Evidence-Based Medicine and State Health Care Coverage: The Washington Health Technology Assessment Program

David J. Rothman , Kristy L. Blackwood, Whitney Adair, and Sheila M. Rothman

Objective. To evaluate the Washington State Health Technology Assessment Program (WHTAP).

Study Setting. Washington State Health Technology Assessment Program proceedings in Seattle, Washington.

Data Collection and Study Design. We assessed the program through observation of its proceedings over a 5-year period, 2009–2014. We conducted detailed analyses of the documents it produced and reviewed relevant literature.

Principal Findings. Washington State Health Technology Assessment Program is unique compared to other state and federal programs. It has successfully applied evidence-based medicine to health care decision making, limited by the strength of available data. It claims cost savings, but they are not substantiated.

Conclusions. Washington State Health Technology Assessment Program is a useful model for other states considering implementation of technology assessment programs. We provide key lessons for improving WHTAP's process.

Key Words. Technology assessment, evidence-based medicine, health care

Over the past 9 years, Washington State has been pursuing an innovative and generally effective program to use evidence-based medicine to determine state health care coverage decisions. Its Health Technology Assessment Program committee evaluates diagnostic and therapeutic technologies—except pharmaceuticals, the responsibility of a different group—by the criteria of safety, efficacy, and cost-effectiveness (Washington Health Care Authority 2016a). Its findings determine state agency coverage for the employee health insurance program, Medicaid, worker's compensation, and correctional health, affecting some 750,000 people (Pollack 2011). Between 2007 and 2013, the committee evaluated 39 technologies granting blanket approval to only three.

We investigated Washington Health Technology Assessment Program's (WHTAP) procedures, findings, and results to learn whether it might serve as a model for improving state decisions on health care coverage, an issue that is now of extraordinary importance. According to the Agency for Healthcare Research and Quality (AHRQ), WHTAP was the first state-administered Health Technology Assessment Program (AHRQ 2008b). Although there are other programs that apply evidence-based medicine to health care, we selected WHTAP for in-depth analysis for several compelling reasons.

First, it operates in only one state, not at the federal level, and therefore has not received the sustained analytic attention devoted to the United States Preventive Services Task Force (USPSTF) and the Medicare Evidence Development and Coverage Advisory Committee (MEDCAC) (Guirguis-Blake et al. 2007; Guyatt, Helfand, and Kunz 2009; Lavertu, Walters, and Weimer 2012).

Second, it has direct decision-making authority; its findings are binding on state agencies. By comparison, the California Health Benefits Review Program (CHBRP) reviews costs and benefits but the legislature decides whether to accept, reject, or modify the CHBRP responses to its inquiries (Oliver and Singer 2006; California Health Benefits Review Program 2013a,b). The USPSTF assesses preventive health services—screenings, counseling, and preventive medications (USPSTF 2016a). The Affordable Care Act requires individual and family insurance plans to cover services receiving a high USPSTF rating, but this stipulation does not apply to Medicare or Medicaid (Siu, Bibbins-Domingo, and Grossman 2015). Although the Institute for Clinical and Economic Review (ICER) administers technology assessment programs at the state and regional level, it is privately funded, not affiliated with state agencies, and provides only policy recommendations (ICER 2016).

Third, WHTAP's decision-making process takes place in public, unlike the USPSTF which deliberates behind closed doors (USPSTF 2016b). Finally, WHTAP is charged to take cost-effectiveness into account, setting it apart from federal programs. The USPSTF explicitly does not consider costs when reviewing evidence and making its recommendations (USPSTF 2017).

Address correspondence to David J. Rothman, Ph.D., Columbia College of Physicians and Surgeons, Columbia University, 630 W 168th Street Suite 1525, New York, NY 10032; e-mail: djr5@cumc.columbia.edu. Kristy L. Blackwood, B.A., is with the Columbia College of Physicians and Surgeons, Columbia University, New York, NY. Whitney Adair, M.B.A., M.P.A., is with the New York University Stern School of Business, New York, NY. Sheila M. Rothman, M.S.W., Ph.D., is with the Columbia Mailman School of Public Health, Columbia University, New York, NY.

BACKGROUND

In 2006, then-Governor Christine Gregoire launched WHTAP as part of her attempt to expand social welfare benefits while respecting budgetary constraints (Blackmore and Budenholzer 2009). As one state official noted: “We will be looking for emerging or fast-growing technologies that could have the biggest impact on the state’s budget” (Wahkiahum County Eagle 2007).

As set forth by the Revised Code of Washington (RCW) 70.14.080–70.14.140, and operating under the state’s Health Care Authority (HCA), the medical directors of the agencies that dispense the majority of health care funds—the Department of Labor and Industries, the Department of Social and Health Services, the Department of Corrections, and the Department of Veteran Affairs—designed the program (Washington State Legislature 2006). They work with the HCA director to select committee members and technologies to be evaluated and implement the committee’s decisions (Washington Healthcare Authority, 2016a). Stakeholders, including industry, insurance companies physicians, and patients may submit recommendations for technologies to be reviewed, but over our study period, their requests carried little weight.

The committee is composed of practicing physicians drawn from a variety of specialties and subspecialties along with several allied health professionals. Members have been screened for first-hand experience with evidence-based medicine and for potential conflicts of interest. They serve terms of 3 years, with two renewals possible, and are compensated on a per diem basis. The administrative staff is small (under five) as is its annual budget (approximately \$1.2 million) (Eaton 2013). As stipulated by the original legislation, the collection and initial evaluation of the relevant clinical data is outsourced to “evidence vendors” who review the literature and deliver a lengthy report on findings to the committee (Washington Healthcare Authority, 2016a).

The committee meets four times a year, setting coverage policies for two technologies at each session. The meetings follow set procedures. In keeping with the state’s Sunshine provisions, sessions are open to the public. State agency medical directors and staff sit off the table but begin the proceedings by explaining why they selected the particular intervention for committee consideration. Although legislation lays out criteria for agencies’ selections, in practice the process was not transparent (Washington Healthcare Authority 2016b).

The public then has the opportunity to deliver timed 5-minute remarks, but otherwise must remain silent (Washington Healthcare Authority 2016a). Evidence vendors then present their report and answer committee inquiries. They are provided with “Key Questions” to guide their research, which include study design, methods, and outcomes. An outside “clinical expert” is also present to respond to committee members’ specific questions. The presentations concluded and the committee discusses the findings and formally votes on coverage.

State agencies are responsible for implementing decisions. They may bring up technologies for rereview after 18 months. Evidence reports and final decisions are available online. There is no other formal dissemination process.

METHODS

We attended WHTAP meetings over a 5-year period (10 in total, beginning in March 2011). We examined documents produced by and for WHTAP, including reviews by evidence vendors; committee decision reports; annual reports; periodic memoranda; printed materials distributed at WHTAP’s open meetings; independent evaluations; and state agency reports. We held informal discussions with several state agency medical directors as well as WHTAP staff, all of whom were cooperative. In addition, we reviewed the literature on evidence-based medicine and technology assessment in the United States and abroad.

RESULTS

Between May 2007 and December 2013, WHTAP evaluated the efficacy, safety, and cost-effectiveness of 39 diagnostic and therapeutic technologies (see Exhibit 1) (Washington Healthcare Authority 2017a). Of the technologies, 14 were diagnostic and 25 were therapeutic. Although many specialties were represented, orthopedics (14 reviews, 36 percent), radiology (six reviews, 15 percent), and cardiology (six reviews, 15 percent) predominated.

For each technology, the committee issued findings on safety, efficacy, and cost-effectiveness, assigning a high, medium, or low score to each. Safety included risks of a procedure and potential adverse side effects. Efficacy considered the strength of evidence for positive or negative outcomes, including comparisons with alternatives. Cost-effectiveness examined the possible

Exhibit 1: Technologies Reviewed, 2007–2013

<i>Technology</i>	<i>Field</i>	<i>Decision</i>
Diagnostic technologies		
Upright/positional MRI	Radiology	Not covered
Virtual colonoscopy/computed tomographic colonography	Gastroenterology	Not covered
Discography	Orthopedics	Not covered
Computed tomographic angiography	Cardiology	Covered with conditions
Calcium scoring	Cardiology	Not covered
Breast MRI	Radiology	Covered with conditions
Routine ultrasound for pregnancy	Radiology	Covered with conditions
Cardiac nuclear imaging	Cardiology	Covered with conditions
Spinal injections	Orthopedics	Covered*
Glucose monitoring	Endocrinology	Covered with conditions
Positron emission tomography scans for lymphoma	Radiology	Covered with conditions
Sleep apnea diagnosis and treatment in adults	Other	Covered with conditions
Upper endoscopy for GERD and GI symptoms	Gastroenterology	Covered with conditions
Vitamin D screening and testing	Other	Covered with conditions
Therapeutic technologies		
Pediatric bariatric surgery	Surgery	Covered with conditions
Implantable infusion pumps	Surgery	Not covered
Arthroscopic knee surgery	Orthopedics	Not covered
Artificial disks	Orthopedics	Covered
Cardiac stent	Cardiology	Covered with conditions
Vagal nerve stimulation	Neurology	Covered with conditions
Bone growth stimulators	Orthopedics	Covered with conditions
Electrical neural stimulation	Neurology	Not covered
Hyaluronic acid/viscosupplementation	Orthopedics	Covered with conditions
Spinal cord stimulators	Orthopedics	Not covered
Knee joint replacement or knee arthroplasty	Orthopedics	Covered
Vertebroplasty, kyphoplasty, and sacroplasty	Orthopedics	Not covered
Applied behavioral analysis therapy for autism	Pediatrics	Covered with conditions
Femoroacetabular impingement syndrome	Orthopedics	Not covered
Osteochondral allograft and autograft transplantation	Orthopedics	Covered with conditions
Microprocessor-controlled lower limb prosthetics	Orthopedics	Covered with conditions
Bone morphogenic proteins for use in spinal fusions	Orthopedics	Covered with conditions
Robotic-assisted surgery	Surgery	Covered with conditions
Intensity-modulated radiation therapy	Radiology	Covered with conditions

Continued

Exhibit 1. *Continued*

<i>Technology</i>	<i>Field</i>	<i>Decision</i>
Stereotactic radiation surgery and stereotactic body radiation therapy	Radiology	Covered with conditions
Hyperbaric oxygen treatment for tissue damage	Surgery	Covered with conditions
Cervical spinal fusion for degenerative disk disease	Orthopedics	Covered with conditions
Cochlear implants-bilateral vs. unilateral	Surgery	Covered with conditions
Catheter ablation procedures for supraventricular tachyarrhythmia	Cardiology	Covered with conditions
Carotid artery stenting	Cardiology	Covered with conditions

*In 2015, following data collection, spinal injections were rereviewed after the time of writing due to new evidence. That review resulted in a “covered with conditions” decision.

impact of an intervention on state agency budgets as well as its value compared to less expensive alternatives.

The committee decided whether to cover a technology, cover it with conditions, or deny coverage. Cover with conditions was the most frequent outcome, and it occurred in 26 technologies (67 percent). The conditional coverage varied according to such criteria as recipients’ age, treatment history, and potential enrollment in a clinical trial. Refusal to cover occurred in 10 technologies (26 percent). Only three technologies received blanket approval (8 percent). In each instance, the committee found strong evidence of safety, efficacy, and cost-effectiveness compared to alternatives. In orthopedics, the committee approved coverage of nine of 14 technologies (64 percent); rates of coverage were higher for radiology (83 percent), cardiology (83 percent), and surgery (80 percent).

Following its deliberations and vote, the committee issued a formal report online of its coverage decision, summarizing the evidence on safety, efficacy, and cost-effectiveness (Franklin and Budenholzer 2009). Some reports linked the decision directly to the committee’s evaluation of the evidence; others, however, did not. Unlike the USPSTF, WHTAP did not assign specific grades or numbers to its evidence evaluation and coverage decision. Nor did it consistently explain whether its decision reflected an absence of data, poor quality of data, or negative outcome findings. By our own analysis of the committee reports for the 10 technologies denied coverage, lack of demonstrated efficacy was the major consideration, followed by lack of safety. The least determinative was cost-effectiveness.

Cost-effectiveness did become relevant when WHTAP evaluated new technologies that required substantial capital outlays. The committee limited coverage for robotic-assisted surgery (Da Vinci equipment requires a \$2 million investment) (Lee 2014). It allowed proton beam therapy (with an outlay of \$145–150 million) only for ocular, central nervous system, and pediatric cancers (Whelan and Langreth 2009). The committee ruled out its most frequent use, prostate cancer, because evidence of efficacy was weak. The committee also refused coverage for routine breast screening with MRIs, upright MRIs, or virtual colonoscopy on the grounds that outcomes were no better than with less costly alternatives.

The committee's analysis of robotic-assisted surgery (RAS) illustrates its approach (Washington Healthcare Authority 2012b). The evidence vendor compared RAS to standard open laparoscopic surgery for 25 procedures, reporting evidence of "low to moderate strength" for shortened hospital stays, longer operating times, and higher costs for purchasing, using, and maintaining the technology. Findings on comparative effectiveness between the RAS and laparoscopic approach were also "insufficient or low overall strength."

At the WHTAP meeting, public comments came predominantly from surgeons, all of whom extolled the new technology and urged full coverage. The committee itself, however, noted a "dreadful" absence of data. "There's not a single randomized or nonrandomized clinical trial" (Washington Healthcare Authority 2012a). It first considered a "no coverage" decision for RAS, but thought that was too extreme. "I have trouble saying," declared one member, "we will no longer pay for the procedure if you turn on the robot. . . . But at the same time, I don't think there's any sort of strong evidence that thing is adding value such that the state should be shelling out some extra money for it" (Washington Healthcare Authority 2012a). In the end, the committee voted to cover it "with conditions." It did not allow "additional payment for use of RAS beyond that for the underlying procedure." State agencies were also to encourage providers "to clearly identify when RAS is used," so as to build a patient database for outcome analysis (Washington Healthcare Authority 2012a).

Reviewing its own record, WHTAP took credit for saving the state nearly \$32 million between May 2007 and December 2010 (Lessler, Fotinos, and Morse 2014). It estimated that denial of coverage for virtual colonoscopy saved \$11 million; limits on CT angiography, \$5 million; its rejection of upright MRIs, \$3 million; and spinal cord stimulation, \$1.8 million. So too, in 2012, the committee asserted that since inception, it had saved the state

\$95 million (Lessler, Fotinos, and Morse 2014). In no case, however, did it supply precise calculations or provide supporting materials.

DISCUSSION

WHTAP, a unique program designed to make health care coverage decisions, has been successful by many measures. Its coverage decisions reflect clinical evidence, and state officials and agency medical directors have not contested them.

The selection and composition of the committee is a particular strength. By including a diverse representation of physician and health care professionals, decisions reflect a wide set of perspectives. By comparison, in both CHBRP and ICER, MDs serve as the primary clinical experts. Moreover, evidence-based decision making is facilitated by a strict disclosure of conflicts of interest. Committee members' clinical experience and outside clinical expert promotes a detailed review of the evidence. Unlike federal programs, cost is a consideration, especially with new and expensive technologies. Finally, WHTAP meetings are open to the public with the opportunity for stakeholder comment. By comparison, only MEDCAC holds public meetings.

Nevertheless, WHTAP procedures have important limitations. For one, analyses of available clinical evidence have shortcomings, some reflecting the program's procedures, others, the state of research (Sox 2010). The availability and quality of the evidence varied considerably. The committee had a clear preference for randomized controlled trials (RCTs) and often wished to differentiate among subsets of patients. But much of the outcome data the committee would want to consider did not exist. For example, there were no RCTs for robotic surgery outcomes. Even when evidence was available, its quality often fell short because design was weak, the sample size was small, or the period of study too limited.

For another, the committee's preference for RCTs has been a source of controversy at public meetings. Physicians believed their bedside experience was being discounted and patients feared their well-being was being compromised. Industry stakeholders took issue with this exclusion as well (Pinson, Gordon, and Curtis 2015). This was especially true when the most recent data were not RCTs but favorable observational studies or case reports. The lack of high-quality data was compounded by variation in evidence vendors' research methodologies. Some evidence vendors included only RCTs; others

incorporated prospective studies and case reports. Although committee members closely questioned the vendor, they ultimately had to rely on its research findings.

Other technology assessment programs have developed methodologies that allow inclusion of a variety of evidence. By weighting studies by quality, they maintained a preference for RCTs but also included other data in their analyses. For example, CHBRP acknowledges that while “observational studies are less rigorous than are RCTs” they should be evaluated whether they are the only source of information on relevant outcomes, such as subsets of patients (CHBRP, 2013b, 2014). ICER uses an evidence matrix which assigns a joint rating based on magnitude of net benefit and level of certainty (Ollendorf and Pearson 2016).

For still another, the committee did not have a consistent and rigorous methodology for reviewing and translating evidence to decisions. They rated technologies in terms of safety, efficacy, and cost-effectiveness as high, medium, or low. But what constituted a low versus medium or high rating was poorly defined, and how they arrived at these judgments was often unclear. The relative importance of the three criteria was not made explicit. When the committee issued a noncoverage decision and cited “insufficient evidence,” it was not apparent whether the conclusion reflected an absence of evidence or compelling data indicating lack of safety or efficacy. In contrast, the USPSTF not only has defined ratings for both magnitude of net benefit and certainty of net benefit but has also developed a simple formula that translates these two ratings into a recommendation decision (Agency for Healthcare Research and Quality 2008a,b).

WHTAP's charge to include cost-effectiveness in its decision making proved difficult to accomplish. First, it did not consistently distinguish between cost impact, cost savings, and cost-effectiveness. Second, it was unclear how cost-effectiveness was measured. Third, although WHTAP was often confronted with a dearth of evidence on cost-effectiveness, it did not have a strategy to address gaps in knowledge. By contrast, CHBRP employs an actuary and cost model to help evaluate the costs of benefits it reviews. Fourth, WHTAP's analysis of the financial impact of its coverage decisions was insufficient. Its claims of cost savings of nearly \$95 million since its inception were undocumented. Finally, information on how state agencies translated committee findings into practice and realized cost savings was not available. While WHTAP may have contributed to substantial cost savings, supporting evidence was lacking.

Finally, beyond the challenges associated with the financial impact of the program, there are no data available on the clinical impact of the committees' decisions. Data demonstrating changes in utilization and outcomes before and after coverage decisions were missing.

CONCLUSIONS AND KEY LESSONS

Given its unique responsibility and overall strong performance in overseeing Washington's health care coverage, WHTAP is a useful model for consideration by other states. Our analysis of its procedures and achievements highlights its strengths and suggests key lessons for improvement of the WHTAP program as well as for other states that might adopt similar strategies:

- Develop methodologies for reporting and evaluating variation in the quality and quantity of existing clinical data. Clarify whether ratings refer to amount of evidence, quality of evidence, or strength of effect
- Establish clear and consistent guidelines for linking ratings to decisions so as to enhance the decision-making process.
- Make available information on how state agency leaders, or other state bodies implement decisions
- Ensure a standard methodology for evaluating cost-effectiveness and release better documented financial data of cost savings.
- Release clinical data on the impact of coverage decisions and encourage research for continued program improvement. Data showing how utilization has changed after committee actions would be particularly useful.

ACKNOWLEDGMENTS

Joint Acknowledgment/Disclosure Statement: The Selz Foundation and the Institute on Medicine as a Profession supported this work. Neither organization had any influence over the acquisition or analysis of data, nor the final product. No other disclosures to report.

Disclaimer: None.

Disclosures: None.

REFERENCES

- Agency for Healthcare Research and Quality. 2008a. *U.S. Preventative Services Task Force Procedure Manual*. AHRQ Publication No. 08-05118-EF. Washington, DC: Agency for Healthcare Research and Quality.
- Agency for Healthcare Research and Quality. 2008b. "State of Washington Implements Nation's First Health Technology Assessment Program" [accessed on October 25, 2016]. Available at <http://www.ahrq.gov/policymakers/case-studies/ockt0801.html>
- Blackmore, C. C., and C. Budenholzer. 2009. "Applying Evidence-Based Imaging to Policy: The Washington State Experience." *Journal of the American College of Radiology* 6 (5): 366–71.
- California Health Benefits Review Program. 2013a. "About CHBRP: Frequently Asked Questions" [accessed on October 25, 2016]. Available at <http://cms3.revize.com/revize/chbrp/faqs.php>
- California Health Benefits Review Program. 2013b. "Summary of Medical Effectiveness Analysis Approach" [Internet] [accessed on October 25, 2016]. Available at http://cms3.revize.com/revize/chbrp/analysis_methodology/summary.php
- California Health Benefits Review Program. 2014. "Medical Effectiveness Analysis Approach" [accessed on October 25, 2016]. Available at http://www.chbrp.org/analysis_methodology/docs/2014_ME_Research_Approach_012714_FINAL.pdf
- Eaton, J. 2013. *The Other Washington Could Hold the Key to Medicare's Cost Crisis*. [Internet]. Washington, DC: The Center for Public Integrity; [Updated 2014 May 19; Cited 2016 April 28]. Available at <https://www.publicintegrity.org/2013/07/29/13052/other-washington-could-hold-key-medicare-cost-crisis>
- Franklin, G. M., and B. R. Budenholzer. 2009. "Implementing Evidence-Based Health Policy in Washington State." *New England Journal of Medicine* 361 (18): 1722–5.
- Guirguis-Blake, J., N. Calonge, T. Miller, A. Siu, S. Teutsch, and E. Whitlock. 2007. "Current Processes of the US Preventive Services Task Force: Refining Evidence-Based Recommendation Development." *Annals of Internal Medicine* 147 (2): 117–22.
- Guyatt, G. H., M. Helfand, and R. Kunz. 2009. "Comparing the USPSTF and GRADE Approaches to Recommendations." *Annals of Internal Medicine* 151 (5): 363.
- Institute for Clinical and Economic Review. 2016. "Programs" [accessed on April 28, 2016]. Available at <http://icer-review.org/>
- Lavertu, S., D. E. Walters, and D. L. Weimer. 2012. "Scientific Expertise and the Balance of Political Interests: MEDCAC and Medicare Coverage Decisions." *Journal of Public Administration Research and Theory* 22 (1): 55–81.
- Lee, J. 2014. "Surgical-Robot Costs Put Small Hospitals in a Bind." *Modern Healthcare* [accessed on October 25, 2016]. Available at <http://www.modernhealthcare.com/article/20140419/magazine/304199985>
- Lessler, D., C. Fotinos, and J. Morse. 2014. "Health Technology Assessment Program Presentation to House Appropriations Subcommittee on Health and Human Services. Presentation Obtained through Private Communication" [accessed on

- October 28, 2016]. Video presentation available at <http://www.tvw.org/watch/?eventID=2014011345>
- Oliver, T. R., and R. F. Singer. 2006. "Health Services Research as a Source of Legislative Analysis and Input: The Role of the California Health Benefits Review Program." *Health Services Research* 41 (3p2): 1124–58.
- Ollendorf, D., and S. D. Pearson. 2016. *ICER Evidence Rating Matrix: A User's Guide*. Boston, MA: Institute for Clinical and Economic Review [accessed October 25, 2016]. Available at <http://icer-review.org/wp-content/uploads/2016/01/Rating-Matrix-User-Guide-FINAL-v10-22-13.pdf>
- Pinson, N., C. Gordon, and P. Curtis. 2015. "Washington HTA Process Evaluation. Portland: Center for Evidenced-based Policy, Oregon Health and Science University." Available at http://www.hca.wa.gov/hta/Documents/hta_2015_process_eval_082515.pdf
- Pollack, A. 2011. "A Panel Decides Washington State's Health Care Costs. New York Times" [accessed on April 28, 2016]. Available at <http://www.nytimes.com/2011/03/22/business/22care.html>
- Siu, A. L., K. Bibbins-Domingo, and D. Grossman. 2015. "Evidence-Based Clinical Prevention in the Era of the Patient Protection and Affordable Care Act: The Role of the US Preventive Services Task Force." *Journal of the American Medical Association* 314 (19): 2021–2.
- Sox, H. C. 2010. "Comparative Effectiveness Research: A Progress Report." *Annals of Internal Medicine* 153 (7): 469–72.
- U.S. Preventive Services Task Force. 2016a. "About the USPSTF" [accessed on April 28, 2016]. Available at <http://www.uspreventiveservicestaskforce.org/Page/Name/about-the-uspstf>
- U.S. Preventive Services Task Force. 2016b. "Public Comments and Nominations" [accessed on October 31, 2016]. Available at <https://www.uspreventiveservicestaskforce.org/Page/Name/public-comments-and-nominations>
- U.S. Preventive Services Task Force. "2017. USPSTF and Cost Considerations" [accessed on March 14, 2017]. Available at <https://www.uspreventiveservicestaskforce.org/Page/Name/uspstf-and-cost-considerations>
- The Wakhiahum County Eagle. 2007. State Will Review Medical Technologies for Safety and Effectiveness. Wakhiahum County Eagle [accessed on April 28, 2016]. Available at <http://www.waheagle.com/story/2007/02/01/news/state-will-review-medical-technologies-for-safety-and-effectiveness/1689.html?m=true>
- Washington Healthcare Authority. 2012a. "Meeting Transcript" [accessed on May 10, 2016]. Pages 146, 150, 167. Available at http://www.hca.wa.gov/hta/meeting-materials/051812_HTCC_Mtg_Transcript.pdf
- Washington Healthcare Authority. 2012b. "Washington HTA Robotic Surgery Final Decision" [accessed on April 29, 2016]. Available at http://www.hca.wa.gov/hta/documents/ras_final_findings_decision_101212.pdf
- Washington Healthcare Authority. 2016a. "Key Questions" [accessed on September 30, 2016]. Available at <http://www.hca.wa.gov/about-hca/health-technology-assessment/key-questions>

- Washington Healthcare Authority. 2016b. "Prioritization Criteria" [accessed on September 28, 2016]. Available at http://www.hca.wa.gov/assets/program/prioritization_criteria%5B2%5D.pdf
- Washington Healthcare Authority. 2017a. "Health Technology Assessment Reviews" [accessed on March 12, 2017]. Available at <http://www.hca.wa.gov/about-hca/health-technology-assessment/health-technology-reviews>
- Washington State Legislature. 2006. "Health Technology Assessment Program Chapter 182-55 WAC" [accessed on September 29, 2016]. (Washington State). Available at <http://apps.leg.wa.gov/wac/default.aspx?cite=182-55&full=true>
- Whelan, D., and R. Langreth. 2009. "The \$150 Million Zapper. *Forbes Magazine*" [accessed on October 25, 2016]. Available at http://www.forbes.com/forbes/2009/0316/062_150mil_zapper.html

SUPPORTING INFORMATION

Additional supporting information may be found online in the supporting information tab for this article:

Appendix SA1: Author Matrix.