

California Health Benefits Review Program

Analysis of Assembly Bill 1771: Telephonic and Electronic Patient Management

A Report to the 2013-2014 California Legislature

April 25, 2014



KEY FINDINGS

Analysis of California Assembly Bill (AB) 1771: Telephonic and Electronic Patient Management

SUMMARY TO THE 2013-14 CALIFORNIA LEGISLATURE • APRIL 25, 2014



AT A GLANCE

AB 1771 (Perez, M. — amended March 11, 2014) would make California the first state in the country to require health insurance carriers to cover and reimburse physicians for patient-initiated evaluation and management (E/M) via telephone and e-mail. The bill would also mandate coverage for other forms of telehealth.

- **The state of “Telehealth” in California?** California law currently recognizes two forms of telehealth — live videoconference and “store-and-forward,” that capture medical information (e.g. photo, recording) and transmission of that information to physicians for review later. Current law does not require coverage or specify a level of reimbursement for live videoconference or store-and-forward. AB 1771 would require coverage and reimbursement for those two recognized telehealth modalities, as well as require reimbursement of telephone and e-mail, which must be equivalent to in-person E/M visits of similar time and complexity.
- **Medical effectiveness.** Advances in technology have been outpacing the publication of studies on these technologies, limiting the research literature on telephone, e-mail, live videoconference, and store-and-forward.
 - **Telephone and e-mail.** There is insufficient evidence to determine whether E/M services provided via telephone or e-mail are as effective as medical care provided in-person.
 - **Live videoconference and store-and-forward.** For the diseases and conditions studied, the evidence suggests that medical care provided by live videoconferencing and store-and-forward is at least as effective as medical care provided in person.
- **Benefit coverage.** 49% of California’s 23.4 million enrollees with state-regulated health insurance currently have some form of benefit coverage for telephone and e-mail patient management; 79% of enrollees currently have some form of benefit coverage for live videoconference and store-and-forward technology.
- **Capacity and access.** CHBRP estimates that AB 1771 would result in an overall increase of between 2.3% and 9.9% *physician* encounters, which includes both in-person, and telephonic or electronic visits.
- **Utilization –Telephonic and electronic visits.** CHBRP estimates that between 6.2% and 25.1% of all E/M visits would occur using telephone, e-mail, live videoconference, or store-and-forward.
- **Impact on expenditures.** CHBRP estimates AB 1771 would increase overall health expenditures — premiums and out-of-pocket expenses — by between \$55.3 million and \$240.7 million.
 - **Premium per member per month impact.** CHBRP estimates premium increases to range from \$0.19 PMPM to \$0.81 PMPM for DMHC-regulated plans in the large-group market, depending on the rate of adoption. Or, from \$0.49 PMPM to \$2.13 PMPM for CDI-regulated policies in the small-group and individual markets, depending on the rate of adoption.
 - **Financial burden of copayments for telephonic and electronic visits for enrollees.** CHBRP assumes a \$20 copayment for telephone, e-mail, live videoconference, or store-and-forward visits, thereby increasing enrollees’ overall out-of-pocket expenses by between \$9.4 million and \$41.3 million collectively for additional visits.
- **Patient experience.** If enacted, CHBRP predicts that patient experience would improve as physicians increase e-mail and telephone responses to patient inquiries, increased convenience, and reduce or eliminate travel times to in-person visits.
- **Long-term impacts.** Technology will continue to drive changes in telehealth. Electronic health records, online patient portals, and increased use of smart phones, will increase demand for these types of services.

BILL SUMMARY

AB 1771 would require state-regulated health insurance, after January 1, 2015, to cover and reimburse physicians for telephonic and electronic E/M services for established patients. If passed, AB 1771 would require

carriers to pay for those services provided via telephone and e-mail, as well as live videoconference and “store-and-forward,” a method by which patients capture medical information and transmit that information to physicians to evaluate at a later time.

AB 1771 also refers to the American Medical Association’s (AMA) Current Procedural Terminology (CPT) for guidelines on physician services for E/M. The CPT codes specify that telephone and e-mail reimbursements apply only to patient-initiated interactions. Therefore, CHBRP limits analysis of services delivered via telephone and e-mail where an established patient first contacted the physician.

Finally, AB 1771 specifies that reimbursements must be “at the same level and amount” as in-person visits of “similar complexity and time expenditure.” CHBRP uses the AMA’s description of the amount of time an encounter should require and the complexity of a patient’s illness.

CONTEXT FOR BILL CONSIDERATION

Technology. Nearly 92% of Californians report having a cell phone and 58% have a smart phone (up from 39% from 2011), according to the Public Policy Institute of California in 2014. Additionally, previous surveys of adults with online access indicate that over 80% of California adults use the internet to address their health.

Telehealth. California law currently includes two methods of electronic communication in its definition of “telehealth,” live videoconference and store-and-forward. Although current law recognizes these two modalities as “telehealth,” it does not require or set standards for reimbursement. AB 1771 would require reimbursement for these modalities, and would also require coverage and reimbursement for telephone and e-mail (Table 1 in next column).

Therefore, CHBRP analyzed the impact of AB 1771 for four modalities: telephone, e-mail, live videoconference, and store-and-forward.

CHBRP KEY FINDINGS: INCREMENTAL IMPACT OF AB 1771

Medical Effectiveness

Advances in technology have been outpacing the publication of studies on telephone, e-mail, live videoconference, and store-and-forward. New, more sophisticated technologies often emerge before studies can be published.

Telephone and e-mail. There is insufficient evidence to determine whether E/M services provided via telephone or e-mail are as effective as medical care provided in-person. Further, it is unknown whether diagnoses made using these technologies are as accurate as diagnoses made during in-person visits. There are studies that showed telephone encounters did not reduce hospital or emergency department visits. CHBRP notes that the absence of evidence does not mean there is no effect; it means the effect is unknown. Research did show that multifaceted web portals that connected patients to their provider, and helped them manage and track their health, resulted in reduced in-person visits, and a higher

likelihood that patients would receive recommended screenings.

Live videoconference and “store-and-forward.” It is unclear whether these two technologies reduce hospitalizations, emergency department visits, or office visits for specialty care. For the diseases and conditions studied, the evidence suggests that medical care provided by live videoconferencing and store-and-forward is at least as effective as medical care provided in person for general health and mental health. Live videoconference may be more accurate than telephone and store-and-forward. Meanwhile, store-and-forward could potentially reduce wait times for specialty outpatient care.

Table 1. Evolution of California’s Telehealth Policy

	Live Videoconferencing	Asynchronous Store-and-Forward	Telephone /E-mail
SB 1665 (1996)	Included in telehealth definition, but does not require coverage	Not explicitly included in telehealth definition	Excluded from definition of telehealth
AB 415 (2011)	Included in telehealth definition, but does not require coverage	Included in telehealth definition, but does not require coverage	Not explicitly included in or excluded from definition of telehealth
AB 1771 proposed (2014)	Requires coverage/payment	Requires coverage/payment	Requires coverage/payment

Source: California Health Benefits Review Program, 2014.

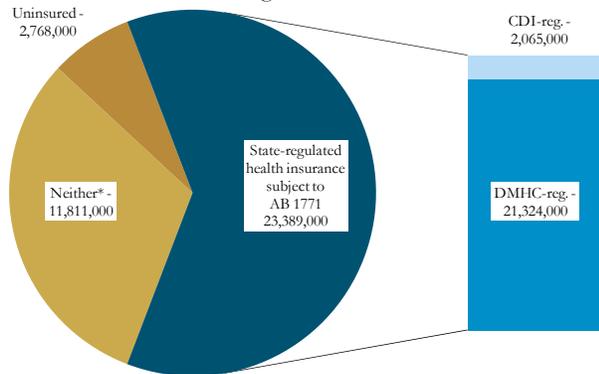
Benefit Coverage, Utilization and Cost

AB 1771 affects the health coverage of 23.4 million enrollees with state-regulated health insurance (Figure 1).

Benefit coverage: Currently, 49% of enrollees have benefit coverage for telephone and e-mail, whereas 79% have benefit coverage for live videoconference and store-and-forward. Postmandate, 100% of enrollees with state-regulated health insurance would have benefit coverage for all four telehealth modalities.

Kaiser Permanente: CHBRP relied on data from Kaiser Permanente Northern California to estimate changes in the number of E/M visits between physicians and patients. Kaiser’s experience is the only well-documented examination of the utilization of telephone and e-mail visits between physicians and patients, pre- and post-implementation of a strategy that included telephone, secure e-mail, and live videoconference visits (2008).

Figure 1. Interaction of AB 1771 With California’s Health Insurance Coverage



Source: California Health Benefit Review Program, 2014.

Notes: *Neither = Federally regulated health insurance, such as Medicare, veterans, or self-insured plans.

Data limitations: Although Kaiser’s rate of telephone and e-mail use serves as a good benchmark, it may underestimate the impact of AB 1771 on the adoption of all four modalities statewide.

- Kaiser does not impose cost sharing for its e-mail or telephone use. CHBRP assumes cost sharing, equivalent to an in-person visit, would occur, which could either dampen enrollees’ use of any of the four telehealth modalities, or prompt physicians to encourage enrollees to interact via a telehealth modality. Therefore, Kaiser’s rate of telephone and e-mail use may not generalize to noncapitated providers.
- Kaiser is a closed and integrated health system, equivalent to a staff-model HMO, where physicians are paid the same salary whether they are providing services in person or via e-mail, telephone, or live videoconference. Such a system may realize savings efficiencies from the use of telephone and e-mail, whereas the impact of AB 1771 on noncapitated (fee-for-service) health insurance may be more limited because the networks of providers may or may not be well-integrated enough to realize savings.

Utilization and cost estimates: CHBRP modeled four scenarios to provide policymakers with a range of estimates of the potential impact of AB 1771 on both utilization and cost. Two scenarios presented in Figure 2 represent low- and high-end estimates, based on how quickly physicians adopt to include telephone, e-mail, live videoconference, and store-and-forward into their workflow and practice. The scenarios assume \$20 cost sharing for telephonic and electronic visits, equivalent to an in-person visit. (Scenarios showing incremental impact of AB 1771 with no cost sharing are presented in Appendix D). CHBRP estimates utilization increase for both capitated and noncapitated health insurance. CHBRP recognizes that capitation rates for specific physician groups might not increase immediately to reflect any anticipated increase in the total cost to provide physician services. However, to the extent CHBRP assumed an increase in the utilization of the four modalities of telehealth services, and, in particular, supplemental telehealth services, the 2015 cost and

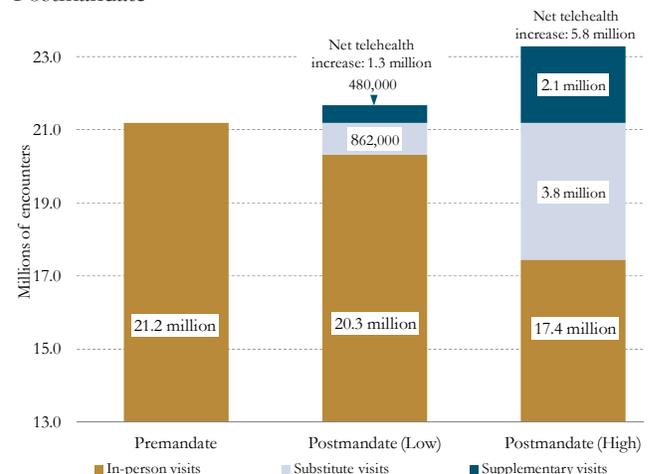
premium estimates in this report assume the impact is reflected completely in all physician capitation rates for commercial HMOs.

Utilization impact: An assumption driving the push for telehealth is that it would increase access by improving efficiencies, and increase capacity to accommodate enrollees newly covered by the Affordable Care Act and rural populations. CHBRP estimates that AB 1771 would result in an overall increase of between 2.3% to 9.9% physician encounters, which includes both in-person, and telephonic or electronic visits. The increase of capacity is constrained by AB 1771’s language, which requires coverage only for those E/M encounters performed by a physician.

CHBRP estimates that between 6.2% to 25.1% of all E/M visits would occur using telephone, e-mail, live videoconference, or store-and-forward.

- **“Substitute” vs. “Supplemental” visits.** Of the visits that would occur telephonically or electronically, CHBRP assumes 60% would be “substitute” visits – replacing existing in-person visits; and 40% would be visits that are “supplemental,” or in other words, “visits” that were previously unreimbursed because physicians could not bill for them, new time slots made because of the increased efficiency of telephonic or electronic visits over in-person visits, or an extension of a physicians’ work hours.

Figure 2. Change in Number and Type of Visit, Pre- and Postmandate



Source: California Health Benefits Review Program, 2014.

* Numbers may not sum due to rounding.

Notes: Low-end estimate assumes 25% of potential telehealth visits are billed; high-end assumes 100% of potential telehealth visits are billed. All visits are charged a \$20 copayment.

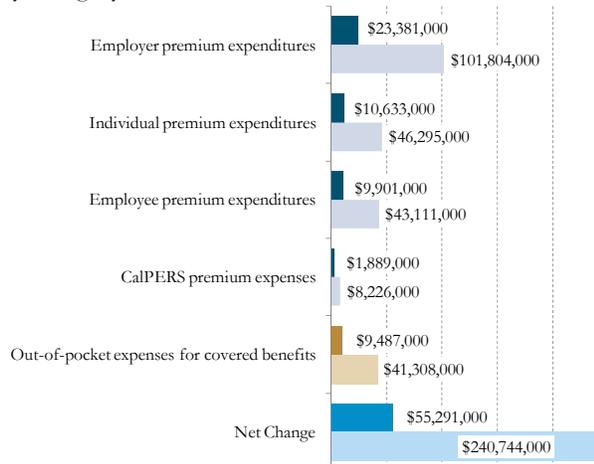
Cost impacts: CHBRP estimates total premiums and out-of-pocket expenditures will increase postmandate.

- On the low end, CHBRP estimates premium increases to range from \$0.19 PMPM for DMHC-regulated plans in the large-group market to \$0.49 PMPM for CDI-regulated policies in the small-group and individual markets.

- On the high end, CHBRP estimates premium increases to range from \$0.81 PMPM for DMHC-regulated plans in the large-group market to \$2.13 PMPM for CDI-regulated policies in the small group and individual markets.

Impact on total expenditures: CHBRP finds that AB 1771 would increase total health expenditures by 0.0431% to 0.1875% overall, due to more visits being delivered. Employers and enrollees would pay higher premiums, and enrollees would pay higher out-of-pocket costs (Fig 3).

Figure 3. Change in Total and Aggregate Expenditures by Category Postmandate, AB 1771



Source: California Health Benefits Review Program, 2014.

Notes: For each category of expenditures, darker bars on top represent low-end estimates. Lighter bars on the bottom represent high-end estimates. Low-end estimate assume 25% of potential telehealth visits are billed; high-end assumes 100% of potential telehealth visits are billed. All visits are charged a \$20 copayment.

Public Health

Health Outcomes: CHBRP estimates that use of all four modes of telehealth will increase in the first year postmandate, however CHBRP is unable to quantify the effect of AB 1771.

- **Telephone and e-mail:** The public health impact is unknown because CHBRP found insufficient evidence of the effectiveness of telephone and e-mail to produce equivalent or better morbidity or mortality outcomes than in-person visits. Note that the absence of evidence is not “evidence of no effect.” It is possible that an impact – positive or negative – could result, but current evidence is insufficient to inform an estimate.
- **Live videoconference and store-and-forward:** Evidence suggests that mortality and morbidity outcomes for live videoconferencing and store-and-forward are equivalent to in-person care; CHBRP estimates an increase of 268,000-1.2 million visits. Therefore, CHBRP estimates that positive health outcomes could occur for some newly covered enrollees; however, the public health impact is unquantifiable due to the unknown health outcomes of additional encounters for patients with a wide array of conditions.

Patient experience: CHBRP anticipates that increasing use of telehealth technologies will improve enrollees’ overall experience because:

- They would have more methods by which to communicate with their physicians;
- Distance and time travelling to and from in-person visits would be reduced along with related costs. As a result, some enrollees may have better health outcomes because the removed travel barrier eliminated otherwise delayed or avoided in-person visits;
- Time off work would also be reduced, leading to higher overall productivity.

Financial burden: CHBRP estimates that AB 1771 would result in an overall increase in enrollees’ net financial burden of between \$9.5 million and \$41.3 million, because enrollees would now be subject to copayments on telephone, e-mail, live videoconference, and store-and-forward visits (equivalent of the copayment for in-person visits.) The financial burden results from visits that (1) were previously occurring but not reimbursable, or (2) constitute visits that would not have occurred without AB 1771, due to distance, inconvenience, or time.

Potential harms: Weak literature cited potential concerns around fragmented care, misdiagnosis, or lack of adherence to security protocols, among other issues. That said, CHBRP found insufficient evidence to determine whether services provided telephonically or electronically would harm patients.

Gender and racial disparities: Although there appear to be some disparities in interest and use of e-mail by sociodemographic characteristics, CHBRP is unable to estimate the impact of AB 1771 on health disparities due to lack of evidence.

Long-Term Impacts

Technology will continue to drive changes in telehealth. Electronic health records, online patient portals, and increased use of smart phones and tablets will increase demand in these types of services from consumers. Based on the Kaiser experience, CHBRP estimates telehealth services, generally and regardless of modality, to increase by 31.2% annually. Health insurance carriers in California have already begun to partner with online-only networks to provide specialty care, or one-time live videoconference encounters. Providing telehealth options — regardless of the specific modality — could potentially be used as a tool to expand networks and provide opportunities for health plans and providers to meet a diverse set of needs for more population groups.

CHBRP is unable to estimate the long term impact of AB 1771 on overall health outcomes and disparities due to the breadth of conditions telehealth affects and the unknown impact of future technology development. To the extent that advances in telehealth technology improve access and provider capacity, CHBRP projects some improvements in patient E/M, especially for enrollees with transportation barriers or chronic conditions.

A Report to the 2013–2014 California State Legislature

**Analysis of Assembly Bill 1771
Telehealth**

April 25, 2014

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The California Health Benefits Review Program (CHBRP) was established in 2002 to provide the California Legislature independent analysis of the medical, financial, and public health impacts of proposed health insurance benefit mandates and repeals per its authorizing statute.¹ 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; (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; and/or (4) specify terms (limits, timeframes, copayments, deductibles, coinsurance, etc.) for any of the other categories.

An 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 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. 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, provides balanced representation among groups with an interest in health insurance benefit mandates or repeals, to review draft analyses to ensure their quality before they are submitted 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 an annual assessment on health plans and insurers in California. All CHBRP reports and information about current requests from the California Legislature are available on the CHBRP website, www.chbrp.org.

¹ Available at: www.chbrp.org/documents/authorizing_statute.pdf.

PREFACE

This report provides an analysis of the medical, financial, and public health impacts of Assembly Bill 1771. In response to a request from the California Assembly Committee on Health on February 25, 2014, the California Health Benefits Review Program (CHBRP) undertook this analysis pursuant to the program's authorizing statute, which established CHBRP to provide independent and impartial analysis of proposed health insurance benefit mandates and repeals.

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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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All CHBRP bill analyses and other publications and resources are available on the CHBRP website, www.chbrp.org.

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TABLE OF CONTENTS

KEY FINDINGS.....	i
LIST OF TABLES AND FIGURES.....	5
EXECUTIVE SUMMARY	7
INTRODUCTION	25
Developing Estimates for 2015 and the Effects of the Affordable Care Act.....	25
Bill-Specific Analysis of AB 1771	26
Interaction With the Affordable Care Act	33
BACKGROUND ON TELEHEALTH.....	35
Frequency of Telehealth in California	36
Disparities in Use of Telehealth.....	38
Overview of Current Procedural Terminology and the Healthcare Common Procedure Coding System Pertinent to AB 1771	40
MEDICAL EFFECTIVENESS	42
Research Approach and Methods	42
Methodological Considerations	43
Outcomes Assessed.....	45
Findings.....	47
Summary of Findings.....	62
BENEFIT COVERAGE, UTILIZATION, AND COST IMPACTS.....	66
Premandate (Baseline) Benefit Coverage, Utilization, and Cost.....	70
Postmandate Impacts of AB 1771.....	73
PUBLIC HEALTH IMPACTS.....	83
Estimated Public Health Outcomes	83
Estimated Impact on Financial Burden.....	87
Potential Harms From Use of Telehealth Services.....	87
Impact on Gender and Racial Disparities	88
LONG-TERM IMPACT OF THE MANDATE.....	90
Long-Term Utilization and Cost Impacts	90
Public Health Impacts.....	91
REFERENCES	94

LIST OF TABLES AND FIGURES

Table 1. Medical Effectiveness Findings for Telephone and E-mail.....	13
Table 2. Medical Effectiveness Findings for Live Videoconferencing and Store-and-Forward ..	14
Table 3. Four Scenarios Describing Potential Incremental Impact of AB 1771	17
Table 4a. AB 1771 Impacts on Benefit Coverage, Utilization, and Cost, 2015	21
Table 4b. AB 1771 Impacts on Benefit Coverage, Utilization, and Cost, 2015 (High)	23
Table 5. Evolution of California’s Telehealth Policy for Specific Modalities.....	29
Table 6. List of Sample Telephone and E-mail Scenarios and Projected Reimbursement Outcomes Associated With AB 1771 for Established Patients Pre- and Postmandate.....	37
Table 7. List of Sample Live Videoconference and Store-and-Forward Scenarios and Projected Reimbursement Outcomes Associated With AB 1771 for Established Patients Pre- and Postmandate	38
Table 8. Comparison of Health Indices Between California’s Urban and Rural Residents, 2011.....	39
Table 9. Four Scenarios Describing the Potential Incremental Impact of AB 1771	68
Table 10. Premandate Utilization and Per-Unit Cost of Telehealth Services	72
Table 11. Net New Encounters by All Four Telehealth Modalities Postmandate	75
Table 12. Premandate (Baseline) Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2015.....	80
Table 13a. Postmandate AB 1771 Impacts on Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2015 (Low).....	81
Table 13b. Postmandate AB 1771 Impacts on Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2015 (High).....	82
Table 14. AB 1771: Summary of Marginal Impacts on High- and Low-End Estimates of Substitution and Supplemental Visits	84
Figure 1. Medical Effectiveness Findings for Telephone and E-mail	12
Figure 2. Medical Effectiveness Findings for Live Videoconferencing and Store-and-Forward ..	14
Figure 3. Medical Effectiveness Findings for Telephone and E-mail	48

Figure 4. Medical Effectiveness Findings for Live Videoconferencing and Store-and-Forward.54
Figure 5. Change in Patient Utilization Once Telehealth Modalities Are Reimbursed.....75
Figure 6. Change in Number and Type of Visit, Pre- and Postmandate.....77

EXECUTIVE SUMMARY

California Health Benefits Review Program Analysis of Assembly Bill 1771

The California Assembly Committee on Health requested on February 25, 2014, 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) 1771, which would require state-regulated health insurance to cover telephonic and electronic patient management services beginning in January 2015. In response to this request, CHBRP undertook this analysis pursuant to the provisions of the program's authorizing statute,² which allows for the review of benefit mandates affecting health insurance regulated by the state.

State benefit mandates apply to a subset of health insurance plans and policies in California, those regulated by one of California's two health insurance regulators:³ the California Department of Managed Health Care (DMHC)⁴ and the California Department of Insurance (CDI).⁵ In 2015, CHBRP estimates that approximately 23.4 million Californians (61.6% of all Californians) will have health insurance that may be subject to any state health benefit mandate law.⁶ Of the rest of the state's population, a portion will be uninsured (and therefore will have no health insurance subject to any benefit mandate), and another portion will have health insurance subject to other state laws or only to federal laws.

AB 1771 would affect the health insurance of approximately 23.4 million enrollees (61.6% of all Californians).

Bill Language, Analysis, and Analytic Approach

AB 1771 requires that after January 1, 2015, DMHC-regulated plans and CDI-regulated policies should "cover physician telephonic and electronic patient management services." Those services would have to be "reimburse(d)...at the same level and amount as face-to-face patient encounters with similar complexity and time expenditure."

Non-face-to-face coverage

If enacted, AB 1771 would require state-regulated plans and policies to reimburse physicians for *non-face-to-face* services — principally telephone and e-mail. Additionally, because the bill language specifies that state-regulated plans and policies must "cover...electronic patient management services" and defines that term to include "electronic communication tools...to

² Available at: www.chbrp.org/docs/authorizing_statute.pdf.

³ California has a bifurcated system of regulation for health insurance. The Department of Managed Health Care (DMHC) 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, which offer benefit coverage to their enrollees through health insurance policies.

⁴ DMHC was established in 2000 to enforce the Knox-Keene Health Care Service Plan of 1975; see Health and Safety Code (H&SC) Section 1340.

⁵ 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 (IC) Section 106(b) or subdivision (a) of Section 10198.6.

⁶ CHBRP's estimates are available at: www.chbrp.org/other_publications/index.php.

enable treating physicians to evaluate and manage existing patients,” AB 1771 could potentially have the effect of requiring coverage — and reimbursement — for any communication technologies used to assist physicians only in evaluating and managing *existing* patients electronically.

Based on this language, CHBRP assumes that coverage and reimbursement would apply to four “electronic communication” modalities:

- *Telephone* and *e-mail*, because they have been specifically identified within the bill, or by the bill author;
- *Live videoconferencing*, which is explicitly included in California’s definition of “telehealth,”⁷ and means the real-time (synchronous) video interaction between patient and physician when they are in different places; and
- *Store-and-forward* (asynchronous) technology, which is also explicitly defined in California’s telehealth law and involves the capture and storage of medical information (such as an x-ray, photograph, sound recording) that is then forwarded to a physician for evaluation.

Throughout this report, CHBRP will refer specifically to each modality when discussing the efficacy or impact of that specific modality. CHBRP will refer to the four modalities collectively as “telehealth,” unless otherwise stated.

Guidelines for non–face-to-face services

AB 1771 specifies that the use of “telephonic and electronic management services” should “enable treating physicians to evaluate and manage existing patients in a manner recognized by the American Medical Association (AMA), Current Procedural Terminology (CPT) codes.”

Because the AMA’s CPT codes specify that *telephone* and *e-mail* reimbursement apply only to *patient-initiated*⁸ interactions, AB 1771 limits coverage of services delivered via telephone and e-mail to cases where an *established* patient first contacted the physician. Other evaluation and management CPT codes do not specify that interactions be patient-initiated, thereby not limiting coverage or reimbursement for live videoconferencing or store-and-forward modalities.

Based on language in AB 1771, CHBRP limits this analysis to only evaluation and management (E/M) services provided and billed by a physician for established patients. CHBRP includes CPT codes, which do not require a physical exam, for evaluation and management services performed at hospitals, nursing facilities, custodial care facilities, assisted living facilities, or at home, and specifically excluded CPT codes that required a physical exam.⁹ (Please see Table D-2 in [Appendix D](#) for the full list of CPT codes used.)

⁷ California Business and Professions Code 2290.5.

⁸ AMA’s billing codes specify that reimbursement for telephone and e-mail transactions must be patient initiated.

⁹ To simplify the analysis, CHBRP did not include any electronic encounters for emergency department E/M of enrollees with state-regulated health insurance because the codes require a physical exam.

Access

One of the central hypotheses about telehealth is that it will increase access to physicians because of increased efficiencies, thereby increasing access: (1) for patients in rural areas; (2) for in-demand specialists; and (3) to meet demand for enrollees newly covered by the Affordable Care Act (ACA).

CHBRP finds limited evidence that AB 1771 would increase the *capacity* of physicians to see additional patients because the bill:

- (1) Limits coverage and reimbursement to encounters with “similar complexity and time expenditure.” Based on this language, CHBRP assumes that most visits that occur via telephone, e-mail, live videoconference, or store-and-forward would be displacing (supplanting) a similarly timed in-person visit, thereby having a limited impact on capacity, and therefore access; and
- (2) Limits coverage and reimbursement to *physicians*, and not nonphysicians who are part of a practice. CHBRP assumes that physicians’ personal bandwidth to respond using any of the telehealth modalities is also limited.

Specifically, CHBRP assumes the AB 1771–related telehealth visits would fall into two categories:

- Substitute (or replace) current in-person visits with e-mail, telephone, live videoconference, or store-and-forward for patient-initiated evaluation and management encounters; and
- Supplement current in-person visits with added services via telehealth, and include both services that (1) would previously not have been delivered in person due to distance, inconvenience, and time, and (2) services that physicians have already been providing via telephone and e-mail, but were previously not billed or reimbursed because they were not covered. Because AB 1771 constrains the covered evaluation and management services to those that are physician-provided only, CHBRP assumes that the capacity to add supplemental services is limited based on each physician’s capacity.¹⁰

The full text of AB 1771 can be found in [Appendix A](#).

Background on Telehealth

Use of the four telehealth modalities for evaluation and management, relevant to AB 1771, would be accelerated in part by: increased penetration of electronic health records (EHR), associated patient portals and office management systems; increased use of mobile communication devices (such as cellular telephones and tablets); increased broadband coverage, which allows, not only better internet coverage, but also easier and more rapid transfer of large

¹⁰ Some telephone and e-mail services will still not be reimbursed due to CPT coding standards related to follow-up visits within 7 days for the same issue, regardless of setting. However, the supplementary services are assumed to occur within coding rules and be billable.

data files; and increased demand for these types of services from consumers, providers, and insurers.

Provider and patient use of technologies

Provider and patient use of e-mail, telephone, and other technologies covered by AB 1771 to communicate about health care is understudied due, in part, to the lack of physician billing data. Interest in (or demand for) these communication tools has been measured through surveys. Patients appear to be interested in e-mail communications with providers, but study conclusions about provider interest, taken as a whole, are ambiguous. For example, one survey found that 20.4% of physicians used e-mail to communicate with their patients, but only 2.9% e-mailed frequently. Of those who did not use e-mail, 58.4% were not interested in future e-mail use with patients (the survey did not identify the reasons for lack of interest.) However, another survey of physicians found that 66% would adopt electronic communication with patients if they were reimbursed.

Rural health disparities in California

California rural communities exhibit disparities in health status and health care access and are a key population for some telehealth services. Travel barriers and inadequate provider–patient ratios are telehealth-relevant factors that contribute to rural health disparities. About 14% (5.2 million) of California’s 37.7 million residents live in rural areas, and in about two-thirds of counties, the number of physicians per capita is less than what is considered adequate to meet demand.

Telehealth may help overcome some of the disparities in health care by redistributing knowledge and expertise when and where it is needed, including rural areas of California. However, telehealth has yet to meet rural demand according to one study. Of 60 California rural health clinics surveyed in 2012, 53% used no telehealth services in 2012, and 47% used videoconferencing; only 5% used store-and-forward and 3% home monitoring. Cost of equipment and lack of arrangements with specialists were the primary obstacles to clinic participation (52% and 48%, respectively). About half of the clinics used the Internet to contact other providers, but just 12% did so to contact patients. These clinics represented 22% of the 271 clinics that provide 44% of primary care in rural California. Physicians provided 56% of care, most of which was primary care (95%), whereas other services were lacking.

CPT codes for reimbursement of telehealth

AB 1771 requires coverage of telephonic and electronic services used to evaluate and manage existing patients (which includes e-mail, store-and-forward, and live videoconferencing). Physicians are reimbursed for their professional services through the use of standardized billing codes, entitled Current Procedural Terminology (CPT[®]). AB 1771 targets CPT codes 99441–99443 for telephone services, 99444 for electronic mail, and a number of in-person E/M codes that can be further defined by modifier codes GT (for interactive audio and video telecommunications systems [live videoconferencing]) and GQ (for asynchronous telecommunications system such as store-and-forward technology). With a few exceptions, the Centers for Medicare & Medicaid (CMS) do not reimburse for telephone and e-mail communications; most commercial insurance carriers follow CMS reimbursement decisions.

Therefore, most physicians are not reimbursed for services they provide by e-mail and telephone, and to a lesser extent for other electronic services. The utilization of telehealth, specifically e-mail and telephone, is difficult to ascertain, in part because of the lack of reimbursement that would document the frequency of services.

Medical Effectiveness

- Studies of the medical effectiveness of telephone, e-mail, live videoconferencing, and store-and-forward encompass patients with a wide range of diseases and conditions.
- Most studies pertinent to AB 1771 examine the use of telephone, e-mail, live videoconferencing, and store-and-forward as substitutes for in-person care. Some studies, especially studies of e-mail, assess the use of these technologies to supplement in-person care.
- A major limitation of the literature on telephone, e-mail, live videoconferencing, and store-and-forward is that advances in technology are outpacing the publication of studies of these technologies. There is often a long delay between the time a study is begun and the time it is published. By the time a study is published, more sophisticated technology may be available at a lower cost.
- There are fewer studies of the medical effectiveness of telephone calls and e-mail than there are of live videoconferences, and store-and-forward. The studies of telephone calls and e-mails also have weaker research designs on average.

Summary of findings

Telephone and e-mail. Taken collectively, the findings from studies of telephone and e-mail interventions similar to those for which AB 1771 would require coverage suggest that there is insufficient evidence to determine whether medical care provided via telephone or e-mail is as effective as medical care provided in-person. (See Figure 1.) Although there is some evidence that e-mail can reduce outpatient visits and improve health status and processes of care, all of the studies were conducted in Kaiser Permanente and other large integrated delivery systems that implemented e-mail as part of web portals with multiple functions. It cannot be determined whether findings from these studies would be replicated if patients were provided access to e-mail outside of a multifaceted web portal and outside an integrated delivery system.

Figure 1. Medical Effectiveness Findings for Telephone and E-mail

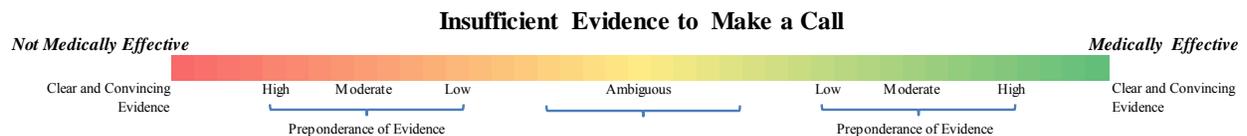


Table 1 below presents findings for the effects of telephone and e-mail on the major types of outcomes assessed by the medical effectiveness team. In all cases, findings are for diseases and conditions that have been studied. These findings may not generalize to other diseases or conditions.

Table 1. Medical Effectiveness Findings for Telephone and E-mail

	Telephone	E-mail
Access to care	Insufficient evidence ¹¹	Insufficient evidence
Utilization	Insufficient evidence	Reduces utilization of office visits if used as part of a multifaceted web portal
Processes of care	Insufficient evidence	Patients more likely to receive recommended screening exams if used as part of a multifaceted web portal in conjunction with in-person care
Accuracy of diagnosis & management	Insufficient evidence	Insufficient evidence
Health status	Ambiguous evidence	Better than in-person care if used as part of a multifaceted web portal

Source: California Health Benefits Review Program, 2014

Telephone

For the diseases and conditions that have been studied:

- There is insufficient evidence to determine whether telephone calls improve access to specialty outpatient care or acute care.
- The preponderance of evidence from studies with strong research designs suggests that supplementing usual care with telephone calls does not affect use of other health care services.
- There is insufficient evidence to determine whether receipt of recommended care is similar for patients treated by telephone and patients treated in-person.
- There is insufficient evidence to determine whether diagnoses and treatment plans based on telephone calls are as accurate as diagnoses and treatment plans based on in-person care.¹²
- Evidence regarding the impact of telephone visits on health outcomes is ambiguous.

E-mail

For the diseases and conditions that have been studied:

¹¹ The absence of evidence is not evidence of no effect. It is an indication that the impact of the intervention on the outcome in question is unknown.

¹² The absence of evidence is not evidence of no effect. It is an indication that the impact of telephone calls on accuracy of diagnoses and treatment plans is unknown.

- There is insufficient evidence to determine whether e-mail improves access to specialty outpatient care or acute care.
- The preponderance of evidence from studies with moderate to weak research designs that examined general populations of patients suggests that use of e-mail as part of a multifaceted web portal reduces utilization of office visits for primary care and specialty care.
- There is a preponderance of evidence from studies with moderate research designs that persons who use secure e-mail within a multifaceted web portal are more likely to receive recommended screening exams.
- There is insufficient evidence to determine whether diagnoses and treatment plans based on e-mails are at least as accurate as diagnoses and treatment plans based on in-person care.
- There is a preponderance of evidence from studies with strong to moderate research designs that use of secure e-mail as part of a multifaceted web portal is associated with better health status.

Live videoconferencing and store-and-forward. Taken collectively, findings from studies of live videoconferencing and store-and-forward suggest that, for the diseases and conditions studied, there is a preponderance of evidence from studies with moderately strong research designs that medical care provided by live videoconferencing and store-and-forward is at least as effective as medical care provided in person. (See Figure 2.)

Figure 2. Medical Effectiveness Findings for Live Videoconferencing and Store-and-Forward

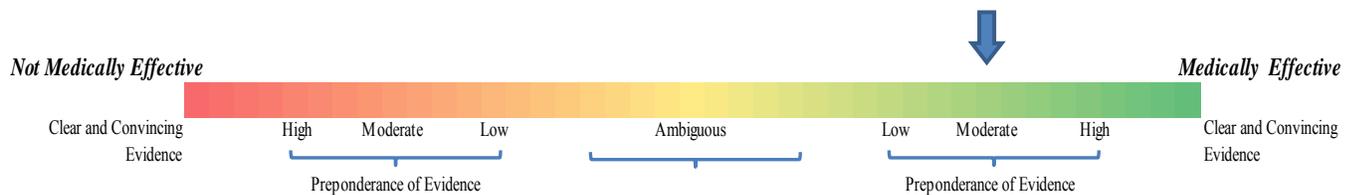


Table 2 below presents findings for the effects of live videoconferencing and store-and-forward on the major types of outcomes assessed by the medical effectiveness team. In all cases, findings are for diseases and conditions that have been studied. These findings may not generalize to other diseases or conditions. Further details regarding findings for live videoconferencing and store-and-forward follow.

Table 2. Medical Effectiveness Findings for Live Videoconferencing and Store-and-Forward

	Live Videoconference	Store-and-Forward
Access to care	Ambiguous evidence	Reduces wait times for specialty outpatient care
Utilization	No effect on utilization of other health care services	Ambiguous evidence
Processes of care	Ambiguous evidence	Patients more likely to receive recommended screening exams if store-and-forward is offered in conjunction with in-person primary care visits
Accuracy of diagnosis & management	Ambiguous evidence relative to in-person care; more accurate than telephone and store-and-forward	Not as accurate as in-person care
Health status	Equivalent to in-person care	Equivalent to in-person care

Source: California Health Benefits Review Program, 2014

Live videoconference

For the diseases and conditions that have been studied:

- Evidence regarding effects of live videoconference on access to care is ambiguous.
- The preponderance of evidence from studies with strong and moderate research designs suggests that live videoconference does not affect use of other health care services.
- Evidence regarding the effect of live videoconference on adherence to recommended treatment is ambiguous.
- Evidence regarding the accuracy of diagnoses made via live videoconference relative to diagnoses made in person is ambiguous, but there is a preponderance of evidence from studies with strong-to-moderate research designs that treatment decisions made based on live videoconference consultations are more accurate than decisions made based on telephone consultations.
- There is clear and convincing evidence that live videoconference and in-person visits have similar effects on health status.

Store-and-forward

For the diseases and conditions that have been studied:

- The preponderance of evidence from studies with strong and moderate research designs suggests that store-and-forward reduces wait times for outpatient visits for specialty care.
- Evidence regarding the impact of store-and-forward on utilization of other health care services is ambiguous.

- Findings from a single randomized controlled trial suggest that use of store-and-forward increases the likelihood that persons will receive recommended screening tests if provided in conjunction with in-person visits for primary care.
- There is a preponderance of evidence from studies with strong-to-moderate research designs that store-and-forward is not as accurate as in-person visits for diagnosis and treatment.
- Findings from studies with strong and moderate research designs suggest that the health status of patients who are treated via store-and-forward is equivalent to that of patients treated in-person.

Benefit Coverage, Utilization, and Cost Impacts

Coverage impacts

- Telephone/e-mail: Premandate, 49% of enrollees (11.4 million) had benefit coverage for telephone and e-mail; postmandate, all 23.4 million enrollees with state-regulated health insurance would have coverage for telephone and e-mail evaluation and management services. Although health insurance carriers indicated coverage — to varying degrees — of each of the four telehealth modalities, the definition of covered telehealth services differs by health insurance carrier, and it is likely that no carrier reimbursed a telehealth service at the level of an in-person visit, as is required by AB 1771.
- Live videoconference and store-and-forward: Premandate, 79% of enrollees (18.6 million) had benefit coverage for live videoconference and store-and-forward. Postmandate, 23.4 million enrollees with state-regulated health insurance would have coverage for the modalities.

Utilization impacts

Tables 4a and 4b summarize the estimated utilization, cost, and benefit coverage impacts of AB 1771. The following general assumptions are helpful in understanding the source of those impacts:

- CHBRP assumes that 60% of all new telehealth services would be *substitute* services (i.e., replacing in-person services of equivalent severity and time), while 40% would be *supplementary* (i.e., additional services that were previously provided and not reimbursed, or not previously provided).^{13,14}
- CHBRP assumes that current billing for telephone and e-mail evaluation and management services underestimates true utilization of these services because half of enrollees subject to AB 1771 do not have coverage for these services, and therefore would not be reflected in claims data. In addition, as previously mentioned, it is likely

¹³ Some telephone and e-mail services will still not be reimbursed due to CPT coding standards related to follow-up visits within 7 days for the same issue, regardless of setting. However, the supplementary services are assumed to occur within coding rules and be billable.

¹⁴ No data were available, but content experts and claims data suggest this is a reasonable estimate.

that health insurance carriers did not reimburse telehealth services at the level of an in-person visit, as is required by AB 1771.

- Current estimates of phone and e-mail service use is based on closed models of care, like Kaiser Permanente, where telephone and e-mail services are already delivered as part of an integrated system and where fee-for-service reimbursement does not occur. The rate of telephone and e-mail utilization in Kaiser Permanente is 26.4%.^{15,16} While the Kaiser Permanente rate of telehealth use serves as a good benchmark, the first year (2015) impact of AB 1771 would be influenced by cost-sharing decisions by carriers and adoption of the technology by physicians outside of an integrated health system.
- While AB 1771 would require all state-regulated health insurance — capitated or noncapitated — to cover evaluation and management services via the four telehealth modalities, CHBRP assumes that increases in utilization of telehealth services with the introduction of AB 1771 would not occur for salary-based systems (such as Kaiser). For plans that contract with external physician groups, CHBRP assumed utilization of telehealth services would increase. CHBRP recognizes that capitation rates for specific physician groups might not increase immediately to reflect any anticipated increase in the total cost to provide physician services. However, to the extent CHBRP assumed an increase in the utilization of the four modalities of telehealth services, and, in particular, supplemental telehealth services, the 2015 cost and premium estimates in this report assume the impact is reflected completely in all physician capitation rates for commercial HMOs.
- Premandate a combined 6.1 million enrollee encounters were performed using telephone, e-mail, or other recognized telehealth modality (telephone: 3.7 million; e-mail: 1.2 million, live videoconferencing: 306,000, store-and-forward: 919,000). (Table 4a or 4b).
- Postmandate, telehealth visits for each modality would increase by between 22% to 95%, depending on the rate of adoption (percentage of potentially billable telehealth visits that are submitted for reimbursement.)

Cost impacts

Instead of assuming even implementation across all plans and providers, CHBRP modeled four separate estimates based on different rates of adoption of all four modalities of telehealth and use of cost-sharing by insurers and/or providers during 2015 to offer perspective on the lower and upper bounds of expenditures, described in Table 3 below. Two of these scenarios assume cost-

¹⁵ This represents the percentage of telephone and e-mail visits — out of all in-person and collective telehealth visits — for Kaiser’s established patients. This value was calculated using Pearl’s (2014) estimate of the level of utilization (22.8%) at Kaiser Permanente Northern California (KPNC) of virtual visits (alternatives to in-person visits conducted via secure e-mail, telephone, or live videoconference) in 2008 and estimates of new patient visits at Kaiser, calculated by subtracting the average annual rate of new visits overall at KPNC (from Milliman’s analysis of Thomson Reuters MarketScan ® data) and subtracted from the total number of visits (Pearl, 2014).

¹⁶ Kaiser’s 2008 estimate was used because this was just before the introduction of KPNC’s inpatient and ambulatory care electronic health record system that includes a suite of patient-friendly Internet, mobile, and video tools had opportunity to take effect. Pearl (2014) shows that by 2013, utilization for telephone and e-mail — as a percentage of all in-person and telehealth visits — increased to 58.3%.

sharing and the two other two assume no cost sharing. CHBRP believes cost sharing scenarios are more likely than no cost sharing once telehealth becomes reimbursable.

Table 3. Four Scenarios Describing the Potential Incremental Impact of AB 1771 (a)

	25% Adoption (b)	100% Adoption (b)
\$20 Cost sharing (equivalent to in-person)	Scenario A (low)	Scenario B (high)
\$0 Cost sharing	Scenario C (c)	Scenario D (c)

Source: California Health Benefits Review Program, 2014.

Note: (a) CHBRP modeled four scenarios, two with cost sharing and two without cost sharing. (b) Adoption means percentage of potentially billable services under full implementation that would actually be delivered and billed. (c) Scenarios C and D can be found in [Appendix D](#).

- Total net annual expenditures are estimated to increase by \$55.3 million, 0.0431% on the low end (Table 4a) or \$240.7 million, 0.1875% on the high end (Table 4b), mainly due to the added reimbursement for supplementary services with the implementation of AB 1771.
- Total premiums are estimated to increase by \$45.8 million on the low end (Table 4a) or \$199.4 million on the high end (Table 4b).
- CHBRP does not estimate any increases to Medi-Cal Managed Care plans. Medi-Cal’s capitated rates are set by the state to cover the cost of healthcare services for beneficiaries in managed care plans. The capitated rates assume that the Medi-Cal managed care plans manage the utilization and costs of healthcare services appropriately and effectively. These assumptions reflect that plans will invest in ongoing improvements, including the costs associated with emerging healthcare technology and services. CHBRP assumes that Medi-Cal Managed Care plans and their contracted physician groups would not further expand their use of any modalities of telehealth services unless it was expected to reduce the total cost of services for enrollees. As a result, CHBRP does not anticipate an increase in the capitated rate set by Medi-Cal.
- The estimated premium increases would not have a measurable impact on the number of persons who are uninsured.

Public Health Impacts

- One of the central hypotheses about expanding coverage for the four telehealth modalities is that access to physicians would increase because of efficiencies associated with the technologies (thus, assisting with accommodating newly covered persons through the ACA). Although there may be some office and individual time management efficiencies gained by physicians using telehealth for E/M services as compared with similar in-person visits, CHBRP finds that AB 1771’s impact on current capacity of physicians to see additional patients would be limited. This is because AB 1771 limits coverage to encounters with “similar complexity and time expenditure,” thus, CHBRP assumes that visits that occur telephonically, via e-mail, live videoconference, or store-and-forward, would be substituting for a similarly timed in-person visit. Additionally, because AB 1771 limits coverage and reimbursement to *physicians*, therefore CHBRP

assumes that physicians' personal bandwidth to respond to any of the telehealth modalities would also be limited.

- Another hypothesis is that expanded access to the four telehealth modalities would increase access to physicians for patients in rural areas, and improve access to in-demand specialists. CHBRP finds that telehealth may improve access from the patient's perspective for both rural and urban patients; however CHBRP is unable to quantify that change. Patients who cannot take time from work, have difficulty traveling, or questions or have problems occurring after usual office hours may find advantages to the convenience of e-mail, phone, and live videoconferencing, and store and forward.

- **Health outcomes:** Although CHBRP estimates that utilization of all four modes of telehealth would increase in the first year postmandate:
 - Telephone/e-mail: CHBRP found insufficient evidence of the effectiveness of telephone and e-mail to produce equivalent or better morbidity or mortality outcomes than in-person visits. Therefore, although telephone and e-mail encounters would increase between 1.1 million and 4.6 million encounters (low and high-end scenarios), the public health impact of AB 1771 is unknown. Note that the absence of evidence is not "evidence of no effect." It is possible that an impact — positive or negative — could result, but current evidence is insufficient to inform an estimate.
 - Store-and-forward/live videoconferencing: For the diseases and conditions studied, evidence indicates that mortality and morbidity outcomes for store-and-forward or live videoconferencing are equivalent to in-person care, and CHBRP estimates that utilization would increase between 268,000 and 1.2 million encounters. Therefore, CHBRP estimates that positive health outcomes could occur for some newly covered enrollees; however, the public health impact is unquantifiable due to the unknown health outcomes of additional encounters for patients with a wide array of conditions.

- **Patient experience:** CHBRP estimates that, postmandate, patient experience would improve as physicians increase their e-mail and telephone responses to patient-initiated inquiries. The improvement is partly attributable to increasing the overall convenience for patients, such as reduced wait times for some visits.

- **Travel burden:** CHBRP estimates, postmandate, travel costs for some enrollees using telehealth services subject to AB 1771 would decrease. As a result, some enrollees may have better health outcomes because the removed travel barrier eliminated otherwise delayed or avoided in-person visits.

- **Lost productivity:** CHBRP estimates AB 1771 would decrease lost productivity associated with travel, however CHBRP is unable to quantify the effect due to lack of data.

- **Financial burden:** CHBRP estimates that AB 1771 would modify coverage and increase enrollees' net financial burden for additional services used by between \$9.5 million and \$41.3 million, in the first year, postmandate. Under AB 1771, all enrollees would share in both the cost of substitute telehealth services and supplemental telehealth

services (patient care that would not have occurred or been billed because telehealth was not covered or reimbursed.)

- **Potential harms:** CHBRP found insufficient evidence to determine whether telehealth services would result in harms to patients. Note that the absence of evidence is not “evidence of no effect.” It is possible that an impact — positive or negative — could result, but current evidence is insufficient to inform an estimate.
- **Disparities:** Although there appear to be some disparities in interest and use of e-mail by sociodemographic characteristics, CHBRP is unable to estimate the impact of AB 1771 on health disparities due to the lack of evidence in access to and use of all telehealth services by subpopulations.

Long-Term Impacts

- **Utilization:** Kaiser reported an increase from 22.8% to 50.3% in the use of telephone, e-mail and live videoconference within a five-year period. That finding indicates that from 2016 on, there is likely to be increased use of telehealth to conduct both substitute and supplementary evaluation and management visits. However, the adoption would be based upon patient preferences (since copayments are identical) and physician capacity (use of technology for secure e-mail messaging, secure videoconferencing, documentation, billing, and ability to collect copayments for remote visits). Based on the Kaiser study, CHBRP anticipates a commensurate increase due to access to telehealth. Once offered to enrollees, telehealth services, collectively, would experience increases of 31.2% year-over-year.
- **Cost:** If telephone and e-mail visits are assumed to replace in-person evaluation and management services, the supplementary telephone and e-mail visits that would have not occurred in the absence of the mandate could have a long-term impact, especially in chronically ill populations, rural areas, and ambulatory care sensitive conditions.
- **Future utilization:** CHBRP assumes that technology will continue to drive changes in the integration of a variety of modalities of telehealth. This includes increased penetration of electronic health records (EHR), associated patient portals and office management systems; increased use of mobile communication devices (such as cellular telephones and tablets); increased broadband coverage which allows not only better internet coverage but easier and more rapid transfer of large data files; and increased demand for these types of services from consumers, providers, and insurers. CHBRP projects that these changes, along with changes in reimbursement, will lead to increased use of telephone, e-mail, and other telehealth services.
- **Long-term public health:** CHBRP is unable to estimate the long term impact of AB 1771 on overall health outcomes and disparities due to the breadth of conditions telehealth affects and the unknown impact of future technology development. To the extent that advances in telehealth technology improve access and provider capacity, CHBRP projects some improvements in patient management and evaluation, especially for those enrollees with transportation barriers or chronic conditions.

Interaction With the Federal Affordable Care Act

- **Value-based care initiatives:** The ACA encourages and promotes the use of telehealth as a way to both increase provider access to sparsely populated areas and also to improve patient care. The ACA pilots a number of “value-based” initiatives — primarily in Medicare and Medicaid — to improve care coordination for patients, and includes telehealth as one of the tools providers may use to accomplish this goal.
- **Essential health benefits:** AB 1771 does not interact with essential health benefits.

Table 4a. AB 1771 Impacts on Benefit Coverage, Utilization, and Cost, 2015

Scenario A —“Low” — \$20 Cost Sharing & 25% of potentially billable telephonic and electronic visits are billed

	Premandate	Postmandate	Increase/ Decrease	Change Postmandate
Benefit Coverage				
Total enrollees with health insurance subject to state-level benefit mandates (a)	23,389,000	23,389,000	0%	0%
Total enrollees with health insurance subject to AB 1771	23,389,000	23,389,000	0%	0%
Number of enrollees with coverage for telephone-based evaluation and management	11,381,927	23,389,000	12,007,073	105%
Number of enrollees with coverage for e-mail-based evaluation and management	11,381,927	23,389,000	12,007,073	105%
Number of enrollees with coverage for live videoconferencing	18,571,927	23,389,000	4,817,073	26%
Number of enrollees with coverage for store-and-forward	18,571,927	23,389,000	4,817,073	26%
Percentage of enrollees with coverage for telephone-based evaluation and management	49%	100%	51%	105%
Percentage of enrollees with coverage for e-mail-based evaluation and management	49%	100%	51%	105%
Percentage of enrollees with coverage for live videoconferencing	79%	100%	21%	26%
Percentage of enrollees with coverage for store-and-forward	79%	100%	21%	26%
Utilization and Cost				
Number of telephone-based evaluation and management services used	3,675,411	4,480,563	805,153	22%
Number of e-mail-based evaluation and management services used	1,225,137	1,493,521	268,384	22%
Number of live videoconferencing services used	306,284	373,380	67,096	22%
Number of store-and-forward services used	918,853	1,120,141	201,288	22%
Average per-unit cost of telephone-based evaluation and management	\$90.38	\$90.38	\$0.00	0%
Average per-unit cost of e-mail-based evaluation and management	\$62.76	\$62.76	\$0.00	0%
Average per-unit cost of live videoconferencing	\$189.93	\$189.93	\$0.00	0%
Average per-unit cost of store-and-forward	\$157.64	\$157.64	\$0.00	0%

	Premandate	Postmandate	Increase/ Decrease	Change Postmandate
Expenditures				
<i>Premium Expenditures by Payer</i>				
Private Employers for group insurance	\$54,590,722,000	\$54,614,103,000	\$23,381,000	0.0428%
CalPERS HMO employer expenditures (c)	\$4,297,494,000	\$4,299,383,000	\$1,889,000	0.0440%
Medi-Cal Managed Care Plan expenditures	\$17,504,711,000	\$17,504,711,000	\$0	0.0000%
Enrollees for individually purchased insurance	\$16,930,080,000	\$16,940,713,000	\$10,633,000	0.0628%
Enrollees with group insurance, CalPERS HMOs, Covered California, and Medi-Cal Managed Care (a) (b)	\$22,232,708,000	\$22,242,609,000	\$9,901,000	0.0445%
<i>Enrollee Expenses</i>				
Enrollee out-of-pocket expenses for covered benefits (deductibles, copayments, etc.)	\$12,867,143,000	\$12,876,630,000	\$9,487,000	0.0737%
Enrollee expenses for noncovered benefits (d)	\$0	\$0	\$0	0.000%
Total Expenditures	\$128,422,858,000	\$128,478,149,000	\$55,291,000	0.0431%

Source: California Health Benefits Review Program, 2014.

Notes: (a) This population includes persons with privately funded and publicly funded (e.g., CalPERS HMOs, Medi-Cal Managed care Plans, Healthy Families Program) health insurance products regulated by 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 57% or \$1,077,000 would be state expenditures for CalPERS members who are state employees or their dependents.

(d) Includes only those expenses that are paid directly by enrollees to providers for services related to the mandated benefit that are not currently covered by insurance. In addition this only includes those expenses that will be newly covered, post-mandate. Other components of expenditures in this table include all health care services covered by insurance

Key: CalPERS HMOs=California Public Employees' Retirement System Health Maintenance Organizations; CDI=California Department of Insurance; DMHC=Department of Managed Health Care.

Table 4b. AB 1771 Impacts on Benefit Coverage, Utilization, and Cost, 2015

Scenario B — “High” — \$20 Cost Sharing & 100% of potentially billable telephonic and electronic visits are billed

	Premandate	Postmandate	Increase/ Decrease	Change Postmandate
Benefit Coverage				
Total enrollees with health insurance subject to state-level benefit mandates (a)	23,389,000	23,389,000	0%	0%
Total enrollees with health insurance subject to AB 1771	23,389,000	23,389,000	0%	0%
Number of enrollees with coverage for telephone-based evaluation and management	11,381,927	23,389,000	12,007,073	105%
Number of enrollees with coverage for e-mail-based evaluation and management	11,381,927	23,389,000	12,007,073	105%
Number of enrollees with coverage for live videoconferencing	18,571,927	23,389,000	4,817,073	26%
Number of enrollees with coverage for store-and-forward	18,571,927	23,389,000	4,817,073	26%
Percentage of enrollees with coverage for telephone-based evaluation and management	49%	100%	51%	105%
Percentage of enrollees with coverage for e-mail-based evaluation and management	49%	100%	51%	105%
Percentage of enrollees with coverage for live videoconferencing	79%	100%	21%	26%
Percentage of enrollees with coverage for store-and-forward	79%	100%	21%	26%
Utilization and Cost				
Number of telephone-based evaluation and management services used	3,675,411	7,181,119	3,505,708	95%
Number of e-mail-based evaluation and management services used	1,225,137	2,393,706	1,168,569	95%
Number of live videoconferencing services used	306,284	598,427	292,142	95%
Number of store-and-forward services used	918,853	1,795,280	876,427	95%
Average per-unit cost of telephone-based evaluation and management	\$90.38	\$90.38	\$0.00	0%
Average per-unit cost of e-mail-based evaluation and management	\$62.76	\$62.76	\$0.00	0%
Number of live videoconference evaluation and management services used	\$189.93	\$189.93	\$0.00	0%

	Premandate	Postmandate	Increase/ Decrease	Change Postmandate
Average per-unit cost of store-and-forward	\$157.64	\$157.64	\$0.00	0%
Expenditures				
<i>Premium Expenditures by Payer</i>				
Private Employers for group insurance	\$54,590,722,000	\$54,692,526,000	\$101,804,000	0.1865%
CalPERS HMO employer expenditures (c)	\$4,297,494,000	\$4,305,720,000	\$8,226,000	0.1914%
Medi-Cal Managed Care Plan expenditures	\$17,504,711,000	\$17,504,711,000	\$0	0.0000%
Enrollees for individually purchased insurance	\$16,930,080,000	\$16,976,375,000	\$46,295,000	0.2734%
Enrollees with group insurance, CalPERS HMOs, Covered California, and Medi-Cal Managed Care (a) (b)	\$22,232,708,000	\$22,275,819,000	\$43,111,000	0.1939%
<i>Enrollee Expenses</i>				
Enrollee out-of-pocket expenses for covered benefits (deductibles, copayments, etc.)	\$12,867,143,000	\$12,908,451,000	\$41,308,000	0.3210%
Enrollee expenses for noncovered benefits (d)	\$0	\$0	\$0	0.0000%
Total Expenditures	\$128,422,858,000	\$128,663,602,000	\$240,744,000	0.1875%

Source: California Health Benefits Review Program, 2014.

Notes: (a) This population includes persons with privately funded and publicly funded (e.g., CalPERS HMOs, Medi-Cal Managed care Plans, Healthy Families Program) health insurance products regulated by 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 57%, or \$4,689,000, would be state expenditures for CalPERS members who are state employees or their dependents.

(d) Includes only those expenses that are paid directly by enrollees to providers for services related to the mandated benefit that are not currently covered by insurance. In addition 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: CalPERS HMOs=California Public Employees' Retirement System Health Maintenance Organizations; CDI=California Department of Insurance; DMHC=Department of Managed Health Care.

INTRODUCTION

The California Assembly Committee on Health requested on February 25, 2014, 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) 1771, which would require state-regulated health insurance to cover telephonic and electronic patient management services beginning in January 2015. In response to this request, CHBRP undertook this analysis pursuant to the provisions of the program's authorizing statute,¹⁷ which allows for the review of benefit mandates affecting health insurance regulated by the state.

State benefit mandates apply to a subset of health insurance plans and policies in California, those regulated by one of California's two health insurance regulators:¹⁸ the California Department of Managed Health Care (DMHC)¹⁹ and the California Department of Insurance (CDI).²⁰ In 2015, CHBRP estimates that approximately 23.4 million Californians (61.6%) will have health insurance that may be subject to any state health benefit mandate law.²¹ Of the rest of the state's population, a portion will be uninsured (and therefore will have no health insurance subject to any benefit mandate), and another portion will have health insurance subject to other state laws or only to federal laws.

AB 1771 would affect the health insurance of approximately 23.4 million enrollees (61.6% of all Californians).

Developing Estimates for 2015 and the Effects of the Affordable Care Act

The Affordable Care Act (ACA)²² is dramatically affecting health insurance and its regulatory environment in California. As of January 2014, an expansion of the Medi-Cal program, California's Medicaid program,²³ and the availability of subsidized and unsubsidized health insurance purchased through Covered California,²⁴ the state's newly established state health insurance marketplace, are significantly increasing the number of people with health insurance in California, and across the United States.

¹⁷ Available at: www.chbrp.org/docs/authorizing_statute.pdf

¹⁸ California has a bifurcated system of regulation for health insurance. The Department of Managed Health Care (DMHC) 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, which offer benefit coverage to their enrollees through health insurance policies.

¹⁹ DMHC was established in 2000 to enforce the Knox-Keene Health Care Service Plan of 1975; see Health and Safety Code (H&SC) Section 1340.

²⁰ 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 (IC) Section 106(b) or subdivision (a) of Section 10198.6.

²¹ CHBRP's estimates are available at: www.chbrp.org/other_publications/index.php.

²² The federal "Patient Protection and Affordable Care Act" (P.L. 111-148) and the "Health Care and Education Reconciliation Act" (P.L. 111-152) were enacted in March 2010. Together, these laws are referred to as the Affordable Care Act (ACA).

²³ The Medicaid expansion is to 133% of the federal poverty level (FPL) —138% with a 5% income disregard.

²⁴ The California Health Benefits Exchange Authorizing Statute is available here:

www.healthexchange.ca.gov/Documents/California%20Codes%20Governing%20the%20Health%20Benefit%20Exchange.pdf.

State health insurance marketplaces, such as Covered California, are selling health insurance in the small-group and individual market²⁵ through qualified health plans (QHPs), which are certified by and sold in a state’s health insurance marketplace. QHPs sold through Covered California are DMHC-regulated plans or CDI-regulated policies, and as such will be subject to California state benefit mandates.

It is important to note that CHBRP’s analysis of proposed benefit mandate bills typically address the incremental effects of the proposed bills—specifically, how the proposed mandate would impact benefit coverage, utilization, costs, and public health, holding all other factors constant. CHBRP’s estimates of these incremental effects are presented in this report. In order to accommodate continuing changes in health insurance enrollment, CHBRP is relying on projections from the California Simulation of Insurance Markets (CalSIM) model²⁶ to help estimate baseline enrollment for 2015. From this projected baseline, CHBRP estimates the incremental impact of proposed benefit mandates that could be in effect after January 2015. CHBRP’s methods for estimating baseline 2015 enrollment from CalSIM projections are provided in further detail in [Appendix D](#).

Bill-Specific Analysis of AB 1771

Bill Language and Analysis

AB 1771 requires that after January 1, 2015, DMHC-regulated plans and CDI-regulated policies should “cover physician telephonic and electronic patient management services.” Those services would have to be “reimburse(d)...at the same level and amount as face-to-face patient encounters with similar complexity and time expenditure.”

Non-face-to-face coverage

Thus, if enacted, AB 1771 would require state-regulated plans and policies to reimburse physicians for *non*–face-to-face services — principally telephone and e-mail. Additionally, because the bill language specifies that state-regulated plans and policies must “cover...electronic patient management services” and defines that term to include “electronic communication tools...to enable treating physicians to evaluate and manage existing patients,” AB 1771 could potentially have the effect of requiring coverage — and reimbursement — for any communication technologies used to assist physicians only in evaluating and managing *established* patients electronically.

However, based on AB 1771’s language, CHBRP has assumed that coverage and reimbursement would apply to four “electronic communication” modalities:

²⁵ Effective 2017, states may allow large-group purchasing through health insurance marketplaces, which may make some large-group plans and policies subject to the requirement to provide essential health benefits [ACA Section 1312(f)(2)(B)].

²⁶ CalSIM was developed jointly and is operated by the University of California, Los Angeles Center for Health Policy Research and the University of California, Berkeley Center for Labor Research. The model estimates the impact of provisions in the ACA on employer decisions to offer, and individual decisions to obtain, health insurance.

- *Telephone* and *e-mail*, because they have been specifically identified within the bill, or by the bill author;
- *Live videoconferencing*, which is explicitly included in California’s definition of telehealth and means the real-time (synchronous) video interaction between patient and physician when they are in different places; and
- *Store-and-forward* (asynchronous) technology, which is also explicitly defined in California’s telehealth law and involves the capture and storage of medical information (such as an x-ray, photograph, sound recording) that is then forwarded to a physician for evaluation at a later time.

Throughout this report, CHBRP will refer specifically to each modality when discussing the efficacy or impact of that specific modality. CHBRP will refer to the four modalities collectively as “telehealth,” unless otherwise stated.

Guidelines for non–face-to-face services

AB 1771 specifies that the use of “telephonic and electronic management services” should “enable treating physicians to evaluate and manage established patients in a manner recognized by the American Medical Association (AMA), Current Procedural Terminology (CPT) codes.” Based on language in AB 1771, CHBRP limits this analysis to only evaluation and management (E/M) services provided and billed by a physician for established patients.

Because the AMA’s CPT codes specify that telephone and e-mail reimbursement apply only to patient-initiated interactions, AB 1771 limits coverage of services delivered via telephone and e-mail to cases where an established patient first contacted the physician. Other evaluation and management CPT codes do not specify that interactions be patient-initiated, thereby not limiting coverage or reimbursement for live videoconferencing or store-and-forward modalities.

Based on language in AB 1771, CHBRP limits this analysis to only evaluation and management (E/M) services provided and billed by a physician for established patients. CHBRP includes CPT codes, which do not require a physical exam, for E/M services performed at hospitals, nursing facilities, custodial care facilities, assisted living facilities, or at home, and specifically excluded CPT codes that *required* a physical exam.²⁷ (Please see Table D-2 in [Appendix D](#) for the full list of CPT codes used.)

Access

One of the central hypotheses about telehealth is that it will increase access to physicians because of increased efficiencies, thereby increasing access: (1) for patients in rural areas; (2) for in-demand specialists; and (3) to meet demand for enrollees newly covered by the Affordable Care Act.

CHBRP finds limited evidence that AB 1771 would increase the *capacity* of physicians to see additional patients because the bill:

²⁷ To simplify the analysis, CHBRP did not include any electronic encounters for emergency department E/M of enrollees with state-regulated health insurance because the codes require a physical exam.

- Limits coverage and reimbursement to encounters with “similar complexity and time expenditure.” Based on this language, CHBRP assumes that most visits that occur via telephone, e-mail, live videoconference, or store-and-forward, would be displacing (supplanting) a similarly timed in-person visit, thereby having a limited impact on capacity, and therefore access; and
- Limits coverage and reimbursement to *physicians*, and not nonphysicians that are part of a practice, CHBRP assumes that physicians’ personal bandwidth to respond to any of the telehealth modalities is also limited.

Specifically, CHBRP assumes the AB 1771-related telehealth visits would fall into two categories:

- ***Substitute*** (or replace) current in-person visits with e-mail, telephone, or live videoconference for patient-initiated E/M visits; and
- ***Supplement*** current in-person visits with added services via telehealth, and include both services that (1) would previously not have been delivered in person due to distance, inconvenience, and time, and (2) services that physicians have already been providing via telephone and e-mail, but were previously not billed or reimbursed²⁸ because they were not covered. Because AB 1771 constrains covered E/M services to those that are physician-provided only, CHBRP assumes that the capacity to add supplemental services is limited based by each physician’s capacity.

The full text of AB 1771 can be found in [Appendix A](#).

Interaction With Existing California Policy

Telehealth, which generally excludes telephone and e-mail communication, provides a way for healthcare providers to evaluate and treat patients — even if doctor and patient are in different places. It is an evolving and growing segment in health care, envisioned as a way to increase and hasten access to health care, particularly for patients in rural areas, and to specialists. Telehealth is also seen as a tool to assist providers and patients manage chronic diseases. The “electronic communications tools” mentioned in AB 1771 could mean a range of modalities in telehealth, from live videoconference, to real-time continuous heart monitors that send data to physicians’ offices, to smart-phone-assisted mobile health, or chip-enabled pills that — once ingested — send data on heart rates, temperature and body movements to physicians and patient electronic medical records. (For more information about telehealth, please see *Background on Telehealth*)

AB 1771 expands on California’s two primary telehealth laws.²⁹

What is telehealth in California?

California’s Business & Professions (B&P) Code³⁰ defines “telehealth” as the delivery of health care services via “information communication technologies” to assist with consultation,

²⁸ Some telehealth services will still not be reimbursed due to CPT coding standards related to follow-up visits within 7 days for the same issue, regardless of setting. However, the supplementary services are assumed to occur within coding rules and be billable.

²⁹ SB 1665 (Thompson, 1996) and AB 415 (2011, Logue).

diagnosis, treatment, and management of patient health care when provider and patient are not in the same place. See *Background on Telehealth* (p. 35) for additional information on the uses of telehealth.

Existing law defines two modalities of telehealth:

- “Synchronous interaction,” or real-time interactions, such as through live videoconference; and
- “Asynchronous store-and-forward,” which means the capture and transmission of patient medical information, (e.g., medical record, x-ray, etc.), which is then sent to a provider at another location at a later time.

Although the definition of telehealth under current law (“information communication technologies”) does not explicitly *exclude* telephone and e-mail, those modalities are also not explicitly *included*. Similarly, California’s existing definition of telehealth does not exclude evolving methods of telehealth, such as remote patient monitoring or mobile health, nor does it explicitly include those methods.

As Table 5 below shows, AB 1771 adds to California’s existing telehealth law to require reimbursement of the technology, and also requires reimbursement for telephone and e-mail.

Table 5. Evolution of California’s Telehealth Policy for Specific Modalities

	Live Videoconferencing	Asynchronous Store-and-Forward	Telephone/E-mail
SB 1665 (1996)	Included in telehealth definition, but does not require coverage	Not explicitly included in telehealth definition	Excluded from definition of telehealth (a)
AB 415 (2011)	Included in telehealth definition, but does not require coverage	Included in telehealth definition, but does not require coverage	Not explicitly included in or excluded from definition of telehealth
AB 1771 (b), proposed (2014)	Requires coverage/payment	Requires coverage/payment	Requires coverage/payment

Source: CHBRP, 2014 review of California’s existing laws.

Notes: (a) SB 922 (Thompson, 1997) clarified exclusion of telephone and fax from telemedicine.

(b) CHBRP analyzed the version of AB 1771 that was amended March 11, 2014.

Existing coverage requirements for telehealth

Existing law prohibits state-regulated plans and policies from requiring in-person encounters (e.g., traditional office visits) if services could be appropriately provided through live videoconference or store-and-forward technology, and subject to health insurance carriers’ contracts with both health care providers and enrollees. In other words, existing law *allows* for coverage of telehealth technologies, but does not require coverage (or accordingly, reimbursement for live videoconference or store-and-forward services).

³⁰ B&P code 2290.5.

California's Medi-Cal Managed Care plans include coverage for live videoconferencing and store-and-forward technology within their capitated rates. The plans do not currently reimburse for telephone and e-mail encounters.³¹

The state's two health insurance regulators have fielded more than 3 dozen complaints³² against insurance carriers' denials of claims related to telehealth in the past 5 years, including one case related to speech therapy via interactive videoconference.³³ All other cases related to coverage for remote patient monitoring, such as real-time continuous heart or glucose monitors, which collect and transmit data on patients' health indicators and that are beyond the scope of AB 1771.

Analytic Approach and Key Assumptions

As previously mentioned, while AB 1771 principally targets reimbursement for patient-initiated³⁴ telephone and e-mail transactions, AB 1771's language could also require reimbursement for any electronic communication technologies used to assist physicians in evaluating and managing existing patients.

Given the potentially broad range of electronically enabled communications between patients and physicians, CHBRP limits analysis of coverage for "electronic communication tools" to those modalities currently defined in the state's B&P Code: (1) live videoconference, and (2) store-and-forward — asynchronous technology, in which a patient captures an image, then forwards that image to the physician to view at later time.

Therefore, CHBRP approaches the analysis in two parts:

- **Phone and e-mail:** Addressing coverage and reimbursement for managing existing patients by telephone and e-mail; and
- **Live videoconference and store-and-forward:** Addressing coverage and reimbursement of telehealth as defined in existing California law.

Telephone and e-mail billing codes

The AMA CPT manual contains four specific billing codes associated with physician interaction via telephone or e-mail.³⁵ CHBRP included these four CPT codes in the analysis.

CHBRP excluded CPT codes that described provider-to-provider phone calls to evaluate and manage patient care because these communications did not include direct patient interaction and, therefore, appear to be outside of the scope of AB 1771. CHBRP also excludes "e-referrals," (i.e., e-mail consultations between physicians — usually primary care and specialists.)

³¹ Department of Health Care Services. Medi-Cal Telehealth Guidelines. Accessed March 11, 2014.³¹ Department of Health Care Services. Medi-Cal Telehealth Guidelines. Accessed March 11, 2014.

³² Independent Medical Review records for California Department of Insurance and Department of Managed Health Care.

³³ Department of Managed Health Care overturned the health plan's denial for telehealth services.

³⁴ AMA's billing codes specify that reimbursement for telephone and e-mail transactions must be patient initiated.

³⁵ CPT codes 99441–99443 are used for patient-initiated telephone calls between a physician and patient (of different lengths ranging from 5 to 30 minutes). CPT code 99444 is used for patient-initiated e-mails from physician to patient. 2012 Current Procedural Terminology Manual, American Medical Association.

CHBRP also excluded CPT codes associated with telephonic and e-mail evaluation and management of patients by nonphysician health care providers³⁶ because AB 1771 does not require coverage and reimbursement for nonphysicians. Likewise, CHBRP also excludes Project Echo and other initiatives that use live videoconference or store-and-forward for consultation between primary care and specialist physicians because provider-to-provider communications falls outside the scope of AB 1771.

Live videoconference and store-and-forward billing codes

AB 1771 specifically targets use of communication tools to “enable treating physicians to *evaluate and manage* existing patients in a manner recognized by the American Medical Association, Current Procedural Terminology (CPT) codes.” Based on that language, CHBRP looked at CPT billing claims associated with “evaluation and management” traditionally delivered in-person and via live videoconference or store-and-forward.³⁷ CHBRP also included HCPCS temporary telehealth codes that have not yet been added to the AMA’s official CPT code manual.

CHBRP excluded E/M CPT codes that require physical examinations because those examinations cannot be done electronically.³⁸

(Please see Table D-2 in [Appendix D](#) for CPT codes included in the analysis. For additional information about CPT codes, see the section *Background on Telehealth*).

Other definitions

CHBRP also uses CPT code definitions for:

- “Existing patient” (established patient) is one who has received professional services from a physician, or another physician of the exact same specialty and subspecialty, and who belong to the same group practice, within the past 3 years;
- “Time” and “complexity” of a condition. CPT codes are descriptive in the amount of time an encounter should require, and the severity of the patient’s illness.

Requirements in Other States

Existing law

Nationwide, CHBRP is aware of:

- **For telephone and e-mail:** One state, Oregon, which currently requires reimbursement for telephone and e-mail evaluation and management — but only in cases where live videoconferencing equipment is unavailable;³⁹

³⁶ CPT codes 98966, 98967, and 98968 for nonphysician corresponding with patients via phone and e-mail.

³⁷ Live videoconference is usually distinguished with the modifier “GT,” while store-and-forward is distinguished with a “GQ” modifier.

³⁸ This analysis includes CPT codes, which do not require a physical exam, for evaluation and management services performed at hospitals, nursing facilities, custodial care facilities, assisted living facilities, or at home. Please see Appendix D for a full list of CPT codes included.

- **Live videoconferencing:** Ten states,⁴⁰ which currently mandate coverage of live videoconferencing by private payers; and
- **Store-and-forward:** Two states, Montana and New Mexico, which require coverage for store-and-forward technology by private payers.

Pending legislation

Nationwide, CHBRP is aware of 39 pending bills in 25 states related to “telehealth,” generally (American Telemedicine Association, 2014). Of those, CHBRP is aware of at least 12⁴¹ states that are considering legislation that would require coverage of telehealth — generally defined to mean live videoconferencing, though some states also include asynchronous store-and-forward, mobile health, and remote patient monitoring as part of telehealth. Most of the states considering mandatory coverage exclude telephone and e-mail from the state’s definition of telehealth, though a handful⁴² of states have broad enough language that could potentially allow the inclusion of phone and e-mail within their state’s definition of telehealth. For instance, Pennsylvania’s HB 491 includes in its definition of telehealth “another telecommunications device that delivers health information concerning a patient to a health care professional.”

Federal Programs’ Telehealth Policies

Medicaid

Almost all states (45) recognize either live videoconference and/or store-and-forward in their Medicaid programs, primarily reimbursing for live videoconferencing⁴³. Only two state Medicaid programs require reimbursement for telephone interactions: Nevada for crisis interventions, and Oregon, in lieu of videoconferencing if equipment is unavailable.

Medicare

Medicare is often used as the benchmark for reimbursement decisions by insurance companies. Medicare⁴⁴ will reimburse for live videoconferencing in all 50 states (DHHS, 2012) if patients are in a rural Health Professional Shortage Area or in areas with a shortage of health professionals; and physically located in a physician office, rural health clinic, or hospital while receiving live videoconferencing services. In other words, patients may not be at a renal dialysis center, or their own home, or the service will not be covered by Medicare.

Medicare covers store-and-forward technology for demonstration programs in Alaska and Hawaii, or coverage of teleradiology and remote EKG applications.

³⁹ http://arcweb.sos.state.or.us/pages/rules/oars_400/oar_410/410_130.html. Accessed March 16, 2014.

⁴⁰ LA, ME, MD, MA, MS, MT, NH, NM, OK, VT.

<http://cchpca.org/sites/default/files/50%20State%20Medicaid%20Update%20Nov.%202013%20-%20Rev.%2012-20.pdf>. Accessed March, 16, 2014.

⁴¹ CT, FL, IA, IL, MA, NE, NY, OH, PA, RI, SC, TN, WA, WV. State legislative websites. Accessed March 24 and 25, 2014.

⁴² NE, OH, PA, RI, WV. State legislative websites. Accessed March 24–25, 2014.

⁴³ 50 States Medicaid Reimbursement Policies, Center for Connected Health Policy, November 2013. Accessed March 14, 2014.

⁴⁴ Medicare is a federal health program for Americans age 65 years and older and disabled Americans.

Medicare does not pay for telephone or e-mail encounters.

Department of Veterans Affairs

The federal Department of Veterans Affairs (VA) has an Office of Telehealth Services, which has experimented with telehealth over the past 2 decades and is widely considered a leader in the integration and use of the technologies. About 36% of veterans of 5.6 million in the VA healthcare system live in rural areas (Office of Rural Health, 2013; U.S. Department of Veterans Affairs, 2012). The VA (Darkins, 2013) defines telehealth as:

- **Home telehealth:** Chronic disease management through remote patient monitoring;
- **Clinical video telehealth:** Live videoconferencing between VA medical facilities;
- **Store-and-forward:** Defined as in California law, and used for conditions such as teleretinal and teledermatology⁴⁵;
- **Teleradiology;**
- **Secure messaging:** Allowing patients to communicate via a web portal or their mobile devices; and
- **Mobile health:** Defined as smart phone applications for self-management of health conditions.

The VA does not include audio-only telephone or e-mail in its definition of telehealth.

The VA supports three National Telehealth Training Centers to continue to develop telehealth capabilities, such as a remote stethoscope (Office of Telehealth Services, 2013) or telemental health. The training centers also serve to standardize training for healthcare professionals. In 2012, the VA performed nearly 1.4 million telehealth consultations via the three modalities to 491,000 unique patients (Darkins et al., 2013). The VA projects the number of veterans using telehealth services will grow by 29% annually (Darkins, 2013).

Interaction With the Affordable Care Act

The ACA encourages and promotes the use of telehealth to increase provider access,⁴⁶ including to medically underserved areas — such as Native American reservations⁴⁷ — to improve patient medication therapy management,⁴⁸ but chiefly as a component of “value-based care.”

Provider Payment Reforms and Affordable Care Act

The ACA pioneers a number of payment methods and demonstration projects⁴⁹ aimed at replacing fee-for-service under Medicare and encouraging more “patient-centered” care.

⁴⁵ Store-and-forward is not limited to these uses.

⁴⁶ Section 340H. Community-based collaborative care network program.

⁴⁷ Section 10306.

⁴⁸ Section 10328.

Through this frame, policymakers seek to incentivize teams of providers to better coordinate the care of a patient, thereby increasing patient engagement, improving quality and reducing overall health costs. These programs, including the formation of accountable-care organizations (ACOs), specifically encourage the use of “telehealth, remote patient monitoring, and other such enabling technologies”⁵⁰ to achieve savings.

Essential Health Benefits

The ACA requires nongrandfathered⁵¹ small-group and individual market health insurance — including, but not limited to, qualified health plans (QHPs) sold in Covered California — to cover 10 specified categories of EHBs.⁵² California has selected the Kaiser Foundation Health Plan Small Group Health Maintenance Organization (HMO) 30 plan as its benchmark plan.^{53,54}

AB 1771 and essential health benefits

AB 1771 does not interact with essential health benefits.

Because EHBs mandate coverage for specific health care services, and telehealth is not a health care service but a method by which to deliver services, it does not alter benefits.⁵⁵

⁴⁹ The Affordable Care Act: Helping Providers Help Patients. A Menu of Options for Improving Care. www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO/downloads/ACO-Menu-Of-Options.pdf. Accessed March 20, 2014.

⁵⁰ Section 3022. Medicare Shared Savings Program.

⁵¹ A grandfathered health plan is defined as: “A group health plan that was created – or an individual health insurance policy that was purchased – on or before March 23, 2010. Grandfathered plans are exempted from many changes required under the ACA. Plans or policies may lose their “grandfathered” status if they make certain significant changes that reduce benefits or increase costs to consumers” (www.healthcare.gov/glossary/grandfathered-health-plan/).

⁵² The 10 specified categories of essential health benefits (EHBs) are: 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. [ACA Section 1302(b)].

⁵³ The U.S. Department of Health and Human Services (HHS) has allowed each state to define its own EHBs for 2014 and 2015 by selecting one of a set of specified benchmark plan options. CCIIO, Essential Health Benefits Bulletin. Available at: http://cciio.cms.gov/resources/files/Files2/12162011/essential_health_benefits_bulletin.pdf. Accessed March 23, 2014.

⁵⁴ H&SC Section 1367.005; IC Section 10112.27.

⁵⁵ However, if California regulators were to interpret telehealth reimbursement to interact with EHBs, then California’s EHBs — as defined by the Kaiser Small Group HMO 30 plan — implicitly includes coverage for the use of telephone and e-mail, live videoconferencing and store-and-forward within its capitated rate, and therefore would be included in EHBs.

BACKGROUND ON TELEHEALTH

AB 1771 would require coverage and, therefore reimbursement to physicians, for telephone, e-mail, and telehealth modalities defined in existing law⁵⁶ — live videoconference and store-and-forward. To provide context for this report’s analytic approach, this section offers background information about the use of four technologies as well as the billing process and codes referenced in AB 1771. These technologies, under the parameters initiated by AB 1771, are defined as:

- **Telephone:** Telephone services are those non–face-to-face encounters *initiated by a patient* to a physician with whom s/he has an established relationship. The encounters are conducted through the use of the telephone and represent the same level of service as an in-person visit (American Medical Association, 2011; Giannangelo, 2006).
- **E-mail:** E-mail services are those non–face-to-face encounters *initiated by a patient* to a physician with whom s/he has an established (“existing”) relationship. The encounters are conducted through the use of e-mail and represent the same level of service as an in-person visit (American Medical Association, 2011; Giannangelo, 2006).
- **Live videoconferencing:** Live videoconferencing service uses two-way interactive audio-video technology to connect users (patients and physicians) when a live, face-to-face interaction is necessary. Video devices can include videoconferencing units, peripheral cameras, videoscopes, or web cameras. Display devices include computer monitors, plasma/LED TV, LCD projectors, and mobile devices such as tablet computers. Live videoconferencing is currently used in a variety of specialties, such as telepsychiatry, teleED care, telestroke, as well as for some disease management programs (Nelson et al., 2014).
- **Store-and-forward:** Store-and-forward telehealth service involves the acquisition and storing of clinical information (e.g. data, image, sound, video) that is then forwarded to (or retrieved by) another site for clinical evaluation (Center for Connected Health Policy, 2013). Two of the more extensively studied examples include teledermatology and teleRetinal imaging. In both cases, a digital picture is taken by a health care provider, and the picture along with the clinical history is then sent electronically to a specialist for evaluation (e.g., diagnosis) and or management.

Over the last decade, telehealth has developed at an accelerating pace, especially within the areas of store-and-forward and live videoconferencing. In particular, telehealth has traditionally focused on *provider-to-provider* consults in a limited area of medical specialties and within or between hospitals. Health insurance coverage and reimbursement for these two modes already exists as part of an episode of care for many enrollees, though, as previously mentioned, coverage is not mandated. AB 1771 would essentially bring telephone and e-mail into the definition of telehealth for reimbursement purposes by requiring coverage of certain medical services by these two modes of communication. Although telephone technology is more than a century old, and the adoption of e-mail is nearly ubiquitous, the idea of covering these modes of communications to facilitate the *patient–provider* relationship is new.

⁵⁶ Business and Professions Code 2290.5.

Efforts to develop the hardware and software infrastructure to support the communication among providers and between patients and providers continues to increase. Major advances in computer and communication technology that support the use of telehealth include: increased penetration of electronic health records (EHR) and associated patient portals and office management systems; increased use of mobile communication devices (such as cellular telephones and tablets); increased use of broadband coverage which allows not only for better internet coverage but for easier and more rapid transfer of large data files; and increased demand for these types of services from consumers, providers, and insurers (Kovner and Knickman, 2011; Nelson and Staggers, 2014; Wilson, 2008). Under the Affordable Care Act (ACA), telehealth services are one approach to address the need for innovative methods to improve access to and quality of care. The development of this field has led to telehealth evidence guidelines and standards within specific specialties (Kassirer, 2000; Krupinski, 2012). Although there is a growing body of literature on e-mail, telephone, and other types of telehealth, research continues to lag behind the fast changing technology and societal trends and there remain gaps in the literature (Currell et al., 2000; Ekeland et al., 2012; Gilman and Stensland, 2013; Heinzlmann et al., 2005; Hersh et al., 2006; Jackson and McClean, 2012; Mair et al., 2000; Struber, 2004).

Frequency of Telehealth in California

Provider and patient use of e-mail, telephone, and other technologies covered by AB 1771 to communicate about health care is understudied due, in part, to the lack of physician billing data. Interest in (or demand for) these communication tools has been measured in the past primarily through surveys. Study conclusions about provider interest, taken as a whole, are ambiguous, while patients appear to be interested in electronic communications with their providers.

Physician use of e-mail

CHBRP found no California or national studies reporting overall utilization rates of telephone, live videoconference, or store-and-forward technologies by physicians. Several older studies offer a ballpark rate of e-mail use by physicians. A 2003 survey of physicians showed that fewer than 25% used e-mail with patients and well under 10% did so regularly (JupiterResearch, 2004). A 2008 survey of 2,057 Florida physicians from various disciplines found that 20.4% used e-mail to communicate with their patients (an increase from 16.6% in 2005), but only 2.9% e-mailed frequently (Menachemi et al., 2011). Of those who did not use e-mail, 58.4% were not interested in future e-mail use with patients. The survey did not identify the reasons for lack of interest. Another survey of physicians in 2003 found that 66% would adopt electronic communication with patients if they were reimbursed (Patt et al., 2003).

Patient use of e-mail and phone

Consumer access to the internet, telephone, and other electronic communication devices is necessary in communicating with physicians for health care treatment and advice. Based on repeated statewide surveys by the Public Policy Institute of California, almost 92% of Californians report having a cell phone and 58% have a smartphone (up from 39% from 2011). Most Californians (56%) report using their cell phones to access the Internet or e-mail — up from 37% since 2008 and 16% from 2011 (Public Policy Institute of California, 2014).

Previous surveys of adults with access to the internet indicate that over 80% of Californian adults with online access use the internet to address their health. CHBRP found no recent data regarding patient use of e-mail or telephone to communicate with their physicians; literature seems to be focused in the early-mid 2000s. For example, studies of patient-provider communication reported a range of 45% to 90% of patients who used the Internet would like to e-mail their physicians, yet only about 5% reported being able to do so (Katz et al., 2003; Sittig and Ash, 2001). A 2002 survey by Moyer et al. found that 90% of users had never used e-mail to communicate with their provider, and that 88% would like to use that option were it available (Blake et al., 2012). Another study of Geisinger Health Systems' outpatient population found that patients' preferred mode of communication for seven categories of information was about equal between e-mail and in-person visits. Telephone was significantly less preferred by patients. Physicians preferred in-person visits and telephone over e-mail for communication (Hassol et al., 2004).

Kaiser Permanente

Kaiser Permanente Northern California (KPNC) is a unique example of an integrated health care delivery system using all four telehealth technologies. KPNC serves approximately 3.4 million enrollees through 8,000 physicians and 21 hospitals. Robert Pearl describes KPNC's 2008 implementation of an inpatient and ambulatory care electronic health record (EHR) system that includes patient-centered Internet, mobile, and live videoconference tools for its members. More than 100 Internet, mobile, and live videoconference applications enable members to review disease-specific information; access personal health information; make appointments, order refills, exchange secure e-mail messages with providers; and participate in virtual care in lieu of an office visit. KPNC's number of virtual visits grew from 4.1 million in 2008 to 10.5 million in 2013 and telephone visits increased from about 640,000 in 2008 to more than 2.3 million in 2013 (Pearl, 2014). The author estimated that by 2016 virtual visits (e-mail/telephone/video) would outnumber in-person office visits, which have remained constant since 2008.

Table 6. List of Sample Telephone and E-mail Scenarios and Projected Reimbursement Outcomes Associated With AB 1771 for Established Patients Pre- and Postmandate

Sample Telephone and E-mail Scenarios	Premandate Reimbursement	Postmandate Reimbursement	Notes
Patient calls or e-mails doctor to follow up the office visit 3 days prior for unresolved sore throat	No	No	Ineligible: Office visit for same condition occurred within 7 days of call
Patient calls or e-mails doctor with suspected new-onset urinary tract infection. Doctor refers patients for a lab visit and prescribes antibiotics over the phone	No	Yes	Meets 2014 AMA-CTP code 99441-4 criteria for reimbursement
Physician calls established patient regarding a chronic condition	No	No	Ineligible: Physician-initiated call
Patient-generated call to their physician resulting in a next-day appointment	No	No	Ineligible: Face-to-face visit occurred within 24 hrs. following call

A patient with chronic heart failure e-mails their physician about worsening of condition, which results in a medication change	No	Yes	As long as the patient can be treated electronically and does not need an in-person appointment
Patient accessing information from web portal such as a follow-up laboratory report	Outside the scope of AB 1771	No	
Physician contacts a specialist with no patient present to consult on a case	Outside the scope of AB 1771	Unchanged	

Source: California Health Benefits Review Program, 2014.

Table 7. List of Sample Live Videoconference and Store-and-Forward Scenarios and Projected Reimbursement Outcomes Associated With AB 1771 for Established Patients Pre- and Postmandate

Sample Live Videoconference and Store-and-Forward Scenarios	Premandate Reimbursement	Postmandate Reimbursement	Notes
Patient at an office visit speaks with a specialist via videoconference facilitated by her primary care doctor	Possibly (depending on insurer's reimbursement policy)	Likely Unchanged	
Review of electronically transmitted data from an established patient to their physician (e.g., picture of a rash)	No	Yes	Store-and-forward, e-mail, or phone communication about a new rash could be eligible for reimbursement
The review of daily electronic transmitted data from the patient to physician (e.g., glucose readings)	No	Maybe	99444 can only be used once in a 7-day period and must be medically necessary
Rural ED videoconferences with contracted Trauma 1 center for consult	Yes	Yes Unchanged	
Videoconference between psychiatrist and established patient for medication management	Possibly	Yes	Telepsychiatry is common with voluntary reimbursement, but AB 1771 would require reimbursement

Source: California Health Benefits Review Program, 2014.

Key: ED=emergency department.

Disparities in Use of Telehealth

Technology Access

There is limited evidence on disparities in use of or outcomes related to technologies covered by AB 1771. Three observational studies considered use of telephone and electronic health care in California and found some disparities by age, race/ethnicity, income, and literacy. Technology users are generally younger, healthier, and live in more affluent communities (Pearl, 2014;

Uscher-Pines et al., 2013). Non-Hispanic whites are also more likely to use online services than other ethnic groups (Pearl, 2014).

Rural Health Disparities in California

California rural communities exhibit disparities in health status (Table 8) and health care access and are a key population for some telehealth services. Travel barriers and inadequate provider-patient ratios are telehealth-relevant factors that contribute to rural health disparities. About 14% (5.2 million) of California’s 37.7 million residents live in rural areas (CalSORH, 2013) and in about two-thirds of counties, the number of physicians per capita is less than what is considered adequate to meet demand (CHCF, 2012).

Table 8. Comparison of Health Indices Between California’s Urban and Rural Residents in 2011

Location	Urban	Rural
Percent of State population	86	14
Percent over age 55 years	53.6	55.9
Self-reported health (%)		
• Self-assessment of poor health	4.4	6.1
• Self-report of mental health issue within 1 to 21 days	34.1	37.8
• Self-report of physical health issue for 15 to 31 days	40.3	52.8
• Self-report of unable to self-care, work or recreation during past 31 days	21.4	27.0
Live birth rate (per 1,000)	13.1	14.3
Crude death rate (per 100,000)	626.3	693.8

Source: California Health Benefits Review Program, 2014, based on Rural Health Report, CalSORH, California State Office of Rural Health, Department of Health Care Services Primary and Rural Health Division.

Telehealth may help to overcome some of the disparities in health care by redistributing knowledge and expertise when and where it is needed, including rural areas of California (Nesbitt, 2012). However, telehealth has yet to meet rural demand according to one study. Of 60 California rural health clinics surveyed in 2012, 53% used no telehealth services in 2012, and 47% used videoconferencing; only 5% used store-and-forward and 3% home monitoring. Cost of equipment and no arrangements with specialists were the primary obstacles to clinic participation (52% and 48%, respectively) (CHCF, 2012). About half of the clinics used the Internet to contact other providers, but just 12% did so to contact patients. These clinics represented 22% of the 271 clinics that provide 44% of primary care in rural California. Physicians provided 56% of care, most of which was primary care (95%), whereas other services were lacking (CHCF, 2012).

Overview of Current Procedural Terminology and the Healthcare Common Procedure Coding System Pertinent to AB 1771

AB 1771 targets Current Procedural Terminology (CPT®) codes associated with telephone, e-mail, and other electronic communication modalities. The American Medical Association developed current CPT and corresponding codes to describe the diagnostic and therapeutic procedures and medical and surgical services that are performed by physicians and others (American Medical Association, 2011; Giannangelo, 2006). These codes are part of the larger Healthcare Common Procedure Coding System (HCPCS), and are used for Medicare and Medicaid reimbursement as well as nationally by health care providers, medical suppliers, and health insurance carriers to streamline the billing and reimbursement process.

HCPCS is composed of three categories of codes: I, II, and III. Category I codes are the CPT codes, representing procedures that are performed by many healthcare professionals (Giannangelo, 2006). CPT level I codes may also have a two-digit modifier that identify a service or procedure that has been altered by some specific circumstance, but not changed in overall scope. This includes the modifiers GT and GQ for “interactive audio and video telecommunications systems” (live videoconferencing) and “asynchronous telecommunications system” such as store-and-forward technology, respectively. (See [Appendix D](#) for codes and modifiers used in this analysis).

Category I HCPCS codes (CPT codes) are divided into six main sections; the *evaluation and management (E/M)* section is most relevant to AB 1771. The E/M codes are designed to report healthcare provider work as performed in different clinical settings. For a health care provider to be reimbursed, the service must be a covered patient benefit and meet the technical criteria for “medical necessity”. Category II HCPCS codes are supplemental tracking codes that are used for performance measurement, and are not relevant to AB 1771. Category III HCPCS codes are temporary codes used to describe emerging or experimental technologies that do not yet qualify for regular CPT codes. These codes may be relevant to AB 1771. Medicare, Medicaid, and many private insurance companies accept select category III codes for reimbursement purposes.

Telephone and Electronic Mail Service CPT Codes

Telephone service CPT codes (99441–99444) are non–face-to-face E/M services provided by a physician to a patient using the telephone. These codes are used by the physician *to report an episode of care initiated by an established patient* (or guardian of an established patient). If the telephone service ends with a decision to see the patient within 24 hours or next available urgent visit appointment, the code is not reported, rather the encounter is considered part of the pre-service work of the subsequent E/M encounter. Likewise, if the telephone call refers to an E/M service performed and billed by the physician within the previous seven days (either physician request or unsolicited patient follow-up) or within the postoperative period of the previously completed procedure, then the service(s) are considered part of that previous E/M service or procedure (American Medical Association, 2013). The three telephone code levels differ only in the number of minutes of medical discussion (as follows):

- **99441:** 5–10 minutes of medical discussion.

- **99442:** Telephone services as above, 11–20 minutes of medical discussion
- **99443:** Telephone services as above, 21–30 minutes of medical discussion.

On-line electronic medical evaluation (CPT code 99444) is a non–face-to-face E/M service by a physician to a patient using Internet resources (or similar electronic communications network) in response to a patient’s online inquiry. Reportable services involve the physician’s personal timely response to the patient initiated inquiry and must involve permanent storage (electronic or hard copy) of the encounter. This service is reported only once for the same episode of care during a seven-day period, although multiple physicians could report their exchange with the same patient. As with telephone services, if the online medical evaluation refers to an E/M previously performed and reported by the physician within the previous seven days (either physician requested or unsolicited patient follow-up) or within the postoperative period of the previously completed procedure, then the service(s) are considered covered by the previous E/M service or procedure. A reportable service encompasses the sum of the communication (e.g., related telephone calls, prescription provision, laboratory orders) pertaining to the online patient encounter (American Medical Association, 2013).

To bill for either a telephone or online electronic visit, the patient must have an established relationship with the physician where professional services have been received during the last three years from the physician, or another physician of the same specialty who belongs to the same group practice (American Medical Association, 2011; Giannangelo, 2006).

Table 3 provides examples of encounters where AB 1771 would or would not require coverage of E/M services. These scenarios are based on CPT telephone and online services codes as well as store-and-forward and live videoconferencing codes. The approval of physician charges would be subject to the insurance carrier and, where disputed, with state regulators (DMHC or CDI).

MEDICAL EFFECTIVENESS

As discussed in the *Introduction*, AB 1771 would require state-regulated health insurance to cover telephonic and electronic patient management services for existing patients beginning in January 2015. State-regulated insurers would also be required to “reimburse...at the same level and amount as face-to-face patient encounters with similar complexity and time expenditure.” The medical effectiveness review includes systematic reviews and individual studies published from 2004 to present.

AB 1771 would mandate coverage of telephone and e-mail evaluation and management encounters with patients and reimbursement of physicians for those services. The medical effectiveness review summarizes findings from the literature on the effectiveness of telephone and e-mail evaluation and management as well as the effectiveness of those telehealth modalities defined in the state’s Business & Professions Code, live videoconference and store-and-forward.

The medical effectiveness review for AB 1771 encompassed studies of patients with a wide range of diseases and conditions because the bill would require coverage and reimbursement for use of telephone, e-mail, live videoconferencing or store-and-forward to provide covered health care services to all enrollees. The specific services assessed varied depending on patients’ conditions.

Research Approach and Methods

Studies of telephone, e-mail, live videoconferencing, and store-and-forward were identified through searches of PubMed, the Cochrane Library, Web of Science, EconLit, and Business Source Complete, the Cumulative Index of Nursing and Allied Health Literature, and PsycInfo. Websites maintained by the following organizations that produce and/or index meta-analyses and systematic reviews were also searched: the Agency for Healthcare Research and Quality, the International Network of Agencies for Health Technology Assessment (INAHTA), the National Health Service (NHS) Centre for Reviews and Dissemination, the National Institute for Health and Clinical Excellence (NICE), and the Scottish Intercollegiate Guideline Network.

The medical effectiveness review included studies of the use of telephone, e-mail, live videoconferencing, or store-and-forward by physicians to provide evaluation and management. The review focused on studies of the use of these technologies by physicians because AB 1771 would only require coverage and reimbursement for use of these services by physicians. Studies of interventions in which registered nurses or other nonphysicians had extensive contact with patients via telephone, e-mail, live videoconference, and store-and-forward were excluded.⁵⁷

Studies of remote patient monitoring were excluded because remote patient monitoring interventions usually involve the use of electronic devices to transmit data on patients’ conditions, such as weight and blood glucose, to health professionals at remote sites. These health professionals analyze the data and use it to identify patients whose conditions are not under control and to contact those patients by telephone, e-mail, or other means to determine

⁵⁷ See, for example, studies included in Neubeck et al.’s (2009) systematic review on telehealth interventions for secondary prevention of heart disease.

whether their treatment plans need to be revised.⁵⁸ For such interventions, one cannot separate the effect of collecting and analyzing data on patients from the effect of contacts between patients and health professionals. In addition, remote monitoring interventions are often provided by registered nurses or other nonphysicians. Physicians are usually consulted only as needed.

The medical effectiveness review also excluded studies of the use of telephone, e-mail, live videoconferencing, and store-and-forward for communications between physicians and between physicians and other health professionals because AB 1771 would only require reimbursement for interactions between physicians and patients.⁵⁹

The search was limited to abstracts of studies published in English. The search was limited to studies published from 2004 to present. Of the 267 articles found in the literature review, 64 were reviewed for potential inclusion in this report on AB 1771, and a total of 36 studies were included in the medical effectiveness review for this report. Some of these studies were systematic reviews that had inclusion criteria that were broader than CHBRP's criteria. In those cases, CHBRP summarized findings only from studies included in the systematic reviews that met its inclusion criteria. The other articles were eliminated because they did not focus on telephone, e-mail, live videoconferencing or store-and-forward, did not assess use of these technologies by physicians, were of poor quality, or did not report findings from clinical research studies. 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 a table describing the studies that CHBRP reviewed (Table C-1) and a table summarizing evidence of effectiveness (Table C-2).

Methodological Considerations

Telephone, e-mail, live videoconferencing and store-and-forward may be used either as a substitute for in-person care or as a supplement to in-person care. For studies of telephone, e-mail, live videoconferencing and store-and-forward as a substitute for in-person care, the relevant questions are: (1) is there evidence that care provided via these technologies is at least as good as care provided in-person; and (2) is there evidence that providing care via these technologies improves access to care. For studies of telephone, e-mail, live videoconferencing, and store-and-forward as a supplement to in-person care, the relevant question is whether there is evidence that adding these technologies to in-person care improves processes of care and health outcomes relative to receiving in-person care alone.

Studies of telephone, e-mail, live videoconferencing, and store-and-forward used for evaluation and management have some important methodological limitations.

⁵⁸ See, for example, studies included in Inglis et al.'s (2010) systematic review of studies on remote monitoring for congestive heart failure.

⁵⁹ One group of studies excluded from CHBRP's review consists of studies of e-referral systems through which primary care providers obtain consultations with specialists to assess whether a patient needs to be referred to the specialists and, if so, what laboratory tests or imaging studies should be completed. (See, for example, Kim-Hwang et al., 2010.) Other examples include studies of Project Echo and other interventions in which specialist physicians use live videoconferencing to educate primary care providers about management of patients with particular conditions. (See, for example, Arora et al., 2011.)

Pace of technological change: A major limitation of the literature on telephone, e-mail live videoconferencing, and store-and-forward is that advances in technology are outpacing the publication of studies of these technologies. There is often a long delay between the time a manuscript is accepted by a journal and the time it is published. By the time a study is published, more sophisticated technology may be available at a lower cost. For example, the cost of technology used to render digital images has decreased substantially. Images captured through cell phones may become adequate for live videoconferencing and store-and-forward applications.

Diseases and conditions studied: Many studies of the effectiveness of physicians' use of telephone, e-mail, live videoconferencing, and store-and-forward only assess outcomes for persons with particular diseases or conditions. Some are well-designed randomized controlled trials (RCTs) that provide strong evidence of the impact of these technologies on patients with the particular disease or condition studied. However, their findings are not fully generalizable to AB 1771 because the bill would require coverage and reimbursement for use of these technologies to treat all diseases and conditions. Findings from a study of the impact of use of secure e-mail on persons with diabetes, for example, may not generalize to patients with other diseases or conditions.⁶⁰

Location: In addition, many studies of telephone, e-mail, live videoconferencing, or store-and-forward have been conducted outside the United States. The organization and financing of health care differs substantially across nations. Generalizing findings from studies conducted outside the United States regarding the impact of telephone, e-mail, live videoconferencing, or store-and-forward on access to care and utilization of other types of health care services is especially challenging because cross-national differences in health care systems may affect the manner in which these technologies are implemented and the in-person care to which these interventions are compared. For this reason, CHBRP's discussion of findings regarding effects on access to care and utilization focuses on studies conducted in the United States; however international studies using other outcomes are included in this review.

Lack of randomization: Many studies of telephone, e-mail, live videoconferencing, and store-and-forward do not randomly assign patients to receive these services as a substitute or supplement for usual care. For example, only one of the studies of secure e-mail conducted in the United States randomly assigned patients to have access to secure e-mail or to not have access to e-mail (Ralston et al., 2009). All other studies of secure e-mail in the United States had before-and-after designs or cross-sectional designs because the studies were conducted in integrated delivery systems that provided secure e-mail access to all enrollees at the same time. (Bredfeldt et al., 2011; Chen et al., 2009; Harris et al., 2009, 2013; Zhou et al., 2007, 2010). Two studies (Zhou et al., 2007, 2010) provide somewhat stronger evidence because the authors compared findings for matched samples of enrollees who used and did not use secure e-mail after it was

⁶⁰ The appropriateness of specific telehealth technologies also varies across diseases and conditions. Store-and-forward is primarily useful for specialties, such as dermatology, for which treatment recommendations are based largely on review of medical imaging. It is not very useful for specialties, such as psychiatry, in which real-time interaction between clinician and patient is integral to treatment.

made available. Users and nonusers were matched on several characteristics that may have affected the findings, such as age, sex, and having a chronic condition. However, the findings could have been affected by differences between users and nonusers on which the subjects were not matched. For example, neither of the studies controlled for income or education, two factors that affect health status independent of the manner in which medical care is delivered. If users of secure e-mail had higher incomes and were better educated than nonusers, the differences in outcomes that Zhou and colleagues observed may have been due to these differences and not to use of secure e-mail.

Sample size: In addition, many studies of telephone, e-mail, live videoconferencing and store-and-forward have examined small numbers of patients. These studies may not have sufficient statistical power to detect statistically significant differences in outcomes between patients treated via telephone, e-mail, live videoconferencing or store-and-forward and patients receiving usual care. Thus, one has less confidence about what the findings mean. If a study with a small sample size does not find a statistically significant difference between patients treated via these technologies and in-person care, the finding may mean that there is no difference between the two mechanisms for providing care or it may mean that the study has not enrolled enough patients to detect a difference. Similarly, if a study with a small sample size finds a statistically significant difference, the magnitude of the difference may not be replicated by a study with a large sample size.

Inability to disaggregate from other interventions. An important limitation of the studies of secure e-mail is that in all cases e-mail access was provided as part of a web portal that included other features such as information about self-care for chronic conditions and minor injuries, access to laboratory and imaging test results, and ability to order refills for prescription drugs. In these studies the effects of secure e-mail cannot be separated from the effects of other web portal features. Findings from these studies are not fully generalizable to AB 1771 because the bill only requires coverage for e-mail and does not require health plans to provide web portals with additional features that could help enrollees manage their conditions.⁶¹

Outcomes Assessed

The medical effectiveness review addressed several major types of outcomes relevant to AB 1771.

- Access to care outcomes, such as reduction in wait times for outpatient appointments and hospitalizations avoided;
- Utilization outcomes, such as changes in numbers of physician visits, emergency department visits, and hospitalizations;
- Process of care outcomes, including both clinician and patient adherence to recommended treatment regimens;

⁶¹ CHBRP excluded studies in which the intervention gave patients access to electronic health records without also providing access to secure e-mail because such studies are outside the scope of AB 1771. The bill would mandate coverage and reimbursement for e-mail but would not require coverage or reimbursement for use of electronic health records.

- Accuracy of diagnoses and treatment plans made based on telephone, e-mail, live videoconferencing and store-and-forward relative to diagnoses and treatment plans based on in-person visits; and
- Health outcomes, including both physiological outcomes, such as blood pressure and blood sugar levels, and patient-reported outcomes, such as scores on surveys about symptoms or quality of life.

Access to care: For the medical effectiveness review, CHBRP focused on measures of access to care that address the availability of medical care. If telephone, e-mail live videoconferencing, and store-and-forward enable physicians to deliver care more efficiently, patients may be able to obtain necessary care more quickly. For example, if these technologies are used to provide treatment or advice for minor conditions, the number of patients requesting outpatient visits for primary care may decrease, potentially reducing waiting time for primary care visits. These technologies may also be used for initial consultations with specialists. If these teleconsultations are sufficient for some patients, waiting times for specialist outpatient visits may decrease. Finally, use of telephone, e-mail, live videoconferencing, and store-and-forward may enable some patients to receive timely outpatient care that could obviate the need for emergency department visits or hospitalizations.

Utilization: In some cases, differences in utilization of health care services may serve as proxies for differences in health status. For example, differences in emergency department visits and hospitalizations are often interpreted as indications of differences in health status because people usually visit emergency departments and hospitals when they are acutely ill. The health status implications of differences in rates of outpatient visits are more difficult to interpret. Many persons may benefit from interaction with clinicians and persons with chronic disease in particular benefit from having clinicians monitor their condition and adjust treatment plans as needed. A key question for studies of telephone and e-mail interventions is whether telephone calls and e-mails serve as substitutes for office visits for patients with minor health care needs. If patients with minor needs can be managed effectively via telephone or e-mail, clinicians may be able to provide more access to outpatient visits for patients with more extensive and more complicated needs.

Processes of care: Studies of the effects of telephone, e-mail, live videoconferencing and store-and-forward on processes of care often focus on patients with specific diseases or conditions. Some studies address effects on patients' adherence to self-administered medications, such as those used to control diabetes, hypertension, and high cholesterol. Others concern effects on use of treatments administered by clinicians, such as tissue plasminogen activator (tPA) for acute stroke. Findings from studies of processes of care for specific diseases or conditions may not generalize to other diseases and conditions.

Accuracy of diagnosis: Most studies on accuracy of diagnosis have assessed use of live videoconferencing or store-and-forward for dermatology. This focus probably reflects both the widespread use of these technologies in dermatology and the ability to make "gold standard" comparisons between dermatologists' initial diagnoses and biopsy results. Many studies of teledermatology have also examined concordance between the diagnoses and treatment recommendations of dermatologists using live videoconferencing or store-and-forward to those

of dermatologists examining patients in person. While there is some value to assessing agreement, the results are useful only if studies control for variation in diagnoses and treatment recommendations across dermatologists. If a dermatologist using teledermatology is compared to another dermatologist examining patients in person, the difference may be due to the differences in the manner in which patients were examined but may also be due to differences between the dermatologists that are independent of the manner in which patients were examined. When examining the same skin lesions, some dermatologists may rate a higher percentage as possibly malignant than another dermatologist regardless of whether the lesions are examined in-person or via live videoconferencing or store-and-forward. The best studies of agreement compare assessments made by two or more clinicians in person to assessments made via live videoconferencing or store-and-forward. This approach enables the research team to determine how well correlated clinicians' diagnoses and treatment plans are when providing care in the same manner. They can then control for that correlation when comparing diagnoses and treatment plans based on live videoconferencing or store-and-forward and in-person care.

Health outcomes: The health outcomes measured vary substantially across studies because many studies enrolled only patients with specific diseases or conditions. The most important health outcomes for persons with diabetes, for example, differ from the most important health outcomes for persons with depression. As a consequence, generalizing findings across studies of the effects of telephone, e-mail, live videoconferencing, and store-and-forward on health outcomes is difficult.

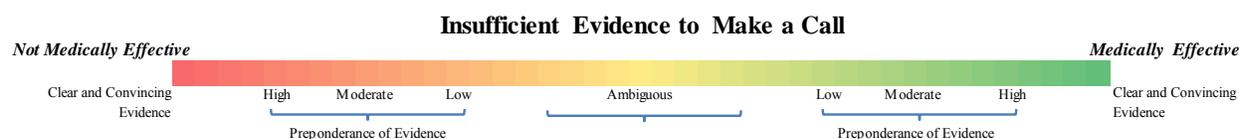
Findings

Findings are reported separately for: (1) telephone and e-mail; and (2) live videoconferencing and store-and-forward.

Telephone and E-mail

- There are fewer studies of telephone and e-mail interventions pertinent to AB 1771 than studies of live videoconferencing and store-and-forward and their research designs are weaker on average.
- Taken collectively, the findings from studies of telephone and e-mail interventions similar to those for which AB 1771 would require coverage suggest that there is insufficient evidence to determine whether medical care provided via telephone or e-mail is as effective as medical care provided in-person.
- Although there is some evidence that e-mail can improve health status and processes of care and reduce outpatient visits, all of the studies were conducted in Kaiser Permanente and other large integrated delivery systems that implemented e-mail as part of web portals with multiple functions. It cannot be determined whether findings from these studies would be replicated if patients were provided access to e-mail outside of a multifaceted web portal and outside an integrated delivery system.

Figure 3. Medical Effectiveness Findings for Telephone and E-mail



Access to care

Telephone. CHBRP did not identify any studies that assessed the impact of telephone calls on access to care. The absence of evidence is not evidence of no effect. It is an indication that the impact of telephone calls on access to care is unknown.

E-mail. CHBRP did not identify any studies that assessed the impact of e-mail on access to care. The absence of evidence is not evidence of no effect. It is an indication that the impact of e-mail on access to care is unknown.

Summary of findings regarding the effects of telephone and e-mail on access to care.

There is insufficient evidence to determine whether telephone calls or e-mail improve access to care. The absence of evidence is not evidence of no effect. It is an indication that the impact of telephone calls and e-mails on access to care is unknown.

Utilization

Telephone. Hospitalizations: The only studies of the effects of telephone calls on hospitalizations were conducted outside the United States. Three RCTs examined the impact of telephone calls on hospitalizations. A RCT of a general population of patients in the United Kingdom⁶² found that patients who had access to afterhours telephone consultations with primary care physicians had similar numbers of hospitalizations as patients who did not have access to afterhours telephone consultations (Darnell et al., 1985). A RCT of post-discharge telephone calls to patients in Hong Kong who had chronic obstructive pulmonary disease (COPD) found that the telephone calls did not reduce the odds of hospitalization relative to usual care (Wong et al., 2005). By contrast, a RCT of persons with asthma in Japan found that telephone calls reduced the odds of hospitalization (Kokubu et al., 2000).

Emergency department visits: Four studies conducted outside the United States assessed the impact of telephone calls on emergency department (ED) visits. Two RCTs of general populations of patients found patients who had access to telephone consultations with primary care physicians had similar numbers of ED visits as patients who did not have access to telephone consultations (Darnell et al., 1985; McKinstry et al., 2002). RCTs of patients with specific diseases or conditions had inconsistent findings. The RCT of telephone calls to patients with COPD was associated with a reduction in ED visits (Wong et al., 2005), whereas the RCT

⁶² As previously mentioned, the organization and financing of health care differs substantially across nations. Generalizing findings from studies conducted outside the United States regarding the impact of telephone, e-mail, live videoconferencing, or store-and-forward on access to care and utilization of other types of health care services is especially challenging because cross-national differences in health care systems may affect the manner in which these technologies are implemented and the in-person care to which these interventions are compared.

of patients with asthma found no difference between patients who received telephone calls and patients who only received usual care (Kokubu et al., 2000).

Primary care office visits: One study conducted in the United Kingdom that used an interrupted time series design found that having primary care physicians make telephone calls to patients who requested a same-day appointment was associated with a 39% decrease in the number of office visits per week (Jiwa et al., 2002).

E-mail. Three studies of the effects of secure e-mail on utilization of other health care services were conducted in the United States. All three studies analyzed data on persons enrolled in Kaiser Permanente or Group Health Cooperative (Chen et al., 2009; Harris et al., 2009; Zhou et al., 2007). In all of these studies enrollees could send secure e-mail to their physicians as part of a multifaceted web portal. Findings may not generalize to persons who have access to e-mail alone. The findings also may not generalize to persons enrolled in health plans in which care is not provided through an integrated delivery system.

Office visits: The two most generalizable studies assess the impact of Kaiser Permanente's web portal on utilization trends among all enrollees in Kaiser Permanente's Hawaii and Pacific Northwest regions (Chen et al., 2009; Zhou et al., 2007). Chen and colleagues (2009) found that the introduction of a web portal with secure e-mail was associated with a 25% decrease in office visits for primary care and a 22% decrease in office visits for specialty care. The study also found that introduction of the web portal was associated with an 11% increase in ED visits and a 19% increase in urgent care visits. Chen and colleagues (2009) only examined aggregate trends in utilization of health care services. They did not assess whether utilization differed between users and nonusers of secure e-mail. Zhou and colleagues (2007) used a stronger research design in which they compared 3,201 web portal users to 3,201 nonusers who were matched on age/sex, selected chronic conditions, and primary care physician. This matched case-control study found that prior to the availability of the web portal, enrollees who became web portal users had a higher mean number of annual in-person visits for primary care per than persons who did not use the web portal (2.44 vs. 2.16 visits). After the web portal became available, the numbers of annual in-person visits for primary care per enrollee decreased among both web portal users and nonusers but that the decrease was larger among users (-10.3% vs. -3.7%). This finding suggests that secure e-mail may substitute for some office visits to primary care providers.

An RCT of a general population of patients who received care in a primary care practice in Norway found that access to secure e-mail was associated with fewer outpatient visits (Bergmo et al., 2005). Although this study was well-designed, its generalizability is limited because it was conducted in a single primary care practice outside the United States.

Findings from studies that focused on persons with diabetes differed from findings of studies of general populations. An observational study of persons with diabetes enrolled in Group Health found that persons with high use of secure e-mail (≥ 12 threads in 15 months) had higher rates of ED visits and outpatient visits for both primary care and specialty care (Harris et al., 2009). A RCT conducted at the University of Washington compared persons with diabetes who had access to a web portal through which they could exchange e-mails with a care manager (Ralston et al., 2009). The RCT found no difference between persons in the intervention and control groups in numbers of inpatient days and numbers of office visits for primary care and specialty care. This

study has a stronger research design than other studies conducted in the United States but the findings may be less generalizable to AB 1771 because patients exchanged e-mails with a care manager and not a physician.

E-mail versus telephone: Six studies assessed whether secure e-mail affects the volume of telephone calls. Their findings are conflicting. One of the two studies of Kaiser Permanente enrollees found that persons who used secure e-mail made fewer telephone calls (Zhou et al., 2007). The other Kaiser study, which only looked at aggregate data, found that the volume of telephone calls increased substantially (Chen et al., 2009). Three studies of general populations of patients conducted in university medical centers in the United States also had conflicting findings. One found that physicians whose patients had access to secure e-mail made fewer telephone calls (Liederman et al., 2005), one found that secure e-mail was associated with an increase in telephone calls (Katz et al., 2003), and the third found that secure e-mail had no effect on telephone calls (Lin et al., 2005). The authors of the RCT conducted in Norway reported that access to secure e-mail was not associated with a change in the number of telephone calls patients made (Bergmo et al., 2005).

Summary of findings regarding the effects of telephone and e-mail on utilization

- The preponderance of evidence from studies with strong research designs suggests that adding telephone calls with physicians to usual care did not reduce ED visits or hospitalizations.
- The preponderance of evidence from studies with moderate to weak research designs that examined general populations of patients suggests that e-mail reduces utilization of office visits for primary care and specialty care.

Processes of care

Telephone. CHBRP identified one RCT that compared telephone calls to usual care (Gruffydd-Jones et al., 2005). The study examined the impact of substituting telephone consultations for in-person visits to monitor asthma control and adjust treatment as needed. The authors found that persons in the telephone group were more likely to have at least one asthma consultation within a 12-month period. The study is an RCT but its generalizability is limited because it was conducted in a single general practice in the United Kingdom⁶³ and only enrolled people with asthma.

E-mail. CHBRP identified three studies of the impact of secure e-mail on receipt of recommended screening exams among persons with diabetes. Two of the studies analyzed data on persons with diabetes who were enrolled in Kaiser Permanente (Bredfeldt et al., 2011; Zhou et al., 2010). One analyzed data on persons enrolled in Group Health Cooperative, an integrated

⁶³ As previously mentioned, the organization and financing of health care differs substantially across nations. Generalizing findings from studies conducted outside the United States regarding the impact of telephone, e-mail, live videoconferencing, or store-and-forward on access to care and utilization of other types of health care services is especially challenging because cross-national differences in health care systems may affect the manner in which these technologies are implemented and the in-person care to which these interventions are compared.

health plan and delivery system that is similar to Kaiser Permanente (Harris et al., 2013). Findings from Kaiser Permanente and Group Health may not generalize to patients who obtain care outside of integrated health systems. In addition, secure e-mail is bundled with web portals that allow patients to do other things that could help them obtain recommended screening such as automated reminders when screenings are due. One cannot be certain that the effects observed are due to secure e-mail and not to other parts of the web portal. Finally, all three of these studies were observational studies with comparison groups that did not control for income, education, or other factors that may have affected adherence to screening recommendations.

Two studies assessed the effect of secure e-mail on receipt of recommended screenings by persons with diabetes (Harris et al., 2013; Zhou et al., 2010). Both studies found that persons with diabetes who used secure e-mail were more likely to have had a hemoglobin A1c test than nonusers who were matched by age, sex, primary care provider, and diagnostic cost group score. Zhou and colleagues also found that secure e-mail users were more likely to have had screening tests for high cholesterol, diabetic nephropathy, and diabetic retinopathy.

One study compared the impact of secure e-mail communications between office visits to telephone communication between office visits on receipt of four screening exams that are important for persons with diabetes (Bredfeldt et al., 2011). The authors used a composite score to examine changes in receipt of annual eye exams, annual foot exams, annual nephropathy screening, and screening regarding smoking status.⁶⁴ The authors found that secure e-mail correspondence was associated with a statistically significant improvement in the composite score but that telephone communication did not have a statistically significant effect.

Summary of findings regarding the effects of telephone and e-mail on processes of care:

- There is insufficient evidence to determine whether substituting telephone visits for in-person visits increases the likelihood that patients will receive recommended care. The absence of evidence is not evidence of no effect. It is an indication that the impact of telephone calls and e-mails on accuracy of diagnoses and treatment plans is unknown.
- There is a preponderance of evidence from studies with moderate research designs that persons with diabetes who use secure e-mail within a multifaceted web portal are more likely to receive recommended screening exams.

Accuracy

Telephone. CHBRP did not identify any studies of the accuracy or agreement of diagnosis and management via telephone versus in-person care. It is an indication that the impact of telephone calls on accuracy and agreement of diagnosis and treatment is unknown.

E-mail. CHBRP did not identify any studies of the accuracy or agreement of diagnosis and treatment plans via e-mail versus in-person care. It is an indication that the impact of e-mail on accuracy and agreement of diagnosis and treatment is unknown.

⁶⁴ Smokers also received advice to quit smoking and were offered smoking cessation treatment.

Summary of findings regarding the effects of telephone and e-mail on accuracy of diagnosis and treatment plans.

- There is insufficient evidence to determine whether diagnoses and treatment plans based on telephone calls or e-mail are at least as accurate as diagnoses and treatment plans based on in-person care. The absence of evidence is not evidence of no effect. It is an indication that the impact of telephone calls and e-mails on accuracy of diagnoses and treatment plans is unknown.

Health outcomes

Most of the studies of the effects of telephone and e-mail on health outcomes that CHBRP identified only assessed persons with specific diseases or conditions and analyzed disease specific measures, such as hemoglobin A1c. The exceptions are a few studies that analyzed general health status as measured by the Short Form Health Survey (e.g., SF-12, SF-36). As a consequence, findings from most studies do not generalize to the entire population whose health insurance coverage would be affected by AB 1771.

Telephone. CHBRP identified three studies of telephone calls that examined effects on health status. Findings from these studies were conflicting.

Two RCTs investigated the impact of substituting telephone calls for some office visits among persons with chronic conditions. One RCT examined the impact on persons with diabetes of using telephone calls to substitute for some in-person office visits to an endocrinologist (Leichter et al., 2013). The authors found that substituting telephone calls for office visits was associated with a larger reduction in weight and with similar outcomes to in-person care for hemoglobin A1c, cholesterol, and blood pressure. An RCT that enrolled persons with asthma in a single primary care practice in the United Kingdom⁶⁵ found that substituting telephone calls for some in-person office visits to general practitioners was associated with better quality of life but did not improve asthma control (Gruffydd-Jones et al., 2005).

One RCT assessed the impact of supplementing usual office-based care with two telephone calls (Bogner et al., 2012). Patients in the telephone plus office-based care group experienced a greater reduction in hemoglobin A1c relative to patients who only received office-based care.

E-mail. CHBRP identified five studies of the impact of secure e-mail on health outcomes. All focused on persons with diabetes. One was an RCT conducted at the University of Washington (Ralston et al., 2009). For this study, a care manager (likely a nurse, but the article does not say) was responsible for responding to e-mails and involved the physicians only as needed. The other four studies were observational studies conducted in Kaiser Southern California (Zhou et al., 2010), Group Health (Harris et al., 2009, 2013), and a private practice in British Columbia,

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Canada (Lau et al., 2014). Ralston and colleagues (2009) randomly assigned patients to receive either usual care or usual care plus access to a web portal that included secure e-mail. Zhou and colleagues (2010) compared secure e-mail users and nonusers who were matched on age, sex, primary care provider, diagnostic cost group score, and measures of health outcomes and receipt of recommended preventive services prior to availability of secure e-mail. Lau and colleagues (2014) also compared users and nonusers. Harris and colleagues (2009 and 2013) compared frequent users of secure e-mail to infrequent users.

The five studies consistently found that use of secure e-mail was associated with better glycemic control as measured by hemoglobin A1c (HbA1c). These findings were robust across different measures of glycemic control (e.g., mean change in HbA1c, mean HbA1c at follow up, percentage of patients with HbA1c <7%). Four of the studies examined effects on hyperlipidemia (high cholesterol) and hypertension (high blood pressure) among persons with diabetes. The RCT found no difference in cholesterol or blood pressure outcomes between secure e-mail users and nonusers (Ralston et al., 2009). Two of the observational studies with comparison groups found that use of secure e-mail was associated with improvement in cholesterol (Harris et al., 2009; Zhou et al., 2010), and one found no difference between users and nonusers (Lau et al., 2014). One observational study (Zhou et al., 2010) reported that use of secure e-mail was associated with improvement in blood pressure, and two observational studies found no difference between users and nonusers (Harris et al., 2009; Lau et al., 2014).

Findings from the RCT may be less generalizable than findings from the other four studies because a care manager responded to e-mails from patients and involved physicians only as needed. In the four other studies, patients exchanged e-mails directly with primary care providers. On the other hand, the RCT has a stronger research design which is likely to yield a more accurate estimate of the intervention's effects. Although the four observational studies used either matching (Lau et al., 2014; Zhou et al., 2010) or regression analysis (Harris et al., 2009, 2013) to control for age, sex, diabetes duration, diabetes severity, co-morbidities, and/or primary care provider characteristics, none controlled for income or education, two factors that may independently affect health outcomes for persons with diabetes.

An important limitation of these studies in terms of generalizability to AB 1771 is that in all cases secure e-mail was part of a web portal that included other features such as information on self-care, ability to order refills for prescription drugs, and ability to view lab test results. One cannot know whether the findings observed would be similar if persons with diabetes only had access to e-mail without other features of a web portal. Additional features of web portals may be especially important for persons with diabetes because their treatment regimens are complicated.

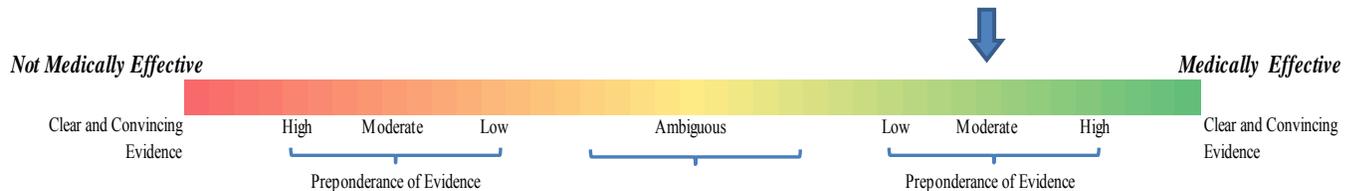
Summary of findings regarding the effects of telephone and e-mail on health outcomes.

- Evidence regarding the impact of telephone visits on health outcomes (relative to in-person care) is ambiguous and limited to diabetes and asthma.
- There is a preponderance of evidence from studies with strong to moderate designs that use of secure e-mail as part of a multi-multifaceted web portal is associated with better glycemic control among persons with diabetes but does not affect hypertension or hyperlipidemia.

Live Videoconferencing and Store-and-Forward

Taken collectively, findings from studies of live videoconferencing and store-and-forward suggest that for the diseases and conditions studied there is a preponderance of evidence from studies with research designs with moderate strength that medical care provided by live videoconferencing and store-and-forward is at least as effective as medical care provided in person.

Figure 4. Medical Effectiveness Findings for Live Videoconferencing and Store-and-Forward



Access to care

Live videoconferencing. Hospital-based specialty care: One observational study conducted in a rural region of Spain examined the impact of live videoconferencing on access to hospital-based specialty outpatient care among persons with any disease or condition (Ferrer-Roca et al., 2010). The study compared patients whose initial visit with a specialist was provided via live videoconference to patients whose initial visit was in person. The authors found that patients whose initial specialist visit was provided by live videoconference were more likely to receive a diagnosis, physical examination, and treatment in less than 1 month and that these differences were statistically significant.

Acute care: Five studies examined the impact of live videoconference on access to acute care for patients with specific types of diseases or conditions. All of the studies compared consultations provided by live videoconference to consultations provided via telephone. An RCT conducted in Hong Kong that compared live videoconference to telephone consultation for patients with acute neurosurgical conditions (head injury, stroke, etc.) found no association between the mode of consultation and the percentage of patients who were transferred to a specialized neurosurgical center at a tertiary hospital (Wong et al., 2006). A controlled trial⁶⁶ conducted in Germany compared live videoconferencing to telephone consultation for patients with acute stroke (Handschu et al., 2008). The authors found that live videoconferencing was associated with a lower rate of transfer to a stroke center at a tertiary hospital. Three before-after studies examined the impact of introducing live videoconferencing on transfers to specialized units at tertiary hospitals. Two of the studies were conducted in the United States and compared live videoconference and telephone consultations for burns and trauma (Duchesne et al., 2008; Saffle et al., 2009). A study conducted in Spain compared live videoconferencing and telephone consultations for acute stroke (Pedragosa et al., 2009). All three studies found that introduction of live videoconferencing was associated with a reduction in transfers to specialized units at tertiary hospitals relative to telephone consultation, thus enabling more patients to be treated closer to their homes. However, in studies with before-after designs, one cannot rule out the

⁶⁶ Live videoconferencing and telephone were used on alternating weeks.

possibility that the differences observed are due to secular trends in care delivery that would have occurred regardless of whether live videoconference were available.

Store-and-forward. Dermatology: CHBRP identified a systematic review of controlled studies of teledermatology that included four studies that assessed the effects of store-and-forward on access to dermatology care (Warshaw et al., 2011). Two of these studies were RCTs and two were observational studies with comparison groups. One of the RCTs was conducted in the United States. These studies consistently found that teledermatology was associated with shorter time to treatment as measured by time until dermatologist appointment, time until biopsy, and time until surgery or other definitive intervention.

A study conducted in New Zealand compared the impact of store-and-forward versus in-person dermatology visits on average wait time for dermatologist appointments. Use of store-and-forward was associated with a substantial reduction in wait times.

Ear, nose, & throat specialists: A before-after study examined the impact of store-and-forward on access to ear, nose, and throat specialists (ENTs) among Native Alaskans living in a rural area (Hofstetter et al., 2010). The authors found that introduction of store-and-forward was associated with a substantial decrease in wait times for appointments with ENT physicians.

Summary of findings regarding the effects of live videoconferencing and store-and-forward on access to care.

- Most studies of the effects of live videoconferencing and store-and-forward on access to care were conducted outside the United States. The findings may not generalize to AB 1771 because there are differences in the organization of health care services in the United States and other countries.
- Evidence regarding effects of live videoconference on transfers of patients to remote specialized tertiary care centers is ambiguous.
- The preponderance of evidence from studies with strong and moderate research designs suggests that store-and-forward reduces wait times for outpatient visits for specialty care.

Utilization

Live videoconference. The most compelling evidence of the effects of live videoconference on use of other health care services comes from a large RCT conducted in the United Kingdom that enrolled patients with a wide range of diseases and conditions (Wallace et al., 2004). The authors found that live videoconference was not associated with statistically significant differences in numbers of hospitalizations, emergency department visits, visits to specialists for outpatient care, and contacts with primary care physicians' offices.

An RCT and an observational study with comparison group that compared the provision of psychotherapy by live videoconference to in-person psychotherapy found no difference in hospitalizations (Modai et al., 2006; O'Reilly et al., 2007). An RCT of organ transplant patients in the United States reached the same conclusion (Leimig et al., 2008).

Four observational studies with comparison groups examined the effects of live videoconference on length of hospital stay for patients with stroke or other neurological conditions. Findings differed depending on the comparison group. One study compared length of stay for stroke patients treated in community hospitals connected with a specialized stroke unit via live videoconference to patients in community hospitals that were not connected to the specialized stroke center. Mean length of stay was lower for patients in community hospitals that had live videoconference but the difference was small (11 days vs. 12 days). Another study compared length of stay for stroke patients treated in a specialized stroke unit in a tertiary hospital to patients treated in a community hospital that was connected with a specialized stroke unit via live videoconference. The authors found no statistically significant difference in length of stay (Audebert et al., 2006). Two studies compared live videoconference consultations to telephone consultations on length of hospital stay for patients with stroke or other neurological conditions (Craig et al., 2004; Handschu et al., 2008). Both studies found that live videoconference was associated with shorter length of stay, but only one study found that the difference was statistically significant (Craig et al., 2004).

Store-and-forward. CHBRP identified only two studies of the impact of store-and-forward on utilization of other health care services. Both studies enrolled persons with skin conditions. An RCT of store-and-forward dermatology that was conducted in the United States found that patients who had store-and-forward consultations were less likely to have an in-person visit to a dermatology clinic (Whited et al., 2013a). An RCT that enrolled Norwegian children with eczema and their parents found that providing access to store-and-forward dermatology consultations and secure e-mail was not associated with a statistically significant difference in use of multiple types of health care services (Bergmo et al., 2009).

Summary of findings regarding utilization for live videoconferencing and store-and-forward.

- The preponderance of evidence from studies with strong and moderate research designs found no statistically significant differences in hospitalizations, ED visits, or office visits for specialty care provided to persons who received in-person care and persons who were treated via live videoconferencing.
- Evidence regarding the impact of store-and-forward on utilization of other health care services is inconsistent and limited to dermatology.

Processes of care

Live videoconference. Mental health: Two RCTs conducted in the United States (Frueh et al., 2007; Ruskin et al., 2004) and one observational study with comparison group conducted in Israel⁶⁷ (Modai et al., 2006) assessed the impact of live videoconference on adherence to treatment among persons with mental illness. The findings of the two RCTs were inconsistent. Frueh and colleagues found no difference in adherence to medication and therapy between

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veterans receiving treatment via live videoconference and persons being treated in person. By contrast, Ruskin and colleagues found that veterans who obtained therapy in person were more adherent to treatment than veterans treated via live videoconference.

Stroke: Two studies assessed the impact of live videoconferencing with neurologists who have expertise in stroke on administration of tissue plasminogen activator (tPA) per clinical practice guidelines. TPA is a protein that dissolves blood clots and improves the flow of blood to the part of the brain affected by a stroke, which can reduce the impact of a stroke on brain function. The American Stroke Association recommends that most patients receive tPA within three hours of the onset of symptoms.⁶⁸ An observational study with comparison group conducted in Germany compared care provided by stroke centers at regional referral hospitals to care provided by community hospitals that were linked to the stroke centers (Audebert et al., 2006). The authors found that average time from admission to treatment was shorter in stroke centers (61 minutes vs. 68 minutes). A before-after study that Pedragosa and colleagues (2009) conducted in Spain found that there was a statistically significant increase in the percentage of patients receiving tPA within three hours of onset of symptoms (68% vs. 30%) after a live videoconferencing system was established that linked community hospitals to neurologists at a specialized stroke center at a regional hospital.

Store-and-forward. One RCT (Conlin et al., 2006) conducted in the United States examined the impact of store-and-forward technology on receipt of annual dilated eye exams among veterans with diabetes. Veterans in the store-and-forward group had images taken by imaging technicians in primary care clinics that were reviewed by ophthalmologists at a remote location. Veterans in the store-and-forward group were more likely to have an annual dilated eye exam (87% vs. 77%).

Summary of findings regarding the impact of live videoconferencing and store-and-forward on processes of care.

- Evidence regarding the effect of live videoconference on adherence to recommended treatment is ambiguous.
- Findings from a single RCT suggest that use of store-and-forward increases the likelihood that persons with diabetes will receive an annual dilated eye exam.

Accuracy

Live videoconference. Studies have examined the effects of live videoconference on accuracy and agreement of diagnoses for multiple diseases and conditions.

Dermatology: The largest body of evidence regarding accuracy of live videoconference and agreement with in-person care is for dermatology. A systematic review synthesized findings of controlled studies (RCTs and observational studies with comparison group) published between 1990 and 2009 (Warshaw et al., 2011). Only one study of live videoconference assessed the

⁶⁸ http://www.strokeassociation.org/STROKEORG/AboutStroke/Treatment/Stroke-Treatments_UCM_310892_Article.jsp.

accuracy of diagnoses relative to both in-person visits and histopathology (i.e., laboratory tests of skin lesion specimens). This is a "gold standard" approach because both means of diagnosis are compared to findings from laboratory tests. This study by Lowitt and colleagues (1998) found that a higher percentage of diagnoses made via live videoconference were accurate than diagnoses made in-person, but the sample size was small (22 persons). Pooled findings from multiple studies suggest that agreement between diagnoses and treatment plans based on live videoconference visits and in-person visits is high and that the rate of agreement for live videoconference is higher than the rate of agreement for store-and-forward dermatology.

Cardiac conditions: One study investigated use of live videoconference to diagnose acute cardiac problems (Scalvini et al., 2002). In this study, electrocardiograms were administered to patients who presented at primary care physician offices with complaints of chest pain and transmitted to hospital-based cardiologists via live videoconference. For patients who were referred to an emergency department, live videoconference diagnoses were compared to diagnoses made in person when the patient arrived at an emergency department. The study found that live videoconference had high sensitivity and high specificity⁶⁹ for diagnosis of acute cardiac problems. In other words, live videoconferencing was able to correctly identify both persons who had acute cardiac problems *and* persons who did not have acute cardiac problems. Correct identification of both groups of patients increases the likelihood that physicians will provide appropriate treatment.

Neurological conditions: A small pilot study of 25 patients compared diagnoses and treatment recommendations for neurological conditions based on live videoconference consultations with diagnoses based on in-person examinations (Craig et al., 2000). In this study, patients were examined by one neurologist via live videoconferencing and then immediately examined in-person by another neurologist. The authors reported that that diagnoses were consistent for 24 of the 25 patients and that treatment recommendations were consistent for 21 of 25 patients.

Stroke: Two studies compared the accuracy of treatment decisions for patients with acute stroke that are based on live videoconference consultations versus telephone consultations. The strongest evidence comes from an RCT of persons with acute stroke in which neurologists at a university medical center in the United States provided consultation to local hospitals in rural areas (Meyer et al., 2008). Accuracy of management (e.g., was tPA administered to patients who would benefit from it) was determined by having a panel of experts who were not involved in treating the patients review medical records. The experts were significantly more likely to judge management as accurate when the consultation was provided by live videoconference than by telephone. A controlled study of patients with acute stroke conducted in Germany found that diagnoses were less likely to be changed once following examination by a neurologist with expertise in stroke if the initial consultation was conducted by live videoconference vs. telephone (Handschu et al., 2008).

Store-and-forward. The largest body of evidence regarding store-and-forward is for dermatology, although some studies that examined accuracy and agreement of store-and-forward for other diseases and conditions exist.

⁶⁹ The sensitivity of a clinical test refers to the ability of the test to correctly identify those patients with the disease. The specificity of a clinical test refers to the ability of the test to correctly identify those patients without the disease.

Dermatology: A systematic review synthesized findings from studies that compared findings from store-and-forward and in-person visits to histopathology (Warshaw et al., 2011). The authors concluded that store-and-forward is less accurate than in-person diagnosis. The absolute difference from a pooled analysis of multiple studies was 19%. The authors also concluded that the accuracy of treatment management decisions made by store-and-forward was generally equivalent to in-person care but inferior for malignant or premalignant lesions. The inferiority of store-and-forward for malignant or premalignant lesions is important because such lesions pose the greatest risk to patients' health.

One study assessed agreement between diagnoses based on store-and-forward images taken via mobile phone to in person visits for dermatology (Lamel et al., 2012b). A strength of this study is that the authors estimated diagnostic agreement between the two dermatologists who participated in the study in three ways: (1) both dermatologists in person; (2) both dermatologists via store-and-forward; and (3) one dermatologist in person and the other dermatologist via store-and-forward. The two dermatologists had high levels of agreement when using the same means to diagnose patients. The authors found a moderate level of agreement for the comparison between in-person visits with one dermatologist and store-and-forward consultations with the other dermatologist.

Diabetic retinopathy: One study investigated use of store-and-forward for diabetic retinopathy (Saari et al., 2004). The digital images were read in random order by three ophthalmologists who had not examined the patients in person. Their diagnoses were compared to diagnoses made in person with an ophthalmoscope. The study found that store-and-forward had high sensitivity and high specificity for diagnosis of diabetic retinopathy.

Heart murmur in children: One study assessed the use of store-and-forward audio files to diagnose heart murmur in children (Dahl et al., 2002). The three pediatric cardiologists, who were blinded to the identities and medical histories of patients, listened to the recordings of children who had no heart murmur, clinically unimportant heart murmur, and clinically important heart murmur in random order and, for patients with heart murmur, heard two recordings of the same patient. This method enabled the authors to calculate consistency within and across cardiologists. The study found that store-and-forward had high sensitivity and high specificity for diagnosis of heart murmur in children.

Burn patients: One observational study conducted in Australia compared store-and-forward to telephone for referrals for outpatient surgery and outpatient visits with plastic surgeons among persons with burns (Wallace et al., 2007). Referrals based on store-and-forward were significantly more likely to be deemed accurate by the plastic surgeons who treated the patients.

Summary of findings regarding the effects of live videoconferencing and store-and-forward on accuracy of diagnosis and treatment plans.

- There is a preponderance of evidence from studies with strong to moderate research designs that treatment decisions made based on live videoconference consultations are more accurate than decisions made based on telephone consultations. Evidence regarding the accuracy of diagnoses made via live videoconference relative to diagnoses made in person is ambiguous.
- There is a preponderance of evidence from studies with strong to moderate research designs that store-and-forward is not as accurate as in-person visits for diagnosis and treatment of dermatological conditions. Single studies with moderate research to weak research designs suggest that diagnoses made via store-and-forward may be as accurate as in-person diagnoses for diabetic retinopathy, heart murmur, and burns.
- There is a preponderance of evidence from studies with strong to moderate designs that providing teledermatology via live videoconference is associated with higher rates of diagnostic and treatment agreement with in-person dermatology than providing teledermatology via store-and-forward.

Health outcomes

Live videoconference. There is a large body of evidence on the effects of live videoconferencing on health outcomes. Most of the studies CHBRP identified were RCTs that compared live videoconference to in-person care.

Multiple diseases and conditions: Three studies conducted in Europe, two RCTs and one observational study with a comparison group, compared SF-12 scores for persons with multiple diseases and conditions who had live videoconference visits versus in-person visits with a specialist (Ferrer-Roca, et al., 2010; Harrison et al., 1999; Wallace et al., 2004). One of the RCTs was quite large, enrolling over 2,000 persons (Wallace et al., 2004). All three studies found that average SF-12 scores were similar in the two groups. An RCT of persons with bulimia reached the same conclusion (Mitchell et al., 2008).

Mental health: The largest body of evidence regarding live videoconference is in telepsychiatry. CHBRP identified eight RCTs that compared live videoconference to in-person psychotherapy among persons with a variety of mental health conditions (Bouchard et al., 2004; De Las Cuevas et al., 2003; Frueh et al., 2007; Mitchell et al., 2008; Morland et al., 2010; Nelson et al., 2003; O'Reilly et al., 2007; Ruskin et al., 2004). Seven were included in a systematic review (Garcia-Lizana and Munoz-Mayorga, 2010), and one was published after the literature search for the systematic review was completed (Morland et al., 2010). Some studies enrolled persons with multiple types of mental illnesses (De Las Cuevas et al., 2003; O'Reilly et al., 2007), whereas others only enrolled patients with specific diagnoses, such as bulimia (Mitchell et al., 2008), depression (Nelson et al., 2003; Ruskin et al., 2004), panic disorder (Bouchard et al., 2004), and post-traumatic stress disorder (Frueh et al., 2007; Morland et al., 2010). The eight RCTs consistently found that mental health outcomes for patients treated via live videoconference were similar to those who were treated in-person. The findings were robust across different

instruments used to measure mental health outcomes, including the mental health subscale of the SF-36 and the Brief Symptom Inventory. A limitation of studies of live videoconference in mental health is that many were conducted in Department of Veterans Affairs medical centers. Findings from studies of veterans may not fully generalize to persons with private health insurance because many served in combat and were exposed to higher levels of violence than many civilians and thus, may have a different mix of mental health diagnoses.

Stroke: Three studies investigated the impact of live videoconference on mortality among persons with acute stroke. One observational study compared persons who received treatment in a specialized stroke unit in a tertiary referral hospital to patients treated in community hospitals who received live videoconference consultations with neurologists at the stroke center (Audebert et al., 2006). The authors found no difference in mortality within 7 days of onset of symptoms. Two studies compared telephone to live videoconference for consultation with neurologists at remote stroke centers. An RCT conducted in the western United States found no difference in odds of mortality within an unspecified time frame (Meyer et al., 2008). An observational study conducted in Germany found that live videoconference was associated with lower mortality within 10 days of acute stroke (Handschu et al., 2008).

Other conditions: A small number of studies have compared live videoconference to in-person care for other conditions. One RCT conducted in the United States compared live videoconference to in-person visits for follow-up care for persons receiving transplants (Leimig et al., 2008). The authors found no difference in rates of infection or transplant rejection between persons who received video visits and persons who had in-person visits. Two observational studies that compared live videoconference to in-person visits for obesity in children found no difference in changes in BMI, physical activity, or nutrition (Davis et al., 2011; Irby et al., 2012). One observational study conducted in the United States compared live videoconference to in-person visits for treatment of diabetic foot ulcers (Wilbright et al., 2004). The authors found no differences in the percentage of forefoot ulcers healed within 12 weeks and the mean time until foot ulcers healed.

Store-and-forward. CHBRP identified only two studies that examined the impact of store-and-forward on health outcomes. A large RCT conducted in the United States found no differences in improvement in dermatological conditions, quality of life, and general health status between persons treated by dermatologists via store-and-forward versus in-person (Whited et al., 2013b). An observational study with comparison group conducted in the United States also found that improvement in dermatological conditions was similar between patients treated via store-and-forward and in person (Pak et al., 2007).

Summary of findings regarding the impact of live videoconferencing and store-and-forward on health outcomes.

- There is clear and convincing evidence that live videoconference and in-person visits have similar effects on general health status and mental health status. Findings from single studies with strong and moderate research designs suggest live videoconference and in-person visits may have similar effects on health outcomes for patients with acute stroke, organ transplants, diabetic foot ulcers, and obesity.
- Findings from two studies with strong and moderate research design suggest that patients who receive dermatology consultations via store-and-forward have health outcomes that are as good as those of patients who have in-person visits with dermatologists.

Marginal Impact of Coverage on Utilization of Telephone, E-mail, Live Videoconferencing, and Store-and-Forward

The medical effectiveness team did not identify any studies that addressed the marginal impact of coverage on utilization of telephone, e-mail, live videoconferencing, or store-and-forward for evaluation and management visits.

Summary of Findings

There is a large body of literature on the impact of telephone calls, e-mail, live videoconferencing, and store-and-forward on the medical effectiveness of these modalities for providing medical care. These studies encompass patients with a wide range of diseases and conditions. Most studies examine the use of telephone, e-mail, live videoconferencing, and store-and-forward as substitutes for in-person care. Some studies, especially studies of e-mail, assess the use of telephone, e-mail, live videoconferencing, and store-and-forward to supplement in-person care.

Telephone and E-mail

- There is insufficient evidence to determine whether medical care provided by telephone or e-mail is as effective as medical care provided in-person.
- Although there is some evidence that e-mail can improve health status and processes of care and reduce outpatient visits, all of the studies were conducted in Kaiser Permanente and other large integrated delivery systems that implemented e-mail as part of web portals with multiple functions. It cannot be determined whether findings from these studies would be replicated if patients were provided access to e-mail outside of a multifaceted web portal and outside an integrated delivery system.
- The absence of evidence is not evidence of no effect. It is an indication that the overall impact of telephone calls and e-mail on access to care, utilization, processes of care, accuracy of diagnosis, and health outcomes is unknown.

Access to care

Telephone

- There is insufficient evidence to determine whether telephone calls improve access to specialty outpatient care or acute care.

E-mail

- There is insufficient evidence to determine whether e-mail improves access to specialty outpatient care or acute care.

Utilization

Telephone

- The preponderance of evidence from studies with strong research designs suggests that adding telephone calls with physicians to usual care did not reduce or increase ED visits or hospitalizations.

E-mail

- The preponderance of evidence from studies with moderate to weak research designs that examined general populations of patients suggests that e-mail reduces utilization of office visits for primary care and specialty care.

Processes of care

Telephone

- There is insufficient evidence to determine whether the likelihood of receiving recommended care is equivalent for telephone visits and in-person visits.

E-mail

- There is a preponderance of evidence from studies with moderate research designs that persons with diabetes who use secure e-mail within a multifaceted web portal are more likely to receive recommended screening exams.

Accuracy of diagnosis and treatment plans

Telephone

- There is insufficient evidence to determine whether diagnoses and treatment plans based on telephone calls are at least as accurate as diagnoses and treatment plans based on in-person care.

E-mail

- There is insufficient evidence to determine whether diagnoses and treatment plans based on e-mails are at least as accurate as diagnoses and treatment plans based on in-person care.

Health outcomes

Telephone

- There is insufficient evidence to determine whether health outcomes are equivalent for telephone visits and in-person visits.

E-mail

- There is a preponderance of evidence from studies with strong-to-moderate designs that use of secure e-mail as part of a multifaceted web portal is associated with better glycemic control among persons with diabetes but does not affect hypertension or hyperlipidemia.

Live Videoconferencing and Store-and-Forward

Access to care

Live videoconference

- Evidence from a single study with a moderately strong research design suggests that live videoconference may improve access to outpatient specialty care.
- Evidence regarding effects of live videoconference on transfers of patients to remote specialized tertiary care centers is ambiguous.

Store-and-forward

- The preponderance of evidence from studies with strong and moderate research designs suggests that store-and-forward reduces wait times for outpatient visits for specialty care.

Utilization

Live videoconference

- The preponderance of evidence from studies with strong and moderate research designs suggests that live videoconference does not reduce or increase hospitalizations, ED visits, or office visits for specialty care.

Store-and-forward

- Evidence regarding the impact of store-and-forward on utilization of other health care services is ambiguous and limited to dermatology.

Processes of care

Live videoconference

- Evidence regarding the effect of live videoconference on adherence to recommended treatment is ambiguous.

Store-and-forward

- Findings from a single RCT suggest that use of store-and-forward increases the likelihood that persons with diabetes will receive an annual dilated eye exam.

Accuracy of diagnosis and treatment plans

Live videoconference

- There is a preponderance of evidence from studies with strong to moderate research designs that treatment decisions made based on live videoconference consultations are more accurate than decisions made based on telephone consultations.
- Evidence regarding the accuracy of diagnoses made via live videoconference relative to diagnoses made in person is inconsistent.
- There is a preponderance of evidence from studies with strong to moderate designs that providing teledermatology via live videoconference is associated with higher rates of diagnostic and treatment agreement with in-person dermatology than providing teledermatology via store-and-forward.

Store-and-forward

- There is a preponderance of evidence from studies with strong to moderate research designs that store-and-forward is not as accurate as in-person visits for diagnosis and treatment of dermatological conditions.
- Single studies with moderate to weak research designs suggest that diagnoses made via store-and-forward may be as accurate as in-person diagnoses for diabetic retinopathy, heart murmur, and burns.

Health outcomes

Live videoconference

- There is clear and convincing evidence that live videoconference and in-person visits have similar effects on general health status and mental health status.
- Findings from single studies with strong and moderate research designs suggest live videoconference and in-person visits may have similar effects on health outcomes for patients with acute stroke, organ transplants, diabetic foot ulcers, and obesity.
- There is a preponderance of evidence that effects of live videoconference and telephone consultations on short-term mortality from stroke are equivalent.

Store-and-forward

- Findings from two studies with strong and moderate research designs suggest that patients who receive dermatology consultations via store-and-forward have health outcomes that are as good as those of patients who have in-person visits with dermatologists.

BENEFIT COVERAGE, UTILIZATION, AND COST IMPACTS

CHBRP examined the cost impact of Assembly Bill (AB) 1771, which would require state-regulated health insurance to cover telephonic and electronically-delivered patient evaluation and management services. AB 1771 would affect the health insurance of approximately 23.4 million enrollees (61.6% of all Californians). If enacted, AB 1771 would require state-regulated plans and policies to reimburse physicians for *non*-face-to-face services — principally telephone and electronically delivered evaluation and management encounters. AB 1771 would also have the effect of requiring coverage — and reimbursement — for any electronic communication technologies used to assist physicians *only* in evaluating and managing *existing* patients electronically.

This section will first present the premandate (baseline) benefit coverage, utilization, and costs and then provide estimates of the impacts on coverage, utilization, and cost if AB 1771 is enacted. For further details on the underlying data sources and methods, please see [Appendix D](#).

Analytic approach

CHBRP limits analysis of AB 1771 to only services provided *by a physician for existing patients*. CPT codes further establish that for telephone or e-mail visits to be billable, patients must first contact the physician. AB 1771 specifically targets use of telephonic and electronic communication tools to “enable treating physicians to evaluate and manage existing patients in a manner recognized by the American Medical Association, Current Procedural Terminology (CPT) codes.” Based on that language, CHBRP analyzed CPT billing claims associated with “evaluation and management” services traditionally delivered to established patients in-person and could potentially be delivered electronically, via telephone, e-mail, live videoconference, or store-and-forward technologies.

In this section, CHBRP uses “telehealth” as the catch-all term collectively representing all four modalities, telephone, e-mail, live videoconferencing, and store-and-forward.

CHBRP examined the literature to obtain estimates for:

- Adoption of telehealth by physicians and patients when it is made available;
- Use of these technologies impact on in-person visits (i.e., how does telehealth serve as a substitute for in-person care);
- Impact on supplementary visits (i.e., how does telehealth generate additional visits or other contacts that provided “added value” to patients’ care that would not have occurred or been billed because telehealth was not covered or reimbursed); and,
- Impact on cost-sharing, and impact on long-term use and health (beyond the one-year horizon in the cost analysis).

As depicted in the *Medical Effectiveness* section, the literature on the medical effectiveness impacts of telehealth is mixed, and while some groups (rural populations, patients with

dermatologic problems, victims of stroke) may benefit from specific interventions related to telehealth, the telehealth literature is not generalizable to the whole population.

Assumptions on utilization and cost

CHBRP assumes insurance carriers would not realize cost savings resulting from either new telehealth services, or telehealth services that *substitute* for in-person visits because:

- Providers would receive reimbursement for telehealth visits equal (in time and complexity) to reimbursement for in-person visits (according to AB 1771 bill language); and
- Providers' capacity remains approximately the same whether devoted to in-person or equivalent telehealth visits (per bill language and CPT code definitions).

Rather, CHBRP anticipates a shift in the service delivery settings from in-person to telehealth visits. The core assumptions that CHBRP made in understanding the impact on utilization and costs are:

- If AB 1771 is enacted, CHBRP assumes physicians would be more likely to bill for services delivered via telehealth modalities that:
 - **Substitute** (or replace) current in-person visits with e-mail, telephone, or live videoconference for patient-initiated evaluation and management encounters; and
 - **Supplement** current in-person visits with added services via telehealth, and include both services that (1) would previously not have been delivered in person due to distance, inconvenience, and time, and (2) services that physicians have already been providing via telephone and e-mail, but were previously not billed or reimbursed because they were not covered.⁷⁰ Because AB 1771 constrains coverage of E/M services to those that are physician-provided only, CHBRP assumes that the capacity to add supplemental services is limited based on each physician's capacity.
- CHBRP assumes that substitute services constitute 60% of all new telehealth services (i.e., replacing in-person services of equivalent severity and time), while supplementary telehealth services would constitute 40% (i.e., additional services that were previously provided but not reimbursed, or not previously provided).⁷¹
- CHBRP uses analysis by Milliman of Thomson Reuters' MarketScan® data on claims to estimate current utilization of phone, e-mail, live videoconference, and store-and-forward.
- CHBRP assumes that current billing for telephone and e-mail E/M services underestimates true utilization of these services because half of enrollees subject to AB

⁷⁰ Some telehealth services will still not be reimbursed due to CPT coding standards related to follow-up visits within 7 days for the same issue, regardless of setting. However, the supplementary services are assumed to occur within coding rules and be billable.

⁷¹ No data were available, but content experts and claims data suggest this is a reasonable estimate. This ratio applies in the absence of cost sharing. Cost sharing would deflate demand for supplementary telehealth services. Please see Appendix D for more details.

1771 do not have coverage for these services, and therefore would not be reflected in claims data. In addition, the definition of covered telehealth services differ by insurance carrier, and it is likely that no carrier reimbursed a telehealth service at the level of an in-person visit, as is required by AB 1771.

- CHBRP assumes that increases in utilization of telehealth services with the introduction of AB 1771 would not occur for salary-based systems (such as Kaiser). For plans that contract with external physician groups, CHBRP assumed utilization of telehealth services would increase. CHBRP recognizes that capitation rates for specific physician groups might not increase immediately to reflect any anticipated increase in the total cost to provide physician services. However, to the extent CHBRP assumed an increase in the utilization of the four modalities of telehealth services, and, in particular, supplemental telehealth services, the 2015 cost and premium estimates in this report assume the impact is reflected completely in all physician capitation rates for commercial HMOs. CHBRP used data from Kaiser Permanente Northern California (KPNC) to estimate postmandate changes in utilization as the KPNC experience is one of the only well-documented examination of utilization of telephone and e-mail visits between physicians and patients. The evaluation occurred over the period of time between 2008 (at the introduction of a telehealth strategy that included phone, secure e-mail, and live videoconference visits went into effect) and 2013. CHBRP uses the “rate of use” of telephone e-mail in 2008 to calculate an estimated level of utilization (26.4%) for those modalities in the first year after enactment, assuming physicians quickly adapt and begin billing for telephone and e-mail services.^{72,73}

Limited evidence on telehealth use and adoption

Kaiser Permanente’s experience in Northern California could both over- or underestimate the use of a fully implemented system for telephone and e-mail. However, KPNC’s evidence on use of telephone and e-mail is the best estimate available for the initial and future adoption of the modalities by providers and patients, once a carrier develops the capacity and pays for telephone and e-mail services.

- First, at Kaiser Permanente, telephone, e-mail, and live videoconference services are already delivered as part of an integrated system where fee-for-service reimbursement does not occur. Enrollees do not pay any cost sharing for telephone or e-mail visits. Although the Kaiser Permanente rate of telephone and e-mail use serves as a good benchmark, the first year (2015) impact of AB 1771 would be influenced by cost-

⁷² This represents the percentage of telehealth visits out of Kaiser’s existing patients. This value was calculated using Pearl’s (2014) estimate of the level of utilization (22.8%) at Kaiser Permanente Northern California (KPNC) of virtual visits (alternatives to in-person visits conducted via secure e-mail, telephone, or live videoconference) in 2008 and estimates of new patient visits at Kaiser (which are not allowed to be reimbursed under AB 1771), calculated by subtracting the average annual rate of new visits overall at KPNC (from Milliman’s Health Cost Guidelines data) and subtracted from the total number of visits.

⁷³ 2008 estimate was used because this was the year in which KPNC introduced an inpatient and ambulatory care electronic health record system that includes a suite of patient-friendly internet, mobile, and video tools. Pearl (2014) shows that by 2013, utilization increased to 58.3% among all visits, which represents 50.3% of existing patient visits when fully implemented and used.

sharing decisions by carriers and adoption of the technology by physicians outside of an integrated, salary-based system.

- In the Kaiser Permanente model, again which does not operate in a fee-for-service environment, the system may realize savings and efficiencies from to the creation and widespread use of telehealth to reduce in-person patient visits and to deliver care to enrollees in outlying areas who face access barriers due to transportation, disability, or work hours. Because of those incentives to deliver more efficient care, even if it is not reimbursed by a typical health insurer, Kaiser Permanente physicians may encourage telephone and e-mail at a higher rate than other health insurance carriers, which are paying physicians fee-for-service based on the number of visits delivered to enrollees. Conversely, health insurance carriers may decide that coverage of all four telehealth modalities would allow them to expand the network of physicians available, deliver more timely care, and meet patient needs in a more efficient way to attract enrollees and cover a wider area. For this reason, Kaiser Permanente’s experience in Northern California may underestimate the use of a fully implemented telehealth system.

Based on these limitations, CHBRP made adjustments to apply Kaiser’s experience to noncapitated market (fee-for-service market), which would include cost sharing.⁷⁴

Instead of assuming even implementation across all plans and providers, CHBRP modeled four separate estimates to provide a range of the variety of reactions anticipated from health plans and providers in terms of technology adoption and cost-sharing. The models are based on different rates of adoption of telehealth and use of cost-sharing by insurers and/or providers during 2015 (Table 9). Two of these scenarios (A and B) assume cost-sharing and the two other two assume no cost sharing (C and D).

CHBRP estimates in Scenario A there is a dampened/modest 25% adoption of telehealth postmandate (the low-end estimate), and in Scenario B that there is full 100% adoption by both providers and patients of the four telehealth modalities postmandate. Both of these scenarios assume enrollees would pay a \$20 copay for telehealth services — equivalent to an in-person visit. CHBRP believes cost sharing scenarios are more likely than no cost sharing once telehealth becomes reimbursable. However, because the no cost sharing scenarios offer perspective on the lower and upper bounds of expenditures, they can be found in [Appendix D](#).

Table 9. Four Scenarios Describing the Potential Incremental Impact of AB 1771 (a)

	25% Phase-In of Adoption	100% Phase-In of Adoption
\$20 Cost sharing	Scenario A (low)	Scenario B (high)

⁷⁴ As previously noted, CHBRP assumes that increases in utilization of telehealth services with the introduction of AB 1771 would not occur for salary-based systems (such as Kaiser). For plans that contract with external physician groups, CHBRP assumed utilization of telehealth services would increase. CHBRP recognizes that capitation rates for specific physician groups might not increase immediately to reflect any anticipated increase in the total cost to provide physician services. However, to the extent CHBRP assumed an increase in the utilization of the four modalities of telehealth services, and, in particular, supplemental telehealth services, the 2015 cost and premium estimates in this report assume the impact is reflected completely in all physician capitation rates for commercial HMOs.

(equivalent to in-person)

\$0 Cost sharing	Scenario C (b)	Scenario D (b)
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Source: California Health Benefits Review Program, 2014.

Note: (a) CHBRP modeled four scenarios, two with cost-sharing and two without cost sharing. (b) Scenarios C and D, without cost sharing, can be found in [Appendix D](#).

Premandate (Baseline) Benefit Coverage, Utilization, and Cost

Premandate (Baseline) Benefit Coverage

Current coverage of telehealth was determined by a survey of the seven largest providers of health insurance in California representing:

- 81.22% of enrollees in the privately funded, DMHC-regulated market;
- 51.87% of enrollees in the CDI-regulated market; and,
- 75.29% of enrollees in the privately funded market subject to state mandates.

DMHC-regulated health plans and CDI-regulated policies report that currently:

- 49% of enrollees have benefit coverage⁷⁵ for telephone and e-mail; and
- 79% of enrollees have benefit coverage for live videoconferencing and store-and-forward.

Employees covered by CalPERS HMOs generally cover telephone and live videoconference, although coverage for e-mail-based services and store-and-forward varies.

Beneficiaries with Medi-Cal Managed Care plans have benefit coverage for live videoconferencing and store-and-forward. Medi-Cal Managed Care does not cover or reimburse for telephone and e-mail.

Premandate (Baseline) Utilization and Per-Unit Cost

Premandate utilization assumptions

CHBRP approaches utilization by examining both Kaiser and non-Kaiser utilization rates. For this a set of assumptions were made:

- Kaiser members are assumed to be unaffected by the AB 1771 under all scenarios and thus are not included in the analysis;

⁷⁵ As previously mentioned, the definition of covered telehealth services differs by insurance carrier, and it is likely that no carrier is currently reimbursing telehealth services at the level of an in-person visit, as is required by AB 1771.

- Non-Kaiser members who had coverage premandate are assumed to have no utilization premandate. Although a carrier may have technically covered telehealth, the level of reimbursement and coverage may vary by carrier and does not appear to be reimbursed and defined as described in AB 1771.
- Non-Kaiser members who had no coverage premandate are also assumed to have no utilization premandate.
- Postmandate, all non-Kaiser members are assumed to use office visits and telehealth services under the provisions of the two scenarios (cost sharing with 100% phase-in of adoptions, cost sharing with 25% phase-in of adoption);
- CalPERS Blue Shield members have coverage for telephone pre-mandate, not e-mail. As with other non-Kaiser members with pre-mandate telehealth coverage, we assume these CalPERS members have no pre-mandate utilization. Post mandate they gain coverage for e-mail, and are assumed to use office visits and telehealth services under the provisions of the 4 scenarios.

Estimating current utilization

CHBRP examines billing codes specific to telephone, e-mail. CHBRP also examined CPT billing claims associated with “evaluation and management” delivered traditionally in-person or “modified” to denote that the service was delivered via live videoconference or store-and-forward. CHBRP also included Healthcare Common Procedure Coding System (HCPCS) temporary telehealth codes that have not yet been added to the AMA’s official CPT code manual. (For a full list of CPT codes included, please see Table D-2 in [Appendix D](#)).

CHBRP also uses CPT code to define:

- “Existing patient” (established patient) is one who has received professional services from a physician, or another physician of the exact same specialty and subspecialty, and who belong to the same group practice, within the past three years;
- “Time” and “complexity” of a condition. CPT codes are descriptive in the amount of time an encounter should require, and the severity of the patient’s illness.

Table 10 shows premandate utilization and unit cost for telephone, e-mail, live videoconference and store-and-forward. CHBRP estimates premandate (baseline) utilization based on Milliman’s analysis of 2012 California claims data.⁷⁶ CHBRP assumes these utilization estimates underreport the extent to which physicians are using telephone and e-mail to communicate with patients, because they are not billing the service due to a lack of standardization for reimbursement or limitations in coverage.

⁷⁶ Milliman uses MarketScan databases reflecting the health care/healthcare claims experience of employees and dependents covered by the health benefit programs of large employers, as detailed in Appendix D and the literature. It should be noted that the MarketScan databases contain claims data collected from insurance companies, Blue Cross Blue Shield plans, and third party administrators, but not from Medi-Cal or Workers Compensation.

Table 10. Premandate Utilization and Per-Unit Cost of Telehealth Services

Telehealth Modality	Number of Encounters (c)	Average Cost Per Service
Telephone (a)	3.7 million	\$90.38
E-mail (a)	1.2 million	\$62.76
Live videoconference (b)	306,000	\$189.93
Store-and-forward (b)	919,000	\$157.64

Source: California Health Benefits Review Program, 2014, as informed by MarketScan.

Notes: (a) Includes all CPT codes associated with telephone e-mail consultations for existing patients.

(b) Includes all CPT codes associated with live videoconference or store-and-forward for existing patients.

(c) May also be found in Table 1.

Premandate (Baseline) Premiums and Expenditures

Table 12 at the end of this section presents per member per month (PMPM) premandate estimates for premiums and expenditures by market segment for DMHC-regulated plans and CDI-regulated policies. Total current annual expenditure for all DMHC-regulated plans and CDI-regulated policies is \$128.4 billion.

Public Demand for Benefit Coverage

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 therefore not subject to state-level mandates) with the benefits that are provided by plans or policies that would be subject to the mandate.

On the basis of conversations with the largest collective bargaining agents in California, CHBRP concluded that unions *currently do not* include coverage arrangements for telehealth, by its existing definition, or phone and e-mail. In general, unions negotiate for broader contract provisions such as coverage for dependents, premiums, deductibles, and broad coinsurance levels.

Among publicly funded self-insured health insurance policies, the Preferred Provider Organization (PPO) plans offered by CalPERS currently have the largest number of enrollees. The CalPERS PPOs *currently* provide benefit coverage similar to what is available through group health insurance plans and policies that would be subject to the mandate.

To further investigate public demand, CHBRP used the bill-specific coverage survey to ask 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.

How Lack of Coverage Results in Cost Shifts to Other Payers

It appears unlikely that the current benefit coverage prompts enrollees to seek care from public programs or other payers, including charities, and other state departments. However, insofar as county health departments, clinics, nonprofit organizations, or foundations currently fund telehealth activities to provide unreimbursed care to their patients to overcome access barriers, there may be a shift from those external funding sources providing telehealth due to the availability of reimbursement for telehealth services covered by AB 1771. That would mean the postmandate premium increases could result in savings to other organizations that have been providing telehealth already, without insurance reimbursement.

Postmandate Impacts of AB 1771

Postmandate Benefit Coverage

CHBRP projects AB 1771 would affect the health insurance of the approximately 23.4 million enrollees with state-regulated health plans and policies (61.6% of all Californians). For AB 1771-specific telehealth modalities:

- Telephone/e-mail: Premandate, 49% of enrollees (11.4 million) had benefit coverage for telephone and e-mail; postmandate, all 23.4 million enrollees with state-regulated health insurance would have coverage for telephone and e-mail evaluation and management services.
- Live videoconference and store-and-forward: Premandate, 79% of enrollees (18.6 million) had benefit coverage for live videoconference and store-and-forward. Postmandate, all 23.4 million enrollees with state-regulated health insurance would have coverage for the modalities.

Postmandate Utilization

Assumptions for postmandate utilization

- Postmandate, all non-Kaiser members are assumed to use office visits and telephone, e-mail, live videoconference, and store-and-forward services under the provisions of the two scenarios.
- Based on a Milliman analysis of MarketScan data, an estimated distribution of telehealth utilization by service type was assumed as follows: telephone-based evaluation and management 60%, e-mail-based evaluation and management 20%, videoconferencing 5%, and store-and-forward 15%.

1771 impact on volume of telehealth

In the absence of cost sharing, utilization of use of telehealth services would increase to approximately 26.4%⁷⁷ in the first year after enactment, assuming physicians quickly adapt to the bill for telephone and e-mail services. The 2008 estimate was used because this was just before the introduction of KPNC’s inpatient and ambulatory care electronic health record system, which includes a suite of patient-friendly Internet, mobile, and video tools had opportunity to take effect. (Please see [Appendix D](#) for the impact of this scenario).

However, as previously discussed, Kaiser’s integrated and closed system, and which already uses telephone and e-mail without cost sharing to deliver evaluation and management services, may not generalize to other types of health insurance contracts. CHBRP made adjustments to apply Kaiser’s experience to a noncapitated market, and includes a \$20 copay.⁷⁸ As described in CHBRP’s analytic approach, two of these scenarios (A and B) assume cost-sharing (\$20 copay) and the two other two assume no cost sharing (Scenarios C and D in [Appendix D](#)). CHBRP believes cost sharing for telehealth would be more likely than no cost sharing once telehealth becomes reimbursable.

CHBRP used a framework (Figure 5) to define increased utilization by distinguishing whether the additional telehealth visits resulting from AB 1771 are “substitute visits” — replacing existing in-person visits with telephonic or electronic visits, or “supplementary visits,” which are telehealth visits that are in addition to current in-person visits, and that would not have been delivered premandate because they were not billable.

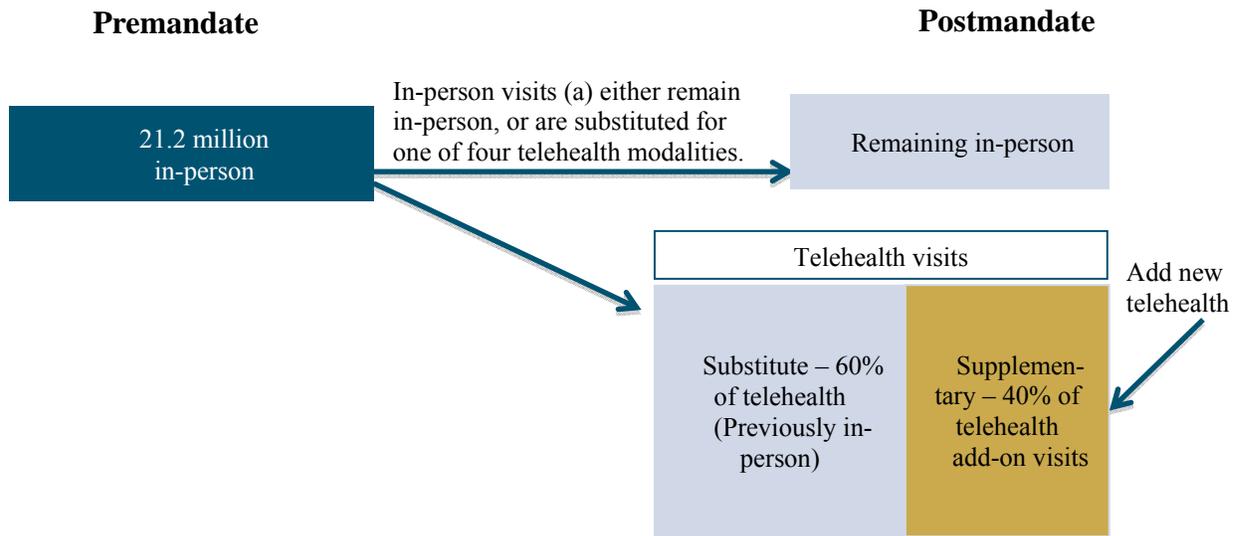
Supplemental visits: Supplemental visits are “new” evaluation and management visits that would increase health care costs overall. CHBRP assumes 40% of new telehealth visits would be supplemental, defined as visits:

- That were previously provided by physicians, but were not being billed because telephone and e-mail were not reimbursed. These could include follow-up visits more than 7 days after the original visit.
- That otherwise would not have occurred because of other barriers, including distance, urgency, etc., that could have (or should have) been done in-person.

⁷⁷ This represents the percentage of telehealth visits out of Kaiser’s existing patients. This value was calculated using Pearl’s (2014) estimate of the level of utilization (22.8%) at Kaiser Permanente Northern California (KPNC) of virtual visits (alternatives to in-person visits conducted via secure e-mail, telephone, or live videoconference) in 2008 and estimates of new patient visits at Kaiser, calculated by subtracting the average annual rate of new visits overall at KPNC (from Milliman’s Health Cost Guidelines data) and subtracted from the total number of visits (Pearl, 2014) 2008 estimate was used because this was just before the introduction of KPNC’s inpatient and ambulatory care electronic health record system that includes a suite of patient-friendly Internet, mobile, and video tools had opportunity to take effect. Pearl (2014) shows that by 2013, utilization of those modalities — as a share of total visits, including in-person — increased to 58.3% among established patients.

⁷⁸ As previously mentioned, the definition of covered telehealth services differs by insurance carrier, and it is likely that no carrier is currently reimbursing telehealth services at the level of an in-person visit, as is required by AB 1771.

Figure 5. Change in Patient Utilization Once Telehealth Modalities Are Reimbursed



Source: California Health Benefits Review Program, 2014.

Note: All physician–patient evaluation and management visits in-person or via a telehealth modality are for established patients.

Substitute visits: CHBRP assumes that with the introduction of AB 1771, 60% of evaluation and management visits would be substitute visits replacing in-person, and commensurately split between e-mail, phone, videoconferencing, and store-and-forward modalities. Because these telehealth visits are replacing in-person visits, health spending would stay the same, or potentially decrease because of increased efficiency, or reduced travel time (Please see the *Public Health* section). CHBRP estimates the net increase in telephonic and electronic visits in Table 11 below.

Table 11. Net New Encounters by All Four Telehealth Modalities Postmandate

	Low-End Estimate	High-End Estimate
Telephone and e-mail	1,074,000	4,674,000
Substitute	689,000	3,001,000
Supplementary	384,000	1,673,000
Live videoconference and store-and-forward	268,000	1,169,000
Substitute	172,000	750,000
Supplementary	96,000	418,000

Source: California Health Benefits Review Program, 2014.

Note: Numbers may not sum due to rounding.

In cases where enrollees would supplement in-person visits with telehealth services, costs would increase as a result of more spending by health insurers and patients in the form of additional reimbursement and cost sharing for those additional telehealth services used. In cases where enrollees are substituting a telehealth visit for an in-person visit, resulting in more efficient use of resources, CHBRP assumes enrollees would see no change in cost sharing due to equivalent cost-sharing requirements for in-person services and telephone, e-mail, live videoconference, and store-and-forward services. Given the supplemental and substitute nature of the visits, it is likely that one may be more sensitive to cost sharing, but there is no evidence to quantify that difference.

AB 1771 impact on volume of in-person visits

CHBRP estimates that telephonic and electronic visits would have the following impact on in-person visits: Figure 6 compares CHBRP's high- and low-end utilization estimates.

- On the low end, a 4.1% decline in in-person visits (from 21.2 million to 20.3 million), but a net increase of 2.3% in all visits — in-person and telehealth — to 21.7 million.

On the high end, a 17.7% decline in in-person visits (from 21.2 million to 17.4 million), but a net increase of 9.9% in all visits — in-person and telehealth — to 23.3 million.

AB 1771 impact on volume of hospitalizations and ER visits

As previously discussed in the *Medical Effectiveness* section, CHBRP assumes telehealth services would not have an impact on hospital utilization as most hospitalization studies found telehealth had no statistically significant effect on volume regardless of the technology used. Similarly, CHBRP assumes telephone and e-mail services would not have an impact on volume of emergency room (ER) visits as the body of literature suggests there is no consistent impact. Please see *Medical Effectiveness* section for a more detailed summary of the literature.

Postmandate Per-Unit Cost

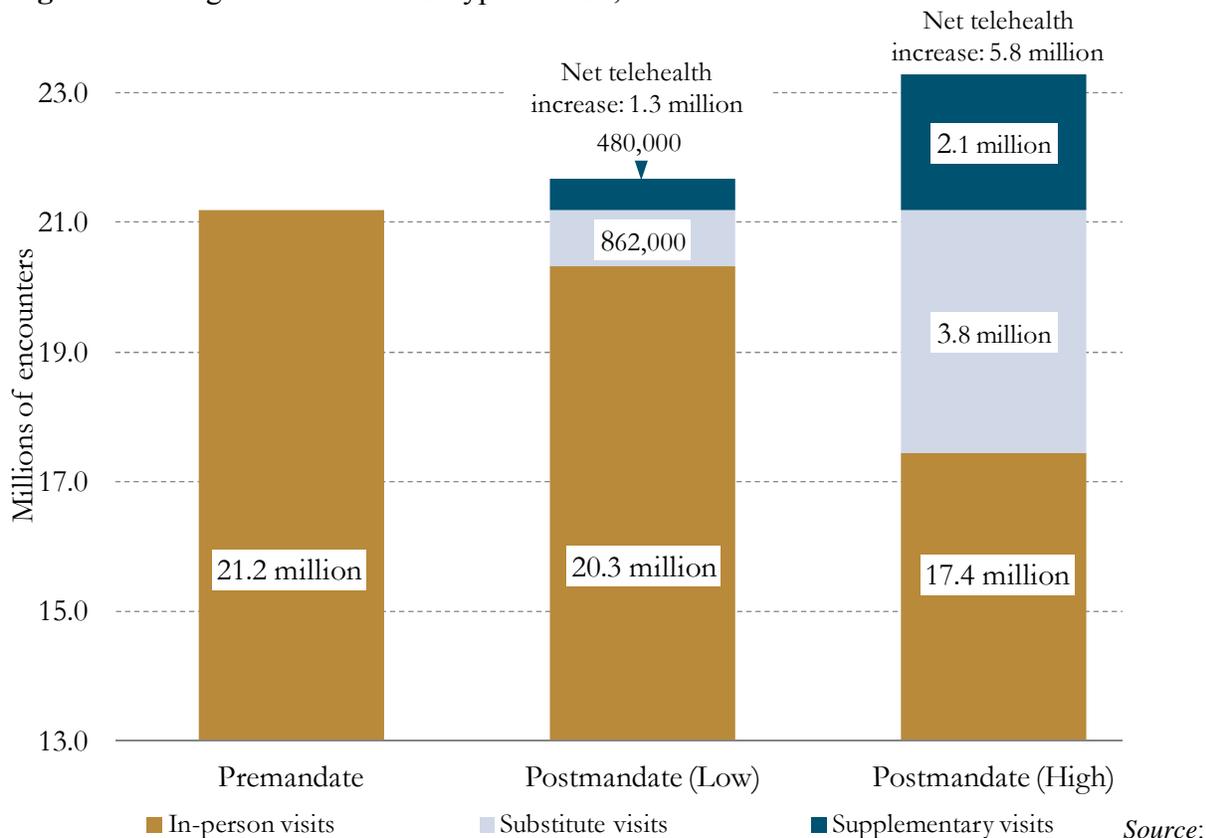
CHBRP assumes that there is no impact on the per-unit costs of each of the telehealth services for health insurance carriers because AB 1771 requires that physicians be reimbursed at the same rate as an equivalent in-person visit.

Postmandate Administrative Expenses and Other Expenses

CHBRP estimates that the increase in administrative costs of DMHC-regulated plans and/or CDI-regulated policies will remain proportional to the increase in premiums. 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 portion of premiums is unchanged. All health plans and insurers include a component for administration and profit in their premiums.

The low-end scenario, assuming 25% adoption of telephone and e-mail services, represents a realistic possibility. Even though providers could potentially bill for the services if AB 1771 were enacted, they could not unless they have secure e-mail and telephone capacity.

Figure 6. Change in Number and Type of Visit, Pre- and Postmandate



Note: Numbers may not sum due to rounding.

Postmandate Expenditures

CHBRP assumes that increases in utilization of telehealth services with the introduction of AB 1771 would not occur for salary-based systems (such as Kaiser). For plans that contract with external physician groups, CHBRP assumed utilization of telehealth services would increase. CHBRP recognizes that capitation rates for specific physician groups might not increase immediately to reflect any anticipated increase in the total cost to provide physician services. Capitated systems pay providers a flat fee per member per month to deliver care, thus they are presumably incentivized to provide efficient care, including the use of telephone and e-mail (Stroetmann et al., 2010). AB 1771 would not affect this arrangement and would not permit physicians to bill for additional reimbursement. However, to the extent CHBRP assumed an increase in the utilization of the four modalities of telehealth services, and, in particular, supplemental telehealth services, the 2015 cost and premium estimates in this report assume the impact is reflected completely in all physician capitation rates for commercial HMOs.

Changes in expenditures

On the low end, AB 1771 would increase total net annual expenditures by \$55,291,000, or 0.04% (Table 13a) for enrollees with DMHC-regulated plans and CDI-regulated policies. This scenario assumes enrollees would pay \$20 cost sharing for telephone, e-mail, live videoconference, or

store-and-forward services. It also assumes 25% phase-in of AB 1771, which means 25% of potentially billable services under full implementation would actually be delivered and billed.

On the high end, assuming 100% of eligible services are billed, total net annual expenditures is \$240,744,000, or 0.19%, of total expenditures (Table 13b). This scenario also assumes \$20 cost sharing for telehealth services.

Changes in premiums

Changes in insurance premiums and enrollee out-of-pocket costs vary by market segment. Please see Tables 13a and 13b for changes. Note that the total population in Tables 13a and 13b reflect the full 23.4 million enrollees in DMHC-regulated plans and CDI-regulated policies subject to AB 1771. Under the \$0 copayment scenarios (in [Appendix D](#)), CHBRP estimates that the increase in premiums due to price sensitivity would be minor.

Among publicly funded DMHC-regulated health plans, CalPERS HMO plans' premiums would increase between \$0.27 PMPM on the low end and \$1.17 PMPM on the high end.

Medi-Cal Managed Care plans currently provide coverage for live videoconferencing and store-and-forward as part of their capitated rates. Medi-Cal Managed Care does not currently pay for telephone and e-mail evaluation and management. Medi-Cal's capitated rates are set by the state to cover the cost of health care services for capitated beneficiaries in managed care plans. The capitated rates assume that the Medi-Cal Managed Care plans manage the utilization and costs of healthcare services appropriately and effectively. These assumptions reflect that plans will invest in ongoing improvements, including the costs associated with emerging healthcare technology and services.

Requiring that carriers pay for telehealth services is not specifically a change in benefits, but rather a change in the settings where benefits can be delivered. Further, although the bill *allows* physicians to bill carriers for telehealth services, it does not require physicians to provide telehealth services. Medi-Cal Managed Care plans, and their contracted physician groups, may already use forms of telehealth services if they believe it is a cost effective way to deliver health care within the available Medi-Cal capitation rates. CHBRP assumes that Medi-Cal Managed Care plans and their contracted physician groups would not further expand their use of any modalities of telehealth services unless it was expected to reduce the total cost of services for enrollees. As a result, CHBRP does not anticipate an increase in the capitated rate set by Medi-Cal. However, CHBRP notes that rate-setting, specifically, has not been discussed with the Department of DHCS and their actuaries may use different assumptions when setting rates if AB 1771 is enacted.

Potential cost offsets or savings in the first 12 months after enactment

CHBRP assumes that any cost offsetting or savings is unlikely to occur in the first 12 months following implementation.

AB 1771 and Essential Health Benefits

In the case of AB 1771, E/M services would simply be delivered in a different way, rather than be considered a new benefit; therefore, these telehealth services would not trigger the ACA requirement that the state defray the cost of additional benefit coverage for enrollees in qualified health plans (QHPs)⁷⁹ in Covered California. EHBs define the minimum benefit coverage that enrollees with health insurance must have, and do not regulate how health insurance carriers pay providers for that coverage. Capitated rates in the commercial HMO market or Medi-Cal HMO market already capture E/M services, so the addition of telehealth modalities would not necessarily change the benefits offered or require physicians to engage in providing services via telehealth.

Postmandate Changes in Uninsured and Public Program Enrollment

Changes in the number of uninsured persons

Under the most aggressive and costly scenario, CHBRP estimates the highest premium increase, of approximately 0.646%, to affect the CDI-regulated individual market; this premium increase would not have a measurable impact on the number of persons who are uninsured. CHBRP does not anticipate loss of health insurance, changes in availability of the benefits beyond those subject to the mandate, changes in offer rates of health insurance, changes in employer contribution rates, changes in take-up of health insurance by employees, or purchase of individual market policies, due to the small size of the increase in premiums after the mandate.

Changes in public program enrollment

CHBRP estimates that the mandate would produce no measurable impact on enrollment in publicly funded insurance programs or on utilization of covered benefits in the publicly funded insurance market.

⁷⁹ In California, QHPs are nongrandfathered small-group and individual market DMHC-regulated plans and CDI-regulated policies sold in Covered California, the state's online marketplace.

Table 12. Premandate (Baseline) Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2015
Applies to both Scenario A “Low” and Scenario B “High”

	DMHC Regulated						CDI-Regulated			Total
	Privately Funded Plans (by Market) (a)			Publicly Funded Plans			Privately Funded Plans (by Market) (a)			
	Large Group	Small Group	Individual	CalPERS HMOs (b)	MCMC (Under 65) (c)	MCMC (65+) (d)	Large Group	Small Group	Individual	
Enrollee Counts										
Total enrollees in plans/ policies subject to state Mandates (e)	8,779,000	2,012,000	2,498,000	845,000	6,364,000	826,000	567,000	662,000	836,000	23,389,000
Total enrollees in plans/ policies subject to AB 1771	8,779,000	2,012,000	2,498,000	845,000	6,364,000	826,000	567,000	662,000	836,000	23,389,000
Premium Costs										
Average portion of premium paid by Employer	\$384.24	\$339.01	\$0.00	\$423.82	\$176.26	\$408.00	\$478.73	\$336.01	\$0.00	\$76,392,927,000
Average portion of premium paid by Employee	\$140.62	\$135.62	\$454.56	\$105.95	\$0.89	\$0.00	\$160.34	\$240.54	\$329.35	\$39,162,788,000
Total Premium	\$524.86	\$474.63	\$454.56	\$529.77	\$177.15	\$408.00	\$639.07	\$576.55	\$329.35	\$115,555,715,000
Enrollee Expenses										
Enrollee expenses for covered benefits (Deductibles, copays, etc.)	\$28.53	\$95.87	\$121.22	\$28.10	\$0.41	\$0.00	\$90.13	\$153.75	\$175.65	\$12,867,143,000
Enrollee expenses for benefits not covered	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
Total Expenditures	\$553.39	\$570.50	\$575.78	\$557.87	\$177.56	\$408.00	\$729.19	\$730.30	\$505.00	\$128,422,858,000

Source: California Health Benefits Review Program, 2014.

Notes: (a) Includes enrollees with grandfathered and nongrandfathered health insurance, inside and outside the exchange.

(b) As of January 14, 2014, 57% of CalPERS HMO members were state retirees, state employees, or their dependents. CHBRP assumes the same ratio for 2015.

(c) Includes children formerly in Healthy Families, which was moved into Medi-Cal Managed Care in 2013 as part of the 2012–13 state budget.

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

(e) This population includes both persons who obtain health insurance using private funds (group and individual) and through public funds (e.g., CalPERS HMOs, Medi-Cal Managed Care Plans). Only those enrolled in health plans or policies regulated by the DMHC or CDI are included. Population includes all enrollees in state-regulated plans or policies aged 0 to 64 years, and enrollees 65 years or older covered by employer-sponsored health insurance.

(f) 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: CalPERS HMOs=California Public Employees’ Retirement System Health Maintenance Organizations; CDI=California Department of Insurance; DMHC=Department of Managed Health Care; MCMC=Medi-Cal Managed Care.

Table 13a. Postmandate AB 1771 Impacts on Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2015 Scenario A “Low”

	DMHC Regulated						CDI-Regulated			Total
	Privately Funded Plans (by Market) (a)			Publicly Funded Plans			Privately Funded Plans (by Market) (a)			
	Large Group	Small Group	Individual	CalPERS HMOs (b)	MCMC (Under 65) (c)	MCMC (65+) (d)	Large Group	Small Group	Individual	
Enrollee counts										
Total enrollees in plans/ policies subject to state mandates (e)	8,779,000	2,012,000	2,498,000	845,000	6,364,000	826,000	567,000	662,000	836,000	23,389,000
Total enrollees in plans/ policies subject to AB 1771	8,779,000	2,012,000	2,498,000	845,000	6,364,000	826,000	567,000	662,000	836,000	23,389,000
Premium costs										
Average portion of premium paid by employer	\$0.14	\$0.19	\$0.00	\$0.19	\$0.00	\$0.00	\$0.34	\$0.28	\$0.00	\$25,271,000
Average portion of premium paid by employee	\$0.05	\$0.07	\$0.19	\$0.05	\$0.00	\$0.00	\$0.12	\$0.20	\$0.49	\$20,534,000
Total premium	\$0.19	\$0.26	\$0.19	\$0.23	\$0.00	\$0.00	\$0.46	\$0.49	\$0.49	\$45,804,000
Enrollee expenses										
Enrollee expenses for covered benefits (deductibles, copays, etc.)	\$0.04	\$0.05	\$0.04	\$0.03	\$0.00	\$0.00	\$0.10	\$0.10	\$0.10	\$9,487,000
Enrollee expenses for benefits not covered	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
Total expenditures	\$0.23	\$0.31	\$0.23	\$0.27	\$0.00	\$0.00	\$0.56	\$0.59	\$0.59	\$55,291,000
Postmandate percentage change										
Percent change insured premiums	0.0353%	0.0549%	0.0421%	0.0440%	0.0000%	0.0000%	0.0720%	0.0847%	0.1484%	0.0396%
Percent change total expenditures	0.0408%	0.0549%	0.0398%	0.0480%	0.0000%	0.0000%	0.0765%	0.0803%	0.1161%	0.0431%

Source: California Health Benefits Review Program, 2014.

Notes: (a) Includes enrollees with grandfathered and nongrandfathered health insurance, inside and outside the exchange.

(b) As of January 14, 2014, 57% of CalPERS HMO members were state retirees, state employees, or their dependents. CHBRP assumes the same ratio for 2015.

(c) Includes children formerly in Healthy Families, which was moved into Medi-Cal Managed Care in 2013 as part of the 2012–13 state budget.

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

(e) This population includes both persons who obtain health insurance using private funds (group and individual) and through public funds (e.g., CalPERS HMOs, Medi-Cal Managed Care Plans). Only those enrolled in health plans or policies regulated by the DMHC or CDI are included. Population includes all enrollees in state-regulated plans or policies aged 0 to 64 years, and enrollees 65 years or older covered by employer-sponsored health insurance.

(f) 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: CalPERS HMOs=California Public Employees’ Retirement System Health Maintenance Organizations; CDI=California Department of Insurance; DMHC=Department of Managed Health Care; MCMC=Medi-Cal Managed Care.

Table 13b Postmandate AB 1771 Impacts on Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2015
Scenario B “High”

	DMHC Regulated						CDI-Regulated			Total
	Privately Funded Plans (by Market) (a)			Publicly Funded Plans			Privately Funded Plans (by Market) (a)			
	Large Group	Small Group	Individual	CalPERS HMOs (b)	MCMC (Under 65) (c)	MCMC (65+) (d)	Large Group	Small Group	Individual	
Enrollee counts										
Total enrollees in plans/policies subject to state mandates (e)	8,779,000	2,012,000	2,498,000	845,000	6,364,000	826,000	567,000	662,000	836,000	23,389,000
Total enrollees in plans/policies subject to AB 1771	8,779,000	2,012,000	2,498,000	845,000	6,364,000	826,000	567,000	662,000	836,000	23,389,000
Premium costs										
Average portion of premium paid by employer	\$0.59	\$0.81	\$0.00	\$0.81	\$0.00	\$0.00	\$1.50	\$1.24	\$0.00	\$110,031,000
Average portion of premium paid by employee	\$0.22	\$0.32	\$0.83	\$0.20	\$0.00	\$0.00	\$0.50	\$0.89	\$2.13	\$89,406,000
Total premium	\$0.81	\$1.13	\$0.83	\$1.01	\$0.00	\$0.00	\$2.00	\$2.13	\$2.13	\$199,436,000
Enrollee expenses										
Enrollee expenses for covered benefits (deductibles, copays, etc.)	\$0.18	\$0.23	\$0.17	\$0.15	\$0.00	\$0.00	\$0.43	\$0.43	\$0.43	\$41,308,000
Enrollee expenses for benefits not covered	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
Total expenditures	\$0.98	\$1.36	\$1.00	\$1.17	\$0.00	\$0.00	\$2.43	\$2.55	\$2.55	\$240,744,000
Postmandate percentage change										
Percent change insured premiums	0.1536%	0.2390%	0.1831%	0.1914%	0.0000%	0.0000%	0.3133%	0.3690%	0.6460%	0.1726%
Percent change total expenditures	0.1777%	0.2391%	0.1735%	0.2091%	0.0000%	0.0000%	0.3330%	0.3496%	0.5056%	0.1875%

Source: California Health Benefits Review Program, 2014.

Notes: (a) Includes enrollees with grandfathered and nongrandfathered health insurance, inside and outside the exchange.

(b) As of January 14, 2014, 57% of CalPERS HMO members were state retirees, state employees, or their dependents. CHBRP assumes the same ratio for 2015.

(c) Includes children formerly in Healthy Families, which was moved into Medi-Cal Managed Care in 2013 as part of the 2012–13 state budget.

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

(e) This population includes both persons who obtain health insurance using private funds (group and individual) and through public funds (e.g., CalPERS HMOs, Medi-Cal Managed Care Plans). Only those enrolled in health plans or policies regulated by the DMHC or CDI are included. Population includes all enrollees in state-regulated plans or policies aged 0 to 64 years, and enrollees 65 years or older covered by employer-sponsored health insurance.

(f) 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: CalPERS HMOs=California Public Employees’ Retirement System Health Maintenance Organizations; CDI=California Department of Insurance; DMHC=Department of Managed Health Care; MCMC=Medi-Cal Managed Care.

PUBLIC HEALTH IMPACTS

As discussed in the *Introduction*, Assembly Bill (AB) 1771 would require state-regulated health plans and policies to cover telehealth services provided by physicians, including telephone or other electronic patient evaluation and management beginning in January 2015. Furthermore, coverage is limited to those services in which there is an established physician–patient relationship. CHBRP estimates that approximately 23.4 million Californians (61.6%) will have health insurance in 2015 that would be subject to this state health benefit mandate law.

This section estimates the short-term public health impact⁸⁰ of AB 1771 on overall morbidity, mortality, access to care, potential harms, patient perception/satisfaction, financial burden, and gender/racial/ethnic disparities. See the *Long-Term Impacts* section for discussion of outcomes beyond the first 12 months of the bill implementation.

The public health analyses are divided by the two main groups of telehealth technologies: telephone/e-mail and live videoconferencing/store-forward.

Estimated Public Health Outcomes

As presented in the *Medical Effectiveness* section, the scope of AB 1771 applies virtually to all diseases and conditions. The volume and quality of literature varies regarding the medical effectiveness of telephone calls, e-mail, live videoconference, and store-and-forward for providing medical care and subsequent health outcomes.

CHBRP finds insufficient evidence to determine whether medical care provided via telephone or e-mail is as effective as medical care provided in-person. Conversely, CHBRP finds that, taken collectively, findings from studies of live videoconferencing and store-and-forward suggest that, for the diseases and conditions studied, there is clear and convincing evidence that medical care provided by live videoconferencing and store-and-forward is at least as effective as medical care provided in person (see the *Medical Effectiveness* section).

Furthermore, CHBRP estimates that the number of enrollees newly covered for telephone and e-mail communications would increase by 105% (12,007,000 enrollees) and by 26% (4,817,000 enrollees) for videoconferencing and store-and-forward. To show the magnitude of difference between its model assumptions, CHBRP presents low-end and high-end scenarios estimating the uptake of various technologies in the first year postmandate. CHBRP estimates that the use of the four modes of telehealth would increase between 22% and 95%. Specifically, patient-initiated telephone and e-mail communications would increase between 1.1 million and 4.6 million encounters (95%). Likewise, use of live videoconferencing and store-and-forward between patients and their physicians would increase between 268,000 and 1.2 million encounters (see Table 11 in the *Benefit Coverage, Utilization, and Cost Impacts* section). CHBRP assumes that without cost sharing, 60% of these new encounters are substitutes for in-person visits and 40% are supplemental visits (encounters already occurring, but unreimbursed and new encounters with patients who would have previously avoided in-person visits due to distance or

⁸⁰ CHBRP defines short term impacts as changes occurring within 12 months of bill implementation.

inconvenience). Overall, CHBRP estimates that between 6.2% and 25.1% of all E/M visits would occur through telehealth. See Table 14, which describes the estimated distribution of patient visits by supplemental or substitute encounters and by modality.

Table 14. AB 1771: Summary of Incremental Impacts on High- and Low-End Estimates of Substitution and Supplemental Visits

	Low-End Scenario A	High-End Scenario B
Telephone/e-mail	1.1 million encounters <ul style="list-style-type: none"> • 689,000 substitute • 384,000 supplementary 	4.7 million encounters <ul style="list-style-type: none"> • 3.0 million substitute • 1.7 million supplementary
Live video/Store-and-forward	268,000 encounters <ul style="list-style-type: none"> • 172,000 substitute • 96,000 supplementary 	1.2 million encounters <ul style="list-style-type: none"> • 750,000 substitute • 418,000 supplementary
Total out-of-pocket expense for all encounters	\$9.5 million	\$41.3 million

Source: California Health Benefits Review Program, 2014.

Note: Numbers may not sum due to rounding.

Morbidity and Mortality

As previously mentioned, the scope of health conditions potentially affected by AB 1771 is vast. Measures of morbidity and mortality are limited to those included in the literature (see *Medical Effectiveness* section). Because telephone and e-mail CPT codes referenced by AB 1771 require patient-initiated contact, inpatient hospitalization was excluded from this analysis, thus the literature reviewed rarely considered mortality outcomes since this is a rare occurrence in outpatient settings. However, there were a number of studies considering morbidity outcomes for certain diseases or conditions, such as diabetes, transplant, obesity, stroke, skin conditions, and mental health. CHBRP found clear and convincing evidence that live videoconference and in-person visits may have similar effects on health outcomes for patients with acute stroke, organ transplants, diabetic foot ulcers, and obesity. Store-and-forward dermatology consultations also have health outcomes that are equivalent to in-person visits.

CHBRP found insufficient evidence of the effectiveness of *telephone and e-mail* to produce equivalent or better morbidity or mortality outcomes than in-person visits. Therefore, although telephone and e-mail encounters would increase between 1.1 million and 4.6 million encounters (low and high-end scenarios), the public health impact of AB 1771 is unknown. Note that the absence of evidence is not “evidence of no effect.” It is possible that an impact — positive or negative — could result, but current evidence is insufficient to inform an estimate.

For the diseases and conditions studied, evidence indicates that mortality and morbidity outcomes for *store-and-forward or live videoconferencing* are equivalent to in-person care, and CHBRP estimates that utilization would increase between 268,000 and 1.2 million encounters. Therefore, CHBRP estimates that positive health outcomes could occur for some newly covered enrollees; however, the public health impact is unquantifiable due to the unknown health outcomes of additional encounters for patients with a wide array of conditions.

Capacity Versus Access

One of the central hypotheses about telehealth is that it will increase access to physicians because of efficiency associated with the technologies (thus, assisting with the absorption of newly covered persons through the ACA). CHBRP finds AB 1771's impact on *capacity* would be limited (1) because AB 1771 limits coverage and reimbursement to encounters with "similar complexity and time expenditure," thus, CHBRP assumes that visits that occur telephonically, via e-mail, live videoconference, or store-and-forward, would be substituting for a similarly timed in-person visit. Additionally, because AB 1771 limits coverage and reimbursement to physicians performing evaluation and management services, CHBRP assumes that physicians' personal bandwidth to respond to any of the telehealth modalities is also limited.

Another hypothesis is that telehealth would increase access to physicians for patients in rural areas, and improve access to in-demand specialists. CHBRP finds that telehealth may improve access from the patient's perspective. Patients who cannot take time from work, have difficulty traveling, or questions or problems occurring after usual office hours may find the convenience of e-mail, phone, and live videoconferencing to be beneficial. These advantages would also extend to those living in urban areas. See below for discussion about patient interest and utilization of these communication modes.

Patient Experience/Satisfaction With Telehealth

One key aspect to estimating the potential impact of AB 1771 is gauging patient interest and uptake of technologies to communicate with their providers. Of the four technologies, CHBRP assumes that telephone and e-mail are the most common and simple modes of communication between patients and providers. Although patients are integral to the use of live videoconferencing, CHBRP only found literature addressing encounters occurring at medical facilities that were facilitated through another provider. CHBRP found no literature evaluating patient-initiated videoconferencing encounters, but believes that these types of encounters are starting to occur and may become more common in the future (See *Long Term Impacts* section). Therefore, in the short term, we address issues pertaining to the patient experience and satisfaction related to telephone, e-mail, and other types of telehealth.

Patient interest and use

CHBRP found limited literature on e-mail, telephone, store-and-forward, or live videoconferencing from the patient perspective. There appears to be variation in patient interest in the use of telehealth services. The most recent data CHBRP found is several years old and out of date — especially for technology — but does provide an indication of interest in this communication tool. A 2010 Harris poll reported that 88% of U.S. adults who use the internet to get medical information online and 53% discuss their findings with their physicians (Taylor, 2010). A previous Harris poll found that 90% of adults online were interested in some kind of online communication with their physician (Harris Interactive, 2008). Several studies have shown that patients would like to use e-mail to communicate with their physicians, if e-mail was available (Goodyear-Smith et al., 2005). Additionally, some patients reported that some of the communication currently taking place by telephone could be replaced by e-mail (Bhor et al., 2006).

Authors of a systematic review of 168 included articles, representing a wide variety of clinical settings, reported high and uniform patient satisfaction with telemedicine regardless of the clinical setting (Heinzelmann et al., 2005). The studies measuring patient satisfaction with telehealth, generally, reported that 20% to 73% of subjects stated they preferred in-person visits to telehealth. Another study included in the review reported that 70% preferred “telemedicine” — specifically, live videoconference and store-and-forward — over in-person care requiring travel (Heinzelmann et al., 2005).

In a systematic review limited to teledermatology, Warshaw et al. reported that in 3 of 5 studies (all of which were randomized controlled trials) that addressed patient satisfaction, patients expressed comparable levels of satisfaction between store-and-forward and in-person care (Warshaw et al., 2011). One nonrandomized study reported greater satisfaction with teledermatology. In the remaining study, patients that had already been seen via store-and-forward, reported greater satisfaction with clinic dermatology (Warshaw et al., 2011). Overall, preference for teledermatology ranged from 38% to 86%. One study reported slightly higher satisfaction with clinic dermatology but 76% of the patients preferred teledermatology over waiting to see a dermatologist (Warshaw et al., 2011).

In a study of adult caregivers (n=229) of children cared for in an urban pediatric primary care clinic, 86.3% reported that they would like to communicate with their provider by e-mail, but only 10.7% reported doing so (Dudas and Crocetti, 2013). Eighty-seven percent of respondents to a 2013 internal survey of Kaiser Permanente members who used the secure patient portal reported that their physicians did a very good or excellent job of meeting their needs (Pearl, 2014).

CHBRP estimates that, postmandate, patient experience would improve as physicians increase their e-mail and telephone responses to patient-initiated inquiries. The improvement is partly attributable to increasing the overall convenience for patients, such as reduced wait times for some visits.

Telehealth effects on patient travel for health care

Patients must travel to obtain their health care, which can be a burden especially for those who live in rural areas or have limited transportation options. As described in the *Background* section, the difference in health status and health care access between urban and rural communities in California is large. Travel costs include the direct costs of transportation and the indirect costs such as lost productivity, loss of income, and delays in treatment. For patients (and their caregivers), traveling from home in a rural location to an urban-based health clinic for treatment can be a potential barrier, as public transportation is often limited. In urban areas, where public transportation is more likely to be available, patients must contend with traffic delays, indirect routes, related transportation costs (such as transportation fares, tolls, parking, etc.) and time (e.g., bus/train schedules, transfers, etc.). Wootton and colleagues (2011) performed a review of the teledermatology literature and found 20 studies (both U.S. and non-U.S.) that measured the percentage of avoided travel through telemedicine (n=5,199 subjects). About 43% of patients were able to avoid travel through the use of store-and-forward compared to usual care (p <0.001). In the seven live videoconferencing and 1 hybrid telehealth studies, an average of 70% of the patients avoided travel compared to usual care (p=0.014) (Wootton et al., 2011). Cusack et al. estimated \$736 million savings in travel costs for telehealth visits using store-and-forward

technologies, \$160 million for live videoconference, and \$912 million for a hybrid approach (Cusack et al, 2007). These estimations are based on 2007 costs of \$0.445 per mile and the assumption that the telehealth consult was successful, in that no additional in-person visits were required. The video and hybrid approaches were estimated to have a success rate of 75% and 33%, respectively (Cusack, et al., 2007). Finally, a retrospective review of the use of store-and-forward telehealth in Alaska found that travel was avoided in one of five primary care visits and three of four specialist visits, saving over \$14 million for 15,6000 patient encounters over 7 years (Ferguson, 2008).

CHBRP estimates, postmandate, travel costs for some enrollees using telehealth services subject to AB 1771 would decrease, as a result, some enrollees may have better outcomes because they are no longer delaying or avoiding in-person visits, in favor of telephonic or electronic communications with physicians. CHBRP is unable to quantify the difference due to a lack of data.

Lost productivity

CHBRP found little literature addressing the prevention of loss of productivity due to travel and in-person wait time. One employer offered a contracted, independent telehealth service and self-reported saving almost \$800,000 in direct health costs and averted lost productivity (Zappe, 2012). In Alaska, store-and-forward telehealth decreased the time to see a specialist, leading to earlier diagnoses and treatments. In this case, the specialty consults were provided largely within the same working day (Ferguson, 2008).

CHBRP estimates AB 1771 would decrease lost productivity associated with travel, however CHBRP is unable to quantify the effect due to lack of data.

Estimated Impact on Financial Burden

When possible, CHBRP estimates the marginal impact of mandates on financial burden, defined as uncovered medical expenses paid by the enrollee as well as out-of-pocket expenses (i.e., deductibles, copayments, and coinsurance). AB 1771 would decrease the financial burden for those enrollees who are newly covered and use telehealth services under this mandate. Table 14 shows that out-of-pocket expenses for all enrollees using telehealth services would *increase* either to \$9.5 million or \$41.3 million, depending on the increase in utilization rate.

CHBRP estimates that AB 1771 would modify coverage and increase enrollees' net financial burden for additional services used by between \$9.5 million and \$41.3 million, in the first year postmandate. Postmandate, enrollees would now share in both the cost of substitute telehealth services and supplemental telehealth services (patient care that would not have occurred or been billed because telehealth was not covered or reimbursed.)

Potential Harms From Use of Telehealth Services

When data are available, CHBRP estimates the marginal change in relevant harms associated with interventions affected by the proposed mandate. In the case of AB 1771, CHBRP found

weak literature regarding potential harms; most conclusions are based on the opinions of experts and case reports. Potential harms frequently mentioned in the telehealth literature include: further fragmentation of care (especially when patients access out of network providers), misdiagnosis (which varies greatly with technology type and disease condition due in part to the lack of context and verbal clues obtained in an in-person visit) (Heinzelmann et al., 2005; Kassirer, 2000), higher rates of follow-up, and potential delays of immediate care seeking in the Emergency Department, which could pose a significant safety risk for patients with urgent or emergent conditions (Hall, 2014; Lewis et al., 2005; Nelson, 2014). Other potential harms associated with e-mail care include those associated with provider lack of adherence to security protocol, informed consent, breaches in patient privacy, and unauthorized access to and/or use of patient healthcare information (Hall, 2014; Menachemi et al., 2011). Two of the barriers to the diffusion and utilization of telehealth in practice from a physician’s perspective is concern about the medical responsibility of maintaining privacy during the exchange of sensitive data necessary to treatment (Timpano, 2013) and concern over increased physician liability.

There is a concern that telehealth, especially store-and-forward and e-mail use, would increase the potential for fraud and abuse. This argument is based on the idea that upcoding would be used to bill for telehealth when it was not necessary. However, medical coding and documentation standards act as an impediment to that type of gaming and exploitation of telehealth billing. Alaska adopted telehealth in 2001 and has not experienced either problem based on a review of 1,300 providers and more than 50,000 billed store-and-forward telehealth visits between years 2001–2007 (Ferguson AS, 2008-9). Many physicians have predicted that their time would be under even greater demand with increased patient use of e-mail (Kassirer, 2000).

CHBRP found insufficient evidence to determine whether telehealth services would result in harms to patients. Note that the absence of evidence is not “evidence of no effect.” It is possible that an impact — positive or negative — could result, but current evidence is insufficient to inform an estimate.

Impact on Gender and Racial Disparities

There are a variety of determinants of health that influence the health status of different groups. CHBRP estimates the mandate’s impact on one of those determinants — access to care through insurance — on existing health disparities; the other determinants of health are generally outside the scope of health insurance mandates (e.g., biological, environmental, social, behavioral, language barriers, etc.). CHBRP analyses are limited to the insured population (because the uninsured would not be affected by a health benefit mandate). Coverage disparities can exist within the insured population and may contribute to gaps in access and/or utilization among those covered (Kirby et al., 2006; Lillie-Blanton and Hoffman, 2005; Rosenthal et al., 2008). To the extent that racial/ethnic groups are disproportionately distributed among policies with more or less coverage, a mandate bringing all policies to parity may impact an existing disparity. The baseline racial/ethnic distribution of the insured population is unknown; therefore, CHBRP is unable to provide a quantitative estimate of a mandate’s possible impact on racial/ethnic disparities.

The use of e-mail as a mode of patient–physician communication requires access to and familiarity with computers. Numerous studies have considered access to and use of computers by various sociodemographic categories including age, gender, income, education level, race, ethnicity, disability and geography and have documented disparities in all categories (Baldassare, 2013; Gibbons, 2008). Specific to the use of e-mail for health care advice and treatment, CHBRP finds that older persons, low-income persons, and minorities (African Americans, Hispanics) are less likely to be interested in or use e-mail to communicate with a physician (Baldassare, 2013; Dudas and Crocetti, 2013; Mitchell et al., 2014; Moller, 2010; U.S. Census, 2011, 2013). They are also less likely to have access to broadband Internet (Baldassare, 2013; Moller, 2010) and an e-mail account (Gibbons, 2008).

Another important topic related to Internet use between patients and providers is health literacy. Internet use between a patient and a physician requires both the ability to read and interpret the other person’s written word (Gibbons, 2008). CHBRP found little evidence on the impact of health literacy on health outcomes associated with telehealth. A 2006 study found that Kaiser diabetes patients reporting limited health literacy were less likely to access and navigate an internet-based patient portal than those with adequate health literacy. Specifically, minorities (African American, Latino, and Filipino) and those with limited health literacy had higher odds of never signing on to the patient portal (odds ratio [OR]: 1.7, [CI 1.4 to 1.9]) compared with those who did not report any health literacy limitation (Sarkar, 2011). CHBRP found no body of literature regarding disparate use of or access to live videoconferencing or store-and-forward technologies.

Age, income, and racial/ethnic disparities exist in rural areas (see the *Background on Telehealth* section), and to the extent that health care access for the rural population is improved, telehealth may reduce disparities. The disparities gap could be widened by the extent that telehealth communication tools are disproportionately accessed by those not underserved, while improving health care outcomes for this group. CHBRP retrieved no literature regarding use of telephone, store-and-forward or live videoconferencing by sociodemographic characteristics.

Although there appear to be some disparities in interest or use of e-mail by sociodemographic characteristics, CHBRP is unable to estimate the impact of AB 1771 on health disparities due to the lack of evidence in access to and use of all telehealth services by subpopulations.

LONG-TERM IMPACT OF THE MANDATE

In this section, CHBRP estimates the long-term impact of AB 1771, defined as impacts occurring beyond the first 12 months of implementation. These estimates are qualitative and based on the existing evidence available in the literature. CHBRP does not provide quantitative estimates of long-term impacts because of unknown improvements in clinical care, changes in prices, implementation of other complementary or conflicting policies, and other unexpected factors.

Long-Term Utilization and Cost Impacts

Utilization Impacts

In the 12 months following enactment, CHBRP estimates that between 6.6% (Scenario A) and 26.4% (Scenario B) of E/M services will be delivered using either telephone, e-mail, live videoconference, or store-and-forward telehealth modalities.

There is limited literature suggesting that application of telehealth for delivery of certain types of E/M visits would be as effective as in-person visits in the long-term in improving patient health, reducing unnecessary health care use, and improving access to evaluation and management services.

CHBRP's review of the literature and expert interviews indicate that there is not sufficient evidence to determine that access to telehealth services specifically would decrease emergency department visits or inpatient discharges over time. However, there is evidence suggesting that outpatient office visits help to reduce emergency room use and inpatient stays for ambulatory care sensitive conditions, so it is also reasonable to assume that improved access to telehealth services would lead to long-term reductions in avoidable emergency room use and hospitalizations, resulting in long-term reductions in spending growth. This argument hinges on the assumption that telehealth-based evaluation and management services would be equivalent in quality and utility to in-person visits that the patient may be currently unable to receive due to distance or transportation. The time and reimbursement on the physician side would be the same as an in-person visit, according to the requirements of AB 1771.

Based on the Kaiser Permanente example (Pearl, 2014), CHBRP estimated that use of telehealth for E/M services would be 26.4% under Scenario B, which reflects the Kaiser utilization rate during its first year implementing telehealth technology.

Over time, the proportion of all visits in the Kaiser model increased from 22.8% to 50.3% within a five-year period of time. That finding indicates that from 2016 on, there is likely to be increased use of telehealth to conduct both substitute and supplementary evaluation and management visits. However, the adoption would be based upon patient preferences (since copayments are identical) and physician capacity (use of technology for secure e-mail messaging, secure videoconferencing, documentation, billing, and ability to collect copayments for remote visits). Based on the Kaiser study, CHBRP anticipates a commensurate increase due to access to telehealth. Once offered to enrollees, telehealth services would experience increases of 31.2% year-over-year.

Cost Impacts

The additional costs of reimbursing telephone and e-mail services are likely to increase with health care inflation and increased use of services. There is no evidence that health care costs would go down due to the reimbursement of telephone and e-mail services, as there is no evidence that expensive services such as emergency department visits or inpatient discharges would be reduced because of better access to telephone and e-mail services. However, as mentioned previously — if telephone and e-mail visits are assumed to replace in-person evaluation and management services, the supplementary telephone and e-mail visits that would have not occurred in the absence of the mandate could have a long-term impact, especially in chronically ill populations, rural areas, and ambulatory care sensitive conditions.

In future years, there is the potential for gaming or fraud with supplemental visits because doctors could “encourage” additional patient-initiated interaction beyond what is needed. CHBRP’s content expert on medical billing and coding indicated that coding standards and the specific requirements for billing telehealth and providing documentation equivalent to office visits that are based upon medical necessity would serve as an impediment to fraud, gaming, upcoding, or abuse. For this reason, we assume that there will be no more incentive to commit fraud or providing inappropriate care via telehealth in contrast to in-person visits.

In estimating the long-term cost impacts of AB 1771, CHBRP considers the following issues:

- **Adoption of telehealth:** CHBRP assumed full adoption in Scenario A and 25% adoption by 2015 in Scenario B. Scenario A is an upper-bound in terms of adoption in 2015, but full adoption and increased use based on the Kaiser experience, is likely to continue to increase spending on telehealth in subsequent years.
- **Provider network implications:** Network expansion and access improvements could be encouraged through reimbursement for telehealth. In the short-term, CHBRP assumed that 60% of the new telehealth use would be replacing in-person visits (i.e., substitution), while 40% would be new supplementary services that could be effectively used in care coordination, follow-up care more than seven days after a billed visit, or to provide services to people with access barriers (like remote location or lack of convenient transportation). This may provide opportunities for health plans and providers to meet a diverse set of needs for more population groups, especially those in rural areas or those facing transportation problems.

Public Health Impacts

CHBRP assumes that technology will continue to drive changes in telehealth. This includes increased penetration of electronic health records (EHR), associated patient portals and office management systems; increased use of mobile and remote communication devices (such as cellular telephones and or medical devices); increased broadband coverage, which allows not only better internet coverage but easier and more rapid transfer of large data files; and increased demand for these types of services from consumers, insurers, and providers. CHBRP projects that this trend, along with changes in reimbursement, would likely increase use of telephone, e-mail, and other telehealth services between patients and providers.

In the future, as these services become more streamlined and technology improves, there is a potential to maximize access and provider capacity through improved patient evaluation and management. For example, remote monitoring is becoming a more common method for managing patients. The use of a small subcutaneous implanted device to detect heart rhythm disturbances is changing how healthcare providers evaluate and management patients with various heart conditions. It is expanding store-and-forward technologies traditionally used between physicians to now include direct patient-physician interaction (Brignole et al, 2006; Moya et al., 2009; Seidl et al., 2000; Krahn et al., 2004). The first digestible monitoring device, approved in 2012, also has potential to change the evaluation and management relationship between patients and physicians. This sand-particle sized microchip, embedded in drugs to monitor a patients' response to treatment, sends signals from the device to a patch worn by the patient, which then transmits relevant information to other devices, such as the patient's and or physician's mobile device (Cressey, 2012). Patients armed with real-time information will have the ability to immediately contact their doctor with questions when abnormal readings arise.

Examples of California telehealth systems: integrated and contracted

Business models and strategies to maximize new reimbursement models and rules are expected to occur. As noted earlier, CHBRP found no studies of patient-initiated live videoconferencing, but there are several examples of models that provide a window into the potential o available for patient management and evaluation.

Teladoc is a national telehealth provider that payers contract with to provide their enrollees with around- the-clock access to physicians via telephone or live videoconference through the Internet. In California, between April 2012 and February 2013, the leading reasons for Teladoc consults by CalPERS members were: acute respiratory illnesses (31.1%), urinary tract infection and urinary symptoms (11.9%), and skin problems (9.1%) (Uscher-Pines and Mehrotra, 2014). Only a small number of the total number of eligible members, 0.9 % (N=2,718) used Teladoc for at least one visit, accounting for a very small proportion of CalPERS' healthcare use. Across the sample of 74,550 adult enrollees of both Teladoc users and nonusers, the average number of monthly visits for all conditions was 291 Teladoc visits as compared with 39,431 office visits and 883 ED visits.

RelayHealth is an online service that gives patients the ability to communicate online with health care providers and office staff 24 hours a day and provides access to more than 30 medical specialty categories. RelayHealth is being used in California by Aetna (Aetna, 2013), Blue Shield of California, ConnectiCare, Silicon Valley Employers Forum, 10 major employers, 5 major medical groups, and Cigna HealthCare. Company-sponsored surveys showed that the majority of doctors and patients found the service easy to use, satisfying, and preferable to an office visit for nonurgent health issues. Results of an unpublished and independent study commissioned by RelayHealth and conducted by University of California, Berkeley, and Stanford-based investigators reported that savings exceeded \$1 per member per month (PR NewsWire, 2002).

LiveHealth OnLine owned and operated by WellPoint, was recently launched in California by Anthem Blue Cross. This program allows Anthem Blue Cross members to initiate online encounters from their home or workplace via live audio/video to speak with a physician.

Currently, patients need access to a desktop or laptop computer with a webcam; however, they will soon be able to use a computer tablet or smartphone.

These are only a few examples of currently available systems, and as telehealth technology continues to evolve and diffuse across the state, the expansion of covered services may change dramatically in unforeseen ways. Issues concerning breaches in data security, informed consent, privacy, unauthorized access to patient healthcare information as well as billing fraud and abuse will need to be monitored continually.

CHBRP is unable to estimate the long term impact of AB 1771 on overall health outcomes and disparities due to the breadth of conditions telehealth affects and the unknown impact of future technology development. To the extent that advances in telehealth technology improve access and provider capacity, CHBRP projects some improvements in patient management and evaluation, especially for those enrollees with transportation barriers or chronic conditions.

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A group of faculty, researchers, and staff complete the analysis that informs California Health Benefits Review Program (CHBRP) reports. The CHBRP **Faculty Task Force** comprises rotating senior faculty from University of California (UC) campuses. In addition to these representatives, there are other ongoing contributors to CHBRP from UC that conduct 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 manages all external communications, including those with the California Legislature. 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.

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