, neck pain, and migraines or severe headache. Additionally, women report slightly higher utilization of acupuncture. Although AB 72 is not estimated to result in an overall increase in acupuncture treatment, it is expected that more women would financially benefit from insurance coverage of acupuncture compared to men.

- Although Asians do not have higher prevalence rates for low back pain, neck pain, and migraines or severe headache, they report the highest utilization of acupuncture. Therefore, Asians are expected to benefit financially from AB 72 more than other racial and ethnic groups until and unless rates in other ethnic groups come to approximate those of Asians.
- Acupuncture needling is used for some health conditions and behaviors associated with premature death, such as smoking and drug addiction. The evidence presented in the *Medical Effectiveness* section indicates that acupuncture needling may increase abstinence from smoking compared to no treatment. However, the evidence also shows that acupuncture needling is not an effective adjuvant treatment for smoking cessation or drug addiction and is not a more effective treatment compared to sham acupuncture needling. Therefore, CHBRP estimates that AB 72 would have no measureable impact on premature death.
- No research was found addressing economic costs associated with neck pain; however, both low back pain and migraines have been found to be associated with high economic costs, comparable to those of heart disease, depression, and diabetes. Since there is no expected overall measurable increase in the use of acupuncture due to AB 72, there is no expected reduction in economic loss associated with conditions related to acupuncture use in a 1-year time period. However, it is possible that in the longer term, passage of AB 72, along with a potential increase in cultural acceptance of acupuncture as a treatment option, would contribute to an increase in utilization of acupuncture and therefore may reduce economic costs associated with these conditions.

Potential Effects of the Federal Affordable Care Act

The federal “Patient Protection and Affordable Care Act” (P.L.111-148) and the “Health Care and Education Reconciliation Act” (H.R.4872) were enacted in March 2010. These laws— together referred to as the “Affordable Care Act” (ACA)—are expected to dramatically affect the California health insurance market and its regulatory environment, with most changes becoming effective in 2014. How these provisions are implemented in California will largely depend on pending legal actions, funding decisions, regulations to be promulgated by federal agencies, and statutory and regulatory actions to be taken by California state government. The provisions that go into effect during these transitional (2011 to 2013) years would affect the baseline, or current enrollment, expenditures, and premiums. It is important to note that CHBRP’s analysis of specific mandate bills typically address the marginal effects of the mandate bill—specifically, how the proposed mandate would impact benefit coverage, utilization, costs, and public health, holding all other factors constant. CHBRP’s estimates of these marginal effects are presented in this report.

Table 1. AB 72 Impacts on Benefit Coverage, Utilization, and Cost, 2011

	Before Mandate	After Mandate	Increase/ Decrease	Change After Mandate
Benefit Coverage				
Total enrollees with health insurance subject to state-level benefit mandates (a)	21,902,000	21,902,000	0	0%
Total enrollees with health insurance subject to AB 72	15,113,000	15,113,000	0	0%
Percentage of enrollees with coverage for the mandated benefit	87.2%	100.0%	12.8%	15%
Number of enrollees with coverage for the mandated benefit	13,171,000	15,113,000	1,942,000	15%
Utilization and Cost				
Coverage similar to mandated levels	3,108,624	3,567,094	458,470	15%
No coverage	458,470	0	(458,470)	-100%
Average per unit cost	\$147	\$147	0	0%
Expenditures				
Premium expenditures by private employers for group insurance	\$52,713,266,000	\$52,744,925,000	\$31,659,000	0.0601%
Premium expenditures for individually purchased insurance	\$6,724,851,000	\$6,724,851,000	\$0	0.0000%
Premium expenditures by persons with group insurance, CalPERS HMOs, Healthy Families Program, AIM or MRMIP (b)	\$15,173,472,000	\$15,184,954,000	\$11,482,000	0.0757%
CalPERS HMO employer expenditures (c)	\$3,465,785,000	\$3,477,498,000	\$11,713,000	0.3380%
Medi-Cal Managed Care Plans state expenditures	\$8,657,688,000	\$8,657,688,000	\$0	0.0000%
MRMIB Plans state expenditures (d)	\$1,050,631,000	\$1,050,631,000	\$0	0.0000%
Enrollee out-of-pocket expenses for covered benefits (deductibles, copayments, etc.) (e)	\$7,548,415,000	\$7,568,403,000	\$19,988,000	0.2648%
Enrollee expenses for noncovered benefits (e)	\$67,395,000	\$0	(\$67,395,000)	-100%
Total Annual Expenditures	\$95,401,503,000	\$95,408,950,000	\$7,447,000	0.0078%

Source: California Health Benefits Review Program, 2011.

Notes: (a) This population includes persons with privately funded and publicly funded (e.g., CalPERS HMOs, Medi-Cal Managed Care Plans, Healthy Families Program, AIM, MRMIP) health insurance products regulated by the DMHC or CDI. Population includes enrollees aged 0 to 64 years and enrollees 65 years or older covered by employment-sponsored insurance.

(b) Premium expenditures by enrollees include employee contributions to employer-sponsored health insurance and enrollee contributions for publicly purchased insurance.

(c) Of the increase in CalPERS employer expenditures, about 58% or \$6,660,000 would be state expenditures for CalPERS members who are state employees or their dependents.

(d) MRMIB Plan expenditures include expenditures for 874,000 enrollees of the Healthy Families Program, 8,000 enrollees of MRMIP, and 7,000 enrollees of the AIM program.

(e) Includes only those expenses that are paid directly by enrollees or other sources to providers for services related to the mandated benefit that are not currently covered by insurance. This only includes those expenses that will be newly covered, postmandate. Other components of expenditures in this table include all health care services covered by insurance.

Key: AIM=Access for Infants and Mothers; CalPERS HMOs=California Public Employees' Retirement System Health Maintenance Organizations; CDI=California Department of Insurance; DMHC=Department of Managed Health; MRMIB=Managed Risk Medical Insurance Board; MRMIP=Major Risk Medical Insurance Program.

INTRODUCTION

The California Assembly Committee on Health requested on January 14, 2011, that the California Health Benefits Review Program (CHBRP) conduct an evidence-based assessment of the medical, financial, and public health impacts of Assembly Bill (AB) 72, a bill that would impose a health benefit mandate by requiring coverage for treatments delivered by a particular profession, in this case, acupuncturists. In response to this request, CHBRP undertook this analysis pursuant to the provisions of the program's authorizing statute.¹⁰

Analysis of AB 72

Approximately 21.9 million Californians (59%) have health insurance that may be subject to a health benefit mandate law passed at the state level.¹¹ Of the rest of the state's population, a portion is uninsured (and so has no health insurance subject to any benefit mandate) and another portion has health insurance subject to other state law or only to federal laws.

Uniquely, California has a bifurcated system of regulation for health insurance subject to state-level benefit mandates. The California Department of Managed Health Care (DMHC)¹² regulates health care service plans, which offer benefit coverage to their enrollees through health plan contracts. The California Department of Insurance (CDI) regulates health insurers,¹³ which offer benefit coverage to their enrollees through health insurance policies.

DMHC-regulated group plans and CDI-regulated group policies would be subject to AB 72, including CalPERS HMOs, but excluding MRMIB Plans and Medi-Cal Managed Care Plans. Therefore, the mandate would affect the health insurance of approximately 15.1 million Californians (40%) with state-regulated health insurance.

Bill language

The full text of AB 72 can be found in Appendix A.

AB 72 is a mandate to provide reimbursement for acupuncture care—that is, it requires coverage for treatments delivered by a particular profession, in this case, acupuncturists. It applies to every

¹⁰ CHBRP's authorizing statute is available at: http://www.chbrp.org/documents/authorizing_statute.pdf

¹¹ CHBRP's estimates are available at: http://www.chbrp.org/other_publications/index.php.

¹² DMHC was established in 2000 to enforce the Knox-Keene Health Care Service Plan of 1975; see Health and Safety Code, Section 1340.

¹³ The CDI licenses "disability insurers." Disability insurers may offer forms of insurance that are not health insurance. This report considers only the impact of the benefit mandate on health insurance policies, as defined in Insurance Code, Section 106(b) or subdivision (a) of Section 10198.6.

health care service plan that provides coverage for hospital, medical, or surgical expenses and to every issuer of health insurance.¹⁴ Although acupuncture can be used to treat dental pain, the bill mandate does not apply to specialized health care plans, such as dental plans. The bill amends Section 1373.10 of the Health and Safety Code and Section 10127.3 of the Insurance Code, and it expands a current mandate to offer coverage into a mandate to provide coverage, and removes exceptions. The bill also mandates coverage for expenses incurred as a result of treatment by holders of a license to practice acupuncture, as defined by Section 4938 of the Business and Professions Code. Further, the bill would apply to group contracts or policies, while the market for individually purchased health insurance would not be affected by this bill. And finally, the bill stipulates that the coverage for acupuncture shall be under terms and conditions as may be agreed upon by the health plan and group contractholder or health insurer and group policyholder.

Analytic approach and key assumptions

The impact of the proposed benefit mandate is dependent on any future changes in the Business and Professions Code and determinations of scope of practice. Because the mandate is not restricted to particular conditions or diseases, CHBRP necessarily limits the analysis of the bill's impact. CHBRP does not evaluate treatments other than acupuncture (needling) for this report. Based on the CHBRP current coverage survey, current coverage for acupuncture does not include herbs used as dietary supplements.¹⁵ CHBRP assumes the terms of coverage with regard to herbal supplements would remain the same postmandate.

The cost and public health impacts of the bill are contingent on California regulators' determinations regarding the bill's mandate to provide coverage "under terms and conditions as may be agreed upon" by a health plan/health insurer and a group contractholder/policyholder. These determinations would affect acupuncture benefit designs, such as the terms of cost sharing, limits on the number of visits, and other annual benefit limits. CHBRP has approached the analysis of the mandate by assuming that the current baseline level of benefits would be extended to all members with group health insurance. Moreover, CHBRP assumes the practices of utilization review and medical management would continue.

The mandate would apply to all enrollees in group plans; however, CHBRP has made the simplifying assumption to exclude persons under age 18 years due to low utilization of acupuncture services and lack of medical literature on its effectiveness on the under-age-18 population.

¹⁴ Health care service plans, commonly referred to as health maintenance organizations, are regulated and licensed by the California Department of Managed Health Care (DMHC), as provided in the Knox-Keene Health Care Services Plan Act of 1975. The Knox-Keene Health Care Services Plan Act is codified in the California Health and Safety Code. Health insurance policies are regulated by the California Department of Insurance and are subject to the California Insurance Code.

¹⁵ Dietary supplements are treated distinctly from drug products or "conventional" foods by the Food and Drug Administration (FDA).

Background on the Disease or Conditions Treated with Acupuncture

Acupuncture therapies are used to treat a variety of conditions. This report focuses primarily on the use of acupuncture in the treatment of three common musculoskeletal or neurological disorders for which acupuncture is frequently used: low back pain, neck pain, and migraine or severe headache. Table 2 details the 3-month period prevalence of these health conditions in the United States population. According to the 2009 National Health Interview Survey (NHIS), low back pain is the most prevalent of these conditions, with 28.2% of respondents reporting pain within the past 3 months, followed by migraine or severe headache at 16%, and neck pain at 15.1%.

Table 2. Period Prevalence of Low back Pain, Neck Pain, and Migraine or Severe Headache in the Past 3 Months

Respondent Characteristic (a)	Health Condition (b)		
	Low back Pain	Neck Pain	Migraine or Severe Headache
All Respondents	28.2%	15.1%	16.0%
Insurance Status			
Insured	28.6%	15.4%	15.2%
Uninsured	28.0%	15.4 %	18.5%
Gender			
Male	26.0%	12.6%	10.0%
Female	30.2%	17.5%	21.8%
Race/Ethnicity			
White	28.8%	15.7%	16.2%
Black	26.7%	12.9%	17.0%
Hispanic	26.3%	15.1%	16.4%
Asian	17.8%	8.5%	8.3%

Source: U.S. Department of Health and Human Services (DHHS). Summary Health Statistics for U.S. Adults: National Health Interview Survey, 2009, Tables 9 and 10.

Notes: (a) Respondents over the age of 18.

(b) Respondents with pain that lasted a whole day or more within the past 3 months and not due to minor aches and pains.

Among these three health conditions, higher prevalence for females in the 3-month period is statistically significant, especially for migraine or severe headache, for which the 3-month period prevalence was over twice that of males. Asian respondents¹⁶ had the lowest 3-month period prevalence for all three conditions, while 3-month period prevalence was comparable for Whites, Blacks, and Hispanics (Table 3).

Although these conditions are highly prevalent, only a small fraction of the population currently uses acupuncture to treat these or the many other health conditions for which acupuncture is utilized. National estimates indicate that in 2007, 1.4% of the adult population had used

¹⁶ The NHIS uses racial categories defined by the OMB (per OMB Federal Registrar notice “Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity” in 1997). The OMB defines “Asian” as “a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.” Further information may be found at: http://www.whitehouse.gov/omb/fedreg_1997standards/.

acupuncture in the past year, which is a 0.3% increase from 2002 (Su and Li, 2011; Barnes et al., 2008). Table 3 indicates differential use of acupuncture by gender and race/ethnicity. Past year acupuncture use is slightly higher among females, and Asians report the highest rate of past year utilization.

Table 3. Past Year Utilization of Acupuncture by Gender and Race/Ethnicity

Respondent Characteristic	Percent Use in Past 12 Months
Total (a)	1.4%
Gender (b)	
Male	1.0%
Female	1.1%
Race/Ethnicity (a)	
White	1.5%
Black	0.6%
Hispanic	1.1%
Asian	3.7%

Source: Su and Li, 2011; Burke et al., 2006.

Notes: (a) This is based on data from the 2007 NHIS-CAM.

(b) This is based on data from the 2002 NHIS-CAM.

Acupuncture is a centuries-old healing art with origins in traditional Chinese medicine, which aims to restore balance to the body and promote overall health. The growing interest in alternative and complementary care in the United States has included acupuncture (IOM, 2005). Beginning in the early 1970s, acupuncture became more accepted in the United States, and states responded by creating a distinct professional license for the practice of acupuncture that allowed non-physicians to practice (Little Hoover Commission, 2004). In 2004, 40 states had some kind of licensure for acupuncturists, including California (McKinley, 2004).¹⁷ The profession is growing, especially in California. In 2011, the California Board of Acupuncture had approximately 11,000 licensed acupuncturists.¹⁸ This represents an approximate 75% increase since 2003, when the California Board of Acupuncture had licensed 6,300 acupuncturists, about a third of the total estimated U.S. acupuncture workforce, the majority of whom worked in a solo practice (Dower, 2003; Eisenberg et al., 2002).

Acupuncture is a family of practices in which the skin is stimulated with the intention, in the traditional understanding, of normalizing patterns of energy (*Qi*) that can manifest as disease. Often this is done by inserting thin metal needles at precise points in the skin;¹⁹ however, other techniques are also used (NIH, 1997). Acupuncture is defined by California law in Section 4927(d) of the Business and Professions Code: “Acupuncture” means the stimulation of a certain point or points on or near the surface of the body by the insertion of needles to prevent or modify the perception of pain or to normalize physiological functions, including pain control, for

¹⁷ According to www.acupuncture.com, 45 of 50 states have some legislation or rules authorizing the practice of acupuncture. The five exception states include: AL, MS, ND, SD, and WY.

¹⁸ Personal Communication, B Bodea, California Acupuncture Board, March 2011.

¹⁹ About 150 points, aligned along 14 main channels or meridians, are used in common practice, but upwards of 2,000 points have been identified (Kaptchuk, 2002).

the treatment of certain diseases or dysfunctions of the body and includes the techniques of electroacupuncture, cupping, and moxibustion (the burning of *moxa*, or mugwort herb, on or near the skin as a counterirritant).²⁰

In accordance with this definition, the scope of practice for a licensed acupuncturist, according to the California Acupuncture Board, includes not only acupuncture (needling), but also other treatments such as massage, moxibustion, and cupping, and the prescription of herbs as dietary supplements.

Acupuncture can be understood as either a broad or narrow modality of treatment. The former view is associated with traditional Chinese medicine; the latter view is sometimes referred to as “medical acupuncture.” It is the more narrow understanding of acupuncture as a technique to treat a particular disease or condition that has typically been incorporated into health care systems based on insurance and evaluations of medical effectiveness. The tension in the two views have been manifest in debates regarding the scope of practice for acupuncturists in California, particularly over the implications of their role as primary care providers (Little Hoover Commission, 2004).²¹

Bill Description

AB 72 is a mandate to reimburse for acupuncture services—that is, it requires coverage for treatments delivered by a particular profession, in this case, acupuncturists. It applies to every health care service plan that provides coverage for hospital, medical, or surgical expenses and to every issuer of health insurance.²² Although acupuncture can be used to treat dental pain, the bill mandate does not apply to specialized health care plans, such as dental plans. The bill amends Section 1373.10 of the Health and Safety Code and Section 10127.3 of the Insurance Code, and it:

- Expands a current mandate to offer coverage into a mandate to provide coverage, and removes exceptions.
- Mandates coverage for expenses incurred as a result of treatment by holders of a license to practice acupuncture, as defined by Section 4938 of the Business and Professions Code.

²⁰ Electroacupuncture is a technique for stimulating an acupuncture point by sending a weak electric current through the metal needle. Cupping is a technique that involves warming small cup-like containers that are then placed on the skin, creating suction. Moxibustion is a technique that involves heating an acupuncture point by burning herbs.

²¹ In 2002, SB 1951 and AB 1943 requested the Little Hoover Commission to report on the State’s regulation of acupuncture and, specifically, to assess the scope of practice and educational requirements for acupuncturists. The Commission found that there is not clear statutory language regarding an acupuncturist’s authority to diagnose a patient and his or her role to serve as a primary care provider (and for example an acupuncturist’s authority to order medical tests), creating confusion about the role of the acupuncturist in the health care system.

²² Health care service plans, commonly referred to as health maintenance organizations, are regulated and licensed by the California Department of Managed Health Care (DMHC), as provided in the Knox-Keene Health Care Services Plan Act of 1975. The Knox-Keene Health Care Services Plan Act is codified in the California Health and Safety Code. Health insurance policies are regulated by the California Department of Insurance and are subject to the California Insurance Code.

- Applies to group contracts or policies. The market for individually purchased health insurance is not affected by this bill.
- The coverage shall be under terms and conditions as may be agreed upon by the health plan and group contractholder or health insurer and group policyholder.

The Council of Acupuncture and Oriental Medicine Associations is sponsoring the bill. The Council and bill author intend to make acupuncture more accessible to Californians. The sponsor notes that acupuncture is an accepted modality of treatment within the California Workers' Compensation System and contends that acupuncture can be an effective treatment, can be less costly than surgery, and sometimes is the preferred treatment among several ethnic minorities.

CHBRP has analyzed one similar bill: Senate Bill (SB) 54 introduced by Assembly Member Dymally in 2007. Prior to CHBRP's inception, a similar bill, SB 573, was introduced by Senator Burton.²³ In 2007, CHBRP estimated that 86.3% of insured Californians subject to the mandate had coverage for acupuncture. As will be discussed in further detail in the *Benefit Coverage, Utilization, and Cost Impacts* section, the percentage of enrollees in DMHC- and CDI-regulated plans and policies (based on CHBRP's surveys) in the group market with acupuncture benefits has increased to 91.8%.

State Activity

California

The California Workers' Compensation system includes acupuncture within its treatment guidelines and is currently in the process of promulgating a medical treatment utilization schedule for acupuncture. Acupuncture is considered indicated for: neck and upper back complaints; elbow complaints; forearm, wrist, and hand complaints; low back complaints; knee complaints; ankle and foot complaints; and pain, suffering, and the restoration of function associated with these conditions. The guidelines allow for the extension of the acupuncture treatment schedule if functional improvement is shown (Title 8, California Code of Regulations, section 9792.20 et seq. Final Text of Regulations—Effective June 15, 2007).

Assembly Bill X3 5 (Evans, Chapter 20, Statutes of 2009) excluded various optional benefits from coverage under the Medi-Cal program, including acupuncture services. Acupuncture is only reimbursable to treatment performed to prevent, modify, or alleviate the perception of severe, persistent chronic pain resulting from generally recognizable medical condition, and is limited to a maximum of two services per calendar month.²⁴ According to the DHCS website, benefits are now only available (except for patients continuing a course of treatment that dates back to 2009) to pregnant women, who receive the optional benefit if it is part of their pregnancy-related care or for services to treat a condition that may cause problems in pregnancy. Additionally, children or young adults aged 20 years and younger who receive full-scope Medi-Cal are eligible. And finally, the limited acupuncture benefit is available to people who live in a licensed nursing home such as a Skilled Nursing Facility (SNF),

²³ AB 54 was vetoed by Governor Schwarzenegger on August 1, 2008, and SB 573 did not pass out of the Assembly in 2002.

²⁴ California Code of Regulations, Title 22, Section 51304(a).

Intermediate Care Facility (ICF), ICF for the Developmentally Disabled (ICF-DD), and Sub Acute Facility (DHCS, 2009.)

The DMHC has collected a negligible (fewer than 10) number of complaints regarding current acupuncture benefits.²⁵ Additionally, there were 67 records that included acupuncture in a varied range of diagnoses categories. Of the IMR cases identified, 27 of the health plans' original decisions were upheld, and 25 were overturned.²⁶ These low numbers and varied issues and outcomes make it difficult to draw any conclusions.

Until recently, the CDI did not track complaints by treatment category and does not have data on acupuncture services at this time. An informal internal poll of CDI staff indicated that any complaints received usually involve limitations on payments for acupuncture treatment as outlined in policy language, if such coverage is provided. In terms of IMR disputes at the CDI, none have occurred since at least before 2009.²⁷

Other States

A number of other states have had legislative activity around coverage for acupuncture. The State of Washington has had mandated coverage of acupuncture since 1994 when a law was passed that mandated coverage for all licensed health care practitioners for all in-state based insurance. The other states that have some sort of acupuncture/provider access mandate include Florida, Maine, Montana, Nevada, New Mexico, Oregon, Rhode Island, Texas, Virginia, and Washington State.

Potential Effects of Federal Affordable Care Act

The federal "Patient Protection and Affordable Care Act" (P.L.111-148) and the "Health Care and Education Reconciliation Act" (H.R.4872) were enacted in March 2010. These laws— together referred to as the "Affordable Care Act" (ACA)—are expected to dramatically affect the California health insurance market and its regulatory environment, with most changes becoming effective in 2014. How these provisions are implemented in California will largely depend on pending legal actions, funding decisions, regulations to be promulgated by federal agencies, and statutory and regulatory actions to be taken by California state government.

The provisions that go into effect during the transitional years (2011 through 2013) would affect the baseline, or current enrollment, expenditures, and premiums. It is important to note that CHBRP's analysis of specific mandate bills typically address the marginal effects of the mandate bill—specifically, how the proposed mandate would impact benefit coverage, utilization, costs, and public health, holding all other factors constant. CHBRP's estimates of these marginal effects are presented in this report. Each of the provisions that have gone into effect by January 2011 has been considered to determine whether they may affect CHBRP's 2011 Cost and

²⁵ Personal Communication with A. Abu-Rahma, DMC, March 2011.

²⁶ Confirmed via Personal Confirmation with A. Abu-Rahma, DMHC, March 2011.

²⁷ Personal Communication with J. Figueroa, March 2011.

Coverage Model. There are still a number of provisions that have gone into effect for which data are not yet available. Where data allows, CHBRP has made adjustments to the Cost and Coverage model to reflect changes in enrollment and/or baseline premiums. These adjustments are discussed in further detail in Appendix D.

A number of ACA provisions will need regulations and further clarity. One example is the ACA's requirement for certain health insurance to cover "essential health benefits." Effective 2014, Section 1302(b) will require small group and individual health insurance, including "qualified health plans" that will be sold in the California Exchange, to cover specified categories of benefits. These essential health benefits (EHBs) are defined as ambulatory patient services; emergency services; hospitalization; maternity and newborn care; mental health and substance use disorder services, including behavioral health treatment; prescription drugs; rehabilitative and habilitative services and devices; laboratory services; preventive and wellness services and chronic disease management; and pediatric services, including oral and vision care. The Secretary of Health and Human Services is charged with defining these categories through regulation, ensuring that the EHB floor "is equal to the scope of benefits provided under a typical employer plan." In addition, the ACA would allow a state to "require that a qualified health plan offered in [the Exchange] offer benefits in addition to the essential health benefits." If the state does so, the state must make payments to defray the cost of those additionally mandated benefits, either by paying the individual directly, or by paying the qualified health plan. This ACA requirement could interact with existing and proposed California benefit mandates, especially if California decided to require qualified health plans to cover California-specific mandates, and those mandates were determined to go beyond the EHB floor. Federal regulations regarding which benefits are to be covered under these broad EHB categories and other details, such as how the subsidies for purchasers of qualified health plans are structured, are forthcoming.²⁸

Essential health benefits for qualified health plans sold in the Exchange and potential interactions with AB 72

The ACA requires beginning 2014 for states to "make payments...to defray the cost of any additional benefits" required of QHPs sold in the Exchange.¹ It is conceivable that EHBs may be defined to include acupuncture under certain EHB categories (e.g. under "chronic disease management" or "ambulatory services"). HHS is to ensure that the definition of EHBs "is equal to the scope of benefits provided under a typical employer plan." There is variation among large and small group employer plans regarding coverage of acupuncture services. Therefore it is unclear whether EHBs would be defined to include acupuncture services and it is unclear that whether, beginning in 2014, AB 72 would incur a fiscal liability for the state. This potential liability would depend on three factors:

- Differences in the scope of benefits in the final EHB package and the scope of mandated benefits in AB 72;
- The number of enrollees in QHPs; and,
- The methods used to define and calculate the cost of additional benefits.

²⁸ For further discussion on EHBs and potential interaction with state mandates, please see *California's State Benefit Mandates and the Affordable Care Act's "Essential Health Benefits"* available here: http://www.chbrp.org/other_publications/index.php.

All of these factors are unknown at this time, and are dependent upon the details of pending federal regulations, state legislative and regulatory actions, and enrollment into QHPs after the Exchange is implemented.

MEDICAL EFFECTIVENESS

Numerous studies of the effectiveness of acupuncture have been conducted in Asia, Europe, and North America. Accordingly, CHBRP could not analyze all of the literature on the effectiveness of acupuncture during the time available for this analysis. Given this constraint, CHBRP decided to focus on studies using the strongest research designs and those that were conducted the most recently. The review also emphasizes evidence regarding musculoskeletal and neurological conditions, because they are the types of conditions for which persons in the United States most frequently use acupuncture (Burke et al., 2006; Cherkin et al., 2002; Lafferty et al., 2006).

Literature Review Methods

Due to the large amount of literature on the effectiveness of acupuncture services, CHBRP limited its literature search to meta-analyses, systematic reviews, evidence-based guidelines, and randomized controlled trials (RCTs) because such studies provide the strongest forms of evidence. Studies of the effects of acupuncture were identified through searches of MEDLINE (PubMed), the Cochrane Database of Systematic Reviews, the Cochrane Register of Controlled Clinical Trials, Web of Science, Business Sources Complete, and EconLit. In addition, Web sites maintained by the following organizations that index or publish systematic reviews and evidence-based guidelines were searched: Agency for Healthcare Research and Quality, International Network of Agencies for Health Technology Assessment, National Health Service Centre for Reviews and Dissemination, National Institutes of Health and Clinical Evidence, and Scottish Intercollegiate Guideline Network.

The search was limited to studies published in English from May 2007 to the present. The time frame for the search was truncated because CHBRP conducted a search of the literature on the effectiveness of acupuncture published through May 2007 for a report it issued in June 2007 on AB 54, an identical bill regarding coverage for acupuncture. The studies identified for the prior review are included here. Twenty-two additional pertinent studies were identified, retrieved, and reviewed. RCTs were included in this report when they were published after a systematic review or meta-analysis of the same condition and if the quality of the RCT is of comparable or higher quality than the synthesized literature. Findings from these studies were integrated with findings from studies that were analyzed for CHBRP's report on AB 54 if they provided the most current synthesis of literature. A more thorough description of the methods used to conduct the medical effectiveness review and the process used to grade the evidence for each outcome measure is presented in Appendix B: Literature Review Methods. Appendix C includes tables that describe the studies that CHBRP reviewed and their findings. A table that lists conditions for which acupuncture is effective appears at the end of this section of the report (Table 4).

This review summarizes findings from the literature on the effectiveness of needling. CHBRP decided to focus on needling because this practice is unique to acupuncture and is typically covered by health plans that provide acupuncture benefits. Studies of both manual acupuncture and electroacupuncture are included. Other procedures often performed by acupuncturists, such as acupressure massage, cupping, and moxibustion, are excluded. Studies of the effectiveness of herbal medications dispensed by acupuncturists are also excluded.

Methodological Considerations

Many of the RCTs included in the meta-analyses and systematic reviews that CHBRP assessed are of low quality, which often precludes reaching strong conclusions about the effectiveness of acupuncture services. Acupuncture treatments are often not standardized, which makes it difficult to determine whether everyone in a treatment group received the same treatment. Methodological issues that may increase the risk of bias in acupuncture studies include differences in needling locations, degrees of needle insertion, use of needle stimulation, and the character and level of patient-provider interactions. Many articles published about these RCTs do not report sufficient information regarding the blinding of subjects and concealment of allocation of subjects to treatment and control groups from researchers analyzing data collected during the study. In addition, the sample sizes are often too small to provide reliable findings and conclusive evidence of acupuncture's effectiveness. Yet while the standardization of procedures is important to establish reliable findings, the generalization of the findings may not apply to real-world settings, as treatment with acupuncture is often tailored to the individual patient's needs. In 2002, researchers studying acupuncture established the Standards for Reporting Interventions in Controlled Trials in Acupuncture (STRICTA) recommendations to promote better reporting of study results (MacPherson et al., 2002). Recently, researchers have begun to design and publish comprehensive reports on findings from large, well-designed RCTs on acupuncture (Kong et al., 2010; La Touche et al., 2010; Vickers et al., 2010).

There is also considerable debate about how studies of acupuncture should be designed (Berman et al., 2010; Langevin et al., 2011). One major limitation of studies that compare acupuncture to no treatment is that they cannot rule out the possibility that improvements that occur in the treatment group are due to a placebo effect. People who receive acupuncture may experience relief from their symptoms because of their beliefs that acupuncture will help, not because acupuncture stimulates a physiological response. Research over the past decade has mostly compared acupuncture to "sham acupuncture," a technique that often involves inserting needles in parts of the body other than traditional acupuncture points. For the purposes of this CHBRP report, sham acupuncture is defined as needling or pricking points on the body that are not traditional acupuncture points. According to Traditional Chinese Medicine, traditional acupuncture points are those points along the meridian, or path, in which "qi" is believed to flow. This design enables researchers to isolate the effect of acupuncture from the placebo effect of receiving treatment. Comparing acupuncture to sham acupuncture also reduces the likelihood that participants will be able to guess correctly whether they are in the treatment or control group, which is likely to reduce attrition in the control group. However, there is a growing body of evidence that sham acupuncture is not an inert placebo, because inserting needles in any part of the body may elicit a physiological response (Berman et al., 2010; Harris et al., 2009; Langevin et al., 2006; Langevin et al., 2011; Linde et al., 2010; NIH, 1997). Researchers have investigated various methods for administering sham acupuncture without inserting needles (e.g., poking the skin with a toothpick in a guidetube), although there is some evidence that even noninvasive sham acupuncture may induce a physiological response, especially if performed at acupuncture points (Berman et al., 2010; Birch, 2006; Kaptchuk, 2002; Langevin et al., 2006; Sherman et al., 2002; Tsukayama et al., 2006). And while the scientific community is proposing new strategies for research designs that address the role of the placebo effect in acupuncture, at

present the best designs for studies of acupuncture seems to be a three-armed design in which acupuncture is compared to sham acupuncture and either no treatment or another treatment (Berman et al., 2010; Langevine et al., 2010).

Comparison of acupuncture with other treatments or as an adjuvant to other treatments is important because other treatments are available for many of the diseases and conditions for which persons in California use acupuncture. For example, analgesic medications, exercise, massage, physical therapy, spinal manipulation (i.e., chiropractic care), steroid injections, and surgery are widely used to treat pain associated with musculoskeletal conditions. Consumers and health professionals need to know how effective acupuncture is relative to other treatments and whether combining acupuncture with another treatment is more effective than either acupuncture or the other treatment alone.

Outcomes Assessed

The health outcomes assessed vary by disease or condition. Most studies of the effectiveness of acupuncture for musculoskeletal and neurological conditions assess effects on pain and functioning. A few studies on these conditions assess other outcomes such as health status, absences from work, and return to work. The primary outcomes evaluated in studies of acupuncture's effects on chemotherapy-induced and postoperative nausea and vomiting are reductions in these side effects of chemotherapy and surgery. Studies of effects of acupuncture as a treatment for cocaine dependence and for smoking cessation are primarily concerned with effects on abstinence.

Study Findings

Findings from the studies included in this review are summarized below. They are grouped by type of comparison (i.e., acupuncture versus no treatment, acupuncture versus sham acupuncture, acupuncture versus other treatments, and acupuncture plus other treatments versus other treatments). Findings regarding the effects of acupuncture on a specific disease or condition may be dispersed across all four categories of comparisons. CHBRP decided to organize the findings by type of comparison rather than by disease or condition, because AB 72 would not limit coverage for acupuncture to any specific diseases or conditions. Presenting findings by type of comparison enables policymakers to more easily assess acupuncture's effectiveness across the wide range of diseases and conditions that have been studied.

Two summaries of the findings from the literature review appear at the end of this section of the report. The first summary is a set of bullet points that summarize findings by type of comparison that appears on pages 32 and 33. The second summary is a table that presents findings by type of disease and condition for which the effectiveness of acupuncture was evaluated (Table 4). Appendix C contains two tables that provide additional information. Table C-1 lists the studies reviewed and describes their characteristics. Table C-2 contains more detailed information on the studies' findings. Appendix B describes the terminology that CHBRP uses to rate the evidence of the effectiveness of interventions.

Acupuncture Versus No Treatment

Musculoskeletal conditions

- Two meta-analyses on the effectiveness of acupuncture relative to no treatment for musculoskeletal conditions were reviewed. The two reviews reported that the preponderance of evidence from RCTs suggests that acupuncture is an effective treatment for back pain and peripheral joint osteoarthritis relative to no treatment (Furlan et al., 2010; Manheimer et al., 2010). Collectively, the studies found that acupuncture reduced pain associated with these musculoskeletal conditions or improved functioning in the short-term. There is *insufficient evidence* to determine whether needle acupuncture is an effective adjuvant treatment for neck pain.

Overall, the preponderance²⁹ of evidence suggests that acupuncture is an *effective* treatment for back pain and peripheral joint osteoarthritis compared to no treatment. There is *insufficient evidence* to determine whether needle acupuncture is an effective treatment for neck pain.

Neurological conditions

Two meta-analyses on the effectiveness of acupuncture for the treatment of migraine and tension-type headaches found that a preponderance of evidence suggests that acupuncture is effective relative to no treatment (Linde et al., 2009a; Linde et al., 2009b). Collectively, the studies found that acupuncture reduced the frequency of headaches and the number of headache days among patients with tension-type headaches and patients with migraine headaches 3 to 4 months after treatment. Among patients with migraines, the study also found that acupuncture relative to no treatment reduced the number of migraine days and the intensity of migraines after 3 to 4 months of treatment.

The preponderance of evidence suggests that acupuncture is an *effective treatment* for patients with migraine and tension-type headache relative to no treatment.

Addiction disorders

There is also some evidence that acupuncture may be more effective than no treatment in facilitating abstinence from smoking. One meta-analysis identified three RCTs that compared acupuncture to no treatment for smoking cessation (White et al., 2011). The authors pooled the results of the three RCTs and found that persons who received acupuncture were 1.9 times more likely to abstain from smoking 6 to 12 months after the study ended than persons who received no treatment. The difference approached statistical significance ($p = 0.06$).

The evidence suggests that acupuncture *may be more effective* than no treatment in facilitating smoking cessation.

²⁹ The term “preponderance” is defined in Appendix B.

Acupuncture Versus Sham Acupuncture

One major limitation of studies that compare acupuncture to no treatment is that they cannot rule out the possibility that improvements that occur in the treatment group are due to a placebo effect. People who receive acupuncture may experience relief from their symptoms because they believe acupuncture will help them and not because acupuncture stimulates a physiological response. Several studies have found that persons who have high expectations of acupuncture are more likely to report improvement in outcomes than persons who have low expectations (Bausell et al., 2005; Kalauokalani et al., 2001). Improvement may also be due solely to the attention persons receive from acupuncturists or acupuncturists' enthusiasm about the treatments they provide (Kaptchuk, 2002; Langevin et al., 2006). As discussed above, researchers have recommended that studies should compare acupuncture to "sham acupuncture." However, these studies may understate the effects of acupuncture, because there is evidence that sham acupuncture is not an inert placebo, especially if it involves needling. In addition, there is no consensus as to what constitutes an appropriate sham treatment. For this reason, CHBRP presents findings from meta-analyses, systematic reviews, and RCTs that compare acupuncture to sham acupuncture as reported and does not critique the appropriateness of the sham treatments that were used.

Musculoskeletal conditions

Seven meta-analyses and systematic reviews and one additional RCT have assessed the effectiveness of acupuncture versus sham acupuncture for treatment of musculoskeletal conditions.

One meta-analysis found that acupuncture is more effective than sham acupuncture for treatment of temporomandibular joint dysfunction. Four RCTs demonstrated positive results in reducing pain but the relevance of the results are limited by the small size of these RCTs.

Two meta-analyses found that acupuncture is no more effective than sham acupuncture for treatment of neck pain and rheumatoid arthritis (Furlan et al., 2010; Lee et al., 2008). Collectively, the studies found no effect of acupuncture relative to sham in reducing pain associated with these conditions. In the study of patients with rheumatoid arthritis, acupuncture was not more effective than sham acupuncture in reducing disability, disease activity, or the number of swollen and tender joint counts relative to sham acupuncture (Furlan et al., 2010).

Findings regarding the effects of acupuncture relative to sham acupuncture on fibromyalgia, peripheral joint osteoarthritis, and shoulder pain were ambiguous. One meta-analysis of acupuncture versus sham acupuncture for fibromyalgia found a reduction of pain but no improvement in fatigue, sleep, or physical function at post-treatment period. At a follow-up of 26 weeks the authors found no benefit of acupuncture over sham acupuncture for pain, fatigue, sleep, or physical function (Langhorst et al., 2009). Similarly, a meta-analysis of nine RCTs that compared acupuncture to sham acupuncture for peripheral joint osteoarthritis found evidence of pain reduction and increased function at 8 weeks post-treatment but borderline significance of these outcomes at 26 weeks (Manheimer et al., 2010). Manheimer et al. (2010) reported that the benefits seen at both 8 weeks and the subsequent 26 weeks were not clinically meaningful improvements, as defined by the authors' thresholds. A systematic review of three RCTs that compared acupuncture to sham acupuncture for shoulder pain found that two of the three RCTs

reported no statistically significant difference in pain and the other reported a small, statistically significant improvement in functioning (Green et al., 2005). The large, well-designed RCT published subsequent to the meta-analysis on shoulder pain found that 65% of patients with shoulder pain reported a 50% reduction in pain from the baseline compared to 24% of patients in the sham group, resulting in a highly significant difference (Molsberger et al., 2010).

There was insufficient evidence to determine whether acupuncture is more effective than sham acupuncture for treatment of lateral elbow pain because the only RCTs that assessed these outcomes had samples that were so small that they may not have had adequate power to detect a statistically significant difference (Green et al., 2002; Trinh et al., 2004).

The preponderance of evidence suggests that acupuncture is *more effective* than sham acupuncture for treatment of temporomandibular joint dysfunction. The preponderance of evidence suggests that acupuncture is *no more effective* than sham acupuncture for treatment of neck pain and rheumatoid arthritis. The evidence of the effectiveness of acupuncture relative to sham acupuncture on fibromyalgia, peripheral joint osteoarthritis, and shoulder pain is *ambiguous*. There is *insufficient evidence*³⁰ to determine whether acupuncture is more effective than sham acupuncture for lateral elbow pain.

Neurological conditions

Five meta-analyses and systematic reviews sought to examine the effectiveness of acupuncture versus sham acupuncture on neurological conditions. One meta-analysis of rigorous sham-controlled RCTs found acupuncture to be no more effective than sham in the recovery after stroke. The results from pooled analyses found acupuncture is no more effective than sham to increase function or the ability to perform activities of daily living (Kong et al., 2010). One meta-analysis found acupuncture is no more effective than sham acupuncture for treatment of migraine headaches. The pooled results from 11 RCTs found no effect of acupuncture relative to sham for the following outcomes: headache frequency, number of migraine attacks, number of migraine days, or headache intensity 3 to 4 months after treatment (Linde et al., 2009a). In contrast, pooled estimates from 4 RCTs from studies of patients with tension-type headaches showed a favorable effect for acupuncture relative to sham in reducing headache frequency and number of headache days, but not for reducing the intensity of headaches 3 to 4 months after treatment (Linde et al., 2009b).

Few RCTs have been conducted on the effects of acupuncture on other neurological conditions. A meta-analysis of studies of acupuncture for any type of epilepsy (Cheuk and Wong, 2008) found one RCT that compared acupuncture to sham acupuncture. That study reported no statistically significant difference in the frequency and duration of seizures or quality of life. A systematic review of studies of the effectiveness of acupuncture versus sham acupuncture for treatment of vascular dementia was also attempted (Peng et al., 2007). However, the authors did not report any results because none of the studies on vascular dementia had randomized subjects or compared acupuncture to sham acupuncture.

³⁰ Definitions of the terms “ambiguous” and “insufficient” appear in Appendix B.

The preponderance of evidence suggests that acupuncture is more effective than sham acupuncture for reducing the frequency of tension-type headaches and the number of headache days, but not for reducing the intensity of headaches. The preponderance of evidence suggests that acupuncture is *not more effective* than sham acupuncture in relieving migraine headaches and increasing functionality from stroke. There is *insufficient evidence* to determine whether acupuncture is more effective than sham acupuncture for treatment of epilepsy or vascular dementia.

Addiction disorders

Three meta-analyses evaluated the effectiveness of acupuncture versus sham acupuncture for treatment of addiction. The authors of one meta-analysis synthesized findings from eight RCTs and concluded that the preponderance of evidence suggested that acupuncture was no more effective than sham acupuncture in increasing abstinence from smoking (White et al., 2011). A second meta-analysis identified one RCT that compared auricular acupuncture³¹ to sham auricular acupuncture for treatment of cocaine dependence (Gates et al., 2006). That study found that acupuncture was no more effective than sham acupuncture in reducing use of cocaine 8 weeks following treatment. A third study (Cho and Whang et al., 2009) reported the results of three RCTs on alcohol dependence and concluded that the preponderance of evidence suggests that acupuncture does not reduce cravings for alcohol consumption.

The preponderance of evidence suggests that acupuncture is *no more effective* than sham acupuncture in facilitating smoking cessation, recovery from cocaine dependence, or reducing alcohol dependence.

*Nausea and vomiting associated with other treatments*³²

Two meta-analyses have assessed the effects of acupuncture versus sham acupuncture on nausea and vomiting associated with other treatments. Because this report focuses on needling, only findings from the RCTs included in these meta-analyses that examined needling are discussed. RCTs that evaluated noninvasive acupressure devices, such as wrist bands that stimulate acupuncture points, are excluded. A meta-analysis of studies of the effect of acupuncture on chemotherapy-induced nausea and vomiting found only one RCT that compared acupuncture needling to sham acupuncture (Ezzo et al., 2006). This single RCT found no statistically significant difference in severity of nausea or percentage of patients vomiting within 24 hours of chemotherapy. Another meta-analysis synthesized the results of six RCTs on the effectiveness of acupuncture versus sham acupuncture for the treatment of postoperative nausea and vomiting. The pooled analyses showed a favorable effect for acupuncture over sham acupuncture in reducing postoperative nausea and vomiting (Lee and Fan, 2009).

³¹ Auricular acupuncture involves the insertion of acupuncture needles into points in the outer ear. Needling these points (either manually or with electroacupuncture) is hypothesized to send signals via the brain to stimulate healing in the parts of the body associated with these points.

³² Includes studies of acupuncture's effects on chemotherapy-induced and postoperative nausea and vomiting.

Overall, the preponderance of evidence suggests that acupuncture is *more effective* than sham acupuncture in lessening postoperative nausea and vomiting. There is *insufficient evidence* to determine whether acupuncture is more effective than sham acupuncture in preventing chemotherapy-induced nausea and vomiting.

Acupuncture Versus Other Treatments

Ideally, each of the following studies would include both a placebo arm and a sham acupuncture arm in order to best assess the effectiveness of acupuncture versus the other treatments. Synthesized literature on these types of studies does not exist, and therefore the following refers only to the face-to-face evaluation of acupuncture versus the other treatment.

Musculoskeletal conditions

Five meta-analyses and systematic reviews reported findings from RCTs and controlled clinical trials (CCTs) that compared acupuncture to other treatments for musculoskeletal conditions.

One meta-analysis summarized the findings from 16 RCTs of back pain on the effects of acupuncture compared to any the following inactive and active placebos: Sham TENS,³³ nonpenetrating needling, superficial needling at nonacupuncture points, guided tubes, toothpick inside the tube, superficial needling, injection of anesthetics, and no stimulation. The preponderance of evidence from pooled results showed that acupuncture is better than these other treatments in reducing pain immediately post-treatment but not at short-term, intermediate term, or long-term follow-up. Additional pooled analyses compared acupuncture to manipulation, medication, and TENS and found no favorable effect of acupuncture relative to these treatments (Furlan et al., 2010).

The meta-analyses and systematic reviews found the effects of acupuncture relative to other treatments to be ambiguous for lateral elbow pain, back pain, peripheral joint arthritis, and for shoulder pain. One systematic review of RCTs on lateral elbow pain found ambiguous evidence regarding the effectiveness of acupuncture relative to ultrasound (Trinh et al., 2004). The authors identified two small RCTs on this topic. One of the RCTs reported that persons who obtained acupuncture experienced greater reduction in pain and functional impairment than persons who received other treatment. The other RCT found no difference in reduction in pain. However, the sample size was so small (n = 17) that the study probably did not have sufficient power to detect statistically significant differences between the effects of the two treatments.

The meta-analysis published by Manheimer and colleagues (2010) summarized findings from RCTs on the effectiveness of acupuncture to improve peripheral joint osteoarthritis pain and function compared to other treatments. The comparison treatments included supervised osteoarthritis education, home exercises and advice leaflet, supervised exercise, or physician consultations with a physiotherapy co-intervention. The preponderance of evidence suggest that acupuncture is better than osteoarthritis education in reducing osteoarthritis pain, but found no difference in pain reduction when comparing acupuncture to the other treatments.

³³ Transcutaneous electrical nerve stimulation

A systematic review examined two RCTs that compared acupuncture to three other treatments for shoulder pain: regional nerve block, steroid injection, and ultrasound. The RCT that compared acupuncture to a regional nerve block found that persons who received acupuncture were slower to obtain relief from pain and were less likely to report a reduction in pain 30 hours after treatment (Green et al., 2005). One small RCT compared acupuncture to both steroid injection and ultrasound. The authors reported no difference in pain. A large RCT published after the systematic review compared acupuncture to conventional orthopedic therapy including 50 mg diclofenac³⁴ daily and 15 treatment sessions of individually selected physiotherapy, physical exercise, heat or cold therapy, ultrasound treatment, and TENS. The results showed that the odds for reduced shoulder pain were four times higher in the acupuncture group compared to the conventional orthopedic therapy group.

Overall, the preponderance of evidence suggests that acupuncture is *more effective* than other treatments for reducing back pain immediately after treatment but not at longer-term follow-up. The preponderance of evidence also suggests that acupuncture is *more effective* than osteoarthritis education for reducing peripheral joint osteoarthritis pain, but is *no more effective* than other osteoarthritis treatments. The evidence of the effect of acupuncture compared to other treatments for shoulder pain is *ambiguous*.

Neurological conditions

One meta-analysis (Linde et al., 2009a) compared acupuncture with drug treatments for patients with migraine headaches. The evidence from the pooled analysis shows that acupuncture was more effective than drug treatments in reducing the frequency of headaches and migraines, but was as effective as drug treatments in reducing the intensity of headaches. There were too few studies to assess the effectiveness of acupuncture relative to other treatment for epilepsy and tension-type headaches (Cheuk and Wong, 2008; Linde et al, 2009b).

Overall, the preponderance of evidence suggests that acupuncture is more effective than drug treatments for reducing the frequency of headaches and migraines and is as effective as drug treatment in reducing headache intensity. There is *insufficient evidence* to determine how effective acupuncture is relative to the other treatments for epilepsy and tension-type headaches.

Addiction disorders

One systematic review examined findings from four RCTs that compared acupuncture to the following usual care treatments for reduction in alcohol cravings: medical detoxification, pharmacological treatment, out-patient program, inpatient program, relapse program, psychological approaches, family therapy, and social support. The results of the studies were not pooled in a meta-analysis due to small sample sizes. Three of the four RCTs found a significant reduction in alcohol cravings while one found no difference. Results should be interpreted with caution due to small sample sizes and a large proportion of subjects who drop out of three of the four studies. In a comparison of acupuncture to aromatherapy there was also no difference in

³⁴ Diclofenac is used to relieve pain, tenderness, swelling, and stiffness caused by osteoarthritis.

alcohol craving (Cho and Whang, 2009). A meta-analysis that compared acupuncture to Nicotine Replacement Therapy (NRT) and counseling found that acupuncture is less effective than NRT but as effective as counseling in facilitating smoking cessation.

The preponderance of evidence on acupuncture relative to other treatments for smoking cessation is that acupuncture is less effective than NRT and as effective as counseling. There is *insufficient evidence* to determine how effective acupuncture is relative to the other treatments for alcohol dependence.

Nausea and vomiting associated with other treatments

One meta-analysis synthesized findings from nine RCTs that compared the effects of acupuncture and antiemetic medications on nausea and vomiting after surgery (Lee and Fan, 2009). A pooled analysis that compared acupuncture to different antiemetics reported acupuncture and antiemetics were equally effective in reducing the risk of postoperative vomiting and experiencing nausea.

The preponderance of evidence suggests that acupuncture is *as effective as* antiemetic medication in reducing the risk of postoperative nausea and vomiting.

Acupuncture Needling Plus Other Treatments Versus Other Treatments Alone (i.e., Acupuncture Needling Used As an Adjuvant Treatment)

Musculoskeletal conditions

Five meta-analyses and one RCT examined the effectiveness of acupuncture as an adjuvant treatment for musculoskeletal conditions. One meta-analysis pooled the results of three RCTs that examined the effect of adding acupuncture to the following treatments for back pain: usual care, TENS, exercise, physiotherapy, or orthopaedic management (Furlan et al., 2010). The results compare the combination of acupuncture and other treatments over other treatments and show reduced pain intensity immediately after treatment and at intermediate-term after the end of treatment. In contrast, one meta-analysis of two studies found no difference in disability when combining acupuncture with these other treatments.

A systematic review summarized the findings from one RCT on the effectiveness of acupuncture as an adjuvant treatment for peripheral joint arthritis (Manheimer et al., 2010). The RCT examined the effect of combining acupuncture with an exercise-based physiotherapy program (including supervised home exercises) versus exercise-based physiotherapy program alone. The results showed that adding acupuncture to this treatment did not result in a greater improvement in pain than the exercise-based physiotherapy program alone. Similarly, a meta-analysis of three RCTs examined acupuncture as an adjuvant to other treatment for rheumatoid arthritis. The results showed that acupuncture added to another treatment did not result in an improvement in pain reduction or joint swelling (Lee et al., 2008).

The authors of a systematic review that assessed the effectiveness of acupuncture as an adjuvant treatment for shoulder pain identified two RCTs that examined acupuncture as an adjuvant to

exercise and to mobilization, respectively (Green et al., 2005). One RCT reported that adding acupuncture to exercise is more effective than exercise alone in reducing pain and improving range of motion and functioning. The other RCT found that combining acupuncture and mobilization does not improve outcomes relative to mobilization alone. However, it is difficult to draw any conclusions from these studies because both have such small sample sizes that they may not have adequate power to detect statistically significant differences in outcomes. Subsequent to the systematic review, a large study randomized shoulder pain patients to receive acupuncture plus physiotherapy or physiotherapy and Mock TENS four weeks after randomization, a significant increase in shoulder function was found in the acupuncture plus physiotherapy group (Vas et al., 2008).

The preponderance of evidence suggests that acupuncture is an *effective* adjuvant treatment for back pain as well as an *effective* adjuvant to exercise for treatment of shoulder pain. The preponderance of evidence suggests that acupuncture is *not an effective* adjuvant treatment for peripheral joint osteoarthritis and rheumatoid arthritis.

Addiction disorders

Meta-analyses have been conducted on the effectiveness of acupuncture as an adjuvant treatment for cocaine dependence (Gates et al., 2006) and nicotine addiction. The meta-analysis on cocaine dependence identified six RCTs that examined whether acupuncture enhanced the effectiveness of methadone, neurobehavioral treatment, or multicomponent residential or inpatient treatment. The pooled estimate of findings from RCTs that measured cocaine use in similar ways found no statistically significant difference in the probability of use. Three of four RCTs that examined whether acupuncture is an effective adjuvant treatment for cocaine dependence found that adding acupuncture did not reduce craving for cocaine (Gates et al., 2006).

These findings suggest that acupuncture is *not an effective* adjuvant treatment for cocaine dependence.

Nausea and vomiting associated with other treatments

One meta-analysis synthesized findings from three RCTs that examined whether electroacupuncture is an effective adjuvant treatment for chemotherapy-induced vomiting (Ezzo et al., 2006).³⁵ The RCTs compared persons who received electroacupuncture plus antiemetic medications to persons who received only antiemetics. A pooled estimate of the findings from the three RCTs suggests that combining acupuncture and antiemetics reduces the probability that a patient will experience chemotherapy-induced vomiting. However, the antiemetic regimens prescribed to patients were not consistent with the American Society of Clinical Oncology's recommendations (Ezzo et al., 2006). The results might differ if patients had received recommended antiemetic regimens. In addition, one very small RCT (n = 11) of the administration of manual acupuncture to children reported that combining acupuncture and antiemetic medication yielded a statistically significant reduction in use of rescue antiemetic medication but no difference in the risk of vomiting (Reindl et al., 2006).

³⁵ None of these studies investigated effects on chemotherapy-induced nausea.

The preponderance of evidence suggests that combining acupuncture and antiemetic medication *reduces the risk* of chemotherapy-induced nausea and vomiting.

Summary of Findings

Needle acupuncture versus no treatment

- The preponderance of evidence suggests that needle acupuncture is *more effective* than no treatment in reducing pain and improving the functioning of persons with back pain, peripheral joint osteoarthritis, migraine headache, and tension-type headache.
- The preponderance of evidence suggests that needle acupuncture *may increase* abstinence from smoking relative to no treatment.
- There is *insufficient evidence* to determine whether needle acupuncture is an effective treatment for neck pain.

Needle acupuncture versus sham acupuncture

- The preponderance of evidence suggests that needle acupuncture is *more effective* than sham acupuncture for treatment of temporomandibular joint dysfunction, postoperative nausea and vomiting, and tension-type headaches (reduction in frequency).
- The preponderance of evidence suggests that needle acupuncture is *not more effective* than sham acupuncture for treatment of neck pain, rheumatoid arthritis, migraine headaches, stroke, alcohol dependence, cocaine addiction, and smoking cessation.
- The evidence of the effectiveness of needle acupuncture relative to sham acupuncture is *ambiguous*³⁶ for treatment of fibromyalgia, peripheral joint osteoarthritis, and shoulder pain.
- There is *insufficient evidence* to determine whether needle acupuncture is more effective than sham acupuncture for treatment of epilepsy, chemotherapy-induced nausea and vomiting, lateral elbow pain, and vascular dementia.

Needle acupuncture versus other treatments

- The preponderance of evidence suggests that acupuncture is *more effective* than other treatments for back pain (immediately post-treatment only), peripheral joint osteoarthritis pain (when compared to osteoarthritis education), and for migraine headaches (reduction in frequency but not in intensity).

³⁶ The evidence is presented as “ambiguous/conflicting” if none of the studies of an outcome have strong research designs and/or if their findings vary widely with regard to the direction, statistical significance, and clinical significance/size of the effect.

- The preponderance of evidence suggests that needle acupuncture is *as effective as* other treatments for postoperative nausea and vomiting.
- The evidence of the effectiveness of needle acupuncture relative to other treatments is *ambiguous* for shoulder pain, and smoking cessation.
- There is *insufficient evidence* to determine whether needle acupuncture is more effective than other treatments for alcohol dependence, epilepsy, lateral elbow pain and tension-type headaches.

Needle acupuncture plus other treatments versus other treatments alone (i.e., acupuncture needling used as an adjuvant treatment)

- The preponderance of evidence suggests that needle acupuncture is an *effective* adjuvant treatment for back pain, chemotherapy-induced nausea and vomiting and an *effective* adjuvant to exercise for treatment of shoulder pain.
- The preponderance of evidence suggests that needle acupuncture is *not an effective* adjuvant treatment for peripheral joint osteoarthritis, rheumatoid arthritis, and cocaine dependence.

Table 4. Effectiveness of Acupuncture by Condition and Type of Comparison

Disease or Condition	Acupuncture vs. No Treatment	Acupuncture vs. Sham Acupuncture	Acupuncture vs. Other Treatments	Acupuncture plus Other Treatments vs. Other Treatments Alone
Musculoskeletal Conditions				
Back pain	Acupuncture effective	No meta-analysis or systematic review*	Acupuncture more effective (immediately post-treatment)	Acupuncture is an effective adjuvant
Neck Pain	Insufficient evidence	Acupuncture no more effective	No meta-analysis or systematic review*	No meta-analysis or systematic review*
Fibromyalgia	No meta-analysis or systematic review*	Ambiguous evidence	No meta-analysis or systematic review*	No meta-analysis or systematic review*
Lateral elbow pain	No meta-analysis or systematic review*	Insufficient evidence	Insufficient evidence	No meta-analysis or systematic review*
Peripheral joint osteoarthritis	Acupuncture effective	Ambiguous evidence	Ambiguous evidence	Acupuncture is an effective adjuvant to patient education
Rheumatoid arthritis	No meta-analysis or systematic review*	Acupuncture no more effective	No meta-analysis or systematic review*	Acupuncture is not an effective adjuvant
Shoulder pain	No meta-analysis or systematic review*	Ambiguous evidence	Ambiguous evidence	Insufficient evidence
Temporomandibular joint dysfunction	No meta-analysis or systematic review*	Acupuncture more effective	No meta-analysis or systematic review*	No meta-analysis or systematic review*
Neurological Disorders				
Headache, migraine	Acupuncture effective	Acupuncture no more effective	Acupuncture more effective (in reducing frequency)	No meta-analysis or systematic review*
Headache, tension	Acupuncture effective	Acupuncture more effective (in reducing frequency)	Insufficient evidence	No meta-analysis or systematic review*
Epilepsy	No meta-analysis or systematic review*	Insufficient evidence	Insufficient evidence	Insufficient evidence
Stroke	No meta-analysis or systematic review*	Acupuncture no more effective	No meta-analysis or systematic review*	No meta-analysis or systematic review*
Vascular dementia	No meta-analysis or systematic review*	Insufficient evidence	No meta-analysis or systematic review*	No meta-analysis or systematic review*

Table 4. Effectiveness of Acupuncture by Condition and Type of Comparison (Cont'd)

Disease or Condition	Acupuncture vs. No Treatment	Acupuncture vs. Sham Acupuncture	Acupuncture vs. Other Treatments	Acupuncture plus Other Treatments vs. Other Treatments Alone
Addiction Disorders				
Alcohol dependence	No meta-analysis or systematic review*	Acupuncture no more effective	Ambiguous evidence	No meta-analysis or systematic review*
Cocaine dependence	No meta-analysis or systematic review*	Acupuncture no more effective	No meta-analysis or systematic review*	Acupuncture is not an effective adjuvant
Smoking cessation	Acupuncture may be effective	Acupuncture no more effective	Ambiguous evidence	No meta-analysis or systematic review*
Nausea and Vomiting				
Chemotherapy-induced nausea and vomiting	No meta-analysis or systematic review*	Insufficient evidence	No meta-analysis or systematic review*	Acupuncture is an effective adjuvant
Postoperative nausea and vomiting	No meta-analysis or systematic review*	Acupuncture more effective	Acupuncture as effective as antiemetic drugs	No meta-analysis or systematic review*

* “No meta-analysis or systematic review” indicates that findings have not been published on this topic since the most up-to-date synthesized report of that condition that are of methodological vigor equal to or greater than those included in the synthesized report.

BENEFIT COVERAGE, UTILIZATION, AND COST IMPACTS

AB 72 would require health plans and policies sold in the *group market* to provide coverage for acupuncture services. According to CHBRP's estimates, there are 15.11 million insured Californians currently enrolled in group health plans regulated under the Health and Safety Code or insured by group health insurance policies regulated under the Insurance Code and, therefore, subject to AB 72; this includes 14.4 million adults aged 18 years and older. Although AB 72 does not specify an age group, CHBRP made a simplifying assumption to focus only on the *adult* population for the cost impact analysis because acupuncture services are utilized almost entirely by those aged 18 years and older. According to the findings of the 2007 NHIS, only 150,000 (0.2%) of children in the United States (those under 18) used acupuncture in the prior 12 months, compared to 3.1 million (1.4%) of adults (those aged 18 years and older). According to the California Acupuncture Board, the scope of practice for a licensed acupuncturist includes acupuncture (needling), but also other treatments such as massage, moxibustion, cupping, and the prescription of dietary supplements and herbal remedies. As explained in the *Introduction*, CHBRP does not evaluate treatments other than acupuncture (needling) for this report. As a result, this section presents the current, or baseline, costs and coverage related to acupuncture (needling) for adults, and then details the estimated utilization, cost, and coverage impacts of AB 72 if it were to pass into law (postmandate).

For further details on the underlying data sources and methods, please see Appendix D. A discussion of the current or baseline levels precedes the presentation of the impact estimates for AB 72.

Current (Baseline) Benefit Coverage, Utilization, and Cost

Current Coverage of the Mandated Benefit

CHBRP conducts a Bill-Specific Coverage Survey of California's largest health plans and insurers. Responses to this survey represented 71.77% of enrollees in the privately funded, CDI-regulated market and 84.88% of enrollees in the privately funded, DMHC-regulated market. Combined, responses to this survey represent 82.15% of enrollees in the privately funded market subject to state mandates.³⁷

Current coverage of acupuncture services was determined by a survey of the seven largest providers of health insurance in California. On the basis of the responses of five health plans and insurers in California, currently 93.68% enrollees have coverage for acupuncture. For plans that provide coverage, survey responses indicated that 98% of the coverage is provided as part of the basic benefit package and 2% of the coverage is provided as an optional benefit ("rider") to purchase. The current level of coverage of mandated benefits also varies by health plan. Some

³⁷ CHBRP analysis of the share of enrollees included in CHBRP's Bill-Specific Coverage Survey of the major carriers in the state is based on "CDI Licenses with HMSR Covered Lives Greater than 100,000" as part of the Accident and Health Covered Lives Data Call, December 31, 2009 by the California Department of Insurance, Statistical Analysis Division, data retrieved from The Department of Managed Health Care's interactive Web site "Health Plan Financial Summary Report," July-September 2010, and CHBRP's Annual Enrollment and Premium Survey.

health plans and insurers provide this service by contracting with a company that specializes in acupuncture services. Privately insured individuals with acupuncture coverage generally have benefit limits, including a maximum number of annual visits. The maximum utilization varied both between plans provided by one carrier and between carriers, with the maximum number of visits per year amongst carriers that responded to the survey ranging from 12 visits per annum to 30 visits per annum. Some carriers combine chiropractic and acupuncture services into a single benefit package. In addition, cost-sharing requirements vary; some health plans require a copayment (\$0–\$50) per office visit, whereas some preferred provider organizations (PPOs) require members to pay all charges in excess of a given dollar value per visit or per calendar year. Of the four carriers that responded to the question about acupuncture referrals, two reported a primary care referral requirement for HMOs. Some health plans limit acupuncture services to the management of neuromusculoskeletal disorders, nausea, and pain.

California Public Employees' Retirement System (CalPERS) provides acupuncture to 52% of enrollees and Medi-Cal no longer provides acupuncture benefits. Healthy Families members also are not subject to this mandate though they are currently covered for 20 visits per year with a \$5 copayment per visit. The premandate per member per month (PMPM) premiums and expenditures in different market segments are detailed in Table 5.

Current Utilization Levels

Approximately 2.4% of Californians used acupuncture treatments in 2002, according to the 2003 California Health Interview Survey Complementary and Alternative Medicine Supplement (CHIS-CAM). This utilization is higher than the 2002 national average (1.1%) according to the 2002 National Health Interview Survey (NHIS) data. The CHIS-CAM has not been repeated since 2002 so more recent data on California-specific utilization is not available. However, the 2007 NHIS data shows that the use of acupuncture across the United States in the prior 12 months among those aged 18 and over increased by 27% to 1.4%. According to the 2002 NHIS and 2007 NHIS, during the time from 2002 to 2007 the ratio of alternative medical systems, which includes acupuncture, used in the last 12 months in the United States, compared to alternative medical systems used in the last 12 months across the Western region (composed of Washington, Oregon, California, Nevada, New Mexico, Arizona, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii) has remained relatively consistent (1.70 and 1.65, respectively). CHBRP estimates that the utilization in California will rise at a rate consistent with the Western region, resulting in an estimated increased baseline utilization of acupuncture in adults in California to 3.1% in 2007. This assumes that utilization in all Western region states rises uniformly. In the absence of post-2007 data on national or state-level complementary or alternative medicine (CAM) use, **the California utilization of acupuncture is assumed to be constant between 2007 and 2010, making the estimated 2010 acupuncture utilization in those aged 18 years and older 3.1%.** This assumes that all alternative medical systems (acupuncture, ayurveda, homeopathic treatment, naturopathy, and traditional healers) have increased uniformly between 2002 and 2007.

A relatively high utilization of acupuncture by Californians may be attributable to the availability of providers and the high concentrations of Asian populations residing in California. California has the largest population of Asians or persons who are Asians in combination with one or more races (5 million out of 16 million) among the 50 states, based on data recently released by the

U.S. Census Bureau News (U.S. Census Bureau, 2010). A higher proportion of Asians, and cultural expectations about health treatments, in a region would predictably increase availability of and exposure to Asian traditional medicine, such as acupuncture (Burke et al., 2006; Goldstein et al., 2005). California accounts for at least one-third of the total U.S. acupuncture workforce, estimated to be between 14,000 and 17,000 acupuncturists (Eisenberg et al., 2002). Both national and California survey data indicate that the utilization of acupuncture among Asians was almost double that of Whites; furthermore, Whites in California are more likely to use acupuncture than Whites in the rest of the nation (Burke et al., 2006; Goldstein et al., 2005).

Per-Unit Charge

Acupuncturists, like other health providers, usually charge for their services using Current Procedural Terminology (CPT) codes. An analysis of 2009 claims data indicated that the average number of procedures performed per visit to an acupuncturist was 1.8, at an average charge per procedure of \$69.05, or \$125.70 per visit. Adjusting to 2011 dollars (by applying an 8% annual cost trend over 2 years), CHBRP estimates that the current average charge per visit is \$147. The claims data also indicated that on an average there were approximately six visits per course of treatment in a year.

The Extent to Which Costs Resulting from Lack of Coverage Are Shifted to Other Payors, Including Both Public and Private Entities

A lack of coverage for acupuncture does result in higher out-of-pocket expenditures for acupuncture services. This is because some group enrollees who are not covered for the acupuncture benefit will choose to pay directly out of pocket for acupuncture treatment. CHBRP estimated that 458,470 such visits occur annually and current out-of-pocket expenditures for these acupuncture services not covered by insurance are approximately \$67.4 million per year.

Public Demand for Benefit Coverage

Public demand for coverage

A previous bill that would have mandated coverage for acupuncture in 2007 (AB 54) had 21 formal supporters, indicative of public interest for this benefit.

Considering the criteria specified by CHBRP's authorizing statute, CHBRP reviews public demand for benefits relevant to a proposed mandate in two ways. CHBRP considers the bargaining history of organized labor and compares the benefits provided by self-insured health plans or policies (which are not regulated by the DMHC or CDI and so not subject to state-level mandates) with the benefits that are provided by plans or policies that would be subject to the mandate.

Based on inquiries with the largest collective bargaining agents in California, large union affiliates tend to cover acupuncture services, with one large union negotiating covered for acupuncture services, capped at 12 visits per year.³⁸

Among publicly funded self-insured health insurance policies, the Preferred Provider Organization (PPO) plans offered by CalPERS currently have the largest number of enrollees. Currently, the largest public self-insured plans are CalPERS' PERSCare and PERS Choice preferred provider organizations (PPO) plans. PERSCare and PERS Choice PPOs cover acupuncture with a deductible, coinsurance, and a calendar-year maximum number of visits. CalPERS Blue Shield HMO provides members with a 25% discount for acupuncture services through the Mylifepath Alternative Care Discount Program.³⁹ The CalPERS PPOs provide benefit coverage similar to what is available through group health insurance plans and policies that would be subject to the mandate; however, the self-insured plans do provide more expansive acupuncture benefits than the fully insured plans.

To further investigate public demand, CHBRP used the bill-specific coverage survey. In the survey, CHBRP asked carriers who act as third-party administrators for (non-CalPERS) self-insured group health insurance programs whether the relevant benefit coverage differed from what is offered in group market plans or policies that would be subject to the mandate. The responses indicated that there were no substantive differences.

Based on coverage levels of these self-insured plans and responses from large unions, CHBRP concludes that there is public demand for acupuncture services by self-insured large groups and collective bargaining agents.

Impacts of Mandated Benefit Coverage

It is estimated that there would be a negligible change in utilization due to the mandate as both the 2002 and 2007 NHIS surveys showed only small differences in utilization between the privately insured and the uninsured (2002: 3.0% and 3.1% respectively, 2007: 3.9% and 4.0% respectively). Cultural acceptance of acupuncture may be a more important determinant factor in utilization than financial barriers.

How Would Changes in Benefit Coverage Related to the Mandate Affect the Availability of the Newly Covered Treatment/Service, the Health Benefit of the Newly Covered Treatment/Service, and the Per-Unit Cost?

Impact on access and health treatment/service availability

On the basis of the responses of five health plans and insurers in California, the number of members in the group market covered for acupuncture services would increase by 12.8 percentage points. Levels of coverage (e.g., number of covered visits per year, when acupuncture is covered for what conditions) is not expected to change. CHBRP estimates that the unit price of acupuncture would stay the same after the mandate, because CHBRP does not anticipate an

³⁸ Personal communication, S Flocks, California Labor Federation, February 2011.

³⁹ Personal communication, P Sherard, CalPERS, March 2011.

increase in demand for acupuncture service in the overall market (see Table 1). As a result, the average unit charge of acupuncture would remain \$147 per visit after the mandate.

Impact on the health benefit of the newly covered treatment/service

How Would Utilization Change As a Result of the Mandate?

CHBRP estimates that there would be no measurable change in utilization due to the mandate for the following reasons:

- **Utilization rates among those with insurance are not different than those without.** Both NHIS and CHIS-CAM data indicated that the differences in utilization of acupuncture services among those who have insurance versus those without insurance is only 0.1% in both California and the nation (Burke et al., 2006; Goldstein et al., 2005). These data indicate that there are other barriers to use of acupuncture services than financial ones. This assumption was also supported by both the 2002 and 2007 NHIS results, which showed very little difference in the utilization rates of alternative medical systems, which includes acupuncture as well as ayurveda, homeopathic treatment, naturopathy, and traditional healers between those privately insured and those who were uninsured (the percent using alternative medical systems under public insurance is lower).
- **Utilization review and medical management is permitted.** The bill allows plans and insurers to use medical management tools. After the mandate, health plans and insurers can apply similar utilization limits and copayment requirements as a way to manage utilization as they currently do. They can also require a primary care provider referral prior to allowing acupuncture services.
- **Acupuncture may still face barriers of cultural acceptance.** The decision to utilize acupuncture as complementary or alternative medicine (CAM) is made based on mutual awareness and cultural acceptance of acupuncture between patients and their providers. A 2002 Washington State study found that 1.3% of enrollees used acupuncture. The authors concluded that the low utilization might be related to the lack of cultural acceptance and assimilation of the modalities into the broader health care market (Lafferty et al., 2006). Although Californians have a relatively higher cultural acceptance of acupuncture, which leads to a relatively high utilization rate (Burke et al., 2006), acupuncture is still not well assimilated into the broader health care delivery system. Currently, about three-quarters of the state's acupuncturists are in solo practice (Dower, 2003). It is possible that over time, acupuncture use may increase due to the increasing awareness of its effectiveness and cultural acceptance.

To What Extent Would the Mandate Affect Administrative and Other Expenses?

CHBRP assumes that if health care costs increase as a result of increased utilization or changes in unit costs, there is a corresponding proportional increase in administrative costs. CHBRP assumes that the administrative cost proportion of premiums is unchanged. All health plans and insurers include a component for administration and profit in their premiums. CHBRP estimates

that the increase in administrative costs of DMHC-regulated plans and/or CDI-regulated group policies would remain proportional to the increase in premiums.

Consequently, claims administration costs are assumed to increase due to an increase in claims for acupuncture. Health plans and insurers will have to modify some insurance contracts and member materials to reflect the new coverage. Health plans and insurers include a component for administration and profit in their premiums. The estimated impact of this mandate on premiums includes the assumption that plans and insurers will apply their existing administration and profit loads to the marginal increase in health care costs produced by the mandate. Given the utilization rates will remain the same after the mandate, the estimated increase of expenditures is mainly due to the increase of the administrative costs as a proportion of the premium.

Impact of the Mandate on Total Health Care Costs

AB 72 is estimated to increase total net annual expenditures by \$7.45 million or 0.0078% for this insured population.

Potential Cost Offsets or Savings in the Short-Term

The mandate is estimated to increase premiums by \$54.9 million (\$31.7 million for the portion of group insurance premiums paid by private employers, \$11.5 million for the portion of group insurance and CalPERS paid by enrollees and \$11.7 million paid by CalPERS employers) and member copayments by \$19.0 million, while simultaneously reducing *out-of-pocket* expenditures by \$67.4 million among those whose acupuncture treatments are currently not covered by insurance.

Impact on long-term costs

CHBRP's estimated cost and utilization impacts do not include any estimated cost reductions for other health care services because it appears that acupuncture is generally administered as a complement to other treatments as opposed to a substitute (Burke et al., 2006).

Cost effectiveness

The majority of cost effectiveness studies on acupuncture have been conducted in Europe, predominantly the UK, Germany, and Denmark. Due to the large difference in healthcare cost structures between single-payer systems such as the UK and universal multi-payer system in Germany and the United States, it is not possible to generalize these results across national boundaries. Cost effectiveness analyses usually report their findings as an incremental cost effectiveness ratio (ICER), often cost per quality adjusted life year (\$/QALY). A QALY places a weight on time in different health states. A year of perfect health is worth 1 and a year of less than perfect health is worth less than 1. Death is considered to be equivalent to 0. Some acupuncture studies have used outcome measures other than the QALY, predominantly pain scores, but also specific function measures, productivity measures and hospitalization rates. Outcomes were typically measured over 1 to 3 years.

A small number of U.S.-based cost effectiveness studies exist. In a general adult population, it has been concluded that acupuncture is cost-effective in improving substance abuse, where the outcome measures were hospitalization rate and drug-free urine screens (Santasiero and Neussle, 2005) and is cost effective in the treatment of carpal tunnel syndrome where pain scores and productivity are the outcome measured (Branco et al., 1999). Bonafede et al. (2008) used managed claims care data in a cross-sectional study of the influence of acupuncture utilization on the utilization of other healthcare services in a U.S. setting. They found that enrollees who had utilized acupuncture services were statistically less likely to use primary care, all outpatient services, pathology services, all surgery, and gastrointestinal.

Outside of the United States, studies have concluded that acupuncture is cost effective in treating patients with:

- allergic rhinitis (ICER= €17,377/QALY) (Witt et al., 2009)⁴⁰
- chronic neck pain (ICER= €2,469/QALY) (Willich et al., 2006)
- dysmenorrhea (ICER= €3,011/QALY) (Witt, Reinhold, Brinkhaus, et al., 2008b)
- headache (ICER= €1,657/QALY) (Witt, Reinhold, Jena, et al., 2008)
- low back pain (ICER= £⁴¹4,241/QALY) (Ratcliffe et al., 2006)
- migraine headache (ICER= £9,180/QALY) (Vickers et al., 2004; Wonderling et al., 2004).
- musculoskeletal system disorders (ICER= €1,945/QALY) (Reinhold et al., 2008)
- osteoarthritis (ICER= €17,845/QALY) (Reinhold et al., 2008)

There is consensus on the ICER value that is the threshold for cost effectiveness. Cost effectiveness thresholds are certainly country-specific and not openly defined, even in countries where cost effectiveness is used in policymaking. In most countries, however, there is a

⁴⁰ For context, current Euro to U.S. dollar conversion rate, as of March 17, 2011 is 1€= \$1.39 U.S., according to www.google.com.

⁴¹ For context, current British Pound to U.S. dollar conversation rate, as of March 17, 2011 is 1£ = \$1.60 U.S., according to www.google.com.

generally accepted, if unconfirmed range in which the threshold lies. The studies listed above indicate that acupuncture treatment may be cost effective as all of the aforementioned studies estimate ICERs for acupuncture treatment below the country-specific threshold range in which the study was conducted.

Impacts for Each Category of Payor Resulting from the Benefit Mandate

Since this mandate does not apply to the individual market, there are no cost impacts in these markets as a result of the mandate. No cost shifting is expected to occur from the public programs to the privately insured market.

Increases in insurance premiums vary by market segment. Increases as measured by percentage change in per member per month (PMPM) premiums are estimated to range from 0.0010% to 0.9690% for the various group markets (Table 6).

Increases as measured by PMPM premiums are estimated to range from \$0.0034 to \$1.47 in the large-group market, the increase in premiums is estimated to range from \$0.0658 to \$0.2533 PMPM. For members with small-group insurance policies, health insurance premiums are estimated to increase by approximately \$0.0034 to \$0.2924 PMPM. For CalPERS, the expected increase in premium is \$1.47. It is estimated that there would be no increase in the premiums for Managed Risk Medical Insurance Board (MRMIB) Plans and Medi-Cal Managed Care Plans as they are not subject to this mandate, as these agencies have determined that this mandate for acupuncture services would not apply to them.

Table 5. Baseline (Premandate) Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2011

	DMHC-Regulated							CDI-Regulated			Total
	Privately Funded Plans (by market)			CalPERS HMOs (b)	Medi-Cal Managed Care Plans		MRMIB Plans (d)	Privately Funded Policies (by market)			
	Large Group	Small Group	Individual		65 and Over (c)	Under 65		Large Group	Small Group	Individual	
Total enrollees in plans/policies subject to state Mandates (a)	10,526,000	2,241,000	733,000	831,000	285,000	3,539,000	889,000	397,000	1,118,000	1,343,000	21,902,000
Total enrollees in plans/policies subject to AB 72	10,526,000	2,241,000	0	831,000	0	0	0	397,000	1,118,000	0	15,113,000
Average portion of premium paid by Employer	\$317.59	\$267.09	\$0.00	\$347.55	\$346.00	\$176.00	\$98.48	\$375.44	\$270.30	\$0.00	\$65,887,370,000
Average portion of premium paid by Employee	\$82.91	\$83.47	\$399.69	\$86.89	\$0.00	\$0.00	\$13.79	\$122.08	\$64.15	\$199.13	\$21,898,323,000
Total Premium	\$400.51	\$350.57	\$399.69	\$434.44	\$346.00	\$176.00	\$112.27	\$497.52	\$334.45	\$199.13	\$87,785,693,000
Enrollee expenses for covered benefits (Deductibles, copays, etc.)	\$21.82	\$32.63	\$84.77	\$22.41	\$0.00	\$0.00	\$4.68	\$63.15	\$123.11	\$58.53	\$7,548,415,000
Enrollee expenses for benefits not covered (e)	\$0.34	\$0.36	\$0.00	\$1.39	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$67,395,000
Total Expenditures	\$422.67	\$383.56	\$484.46	\$458.23	\$346.00	\$176.00	\$116.95	\$560.76	\$457.56	\$257.66	\$95,401,503,000

Source: California Health Benefits Review Program, 2011.

Notes: (a) This population includes persons insured with private funds (group and individual) and insured with public funds (e.g., CalPERS HMOs, Medi-Cal Managed Care Plans, Healthy Families Program, AIM, MRMIP) enrolled in health plans or policies regulated by the DMHC or CDI. Population includes enrollees aged 0 to 64 years and enrollees 65 years or older covered by employment-sponsored insurance.

(b) Of these CalPERS HMO members, about 58% or 482,000 are state employees or their dependents.

(c) Medi-Cal Managed Care Plan expenditures for members over 65 years of age include those who also have Medicare coverage.

(d) MRMIB Plan expenditures include expenditures for 874,000 enrollees of the Healthy Families Program, 8,000 enrollees of MRMIP, and 7,000 enrollees of the AIM program.

(e) Includes only those expenses that are paid directly by enrollees or other sources to providers for services related to the mandated benefit that are not currently covered by insurance. This only includes those expenses that will be newly covered, postmandate. Other components of expenditures in this table include all health care services covered by insurance.

Table 6. Impacts of the Mandate on Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2011

	DMHC-Regulated							CDI-Regulated			Total
	Privately Funded Plans (by market)			CalPERS HMOs (b)	Medi-Cal Managed Care Plans		MRMIB Plans (d)	Privately Funded Policies (by market)			
	Large Group	Small Group	Individual		65 and Over (c)	Under 65		Large Group	Small Group	Individual	
Total enrollees in plans/policies subject to state Mandates (a)	10,526,000	2,241,000	733,000	831,000	285,000	3,539,000	889,000	397,000	1,118,000	1,343,000	21,902,000
Total enrollees in plans/policies subject to AB 72	10,526,000	2,241,000	0	831,000	0	0	0	397,000	1,118,000	0	15,113,000
Average portion of premium paid by Employer	\$0.2008	\$0.2238	\$0.0000	\$1.1746	\$0.0000	\$0.0000	\$0.0000	\$0.0497	\$0.0027	\$0.0000	\$43,372,000
Average portion of premium paid by Employee	\$0.0524	\$0.0686	\$0.0000	\$0.2937	\$0.0000	\$0.0000	\$0.0000	\$0.0162	\$0.0006	\$0.0000	\$11,482,000
Total Premium	\$0.2533	\$0.2924	\$0.0000	\$1.4683	\$0.0000	\$0.0000	\$0.0000	\$0.0658	\$0.0034	\$0.0000	\$54,854,000
Enrollee expenses for covered benefits (Deductibles, copays, etc.)	\$0.1191	\$0.1255	\$0.0000	\$0.1418	\$0.0000	\$0.0000	\$0.0000	\$0.0297	\$0.0014	\$0.0000	\$19,988,000
Enrollee expenses for benefits not covered (e)	-\$0.3432	-\$0.3617	\$0.0000	-\$1.3899	\$0.0000	\$0.0000	\$0.0000	-\$0.0857	-\$0.0041	\$0.0000	-\$67,395,000
Total Expenditures	\$0.0292	\$0.0562	\$0.0000	\$0.2202	\$0.0000	\$0.0000	\$0.0000	\$0.0099	\$0.0007	\$0.0000	\$7,447,000
Percentage Impact of Mandate											
Insured Premiums	0.0632%	0.0834%	0.0000%	0.3380%	0.0000%	0.0000%	0.0000%	0.0132%	0.0010%	0.0000%	0.0625%
Total Expenditures	0.0069%	0.0147%	0.0000%	0.0481%	0.0000%	0.0000%	0.0000%	0.0018%	0.0001%	0.0000%	0.0078%

Source: California Health Benefits Review Program, 2011.

Notes: (a) This population includes persons insured with private funds (group and individual) and insured with public funds (e.g., CalPERS HMOs, Medi-Cal Managed Care Plans, Healthy Families Program, AIM, MRMIP) enrolled in health plans or policies regulated by the DMHC or CDI. Population includes enrollees aged 0 to 64 years and enrollees 65 years or older covered by employment-sponsored insurance.

- (b) Of these CalPERS HMO members, about 58% or 482,000 are state employees or their dependents.
- (c) Medi-Cal Managed Care Plan expenditures for members over 65 years of age include those who also have Medicare coverage.
- (d) MRMIB Plan expenditures include expenditures for 874,000 enrollees of the Healthy Families Program, 8,000 enrollees of MRMIP, and 7,000 enrollees of the AIM program.
- (e) Includes only those expenses that are paid directly by enrollees or other sources to providers for services related to the mandated benefit that are not currently covered by insurance. This only includes those expenses that will be newly covered, postmandate. Other components of expenditures in this table include all health care services covered by insurance.

PUBLIC HEALTH IMPACTS

AB 72 mandates coverage for acupuncture therapies, which are used to treat a variety of common conditions, including musculoskeletal and neurological disorders such as low back pain, neck pain, and migraine or severe headache. According to the 2009 National Health Interview Survey (NHIS), low back pain is the most prevalent of these, with 28.2% of respondents reporting pain, followed by migraine or severe headache (16%), and neck pain (15.1%) (DHHS, 2010). This section presents the overall public health impact of AB 72, followed by an analysis examining the potential for reduction in gender and racial/ethnic disparities in health outcomes and the potential for the mandate to reduce premature death and societal economic losses.

The proposed mandate is not restricted to treatment for particular conditions or diseases; the mandate also includes therapies provided by acupuncture practitioners that do not involve needling, such as cupping, massage, and herbal remedies. For practical reasons CHBRP limits the analysis of the bill's impact to needling therapy for the three common conditions cited above—low back pain, neck pain, and migraine or severe headache.

CHBRP estimates that there would be no measurable increase in acupuncture utilization and thus finds that AB 72 would have no public health impact.

Public Health Outcomes

Studies of acupuncture needling have compared it to (1) no treatment, (2) sham acupuncture, (3) other treatments, and (4) as adjuvant therapy. As discussed in the *Medical Effectiveness* section, studies comparing acupuncture needling to no treatment tend to show acupuncture in the most favorable light due to the placebo effect. The discussion below focuses on studies with no-treatment control groups—while not ignoring other designs—because these are expected to be the most sensitive, i.e., to detect benefit from acupuncture if it exists. Furthermore, if these more sensitive designs do not find benefit despite a bias toward positive results from the placebo effect, it becomes unlikely that a real benefit exists.

As presented in the *Medical Effectiveness* section, there is a preponderance of evidence to suggest that acupuncture needling is effective in treating a variety of conditions, including back pain, peripheral joint osteoarthritis, headache, and postoperative nausea and vomiting.⁴² When used as adjuvant treatment, evidence suggests that acupuncture needling is also effective in treating back pain and chemotherapy-induced nausea and vomiting. While neck pain is a highly prevalent condition for which acupuncture needling is commonly used, the medical effectiveness review finds the efficacy of acupuncture needling as pain reduction treatment is largely unknown due to insufficient evidence.

⁴² The Medical Effectiveness review found that a preponderance of evidence suggests that acupuncture needling was effective in treating these conditions compared to no treatment or sham acupuncture. For some conditions, acupuncture needling was found to be effective when compared to no treatment, however, it was not found to be effective compared to sham acupuncture.

As presented in the *Benefit Coverage, Utilization, and Cost Impacts* section, it is estimated that there would be no measureable change in utilization due to the mandate. Both the 2002 and 2007 NHIS surveys showed only small differences in utilization between the privately insured and uninsured population (2002: 3.0% and 3.1%, respectively; 2007: 3.9% and 4.0%, respectively). As described in the *Medical Effectiveness* section, there is a preponderance of evidence that acupuncture needling is medically effective for a variety of conditions; however, AB 72 is not expected to increase utilization of acupuncture needling. Therefore, no public health impact is expected.

AB 72 would decrease the out-of-pocket expenses of some patients utilizing acupuncture. The *Benefit Coverage, Utilization, and Cost Impacts* section estimates a reduction in out-of-pocket expenditures of \$67.4 million among those whose utilization of acupuncture services are not currently covered by insurance. For patients whose expenses decreased, the change would reduce the financial hardship associated with acupuncture utilization.

Impact on Gender and Racial Disparities

Several competing definitions of “health disparities” exist. CHBRP relies on the following definition: *A health disparity/inequality is a particular type of difference in health or in the most important influences of health that could potentially be shaped by policies; it is a difference in which disadvantaged social groups (such as the poor, racial/ethnic minorities, women or other groups that have persistently experienced social disadvantage or discrimination) systematically experience worse health or great health risks than more advantaged groups* (Braveman, 2006).

CHBRP investigated the effect that AB 72 would have on health disparities by gender, race, and ethnicity. Evaluating the impact on racial and ethnic disparities is particularly important because racial and ethnic minorities report having poorer health status and worse health indicators (KFF, 2007). One important contributor to racial and ethnic health disparities is differential rates of insurance, where minorities are more likely than Whites to be uninsured; however disparities still exist within the insured population (Kirby et al., 2006; Lille-Blanton and Hoffman, 2005). Since AB 72 would only affect the insured population, a literature review was conducted to determine whether there are gender, racial, or ethnic disparities associated with the prevalence of musculoskeletal or neurological disorders and the utilization of acupuncture outside of disparities attributable to differences between insured and uninsured populations.

Impact on Gender Disparities

Evidence indicates that gender disparities exist in the prevalence of conditions commonly treated with acupuncture. Of the three health conditions examined in this analysis—low back pain, neck pain, and migraine or severe headache—women report these conditions at statistically significantly higher rates than do men. For example, the prevalence of migraine or severe headache is substantially higher in women compared to men (22% vs. 10%) according to the National Health Interview Survey (NHIS) (DHHS, 2010). This finding is consistent with other studies on severe headaches and migraines, which indicate that migraines are two to three times more prevalent among women, possibly due to hormonal differences and migraine attacks associated with menstruation (Breslau and Rasmussen, 2001; Victor et al., 2010).

There is also a disparity in the utilization of acupuncture by gender. Evidence indicates that women in the general population are slightly more likely than men to report using acupuncture needling (Burke et al., 2006; Goldstein et al., 2005; Rafferty et al., 2002). Although CHBRP anticipates that greater use of acupuncture needling by women would also occur in the insured population, no data are available addressing this. As presented in the *Benefit Coverage, Utilization, and Cost Impacts* section, AB 72 is not expected to result in an overall increase in acupuncture utilization; thus, the impact of the mandate on reducing gender disparities is unknown. However, given that women have a higher prevalence than men for conditions commonly treated with acupuncture, it is expected that women would be more likely to benefit financially than men from insurance coverage of acupuncture.

Impact on Racial/Ethnic Disparities

According to the NHIS, slight racial/ethnic disparities exist in prevalence of low back pain, neck pain, and migraine or severe headache. Whites have a slightly higher prevalence of low back pain and neck pain, and Blacks suffer from migraine or severe headache at somewhat higher rates than other racial and ethnic groups. Asians have significantly lower prevalence for each condition. (See Table 2 in the *Introduction*.)

Despite having the lowest prevalence for the conditions on which this report focuses, Asians have the highest utilization of acupuncture needling. Su and Li (2011) found that, in 2007, Asians had the highest rate of acupuncture use in the past year, followed by Whites, Hispanics and Blacks (see Table 3 in the *Introduction*). Goldstein et al. (2005) found similar results among California respondents, with 5.9% of Asians using acupuncture in the past year, compared to 3.1% of Whites, 2.4% of Blacks, and 1.3% of Hispanics. In comparing use from 2002 to 2007, both Asians and Whites increased their utilization of acupuncture, and Hispanics and Blacks had decreased their utilization (Su and Li, 2011). Although we anticipate that the racial and ethnic patterns of acupuncture utilization seen in the general California population would also apply to California's insured population, no evidence is available to support or refute that assumption.

As presented in the *Benefit Coverage, Utilization, and Cost Impacts* section, AB 72 is not expected to result in an overall increase in acupuncture utilization; thus, the impact of the mandate on reducing racial and ethnic disparities is unknown. However, given that Asians utilize acupuncture at higher rates, it is expected that insured Asians would financially benefit from insurance coverage of acupuncture to a greater degree than other racial and ethnic groups until and unless acupuncture usage rates in other groups approximate those of Asians.

Impacts on Premature Death and Economic Loss

Premature death is often defined as death before the age of 75 (Cox, 2006). The overall impact of premature death due to a particular disease can be measured in years of potential life lost prior to age 75 and summed for the population (generally referred to as "YPLL") (Cox, 2006; Gardner and Sanborn, 1990). In California, it is estimated that there are nearly 102,000 premature deaths each year accounting for more than two million YPLL (Cox, 2006). In order to measure the impact of premature mortality across the population impacted by a proposed mandate, CHBRP first collects baseline mortality rates. Next, the medical effectiveness literature is examined to determine if the proposed mandated benefit impacts mortality. In cases where a reduction in

mortality is projected, a literature review is conducted to determine if the YPLL has been established for the given condition. Some diseases and conditions do not result in death and therefore a mortality outcome is not relevant.

Economic loss associated with disease is generally presented in the literature as an estimation of the value of the YPLL in dollar amount (i.e., valuation of a population's lost years of work over a lifetime). For CHBRP analyses, a literature review is conducted to determine if lost productivity has been established in the literature. In addition, morbidity associated with the disease or condition of interest can also result in lost productivity; either by causing the worker to miss days of work due to their illness or due to their role as a caregiver for someone else who is ill.

Premature Death

Acupuncture needling is used for some health conditions and behaviors associated with premature death, such as smoking and drug addiction. The evidence presented in the *Medical Effectiveness* section indicates that acupuncture needling may increase abstinence from smoking compared to no treatment. However, the evidence also shows that acupuncture needling is not an effective adjuvant treatment for smoking cessation or drug addiction and is not a more effective treatment compared to sham acupuncture needling. Therefore, CHBRP estimates that AB 72 would have no measureable impact on premature death.

Economic Loss

There are substantial costs associated with both low back pain and migraine or severe headache. These conditions have been found to be associated with high economic costs comparable to those of heart disease, depression, and diabetes (Maetzel and Li, 2002). Manchikanti et al. (2009) estimate that health expenditures for individuals with back pain are about 60% higher than those without back pain, and that back pain related to lost work time and productivity costs employers over \$19 billion annually. Guo et al. (1999) found that in 1988, 102 million workdays were lost as a result of back pain. Mennini et al. (2008) found that indirect costs due to migraine total \$14.5 billion annually, including \$7.9 billion due to absenteeism and \$5.4 billion due to diminished productivity. Migraine sufferers report losing nearly five workdays annually because of migraines, which can also cause work productivity to be reduced by 50% (Schultz et al., 2009). Although these conditions are related to economic loss, since no increase in acupuncture utilization is expected as a result of AB 72, there would be no change in economic loss.

Long-term Public Health Impacts

Since AB 72 is not expected to result in an overall increase in use of acupuncture treatment, there is no expected reduction in economic loss associated with conditions related to acupuncture use in a 1-year time period. However, it is possible that in the longer term, passage of AB 72, along with potential increase in cultural acceptance of acupuncture as a treatment option, would contribute to increased utilization of acupuncture and therefore may reduce economic costs associated with these conditions.

APPENDICES

Appendix A: Text of Bill Analyzed

On January 14, 2011 the Assembly Committee on Health requested that CHBRP analyze AB 72.

The text of AB 72, as analyzed, follows.

BILL NUMBER: AB 72 INTRODUCED
BILL TEXT

INTRODUCED BY Assembly Member Eng

DECEMBER 21, 2010

An act to amend Section 1373.10 of the Health and Safety Code, and to amend Sections 10127.3 and 10176 of the Insurance Code, relating to health care coverage.

LEGISLATIVE COUNSEL'S DIGEST

AB 72, as introduced, Eng. Health care coverage: acupuncture.

Existing law requires a health care service plan, that is not a health care maintenance organization or is not a plan that enters exclusively into specialized health care service plan contracts, and a disability insurer issuing policies on a groupwide basis, to offer acupuncture coverage under those terms and conditions as may be agreed upon by the parties, with specified exceptions. A willful violation of the laws regulating health care service plans is a crime.

This bill would instead require every health care service plan, except a plan that enters exclusively into specialized health care service plan contracts, and every disability insurer issuing policies on a groupwide basis, to provide acupuncture coverage under those terms and conditions as may be agreed upon by the parties.

Because a violation of this bill's requirements with respect to a health care service plan would be a crime, this bill would impose a state-mandated local program by creating a new crime.

Existing law authorizing a disability insurance policy to provide payment for acupuncture services requires that the disability insurance policy or contract expressly include acupuncture as a benefit in order for a licensed or certified acupuncturist to be paid

or reimbursed under the policy for his or her services.

This bill would delete the requirement conditioning the payment and reimbursement of a certified or licensed acupuncturist, for his or her services, on the express inclusion of acupuncture as a benefit in a disability insurance policy or contract. This bill would also make technical and conforming changes.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

Vote: majority. Appropriation: no. Fiscal committee: yes.
State-mandated local program: yes.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 1373.10 of the Health and Safety Code is amended to read:

1373.10. (a) On and after January 1, 1985, every health care service plan, that is not a health maintenance organization or is not a plan that enters exclusively into specialized health care service plan contracts, as defined by subdivision ~~(n)~~

~~(o)~~ of Section 1345, ~~which~~ *that* provides coverage for hospital, medical, or surgical expenses, shall offer coverage to group contract holders for expenses incurred as a result of treatment by holders of certificates under Section 4938 of the Business and Professions Code, under ~~such~~ terms and conditions as may be agreed upon between the health care service plan and the group contract holder.

~~—A health care service plan is not required to offer the coverage provided by this section as part of any contract covering employees of a public entity.~~

~~—(b) For the purposes of this section, "health maintenance organization" or "HMO" means a public or private organization, organized under the laws of this state, which does all of the following:~~

~~—(1) Provides or otherwise makes available to enrolled participants health care services, including at least the following basic health care services: usual physician services, hospitalization, laboratory, X-ray, emergency and preventive services, and out-of-area coverage.~~

~~—(2) Is compensated, except for copayments, for the provision of basic health care services listed in paragraph (1) to enrolled participants on a predetermined periodic rate basis.~~

~~—(3) Provides physician services primarily directly through physicians who are either employees or partners of the organization, or through arrangements with individual physicians or one or more groups of physicians, organized on a group practice or individual practice basis.~~

(b) On and after January 1, 2012, every health care service plan, that is not a plan that enters exclusively into specialized health care service plan contracts, as defined by subdivision (o) of Section 1345, that provides coverage for hospital, medical, or surgical expenses, shall provide coverage to group contract holders for expenses incurred as a result of treatment by holders of certificates under Section 4938 of the Business and Professions Code, under terms and conditions as may be agreed upon between the health care service plan and the group contract holder.

SEC. 2. Section 10127.3 of the Insurance Code is amended to read:

10127.3. (a) On and after January 1, 1985, every insurer issuing group disability insurance ~~which~~ *that* covers hospital, medical, or surgical expenses shall offer coverage for expenses incurred as a result of treatment by holders of certificates under Section 4938 of the Business and Professions Code, under ~~such~~ terms and conditions as may be agreed upon between the group policyholder and the insurer.

~~—An insurer is not required to offer the coverage provided by this section as part of any policy covering employees of a public entity.~~

(b) On and after January 1, 2012, every insurer issuing group disability insurance that covers hospital, medical, or surgical expenses shall provide coverage for expenses incurred as a result of treatment by holders of certificates under Section 4938 of the Business and Professions Code, under terms and conditions as may be agreed upon between the group policyholder and the insurer.

SEC. 3. Section 10176 of the Insurance Code is amended to read:

10176. In disability insurance, the policy may provide for payment of medical, surgical, chiropractic, physical therapy, speech pathology, audiology, acupuncture, professional mental health, dental, hospital, or optometric expenses upon a reimbursement basis, or for the exclusion of any of those services, and provision may be made therein for payment of all or a portion of the amount of charge for these services without requiring that the insured first pay the expenses. The policy shall not prohibit the insured from selecting any psychologist or other person who is the holder of a certificate or license under Section 1000, 1634, 2050, 2472, 2553, 2630, 2948, 3055, or 4938 of the Business and Professions Code, to perform the particular services covered under the terms of the policy, the

certificate holder or licensee being expressly authorized by law to perform those services.

~~—If the insured selects any person who is a holder of a certificate under Section 4938 of the Business and Professions Code, a disability insurer or nonprofit hospital service plan shall pay the bona fide claim of an acupuncturist holding a certificate pursuant to Section 4938 of the Business and Professions Code for the treatment of an insured person only if the insured's policy or contract expressly includes acupuncture as a benefit and includes coverage for the injury or illness treated. Unless the policy or contract expressly includes acupuncture as a benefit, no person who is the holder of any license or certificate set forth in this section shall be paid or reimbursed under the policy for acupuncture.~~

Nor shall the policy prohibit the insured, upon referral by a physician and surgeon licensed under Section 2050 of the Business and Professions Code, from selecting any licensed clinical social worker who is the holder of a license issued under Section 4996 of the Business and Professions Code or any occupational therapist as specified in Section 2570.2 of the Business and Professions Code, or any marriage and family therapist who is the holder of a license under Section 4980.50 of the Business and Professions Code, to perform the particular services covered under the terms of the policy, or from selecting any speech-language pathologist or audiologist licensed under Section 2532 of the Business and Professions Code or any registered nurse licensed pursuant to Chapter 6 (commencing with Section 2700) of Division 2 of the Business and Professions Code, who possesses a master's degree in psychiatric-mental health nursing and is listed as a psychiatric-mental health nurse by the Board of Registered Nursing or any advanced practice registered nurse certified as a clinical nurse specialist pursuant to Article 9 (commencing with Section 2838) of Chapter 6 of Division 2 of the Business and Professions Code who participates in expert clinical practice in the specialty of psychiatric-mental health nursing, or any respiratory care practitioner certified pursuant to Chapter 8.3 (commencing with Section 3700) of Division 2 of the Business and Professions Code to perform services deemed necessary by the referring physician, that certificate holder, licensee or otherwise regulated person, being expressly authorized by law to perform the services.

Nothing in this section shall be construed to allow any certificate holder or licensee enumerated in this section to perform professional mental health services beyond his or her field or fields of competence as established by his or her education, training, and experience. For the purposes of this section, "marriage and family therapist" means a licensed marriage and family therapist who has received specific instruction in assessment, diagnosis, prognosis,

and counseling, and psychotherapeutic treatment of premarital, marriage, family, and child relationship dysfunctions that is equivalent to the instruction required for licensure on January 1, 1981.

An individual disability insurance policy, which is issued, renewed, or amended on or after January 1, 1988, *and* which includes mental health services coverage may not include a lifetime waiver for that coverage with respect to any applicant. The lifetime waiver of coverage provision shall be deemed unenforceable.

SEC. 4. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

Appendix B: Literature Review Methods

Appendix B describes methods used in the medical effectiveness literature review for AB 72.

Numerous studies of the effectiveness of acupuncture have been conducted in Asia, Europe, and North America. This literature is especially large because acupuncture is used to treat a wide variety of diseases and conditions. CHBRP could not review all of this literature during the time available for this review. In light of this constraint, CHBRP decided to focus on the strongest and most current evidence of the effectiveness of acupuncture.

The search was limited to studies published in English from May 2007 to present. The time frame for the search was truncated because CHBRP conducted a search of the literature published through May 2007 on the effectiveness of acupuncture for a report it issued in June 2007 on AB 54, an identical bill regarding coverage for acupuncture.

The literature review was limited to studies of the effectiveness of acupuncture needling. This practice is unique to acupuncture and is typically covered by health plans that provide acupuncture benefits. Studies of both manual acupuncture and electroacupuncture are included.

Only studies published in English were included. Three databases that exclusively index studies on traditional Chinese medicine (i.e., EastView CAJ-Med, Traditional Chinese Database System, and WanFang Data COJ [Chinese Medicine Premier]) were excluded. Although these databases contain many publications on acupuncture, they were not searched because less than 1% of them are written in English. CHBRP could not translate articles from Chinese to English during the limited time available for this review. In addition, many of the studies are not written in a standardized format and do not contain the information needed to assess their quality. Finally, these databases are difficult to search because they do not use standardized methods to index publications (Murphy and Fang, 2007).

The following databases of literature on acupuncture were searched: PubMed, CINAHL, and the Cochrane Library, including the Cochrane Database of Systematic Reviews and the Cochrane Central Register of Controlled Trials.

Six hundred and forty-six abstracts were reviewed for the literature review for AB 72. A total of 22 studies were included in the current review. These studies consisted of 19 meta-analyses and systematic reviews and two individual RCTs.

In making a “call” for each outcome measure, the team and the content expert consider the number of studies as well the strength of the evidence. To grade the evidence for each outcome measured, the team uses a grading system that has the following categories:

- Research design
- Statistical significance
- Direction of effect
- Size of effect

- Generalizability of findings

The grading system also contains an overall conclusion that encompasses findings in the five domains described above. The conclusion is a statement that captures the strength and consistency of the evidence of an intervention's effect on an outcome. The following terms are used to characterize the body of evidence regarding an outcome.

- Clear and convincing evidence
- Preponderance of evidence
- Ambiguous/conflicting evidence
- Insufficient evidence

The conclusion states that there is “clear and convincing” evidence that an intervention has a favorable effect on an outcome if most of the studies included in a review have strong research designs and report statistically significant and clinically meaningful findings that favor the intervention.

The conclusion characterizes the evidence as “preponderance of evidence” that an intervention has a favorable effect if most but not all five criteria are met. For example, for some interventions, the only evidence available is from nonrandomized studies or from small RCTs with weak research designs. If most such studies that assess an outcome have statistically and clinically significant findings that are in a favorable direction and enroll populations similar to those covered by a mandate, the evidence would be classified as a “preponderance of evidence favoring the intervention.” In some cases, the preponderance of evidence may indicate that an intervention has no effect or an unfavorable effect.

The evidence is presented as “ambiguous/conflicting” if none of the studies of an outcome have strong research designs and/or if their findings vary widely with regard to the direction, statistical significance, and clinical significance/size of the effect.

The category “insufficient evidence” of an intervention's effect is used where there is little if any evidence of an intervention's effect.

The search terms used to locate studies relevant to the AB 72 were as follows.

PubMed

Medical Subject Headings (MeSH) & Keywords

NOTES: all terms labeled as “[MeSH]” are Medical Subject Headings that were searched without qualification to retrieve the concept both as MeSH and keyword. Terms listed in lower case were only entered as keywords in the search to retrieve recently published articles that have not been indexed with MeSH terms. Some keywords map directly to MeSH terms.

"Absenteeism"[Mesh]

"Acupuncture Points"[Mesh]
"Acupuncture Therapy"[Mesh]
"Acupuncture Therapy/economics"[Majr]
"Acupuncture Therapy/economics"[Mesh]
"Acupuncture Therapy/mortality"[Mesh]
"Acupuncture Therapy/utilization"[Majr]
"Acupuncture Therapy/utilization"[Mesh]
"Acupuncture"[Mesh]
"Acupuncture/economics"[Majr]
"Acupuncture/economics"[Mesh]
"Age Factors"[Mesh]
"bay area"
"bay area"[tiab]
"cost effectiveness"[tiab]
"Cost of Illness"[Mesh]
"Costs and Cost Analysis"[Majr]
"Costs and Cost Analysis"[Mesh]
"Cubital Tunnel Syndrome"[Mesh]
"Elbow Joint"[Mesh]
"Elbow"[Mesh]
"Ethnic Groups"[Mesh]
"Health Care Costs"[Mesh]
"Healthcare Disparities"[Mesh]
"in process"[sb]
"incremental cost effectiveness ratio"[tiab]
"Insurance"[Mesh]
"Meridians"[Mesh]
"meta-analysis"[tiab]
"Musculoskeletal Diseases"[Mesh]
"Nausea"[Mesh]
"Nervous System Diseases"[Mesh]
"nervous system"
"nervous system"[tiab]
"Poverty"[Mesh]
"Quality of Life"[Mesh]
"quality of life"[tiab]
"randomized controlled trial"[tiab]
"Sex Factors"[Mesh]
"Shoulder Dislocation"[Mesh] English
"Shoulder Fractures"[Mesh]
"Shoulder Joint"[Mesh]
"Shoulder Pain"[Mesh]
"Shoulder"[Mesh]
"Social Class"[Mesh]
"Socioeconomic Factors"[Mesh]
"Substance-Related Disorders"[Mesh]

"substance abuse"
"substance abuse"[tiab]
"systematic review"[tiab]
"Tennis Elbow"[Mesh]
"Utilization Review"[Mesh]
"Vomiting"[Mesh]
"Wounds and Injuries"[Mesh]
absenteeism[tiab]
acupuncture[tiab]
addiction
addiction[tiab]
alcoholics[tiab]
alcoholism
alcoholism[tiab]
arthritis
arthritis[tiab]
athlet*
athlet*[tiab]
california
california*
california*[tiab]
californian*
cost effective*
cost[tiab]
crainocerebral
craniocerebral[tiab]
Cupping[Mesh]
cupping[ti]
disparit*[tiab]
elbow
elbows
electro-acupuncture
electro-acupuncture[tiab]
electroacupuncture
electroacupuncture[tiab]
electroanaesthesia
epilepsy
epilepsy[tiab]
ethnic[tiab]
gender[tiab]
headache
headache[tiab]
injuries
injuries[tiab]
injury
injury[tiab]

los angeles
los angeles[tiab]
meta-analyses
metaanalysis[tiab]
Moxibustion[Mesh]
moxibustion[ti]
musculoskeletal
Musculoskeletal[tiab]
nausea
nausea[tiab]
osteoarthritis
osteoarthritis[tiab]
pain
pain[tiab]
poverty[tiab]
racial[tiab]
san diego
san diego[tiab]
san francisco
san francisco[tiab]
seizure*
seizure*[tiab]
shoulder
societal[tiab]
socioeconomic[tiab]
stroke
stroke[tiab]
tendonitis
tendonitis[tiab]
utilization
vomit*
vomit*[tiab]

Limiters:

Child
Editorials
English
Meta-Analysis
Publication Date from 2001
Publication Date from 2003
Publication Date from 2004
Publication Date from 2004 to 2011
Publication Date from 2007/05 to 2011
Randomized Controlled Trial
Review
Systematic Reviews

The Cochrane Library:

Cochrane Database of Systematic Reviews (CDSR; Cochrane Reviews)
Database of Abstracts of Reviews of Effects (DARE; Other Reviews)
Cochrane Central Register of Controlled Trials (CENTRAL; Clinical Trials)
Cochrane Methodology Register (CMR; Methods Studies)
Health Technology Assessment Database (HTA; Technology Assessments)
NHS Economic Evaluation Database (NHSEED; Economic Evaluations)

"quality of life"

(acupuncture):ti,ab,kw

(elbow):ti,ab,kw

(electro-acupuncture):ti,ab,kw

(electroacupuncture):ti,ab,kw

(shoulder):ti,ab,kw

absenteeism

acupuncture

Acupuncture Therapy/economics - Mesh

Acupuncture Therapy/utilization - Mesh

Acupuncture/economics - Mesh

Acupuncture/utilization - Mesh

costs

cupping

disparit*

electro-acupuncture

electroacupuncture

ethnic*

gender

moxibustion

poverty

racial*

social

Societal

socioeconomic*

Limiters:

From 2004 to 2011

Web of Science

"bay area"

"cost benefit"

"nervous system"

"outcome assessment"

"quality of life"
"substance abuse"
absenteeism
acupuncture
addiction
alcoholics
alcoholism
arthritis
athlet*
california*
cost
costs
craniocerebral
cupping
disparit*
economic*
electro-acupuncture
electroacupuncture
epilepsy
ethnic*
gender
headache
injuries
injury
Insurance
insured
los angeles
meta-analysis
metaanalysis
moxibustion
musculoskeletal
nausea
osteoarthritis
pain
poverty
racial*
review
san diego
san francisco
seizure*
social
societal
socioeconomic*
spending
stroke
systematic review

tendonitis
utilisation
utilization
vomit*

Limiters:

Language=(English)
Timespan=2003-2011

Business Source Complete

acupuncture
electro-acupuncture
electroacupuncture
meta-analysis
metaanalysis
review
systematic review

Limiters:

Scholarly (Peer Reviewed) Journals
Published Date from: 20040101-20101231

EconLit

acupuncture
electroacupuncture
electro-acupuncture

INAHTA(CRD) - CRD,HTA,DARE databases are already covered in Cochrane Library

acupuncture
electroacupuncture
electro-acupuncture

CINAHL (Cumulative Index to Nursing and Allied health Literature)

"bay area"
"nervous system"
"quality of life"
"substance abuse"

absenteeism
acupuncture
addiction
alcoholic*
alcoholism
arthritis
athlet*
california*
craniocerebral
cupping
disparit*
electro-acupuncture
electroacupuncture
epilepsy
ethnic*
gender
headache
injuries
injury
los angeles
MH "Absenteeism+"
MH "acupuncture therapy+"
MH "acupuncture+"
MH "Acupuncture+/UT/SN"
MH "Age Factors+"
MH "Cost of Illness+"
MH "Ethnic Groups+"
MH "Health Care Costs+"
MH "Healthcare Disparities+"
MH "Musculoskeletal Diseases+"
MH "Nervous System Diseases+"
MH "Poverty+"
MH "Quality of Life+"
MH "Sex Factors+"
MH "Single-Payer System"
MH "Social Class+"
MH "Socioeconomic Factors+"
MH "Substance-Related Disorders+"
MJ "Acupuncture+/EC"
MJ "Costs and Cost Analysis+"
MJ "Insurance, Health, Reimbursement+"
MJ "Insurance+"
MM "Acupuncture+/UT/MO"
MM "Outcome Assessment"
MM "Treatment Failure"
MM "Treatment Outcomes"

MM "Utilization Review"

moxibustion
musculoskeletal
nausea
osteoarthritis
pain
pain
poverty
racial*
san diego
san francisco
seizure*
shoulder
societal
socioeconomic
stroke
tendonitis
TI "cost benefit"
TI cost
TI costs
TI economic*
TI insurance
TI insured*
TI spending*
TI use
TI utilisation
TI utilization
use
utilizations
vomit*

Limiters:

Age Groups: All Adult
English Language
Journal Subset: USA
Published Date from: 20040101-20111231
Published Date from: 20070101-20111231
Peer Reviewed
Publication Type: Clinical Trial, Meta Analysis, Review, Systematic Review

PsycInfo

"incremental cost effectiveness ratio"
"quality of life"
absenteeism
Date Range: 2004 to 2011

Date Range: 2007 to 2011
DE="acupuncture"
DE="behavioral economics"
DE="budgets"
DE="costs and cost analysis"
DE="economics"
DE="evolutionary economics"
DE="health care costs"
DE="health care economics"
DE="health care utilization"
DE="health disparities"
DE="money"
DE="neuroeconomics"
DE="pharmacoeconomics"
DE="treatment barriers"
DE="treatment effectiveness evaluation"
DE="utilization reviews"
disparit*
effectiveness
efficacy
ethnic*
gender
mortality
poverty
racial*
societal
society
socioeconomic
TI=effectiveness
TI=efficacy

Limiters:

Journal Articles Only
English Only
Age is Adulthood (18 yrs & older)
ME=(literature review)
ME=(meta analysis)
ME=(systematic review)

Appendix C: Summary Findings on Medical Effectiveness

Appendix C describes the studies of the medical effectiveness of acupuncture included in this review.

Table C-1. Description of Published Studies on the Medical Effectiveness of Acupuncture

Table C-1a. Studies of Musculoskeletal Disorders

Condition	Citation	Type of Study	Intervention vs. Comparison Group	Population Studied ⁴³	Location
Fibromyalgia	Langhorst et al., 2010	Systematic Review	Acupuncture vs. sham or simulated acupuncture	7 RCTs and quasi-randomized trials that enrolled 242 patients with fibromyalgia	Europe and North America
Lateral elbow pain	Green et al., 2002	Systematic review	Acupuncture vs. sham acupuncture; Acupuncture plus other treatments vs. other treatments	3 RCTs that enrolled 190 persons over age 16 yrs who had lateral elbow pain	Not reported
Lateral elbow pain	Trinh et al., 2004	Systematic review	Acupuncture vs. sham acupuncture; Acupuncture vs. other treatments	6 RCTs and controlled clinical trials (CCTs) that enrolled 282 persons with pain due to tennis elbow, lateral epicondyle pain, lateral elbow pain, lateral epicondylitis, or any pain originating from the extensor tendon	Not reported
Back Pain	Furlan et al., 2010	Systematic Review	Acupuncture vs. no treatment; Acupuncture vs. other treatments, (includes sham); Acupuncture plus other treatments vs. other treatments	20 RCTs that enrolled 4,463 patients with non-specific back pain.	Not reported
Neck Pain	Furlan et al., 2010	Systematic Review	Acupuncture vs. no treatment; Acupuncture vs. sham	5 RCTs that enrolled 172 patients with specific or non-specific neck pain	Not reported
Peripheral joint osteoarthritis	Manheimer et al., 2010	Meta-analysis	Acupuncture vs. no treatment; Acupuncture vs. sham acupuncture; Acupuncture vs. other treatments; Acupuncture plus other treatments vs. other treatments	13 RCTs involving 2,270 people with osteoarthritis of the knee, hip, or hand	Europe, Far East, North America
Rheumatoid arthritis	Lee et al., 2008	Systematic Review	Acupuncture vs. sham acupuncture	8 RCTs that enrolled with rheumatoid arthritis	Brazil, Canada, China, UK

⁴³ For all meta-analyses and systematic reviews listed in this table, the total numbers of studies and numbers of persons enrolled reflect only those studies included in these reviews for which persons in the treatment group received either manual needling or electroacupuncture. Studies that assessed acupressure or other noninvasive forms of acupuncture are not included in the numbers of studies and enrollees.

Table C-1a. Studies of Musculoskeletal Disorders (Cont'd)

Condition	Citation	Type of Study	Intervention vs. Comparison Group	Population Studied	Location
Shoulder Pain	Molsberger et al., 2010	RCT	Acupuncture vs. sham acupuncture; Acupuncture vs. other treatments	RCT that enrolled 424 patients with chronic shoulder pain	Germany
Shoulder Pain	Green et al., 2005	Systematic review	Acupuncture vs. sham acupuncture; Acupuncture vs. other treatments; Acupuncture plus other treatments vs. other treatments	9 RCTs and CCTs that enrolled 525 persons over age 16 years who had shoulder pain or disorder for more than 3 weeks who did not also have neck or arm pain and who did not have a history of other diseases or conditions that cause shoulder pain	Not reported
Shoulder Pain	Vas et al., 2008	RCT	Acupuncture plus other treatments vs. other treatments	RCT that enrolled 425 patients with a clinical diagnosis of unilateral subacromial syndrome	Spain
Temporo-mandibular dysfunction	La Touche et al., 2010	Systematic Review	Acupuncture vs. sham acupuncture or laser placebo	4 RCTs that enrolled 96 patient diagnosed with temporomandibular dysfunction who suffered painful symptoms	Not reported

Table C-1b. Studies of Neurological Disorders

Condition	Citation	Type of Study	Intervention vs. Comparison Group	Population Studied	Location
Epilepsy	Cheuk and Wong, 2008	Meta-analysis	Acupuncture vs. sham acupuncture; Acupuncture vs. other treatments; Acupuncture plus other treatments vs. other treatments	11 RCTs that enrolled 914 persons with epilepsy	China, Norway
Headaches, migraine	Linde et al., 2009a	Meta-analysis	Acupuncture vs. no treatment; Acupuncture vs. sham acupuncture; Acupuncture vs. other treatments	22 RCTs and CCTs that enrolled 4,419 migraine patients	Brazil, Denmark, France, Germany, Italy, Sweden, United Kingdom
Headaches, Tension-type	Linde et al., 2009b	Meta-analysis	Acupuncture vs. no treatment; Acupuncture vs. sham acupuncture; Acupuncture vs. other treatments	11 RCTs that enrolled 2317 patients with tension-type headaches	Finland, Germany, Italy Sweden, United Kingdom
Stroke	Kong et al., 2010	Systematic review	Acupuncture vs. sham acupuncture	10 RCTs that enrolled 711 patients with diagnosis of stroke, acute, subacute, and chronic phase	China and Western Counties
Vascular dementia	Peng et al., 2007	Systematic review	Acupuncture or electroacupuncture vs. sham acupuncture	Persons diagnosis with vascular dementia	Not reported

Table C-1c. Studies of Addiction Disorders

Condition	Citation	Type of Study	Intervention vs. Comparison Group	Population Studied	Location
Alcohol dependence	Cho and Whang, 2009	Systematic review	Acupuncture ⁴⁴ vs. sham acupuncture; Acupuncture vs. other treatments	8 RCTs that enrolled 978 patients with diagnosed alcohol dependency	Bulgaria, China, Germany, Switzerland, United Kingdom, United States
Cocaine dependence	Gates et al., 2006	Meta-analysis	Acupuncture vs. sham acupuncture; Acupuncture plus other treatments vs. other treatments	7 RCTs that enrolled 1,433 persons who were dependent on cocaine or crack cocaine	Not reported
Smoking cessation	White et al., 2011	Meta-analysis	Acupuncture vs. no treatment; Acupuncture vs. sham acupuncture; Acupuncture vs. other treatments	11 RCTs that enrolled 2,045 smokers of any age	Canada, Taiwan, France, New Zealand, United Kingdom, United States

Table C-1d. Studies of Nausea and Vomiting

Condition	Citation	Type of Study	Intervention vs. Comparison Group	Population Studied	Location
Chemotherapy-induced nausea and vomiting	Ezzo et al., 2006	Meta-analysis	Acupuncture vs. sham acupuncture; Electroacupuncture plus other treatment vs. other treatment	4 RCTs that enrolled 214 persons with cancer who received chemotherapy	Not reported
Postoperative nausea and vomiting	Lee and Fan, 2009	Meta-analysis	Acupuncture or electroacupuncture vs. sham acupuncture; Acupuncture vs. other treatments	9 RCTs that enrolled adults who had undergone surgery	Not reported

⁴⁴ Cho and Whang (2009) included trials of acupuncture, auricular acupuncture, electroacupuncture, auricular electroacupuncture, or auricular laser acupuncture.

Table C-2. Summary of Findings from Studies of the Medical Effectiveness of Acupuncture

Table C-2a. Acupuncture vs., No Treatment

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Musculoskeletal Disorders						
Back Pain						
Intensity of Back Pain	Furlan et al., 2010	1 meta-analysis	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Weighted mean difference -1.19 (-2.17, -0.21) 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is more effective than no treatment in reducing pain intensity.
Peripheral joint osteoarthritis						
Knee and hip pain	Manheimer et al., 2010	1 meta-analysis	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Absolute percent change 14.5%; relative percent change 29.14%; 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is more effective than no treatment in reducing pain and increasing function weeks.
Knee and hip function		1 meta-analysis	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Absolute percent change 13.0%; Relative percent change 25.21%. 	
Neurological Disorders						
Headaches, Migraine						
Reduction in headaches	Linde et al., 2009a	1 meta-analyses	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Pooled risk ratio 2.33 (2.02, 2.69) 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is more effective than no treatment in reducing headache frequency, migraine attacks, migraine days, and migraine intensity.
Migraine attacks			<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Mean difference -0.79 (-1.12, -0.47) 	
Migraine days			<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Mean difference -1.64 (-2.87, -.041) 	
Migraine intensity			<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std. mean difference -0.77 (-.94, -.61) 	

Table C-2a. Acupuncture vs. No Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Headaches, Tension-type						
Reduction in headaches	Linde et al., 2009b	2 RCTs	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Risk ratios 2.69 (2.22, 3.23) 11.36 (3.69, 34) 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is better than no treatment in reducing headache frequency and the number of headache days 3 to 4 months after treatment
Headache days			<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Mean difference -3.41 (-4.23, -2.59) -6.40 (-8.81, -3.99) 	
Addiction Disorders						
Smoking Cessation						
Abstinence from smoking	White et al., 2010	1 meta-analysis	<ul style="list-style-type: none"> Approaching statistical significance 	<ul style="list-style-type: none"> Higher odds of abstinence 	<ul style="list-style-type: none"> Odds ratio 1.79 (0.98, 3.28) 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture may increase abstinence from smoking.

Table C-2b. Acupuncture vs. Sham Treatment

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Musculoskeletal Disorders						
Fibromyalgia						
Pain reduction at post-treatment	Langhorst et al., 2010	1 meta-analysis	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std. mean difference -0.25 (-.49, -.02) 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is not more effective than sham acupuncture in reducing fatigue, pain or affecting sleep, at longer-term follow-up, but is more effective than sham in reducing pain at the post-treatment period.
Fatigue at post-treatment			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Sleep at post-treatment			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Physical function at post-treatment			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Pain reduction at follow-up			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		

Table C-2b. Acupuncture vs. Sham Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Physical function at followup			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Lateral elbow pain						
Elbow pain and functional impairment	Green et al., 2002 Trinh et al., 2004	Systematic review	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Not reported consistently 	<ul style="list-style-type: none"> Insufficient evidence on the effectiveness of acupuncture versus sham due to limited studies and small sample sizes.
Peripheral joint osteoarthritis						
Osteoarthritis pain at 8 weeks	Manheimer et al., 2010	1 meta-analysis	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std. mean difference -0.28 (-0.45, -0.09) 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is better than sham acupuncture in reducing short-term osteoarthritis pain and function, but is not different from sham acupuncture in reducing longer-term pain and function.
Osteoarthritis function at 8 weeks			<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std. mean difference -0.28 (-0.46, -0.09) 	
Osteoarthritis pain at 26 weeks			<ul style="list-style-type: none"> Approaching statistical significance 	<ul style="list-style-type: none"> Approaching better 	<ul style="list-style-type: none"> Std mean difference -0.10 (-0.21, 0.01) 	
Osteoarthritis function at 26 weeks			<ul style="list-style-type: none"> Approaching statistical significance 	<ul style="list-style-type: none"> Approaching better 	<ul style="list-style-type: none"> Std mean difference -0.11 (-0.22-0.00) 	
Neck Pain						
Pain, Non-specific	Furlan et al., 2010	1 Meta-analysis	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is not different from sham acupuncture in reducing pain for non-specific or specific neck pain.
Pain, Specific			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		

Table C-2b. Acupuncture vs. Sham Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Rheumatoid Arthritis						
Pain	Lee et al., 2008	1 Meta-analysis	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is not different from sham acupuncture in reducing pain, functional disability, disease activity, or the number of swollen and tender joints.
Disability (HAQ and ACR20)			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Disease activity (DAS)			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Swollen and tender joint count			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Shoulder Pain						
Pain	Green et al., 2005	3 RCTs	<ul style="list-style-type: none"> Not statistically difference in pain in 2 of 3 studies 	<ul style="list-style-type: none"> No difference in 2 of 3 studies 		<ul style="list-style-type: none"> The preponderance of evidence suggests that acupuncture is as effective as sham acupuncture in treating shoulder pain.
Pain	Molsberger et al., 2010	1 RCT	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Odds ratio 5.96 (3.34, 10.35) 	<ul style="list-style-type: none"> A single RCT found that acupuncture is effective in reducing pain compared to sham acupuncture.
Temporomandibular dysfunction						
Pain	La Touche, et al., 2010	1 meta-analysis	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std. mean difference 0.83 (0.41, 1.25) 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is more effective than sham acupuncture in reducing pain.

Table C-2b. Acupuncture vs. Sham Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Neurological Disorders						
Epilepsy						
Frequency of Seizure	Cheuk and Wong et al., 2008	• 1 RCT	• Not statistically significant	• No effect		• Insufficient evidence to determine whether acupuncture is more effective than sham acupuncture in reducing the frequency and duration of seizures or the quality of life for persons with epilepsy.
Seizure free weeks			• Not statistically significant	• No effect		
Quality of Life			• Not statistically significant	• No effect		
Headaches, Migraine						
Reduction in headaches	Linde et al., 2009a	1 meta-analyses	• Not statistically significant	• No effect		• Preponderance of evidence suggests that acupuncture is not more effective than sham acupuncture in reducing headache frequency, migraine intensity, or the number of migraine attacks or days.
Migraine attacks			• Not statistically significant	• No effect		
Migraine days			• Not statistically significant	• No effect		
Migraine intensity			• Not statistically significant	• No effect		
Headaches, Tension-type						
Reduction in headaches	Linde et al., 2009b	1 meta-analysis	• Statistically significant	• Better	• Risk ratio 1.24 (1.05, 1.46)	• Preponderance of evidence suggests that acupuncture is more effective than sham acupuncture in reducing headaches, the number of headache days, but is as effective as sham in reducing headache intensity.
Headache days			• Statistically significant	• Better	• Mean difference -1.94 (-3.15, -0.72)	
Headache intensity			• Not statistically significant	• No effect		

Table C-2b. Acupuncture vs. Sham Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Stroke						
Activities of daily living	Kong et al., 2010	1 meta-analysis	• Not statistically significant	• No effect		• Preponderance of evidence suggests that acupuncture is not more effective than sham acupuncture in increasing function or activities of daily living.
Function			• Not statistically significant	• No effect		
Vascular dementia						
Peng et al., 2007		• Systematic review) ⁴⁵	• Not reported	• Not reported	• Not reported	• Insufficient evidence to assess the effectiveness for vascular dementia because there are no RCTs and few high-quality CCTs.
Addiction Disorders						
Alcohol dependence						
Cravings	Cho and Whang, 2009	3 RCTs	• Not statistically significant in 3 of 3 RCTs	• No effect		• Preponderance of evidence suggests that acupuncture is not more effective than sham in reducing cravings or withdrawal symptoms.
Withdrawal symptoms		1 RCT	• Not statistically significant	• No effect		
Cocaine dependence						
Cravings	Gates et al., 2006	1 meta-analysis	• Not statistically significant	• No effect		• Preponderance of evidence suggests that acupuncture is as effective as sham acupuncture in reducing cravings or the severity of addiction.
Severity of addiction			• Not statistically significant	• No effect		

⁴⁵ The authors of this systematic review did not report any results because they determined that none of the studies of the effect of acupuncture on vascular dementia met their criteria for inclusion in their systematic review. Reasons for exclusion included lack of randomization, use of Western medicine in the control group, and use of acupuncture in combination with another therapy, such as acupoint-injection, herbal drugs, and moxibustion (Peng et al., 2007).

Table C-2b. Acupuncture vs. Sham Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Smoking cessation						
Abstinence from smoking	White et al., 2011	1 meta-analysis	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is as effective as sham acupuncture in increasing abstinence from smoking.
Nausea and Vomiting						
Chemotherapy-induced nausea and vomiting						
Severity of nausea	Ezzo et al., 2006	1 meta-analysis	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 	Postoperative nausea and vomiting	<ul style="list-style-type: none"> Insufficient evidence to determine whether acupuncture is more effective than sham acupuncture in reducing severity of nausea or probability of vomiting.
Frequency of vomiting			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Postoperative nausea and vomiting						
Risk for nausea	Lee and Fan, 2009	1 meta-analysis	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	RR = 0.65 (0.48, 0.89)	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is more effective than sham acupuncture in reducing the risk of postoperative nausea.
Risk for vomiting			<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	RR = 0.60 (0.48, 0.89)	

Table C-2c. Acupuncture vs, Other Treatment

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Musculoskeletal Disorders						
Back Pain						
Back pain immediate post-treatment	Furlan et al., 2010	1 meta-analysis comparisons with placebo/sham	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Mean difference 0.59 (-0.93, -0.25) 	<ul style="list-style-type: none"> Preponderance of evidence suggests acupuncture is better than most other treatments at post-treatment, but not at further follow-up stages.
Back pain short-term post-treatment			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Back pain intermediate post-treatment			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Back pain long-term post-treatment			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Back pain immediate post-treatment		comparison with manipulation	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Worse 	<ul style="list-style-type: none"> Mean difference 3.7 (1.5, 5.8) 	
Back pain immediate post-treatment		comparison with medication	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Back pain intermediate post-treatment			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Back pain immediate post-treatment		comparison with TENS	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Back pain short-term post-treatment			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Lateral elbow pain						
Elbow pain	Trinh et al., 2004	Systematic review of 2 small RCTs	<ul style="list-style-type: none"> 1 RCT was not statistically significant and 1 RCT was statistically significant 		Not reported	<ul style="list-style-type: none"> The evidence regarding the effectiveness of acupuncture relative to ultrasound for treatment of lateral elbow pain is ambiguous.

Table C-2c. Acupuncture vs, Other Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Peripheral joint osteoarthritis						
Osteoarthritis pain	Manheimer et al., 2010	1 RCT comparison with supervised osteoarthritis education	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	Std. mean difference -0.51 (-0.74, -0.27)	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture relative to osteoarthritis education is associated with improvement in pain and functions, but acupuncture is as effective other treatments.
Osteoarthritis pain		1 RCT comparison with home exercises/ advice leaflet	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Osteoarthritis pain		1 RCT comparison with supervised exercise	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Osteoarthritis pain		1 RCT comparison with physician consultations (with a physiotherapy co-intervention)	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std. mean difference -0.60 (-0.76, -0.44) 	
Function		1 RCT comparison with supervised osteoarthritis education	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std. mean difference -0.52 (-0.76, -0.28) 	
Function		1 RCT comparison with. home exercises/ advice leaflet	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Function		1 RCT comparison with supervised exercise	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Function		1 RCT comparison with physician consultations (with a physiotherapy co-intervention)	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std. mean difference -0.67 (-0.83, -0.50) 	

Table C-2c. Acupuncture vs. Other Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Shoulder pain						
Shoulder pain	Green et al., 2005	Systematic comparisons to regional nerve block	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Worse 	<ul style="list-style-type: none"> 65 minutes longer to achieve pain relief with acupuncture compared to regional nerve block 	<ul style="list-style-type: none"> Insufficient evidence to determine the effectiveness of acupuncture relative to regional nerve block, steroid injection, and ultrasound in relieving shoulder pain.
		Comparison to steroid injection	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No difference 		
		Comparison to ultrasound	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No difference 		
Shoulder pain	Molsberger et al., 2010	1 RCT comparison with convention orthopedic therapy	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Odds ration 3.15 (1.9 , 5.2) 	<ul style="list-style-type: none"> Evidence suggests that acupuncture is more effective than other treatments for shoulder pain.
Neurological Disorders						
Epilepsy						
Seizure frequency	Cheuk and Wong, 2008	Meta-analysis comparison with phenytoin	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		<ul style="list-style-type: none"> The preponderance of evidence suggests that acupuncture is not more effective than phenytoin and valproate.
Seizure frequency		Meta-analysis comparison to valproate	<ul style="list-style-type: none"> Statistically significant, but not reliable – small sample 	<ul style="list-style-type: none"> Not reliable 	<ul style="list-style-type: none"> Std mean difference 1.44 (1.05, 1.98) 	

Table C-2c. Acupuncture vs. Other Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Headache, Migraine						
Headache frequency	Linde et al., 2009a	Meta-analysis comparison with drug treatment	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std mean difference -0.26 (-0.41, -0.11) 	<ul style="list-style-type: none"> The preponderance of evidence suggests that acupuncture relative to drug treatments is ambiguous.
Migraine attacks			<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std mean difference -0.32 (-0.59, -0.04) 	
Migraine days			<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Std mean difference -0.70 (-1.23, -0.17) 	
Headache intensity			<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Headache, Tension-type						
Headache frequency	Linde et al., 2009b	Meta-analysis	<ul style="list-style-type: none"> Insufficient evidence – small samples 			
Addiction Disorders						
Alcohol addiction						
Cravings	Cho and Whang, 2009	4 RCTs comparison with conventional treatment	<ul style="list-style-type: none"> 3 RCTs not pooled found a significant reduction in alcohol cravings, 1 reported no difference 	<ul style="list-style-type: none"> Results not shown 		<ul style="list-style-type: none"> The preponderance of evidence suggests that acupuncture relative to conventional treatment and aromatherapy is ambiguous.
Cravings		1 RCT comparison to aromatherapy	<ul style="list-style-type: none"> No significant difference 	<ul style="list-style-type: none"> No Effect 		

Table C-2c. Acupuncture vs. Other Treatment (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Smoking cessation						
Smoking cessation	White et al., 2010	Meta-analysis comparison with NRT	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Worse 	<ul style="list-style-type: none"> Risk ratio 0.64 (0.42, 0.98) 	<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is less effective than NRT and as effective as smoking cessation counseling in facilitating smoking cessation.
Smoking cessation		RCT comparison with counseling	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No Effect 		
Nausea and Vomiting						
Postoperative nausea and vomiting						
Nausea	Lee and Fan, 2009	Meta-analysis comparisons to antiemetic drugs	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No Effect 		<ul style="list-style-type: none"> Preponderance of evidence suggests that acupuncture is as effective as antiemetic drugs in alleviating postoperative nausea and vomiting and reducing use of rescue antiemetic.
Vomiting		Meta-analysis comparisons to antiemetic drugs	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No Effect 		
Vomiting		Meta-analysis comparisons to Rescue antiemetic	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No Effect 		

Table C-2d. Acupuncture Plus Other Treatments vs. Other Treatments Alone

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Musculoskeletal Disorders						
Back pain						
Back pain at immediate post-treatment	Furlan et al., 2010	1 meta-analysis Acupuncture and therapies vs. therapies	<ul style="list-style-type: none"> Statistically significant 	Better	<ul style="list-style-type: none"> Mean difference 1.65 (-2.32, -0.98) 	<ul style="list-style-type: none"> The preponderance of evidence suggests that acupuncture is an effective adjuvant treatment for back pain.
Back pain at short-term post-treatment			<ul style="list-style-type: none"> Statistically significant 	Better	<ul style="list-style-type: none"> Mean difference -2.23 (-3.68, -0.79) 	
Back pain at intermediate-term post-treatment			<ul style="list-style-type: none"> Statistically significant 	Better	<ul style="list-style-type: none"> Mean difference -1.55 (-2.29, -0.81) 	
Disability at short-term treatment			<ul style="list-style-type: none"> Statistically significant 	No effect		
Peripheral joint osteoarthritis						
Pain	Manheimer et al., 2010	1 RCT Acupuncture as an adjunct to exercise-based physiotherapy program	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		<ul style="list-style-type: none"> The preponderance of evidence suggests that acupuncture is not an effective adjuvant treatment for osteoarthritis arthritis pain.
Rheumatoid arthritis						
Pain frequency	Lee et al., 2008	Meta analysis Acupuncture plus moxibustion vs. conventional drugs	<ul style="list-style-type: none"> Not statistically significant 			<ul style="list-style-type: none"> The preponderance of evidence suggests that acupuncture is not an effective adjuvant treatment for rheumatoid arthritis pain.
Pain reduction			<ul style="list-style-type: none"> Not statistically significant 			
Joint swelling index			<ul style="list-style-type: none"> Not statistically significant 			

Table C-2d. Acupuncture Plus Other Treatments vs. Other Treatments Alone

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Shoulder pain						
Composite measure of pain, range of motion, and functioning	Green et al., 2005	1 systematic review acupuncture as an adjunct to exercise	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> 9% increase in composite measure 	<ul style="list-style-type: none"> Insufficient evidence to determine whether acupuncture combined with exercise is more effective than exercise alone in treating shoulder pain.
		Acupuncture as an adjunct to mobilization	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		
Functional assessment of shoulder	Vas et al., 2008	1 RCT Acupuncture and physiotherapy or Mock Tens and physiotherapy and physiotherapy	<ul style="list-style-type: none"> Statistically significant 	<ul style="list-style-type: none"> Better 	<ul style="list-style-type: none"> Mean difference 6.0 (3.2, 8.8) 	<ul style="list-style-type: none"> The evidence suggests that acupuncture is an effective adjuvant treatment for shoulder function.
Addiction Disorders						
Cocaine dependence						
Cocaine dependence	Gates et al., 2006	1 Meta-analysis adding auricular acupuncture to methadone, neurobehavioral treatment, or multi-component residential or inpatient treatment does not reduce cocaine use, cocaine craving, or severity of addiction	<ul style="list-style-type: none"> Not statistically significant 	<ul style="list-style-type: none"> No effect 		<ul style="list-style-type: none"> The preponderance of evidence suggests that acupuncture is not an effective adjuvant treatment for cocaine dependence.

Table C-2d. Acupuncture Plus Other Treatments vs. Other Treatments Alone (Cont'd)

Outcome	Citation(s)	Research Design	Statistical Significance	Direction of Effect	Size of Effect	Conclusion
Nausea and Vomiting						
Chemotherapy-induced nausea and vomiting						
Vomiting	Ezzo et al., 2006	<ul style="list-style-type: none"> • Meta-analysis Electroacupuncture plus antiemetics 	<ul style="list-style-type: none"> • Statistically significant 	<ul style="list-style-type: none"> • Better 	<ul style="list-style-type: none"> • Risk ratio 0.76 (0.60, 0.97) 	<ul style="list-style-type: none"> • Preponderance of evidence from 3 small RCTs suggests that that combining electroacupuncture and antiemetics reduces incidence of acute vomiting among persons receiving chemotherapy. • Insufficient evidence to assess the effects of manual acupuncture as an adjuvant to antiemetic medication.
Nausea		<ul style="list-style-type: none"> • RCT published after the meta-analysis (1 RCT, 11 persons) 	<ul style="list-style-type: none"> • Not statistically significant 	<ul style="list-style-type: none"> • No difference 		
Use of antiemetic medication		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Statistically significant in 1 study of manual acupuncture for use of rescue antiemetics 		Insufficient evidence	

Appendix D: Cost Impact Analysis: Data Sources, Caveats, and Assumptions

This appendix describes data sources, as well as general and mandate-specific caveats and assumptions used in conducting the cost impact analysis. For additional information on the cost model and underlying methodology, please refer to the CHBRP Web site at http://www.chbrp.org/analysis_methodology/cost_impact_analysis.php.

The cost analysis in this report was prepared by the members of cost team, which consists of CHBRP task force members and contributors from the University of California, San Diego, and the University of California, Los Angeles, as well as the contracted actuarial firm, Milliman, Inc. (Milliman). Milliman provides data and analyses per the provisions of CHBRP's authorizing legislation.

Data Sources

In preparing cost estimates, the cost team relies on a variety of data sources as described below.

Health insurance

1. The latest (2009) California Health Interview Survey (CHIS), which is used to estimate health insurance for California's population and distribution by payor (i.e., employment-based, individually purchased, or publicly financed). The biennial CHIS is the largest state health survey conducted in the United States, collecting information from approximately 50,000 households. More information on CHIS is available at <http://www.chis.ucla.edu>.
2. The latest (2010) California Employer Health Benefits Survey is used to estimate:
 - Size of firm,
 - Percentage of firms that are purchased/underwritten (versus self-insured),
 - Premiums for health care service plans regulated by the Department of Managed Health Care (DMHC) (primarily health maintenance organizations [HMOs] and Point of Service Plans [POS]),
 - Premiums for health insurance policies regulated by the California Department of Insurance (CDI) (primarily preferred provider organizations [PPOs] and fee-for-service plans [FFS]), and
 - Premiums for high deductible health plans (HDHPs) for the California population with employment-based health insurance.
 - This annual survey is currently released by the California Health Care Foundation/National Opinion Research Center (CHCF/NORC) and is similar to the national employer survey released annually by the Kaiser Family Foundation and the Health Research and Educational Trust. Information on the CHCF/NORC data is available at: <http://www.chcf.org/publications/2010/12/california-employer-health-benefits-survey>.

3. Milliman data sources are relied on to estimate the premium impact of mandates. Milliman's projections derive from the Milliman Health Cost Guidelines (HCGs). The HCGs are a health care pricing tool used by many of the major health plans in the United States. See <http://www.milliman.com/expertise/healthcare/products-tools/milliman-care-guidelines/index.php>. Most of the data sources underlying the HCGs are claims databases from commercial health insurance plans. The data are supplied by health insurance companies, Blues plans, HMOs, self-funded employers, and private data vendors. The data are mostly from loosely managed healthcare plans, generally those characterized as preferred provider plans or PPOs. The HCGs currently include claims drawn from plans covering 4.6 million members. In addition to the Milliman HCGs, CHBRP's utilization and cost estimates draw on other data, including the following:
 - The MarketScan Database, which includes demographic information and claim detail data for approximately 13 million members of self-insured and insured group health plans.
 - An annual survey of HMO and PPO pricing and claim experience. The most recent survey (2010 Group Health Insurance Survey) contains data from seven major California health plans regarding their 2010 experience.
 - Ingenix MDR Charge Payment System, which includes information about professional fees paid for healthcare services, based upon approximately 800 million claims from commercial insurance companies, HMOs, and self-insured health plans.
 - These data are reviewed for applicability by an extended group of experts within Milliman but are not audited externally.
4. An annual survey by CHBRP of the seven largest providers of health insurance in California (Aetna, Anthem Blue Cross of California, Blue Shield of California, CIGNA, Health Net, Kaiser Foundation Health Plan, and PacifiCare) to obtain estimates of baseline enrollment by purchaser (i.e., large and small group and individual), type of plan (i.e., DMHC- or CDI-regulated), cost-sharing arrangements with enrollees, and average premiums. Enrollment in plans or policies offered by these seven firms represents an estimated 93.7% of the persons with health insurance subject to state mandates. This figure represents an estimated 94.4% of enrollees in full service (non-specialty) DMHC-regulated health plans and an estimated 90.1% of enrollees in full service (non-specialty) CDI-regulated policies.⁴⁶

Publicly funded insurance subject to state benefit mandates

5. Premiums and enrollment in DMHC-regulated health plans and CDI-regulated policies by self-insured status and firm size are obtained annually from CalPERS for active state and local government public employees and their dependents who receive their benefits through

⁴⁶ CHBRP analysis of the share of enrollees included in CHBRP's Bill-Specific Coverage Survey of the major carriers in the state is based on "CDI Licenses with HMSR Covered Lives Greater than 100,000" as part of the Accident and Health Covered Lives Data Call, December 31, 2009, by the California Department of Insurance, Statistical Analysis Division, data retrieved from the Department of Managed Health Care's interactive Web site "Health Plan Financial Summary Report," July-September 2010, and CHBRP's Annual Enrollment and Premium Survey.

CalPERS. Enrollment information is provided for DMHC-regulated health care service plans covering non-Medicare beneficiaries—about 74% of CalPERS total enrollment. CalPERS self-funded plans—approximately 26% of enrollment—are not subject to state mandates. In addition, CHBRP obtains information on current scope of benefits from evidence of coverage (EOCs) documents publicly available at <http://www.calpers.ca.gov>.

6. Enrollment in Medi-Cal Managed Care (beneficiaries enrolled in Two-Plan Model, Geographic Managed Care, and County Operated Health System plans) is estimated based on CHIS and data maintained by the Department of Health Care Services (DHCS). The DHCS supplies CHBRP with the statewide average premiums negotiated for the Two-Plan Model, as well as generic contracts that summarize the current scope of benefits. CHBRP assesses enrollment information online at http://www.dhcs.ca.gov/dataandstats/statistics/Pages/RASS_General_Medi_Cal_Enrollment.aspx.
7. Enrollment data for other public programs—Healthy Families Program (HFP), Access for Infants and Mothers (AIM), and the Major Risk Medical Insurance Program (MRMIP)—are estimated based on CHIS and data maintained by the Managed Risk Medical Insurance Board (MRMIB). The basic minimum scope of benefits offered by participating health plans under these programs must comply with all requirements for DMHC-regulated health plans, and thus these plans are affected by state-level benefit mandates. CHBRP does not include enrollment in the Post-MRMIP Guaranteed-Issue Coverage Products as these persons are already included in the enrollment for individual market health insurance offered by DMHC-regulated plans or CDI-regulated insurers. Enrollment figures for AIM and MRMIP are included with enrollment for Medi-Cal in presentation of premium impacts. Enrollment information is obtained online at <http://www.mrmib.ca.gov/>. Average statewide premium information is provided to CHBRP by MRMIB staff.

General Caveats and Assumptions

The projected cost estimates are estimates of the costs that would result if a certain set of assumptions were exactly realized. Actual costs will differ from these estimates for a wide variety of reasons, including:

- Prevalence of mandated benefits before and after the mandate may be different from CHBRP assumptions.
- Utilization of mandated benefits (and, therefore, the services covered by the benefit) before and after the mandate may be different from CHBRP assumptions.
- Random fluctuations in the utilization and cost of health care services may occur.

Additional assumptions that underlie the cost estimates presented in this report are:

- Cost impacts are shown only for plans and policies subject to state benefit mandate laws.
- Cost impacts are only for the first year after enactment of the proposed mandate.

- Employers and employees will share proportionately (on a percentage basis) in premium rate increases resulting from the mandate. In other words, the distribution of premium paid by the subscriber (or employee) and the employer will be unaffected by the mandate.
- For state-sponsored programs for the uninsured, the state share will continue to be equal to the absolute dollar amount of funds dedicated to the program.
- When cost savings are estimated, they reflect savings realized for 1 year. Potential long-term cost savings or impacts are estimated if existing data and literature sources are available and provide adequate detail for estimating long-term impacts. For more information on CHBRP's criteria for estimating long-term impacts please see: http://www.chbrp.org/analysis_methodology/cost_impact_analysis.php.
- Several recent studies have examined the effect of private insurance premium increases on the number of uninsured (Chernew et al., 2005; Hadley, 2006; Glied and Jack 2003). Chernew et al. (2005) estimate that a 10% increase in private premiums results in a 0.74 to 0.92 percentage point decrease in the number of insured, while Hadley (2006) and Glied and Jack (2003) estimate that a 10% increase in private premiums produces a 0.88 and 0.84 percentage point decrease in the number of insured, respectively. The price elasticity of demand for insurance can be calculated from these studies in the following way. First, take the average percentage point decrease in the number of insured reported in these studies in response to a 1% increase in premiums (about -0.088), divided by the average percentage of insured persons (about 80%), multiplied by 100%, i.e., ($\{-0.088/80\} \times 100 = -0.11$). This elasticity converts the *percentage point* decrease in the number of insured into a *percentage* decrease in the number of insured persons for every 1% increase in premiums. Because each of these studies reported results for the large-group, small-group, and individual insurance markets combined, CHBRP employs the simplifying assumption that the elasticity is the same across different types of markets. For more information on CHBRP's criteria for estimating impacts on the uninsured please see: http://www.chbrp.org/analysis_methodology/cost_impact_analysis.php.

There are other variables that may affect costs, but which CHBRP did not consider in the cost projections presented in this report. Such variables include, but are not limited to:

- Population shifts by type of health insurance: If a mandate increases health insurance costs, some employer groups and individuals may elect to drop their health insurance. Employers may also switch to self-funding to avoid having to comply with the mandate.
- Changes in benefit plans: To help offset the premium increase resulting from a mandate, subscribers/policyholders may elect to increase their overall plan deductibles or copayments. Such changes would have a direct impact on the distribution of costs between the health plan and policies and enrollees, and may also result in utilization reductions (i.e., high levels of patient cost sharing result in lower utilization of health care services). CHBRP did not include the effects of such potential benefit changes in its analysis.
- Adverse selection: Theoretically, individuals or employer groups who had previously forgone health insurance may now elect to enroll in a health plan or policy, postmandate, because they perceive that it is to their economic benefit to do so.

- Medical management: Health plans and insurers may react to the mandate by tightening medical management of the mandated benefit. This would tend to dampen the CHBRP cost estimates. The dampening would be more pronounced on the plan types that previously had the least effective medical management (i.e., PPO plans).
- Geographic and delivery systems variation: Variation in existing utilization and costs, and in the impact of the mandate, by geographic area and delivery system models: Even within the health insurance types CHBRP modeled (HMO—including HMO and point of service [POS] plans—and non-HMO—including PPO and fee for service [FFS] policies), there are likely variations in utilization and costs by type. Utilization also differs within California due to differences in the health status of the local population, provider practice patterns, and the level of managed care available in each community. The average cost per service would also vary due to different underlying cost levels experienced by providers throughout California and the market dynamic in negotiations between providers and health plans or insurers. Both the baseline costs prior to the mandate and the estimated cost impact of the mandate could vary within the state due to geographic and delivery system differences. For purposes of this analysis, however, CHBRP has estimated the impact on a statewide level.
- Compliance with the mandate: For estimating the postmandate coverage levels, CHBRP typically assumes that plans and policies subject to the mandate will be in compliance with the coverage requirements of the bill. Therefore, the typical postmandate coverage rates for populations subject to the mandate are assumed to be 100%.

Potential Effects of the Federal Affordable Care Act

As discussed in the *Introduction*, there are a number of the ACA provisions that have already gone into or will go into effect over the next 3 years. Some of these provisions affect the baseline or current enrollment, expenditures, and premiums. This subsection discusses adjustments made to the 2011 Cost and Coverage Model to account for the potential impacts of the ACA that will have gone into effect by January 2011. It is important to emphasize that CHBRP's analysis of specific mandate bills typically address the marginal effects of the mandate bill—specifically, how the proposed mandate would impact benefit coverage, utilization, costs, and public health, holding all other factors constant. CHBRP's estimates of these marginal effects are presented in the *Benefit Coverage, Utilization, and Cost Impacts* section of this report.

CHBRP reviewed the ACA provisions and determined whether and how these provisions might affect:

1. The number of covered lives in California, and specifically the makeup of the population with health insurance subject to state mandates
2. Baseline premiums and expenditures for health insurance subject to state mandates, and
3. Benefits required to be covered in various health insurance plans subject to state mandates.

There are still a number of provisions that have gone into effect for which data are not yet available. Where data allows, CHBRP has made adjustments to the 2011 Cost and Coverage model to reflect changes in enrollment and/or baseline premiums and these are discussed here.

Coverage for adult children

PPACA Section 2714, modified by HR 4872, Section 2301, requires coverage for adult children up to age 26 as dependants to primary subscribers on all individual and group policies, effective September 23, 2010. California's recently enacted law, SB 1088 (2010), implements this provision. This could potentially affect both premiums and enrollment in 2011. According to the California Health Interview Survey (CHIS) approximately 22% of Californians aged 19 to 25 (1,063,000) were estimated to be uninsured at some point in 2009. As a result of the ACA, many of these young adults will likely gain access to health insurance through a parent. This dynamic may diminish the number of uninsured and may also shift some young adults from the individually purchased health insurance market into the group market. The Departments of Treasury, Labor, and Health and Human Services estimate, for 2011, the number of young adults newly covered by his/her parent's plan would be about 0.78 to 2.12 million (using high and low take-up rate assumptions, respectively). Of these young adults, about 0.2 to 1.64 million would have previously been uninsured. The corresponding incremental cost impact to group insurance policies is estimated to be a premium increase of 0.5% to 1.2%. Based on the responses to the Annual Enrollment and Premium survey, there has been an increase of 1% to 1.5% in enrollment for the 19 to 25 year olds and the increase varies depending on whether the parents were enrolled in the large group, small group or individual markets. Based on analysis of the estimates from the Departments of Treasury, Labor and Health and Human Services as well as CHIS 2009 data, approximately 25% of the increase in enrollment represents a shift from the individual market and approximately 75% were previously uninsured. CHBRP took these estimates into account and adjusted underlying population data since source data did not reflect the effects of this provision, because shift in populations were expected to be significant, and to account for potential lags in enrollment (e.g. due to awareness).

Minimum Medical Loss Ratio requirement

PPACA Section 2718 requires health plans offering health insurance in group and individual markets to report to the Secretary of Health and Human Services the amount of premium revenue spent on clinical services, activities to improve quality, and other non-claim costs. Beginning in 2011, large group plans that spend less than 85% of premium revenue and small group/individual market plans that spend less than 80% of premium revenue on clinical services and quality must provide rebates to enrollees. According to the Interim Final Rule (45 CFR Part 158), "Issuers will provide rebates to enrollees when their spending for the benefit of policyholders on reimbursement for clinical services and quality improvement activities, in relation to the premiums charged, is less than the MLR standards established pursuant to the statute."⁴⁷ The requirement to report medical loss ratio is effective for the 2010 plan year, while the requirement to provide rebates is effective January 1, 2011. The MLR requirement, along with the rebate payment requirement, will affect premiums for 2011, but the effects are unknown and data are not yet available. There is potential for substantial impact on markets with higher administrative costs, including the small and individual group markets. Responses to CHBRP's Annual Enrollment and Premiums Survey indicate that carriers intend to be in compliance with these requirements. For those that may not be in compliance, the requirement to pay rebates is intended to align the MLR retrospectively. Therefore, for modeling purposes, CHBRP has

⁴⁷ Department of Health and Human Services, *Interim Final Rule: Health Insurance Issuers Implementing Medical Loss Ratio (MLR) Requirements Under the Patient Protection and Affordable Care Act*. 45 CFR Part 158. December 1, 2010.

adjusted administrative and profit loads to reflect MLRs that would be in compliance with this provision.

Pre-Existing Condition Insurance Plan (PCIP)

PPACA Section 1101 establishes a temporary high-risk pool for individuals with pre-existing medical conditions, effective 90 days following enactment until January 1, 2014. In 2010, California enacted AB 1887 and SB 227, providing for the establishment of the California Pre-Existing Condition Insurance Plan (PCIP) to be administered by the Managed Risk Medical Insurance Board (MRMIB) and federally funded per Section 1101. MRMIB has projected average enrollment of 23,100 until the end of 2013, when the program will expire. As of December 2010, there were approximately 1,100 subscribers.⁴⁸ The California PCIP is not subject to state benefit mandates,⁴⁹ and therefore this change does not directly affect CHBRP's Cost and Coverage Model. CHBRP has revised its annual update of *Estimates of the Sources of Health Insurance in California*.⁵⁰ to reflect that a slight increase in the number of those who are insured under other public programs that are not subject to state level mandates.

Prohibition of pre-existing condition exclusion for children

PPACA Sections 1201 & 10103(e): Prohibits pre-existing condition exclusions for children. This provision was effective upon enactment). California's recently enacted law, AB 2244 (2010) implements this provision. AB 2244 also prohibits carriers that sell individual plans or policies from refusing to sell or renew policies to children with pre-existing conditions. Carriers that do not offer new plans for children are prohibited from offering for sale new individual plans in California for 5 years.⁵¹ This provision could have had significant premium effects, especially for the DMHC- and CDI-regulated individual markets. The premium information is included in the responses to CHBRP's Annual Enrollment and Premium Survey. Thus the underlying data used in CHBRP annual model updates captured the effects of this provision.

Prohibition of lifetime limits and annual benefit limit changes

PPACA Section 2711 prohibits individual and group health plans from placing lifetime limits on the dollar value of coverage, effective September 23, 2010. Plans may only impose annual limits on coverage and these annual limits may be no less than \$750,000 for "essential health benefits." The minimum annual limit will increase to \$1.25 million on Sept. 23, 2011, and to \$2 million on Sept. 23, 2012. In 2010, CHBRP conducted an analysis of SB 890 which sought to prohibit lifetime and annual limits for "basic health care services" covered by CDI-regulated policies. CHBRP's indicated that DMHC-regulated plans were generally prohibited from having annual or lifetime limits. The analysis also indicated that less than 1% of CDI-regulated policies in the state had annual benefit limits and of those, the average annual benefit limit was approximately \$70,000 for the group market and \$100,000 for the individual market. Almost all CDI-regulated policies had lifetime limits in place and the average lifetime limits was \$5 million. After the

⁴⁸ Enrollment report presented at the Managed Risk Medical Insurance Board Meeting, January 19, 2010. Available at:

http://www.mrmib.ca.gov/MRMIB/Agenda_Minutes_011911/Agenda_Item_9.a_PCIP_Board_Report_for_Dec_2010_FINAL.pdf

⁴⁹ Correspondence with John Symkowitz, Legislative Coordinator, MRMIB, October 19, 2010.

⁵⁰ See: http://www.chbrp.org/other_publications/index.php.

⁵¹ See enacted language at: http://www.leginfo.ca.gov/pub/09-10/bill/asm/ab_2201-2250/ab_2244_bill_20100930_chaptered.pdf

effective date of the PPACA Section 2711, removal of these limits may have had an effect on premiums. As mentioned, premium information is included in the responses to CHBRP's Annual Enrollment and Premium Survey. Thus the underlying data used in CHBRP annual model updates captured the effects of this provision to remove lifetime limits and to increase annual limits for those limited number of policies that had annual limits that fell below \$750,000.

Medi-Cal Managed Care Enrollment: Seniors and Persons with Disabilities

While the PPACA allows states the option to expand coverage to those not currently eligible for Medicaid (Medi-Cal in California), large scale expansions are not expected to be seen during 2011. However, as a result of the 2010-2011 California Budget Agreement, there are expected to be shifts in coverage for seniors and persons with disabilities. Specifically, "Seniors and persons with disabilities who reside in certain counties which have managed care plans, and who are not also eligible to enroll in Medicare, will be required to enroll in a managed care plan under a phased-in process."⁵² The Medi-Cal Managed Care enrollment in CHBRP's 2011 Cost and Coverage Model has been adjusted to reflect this change. Baseline premium rates have also been adjusted to reflect an increase in the number of seniors and persons with disabilities in Medi-Cal Managed Care. Information from DHCS indicates these changes will go into effect July 1, 2011, and would affect approximately 427,000 Medi-Cal beneficiaries.⁵³ CHBRP used data from the DHCS to adjust enrollment in Medi-Cal Managed Care, and to adjust premiums to account for the change in acuity in the underlying populations.⁵⁴

Bill Analysis-Specific Caveats and Assumptions

Baseline utilization assumptions

The most recent data on baseline utilization of acupuncture among Californians was collected in 2002. This showed that approximately 2.4% of Californians used acupuncture treatments in 2002, according to the 2003 California Health Interview Survey Complementary and Alternative Medicine Supplement (CHIS-CAM). This utilization is higher than the 2002 national average (1.1%) according to the 2002 National Health Interview Survey (NHIS) data. The CHIS-CAM has not been repeated since 2002 so more recent data on California-specific utilization is not available. However, the 2007 NHIS data shows that the use of acupuncture in the prior 12 months among those aged 18 and over has increased by 27% to 1.4%. According to the 2002 NHIS and 2007 NHIS, during the time from 2002 to 2007 the ratio of alternative medical systems, which includes acupuncture, used in the last 12 months across the nation, compared to alternative medical systems used in the last 12 months across the Western region (composed of Washington, Oregon, California, Nevada, New Mexico, Arizona, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii) has remained relatively consistent (1.70 and 1.65, respectively). CHBRP estimates that the utilization in California will rise at a rate consistent with

⁵² Taylor, M. Legislative Analyst, *The Budget Package 2010-11 California Spending Plan*. LAO: November 2010. Available at:

http://www.lao.ca.gov/reports/2010/bud/spend_plan/spend_plan_110510.pdf

⁵³ Data from the Department of Health Care Services, Medi-Cal Managed Care Division. Received January 14, 2011.

⁵⁴ See the study conducted for DHCS by Mercer on this topic: Mercer, *Medi-Cal Acuity Study: Seniors and Persons with Disabilities*. September 28, 2010. Available at

http://www.dhcs.ca.gov/provgovpart/Documents/Waiver%20Renewal/SPD_Study_092810.pdf.

the Western region, resulting in an estimated increased baseline utilization of acupuncture in adults in California to 3.1% in 2007. This assumes that utilization in all Western region states rises uniformly. In the absence of post-2007 data on national or state-level complementary or alternative medicine (CAM) use, the California utilization of acupuncture is assumed to be constant between 2007 and 2010, making the estimated 2010 acupuncture utilization in those aged 18 years and older 3.1%. This also assumes that all alternative medical systems, (acupuncture, ayurveda, homeopathic treatment, naturopathy, and traditional healers) have increased uniformly between 2002 and 2007.

Impact of the bill on utilization assumptions

It is assumed that utilization of acupuncture will not change as a result of this bill. This assumption is based on the NHIS data in 2002 and 2007 (NHIS, 2002 and NHIS, 2007), which found that privately insured individuals utilized acupuncture services at least once the last 12 months at a similar rate to individuals with no health insurance (private or publicly funded). In addition, this was the assumption made in the 2007 analysis of an identical bill (AB 54). Lastly, the time horizon of the analysis presented in this report is only one year and with the broader uncertainties of the impact of the ACA across all services, it is difficult to make a sound estimate of changes in utilization of acupuncture as a result of AB72.

Appendix E: Information Submitted by Outside Parties

In accordance with CHBRP policy to analyze information submitted by outside parties during the first two weeks of the CHBRP review, the following parties chose to submit information.

The American Academy of Acupuncture and Oriental Medicine (AAAOM) submitted information on January 26, 2011. The submitted information included a PowerPoint presentation made by one of the co-authors of *Economic Evaluation in Acupuncture: Past and Future* in *The American Acupuncturist*, Fall 2009, Volume 49 by Michael Jabbour, LAc, MS, Michael T. Sapko, MD, PhD, David W. Miller, MD, LAc, et al. Additionally, the AAAOM submitted a Fact sheet on acupuncture's cost effectiveness. Finally, the AAAOM submitted an Excel spreadsheet of studies on effectiveness of various alternative medicine therapies, most of which include acupuncture, but most were not just limited to acupuncture.

Submitted information is available upon request.

For information on the processes for submitting information to CHBRP for review and consideration please visit: http://www.chbrp.org/recent_requests/index.php.

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A group of faculty and staff undertakes most of the analysis that informs reports by the California Health Benefits Review Program (CHBRP). The CHBRP **Faculty Task Force** comprises rotating representatives from six University of California (UC) campuses and three private universities in California. In addition to these representatives, there are other ongoing contributors to CHBRP from UC. This larger group provides advice to the CHBRP staff on the overall administration of the program and conducts much of the analysis. The **CHBRP staff** coordinates the efforts of the Faculty Task Force, works with Task Force members in preparing parts of the analysis, and coordinates all external communications, including those with the California Legislature. The level of involvement of members of the CHBRP Faculty Task Force and staff varies on each report, with individual participants more closely involved in the preparation of some reports and less involved in others. As required by CHBRP's authorizing legislation, UC contracts with a certified actuary, Milliman Inc., to assist in assessing the financial impact of each legislative proposal mandating or repealing a health insurance benefit. Milliman also helped with the initial development of CHBRP methods for assessing that impact. The **National Advisory Council** provides expert reviews of draft analyses and offers general guidance on the program to CHBRP staff and the Faculty Task Force. CHBRP is grateful for the valuable assistance and thoughtful critiques provided by the members of the National Advisory Council. However, the Council does not necessarily approve or disapprove of or endorse this report. CHBRP assumes full responsibility for the report and the accuracy of its contents.

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