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September 2016

# Updated Inventory of Evidence-based, Research-based, and Promising Practices: *Prevention and Intervention Services for Adult Behavioral Health*

The 2013 Washington State Legislature passed 2SSB 5732 which established the following:

> *The systems responsible for financing, administration, and delivery of publicly funded mental health and chemical dependency services to adults must be designed and administered to achieve improved outcomes for adult clients served by those systems through increased use and development of evidence-based, research-based, and promising practices.*[1]

The legislation directed the Washington State Institute for Public Policy (WSIPP) to create, in consultation with the Department of Health and Social Services (DSHS), University of Washington Evidence-Based Practice Institute (EBPI), University of Washington Alcohol and Drug Abuse Institute (ADAI), and the Washington Institute for Mental Health Research and Training (WIMHRT), an inventory of evidence-based, research-based, and promising practices. The legislation allowed one year to develop the initial inventory. The inventory of interventions and policies in adult mental health and chemical dependency services was published in May 2014.[2] DSHS used the inventory and input from the steering committee established by the law to develop a strategy to improve behavioral health.[3]

2SSB 5732 did not contain language directing WSIPP to update this inventory in the future.[4] This September 2016 report is the second update of the Adult Behavioral Health inventory and was funded through a WSIPP Board-approved contract with the Division of Behavioral Health and Rehabilitation (DBHR) at DSHS. At this time no further updates are planned.

While the definitions used to build the inventory have not changed since the inventory was originally published in May 2014, programs may be classified differently with each update as new research becomes available and refinements are made to the WSIPP benefit-cost model. Thus, it is important to note that the inventory is a snapshot that can change as new evidence and information is incorporated.

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[1] Second Substitute Senate Bill 5732, Chapter 338, Laws of 2013.
[2] Miller, M., Fumia, D., & Kay, N. (2014). *Inventory of evidence-based, research-based, and promising practices prevention and intervention services for adult behavioral health.* (Doc. No. 14-05-4101). Olympia: Washington State Institute for Public Policy.
[3] The final report of the task force was published in December 2014.
http://leg.wa.gov/JointCommittees/archive/ABHS/Documents/ABHS%20TF%20Final%20Report.pdf
[4] Second Substitute House Bill 2536 from the 2012 Legislative Session directed WSIPP and EBPI to prepare a similar inventory for children's mental health, child welfare, and juvenile justice. The language in that bill did authorize updating the inventory on a periodic basis.

## Creating the Adult Behavioral Health Inventory

Our approach to developing the inventory is the same approach we use for legislatively directed inventories in other policy areas. The first step is to estimate the degree to which various public policies and programs can achieve desired outcomes, such as improvements in mental health, or reductions in illicit drug use.[5] For each program or policy, we carefully analyze all high-quality studies from the United States and elsewhere to identify interventions or policies that have been tried, tested, and found to either achieve or not achieve improvements in outcomes. We look for research studies with strong evaluation designs and exclude studies with weak research methods. Using all credible evaluations we can locate on a given topic, we then conduct a meta-analysis to determine the average effect of the program and a margin of error for that effect.[6] The research standards are outlined in the box below.

**Standards of Research Rigor for Meta-Analysis**

When WSIPP is asked by the legislature to conduct an evidence-based review, we follow a number of steps to ensure a rigorous and consistent analysis. These procedures include the following:

- ✓ We consider all available studies we can locate on a topic rather than selecting only a few; that is, we do not "cherry pick" studies to include in our reviews.
- ✓ To be included in our reviews, we require that an evaluation's research design include treatment and comparison groups from intent-to-treat samples. Random assignment studies are preferred, but we include quasi-experimental studies when the study uses appropriate statistical techniques. Natural experimental designs including regression discontinuity and instrumental variables are also considered.
- ✓ We then use a formal statistical procedure, meta-analysis, to calculate an average "effect size," which indicates the expected magnitude of the relationship between the treatment and the outcome of interest. That is, we determine whether the weight of the evidence indicates outcomes are, on average, achieved.

The second step is to use the results from our analysis of program effects to determine whether the lifetime benefits of the program exceed the costs to Washington's taxpayers. That is, we conduct a formal benefit-cost analysis.

The third analytical step involves testing the robustness of our results. Any tabulation of benefits and costs involves some degree of uncertainty about future performance. This uncertainty is expected in any investment analysis, whether in the private or public sector. To assess the riskiness of our conclusions, we perform a "Monte Carlo simulation" in which we vary the key factors in our calculations. The purpose of the risk analysis is to determine the odds that the benefits of a particular policy option will exceed the costs. This type of analysis is used by many businesses in investment decision making.

[5] For the inventory, we look for studies measuring outcomes related to the reasons for treatment. For example, in programs treating substance abuse, we include studies that measure reductions in alcohol or drugs or outcomes such as employment. We would not include studies that measure outcomes that may or may not be related to the behavioral change, such as retention in treatment or client satisfaction, if the studies did not also measure substance abuse. Similarly, studies of programs intended for persons with serious mental illness had to include some measure of symptom improvement, such rates of psychiatric hospitalization, arrest, or employment.

[6] All methods are described in detail in http://www.wsipp.wa.gov/TechnicalDocumentation/WsippBenefitCostTechnicalDocumentation.pdf

Thus, for each option, we produce two "big picture" findings: expected benefit-cost results (net present values and benefit-cost ratios) and, given our understanding of the risks involved, the odds that the policy will at least have benefits greater than costs.

## Classifying Practices as Evidence-based, Research-based, and Promising

The legislature established definitions for evidence-based, research-based, and promising practices for adult behavioral health in 2SSB 5732.[7] These definitions were used to assemble the list of promising practices and define interventions as evidence-based and research-based. The following definitions are taken verbatim from the bill.

**Legislative Definitions of Evidence-based, Research-based, and Promising Practices**

***Evidence-based practice***

*A program or practice that has been tested in heterogeneous or intended populations with multiple randomized, or statistically controlled evaluations, or both; or one large multiple site randomized, or statistically controlled evaluation, or both, where the weight of the evidence from a systemic review demonstrates sustained improvements in at least one outcome. "Evidence-based" also means a program or practice that can be implemented with a set of procedures to allow successful replication in Washington and, when possible, is determined to be cost-beneficial.*

***Research-based practice***

*A program or practice that has been tested with a single randomized, or statistically controlled evaluation, or both, demonstrating sustained desirable outcomes; or where the weight of the evidence from a systemic review supports sustained outcomes as described in subsection (14) of this section but does not meet the full criteria for evidence-based.*

***Promising practice***

*A practice that, based on statistical analyses or a well-established theory of change, shows potential for meeting the evidence-based or research-based criteria, which may include the use of a program that is evidence-based for outcomes other than those listed in subsection (14) of this section (defining "evidence-based").*

For this inventory update, DBHR asked stakeholders at the Behavioral Health Organizations to suggest topics of interest. We also updated reviews of several interventions reviewed for the original inventory.

For each program where research is available, we conduct meta-analysis and benefit-cost analysis to classify practices as evidence- or research-based according to the above definitions. If outcome evaluations exist, but the evidence indicates a non-significant (p-value > 0.2) effect on desired outcomes in the expected direction, then the program is designated as promising. When we cannot locate rigorous outcome evaluations for a program, or the effect on outcomes was mixed, the program is sent to the institutes at the University of Washington (ADAI, WIMHRT, and EBPI) to determine whether it meets the criteria for promising.

[7] RCW 71.24.025.

To assemble the inventory, we operationalize each criterion in the statutory definitions. These are the same criteria WSIPP has used in assembling inventories in other policy areas including children's services, adult corrections, and the K–12 Learning Assistance Program. The criteria are as follows:

1) Heterogeneity. To be designated as evidence-based a program must have been tested on a "heterogeneous" population. We operationalized heterogeneity in two ways. First, the proportion of program participants belonging to ethnic/racial minority groups must be greater than or equal to the proportion of minority adults in Washington. From the 2010 Census, for adults in Washington, 76% were white and 24% belonged to ethnic/racial minority groups.[8] Thus, if the weighted average of program participants in the outcome evaluations of the program was at least 24% ethnic/racial minority, then the program was considered to have been tested in a heterogeneous population.

   Second, the heterogeneity criterion can also be achieved if at least one of a program's outcome evaluations has been conducted on adults in Washington and a subgroup analysis demonstrates the program is effective for ethnic/racial minorities ($p < 0.2$).

   Programs whose evaluations do not meet either of these two criteria do not meet the heterogeneity definition.

2) Weight of evidence. To meet the evidence-based definition, results from a random effects meta-analysis (p-value < 0.20) of multiple evaluations or one large multiple-site evaluation must indicate the practice achieves the desired outcome(s).[9] To meet the research-based definition, one single-site evaluation must indicate the practice achieves the desired outcomes (p-value < 0.20).

3) Benefit-cost. The statute defining evidence-based practices requires that, when possible, a benefit-cost analysis be conducted. We use WSIPP's benefit-cost model to determine whether a program meets this criterion.[10] Programs that do not achieve at least a 75% chance of a positive net present value do not meet the benefit-cost test. The WSIPP model uses Monte Carlo simulation to test the probability that benefits exceed costs. The 75% standard was deemed an appropriate measure of risk aversion.

If a program is not listed on the inventory, we have not yet had the opportunity to review it or it does not meet the criteria for promising. If a program is listed on the inventory but does not meet any of the criteria for evidence-based, research-based, or promising, then the program is ineffective or has adverse effects and should not be used if the goal is to achieve one of the desired outcomes such as reductions in use of alcohol and drugs or reductions in symptoms of mental illness identified in the evidence-based definition. The adult behavioral health inventory is displayed at the end of this report and is also available on our website.[11] Further information on the individual programs contained in the inventory can also be found on our website.[12]

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[8] United States Census Bureau, 2010. Retrieved from http://factfinder2.census.gov/.

[9] To operationalize the benefit-cost criterion, net benefits must exceed costs at least 75% of the time. After considerable analysis, we found that a typical program that WSIPP has analyzed may produce benefits that exceed costs roughly 75% of the time with a p-value cut off of up to 0.20. Thus, we determined that programs with p-values < 0.20 on desired outcomes should be considered research-based to avoid classifying programs with desirable benefit-cost results as promising. This decision took place after the initial May 2014 inventory where we used $p < 0.10$ as the cut off.

[10] For information about WSIPP's benefit-cost model, see http://www.wsipp.wa.gov/TechnicalDocumentation/WsippBenefitCostTechnicalDocumentation.pdf

[11] http://www.wsipp.wa.gov/ReportFile/1644

[12] http://www.wsipp.wa.gov/BenefitCost

## Updates to the Inventory as of September 2016

Since the last adult behavioral health inventory was published in January 2015, WSIPP reviewed and added 14 new programs.

Two of the new programs were classified as evidence-based.

- ✓ Acceptance and Commitment Therapy for adult anxiety
- ✓ Eye Movement Desensitization and Reprocessing (EMDR) for adult posttraumatic stress disorder (PTSD)

Eight of the new programs were classified as research-based.

- ✓ Acceptance and Commitment Therapy for schizophrenia/psychosis
- ✓ Alcohol Literacy Challenge (for college students)
- ✓ Cognitive behavioral therapy (CBT) for prodromal psychosis
- ✓ Contingency management (lower-cost) for opioid abuse
- ✓ Critical Time Intervention for serious mental illness
- ✓ Integrated treatment for first-episode psychosis
- ✓ Integrated treatment for prodromal psychosis
- ✓ Motivational interviewing to enhance treatment engagement for serious mental illness

Three of the new programs were classified as promising.

- ✓ Cognitive-behavioral coping skills therapy for opioid abuse
- ✓ Integrated Dual Disorder Treatment (IDDT)
- ✓ Wraparound for pregnant/postpartum women in substance abuse treatment

One of the new programs was classified as having null or iatrogenic effects

- ✓ Assisted outpatient treatment

Since January 2015, WSIPP modified the statistical calculations applied to some types of studies and adjusted its benefit-cost methodology.[13] These calculations affected the detailed statistical results for each program. Due to these changes, WSIPP reclassified three programs.

Two programs moved from evidence-based to research-based.

- ✓ Buprenorphine/buprenorphine-naloxone (Suboxone and Subutex) treatment
- ✓ Cognitive-behavioral coping skills therapy

Finally, one program, Community Reinforcement and Family Training (CRAFT) for engaging clients in treatment, moved from promising to research-based because of new evidence available for review.

[13] WSIPP's meta-analytic and benefic-cost methods are described in detail in our technical documentation. http://www.wsipp.wa.gov/TechnicalDocumentation/WsippBenefitCostTechnicalDocumentation.pdf

## Limitations

The benefit-cost analyses in this report reflect only those outcomes that were measured in the studies we reviewed and are "monetizable" with the current WSIPP benefit-cost model. "Monetizable" means that we can link the outcome to future economic consequences, such as labor market earnings, criminal justice involvement, or health care expenditures. At this time we are unable to monetize some relevant outcomes, such as global functioning or social connectedness. One outcome in particular, homelessness, was measured in evaluations of several programs we reviewed. While the current WSIPP benefit-cost model does not estimate the benefits of reducing homelessness, we examined a recent comprehensive benefit-cost study of housing vouchers to test the sensitivity of our results.[14]

## Future updates and extensions of the inventory

2SSB 5732 did not contain language directing WSIPP to update this inventory in the future.[15] This update was funded through a WSIPP Board-approved contract with the Division of Behavioral Health and Rehabilitation at the Department of Social and Health Services. At this time no further updates are planned.


## Acknowledgments

We would like to thank leadership and staff at the Department of Social and Health Services, Behavioral Health Administration (BHA), and the Health Care Authority for their guidance in creating the list of high priority interventions to review for the inventory and their assistance in describing/explaining specific programs. Representatives of the three UW institutes provided guidance on identifying promising programs. We are especially grateful to Maria Monroe-DeVita, Eric Trupin, and Dennis Donovan for assembling an excellent team to review programs.


[14] Carlson, D., Haveman, R., Kaplan, T., & Wolfe, B. (2011). The benefits and costs of the Section 8 housing subsidy program: A framework and estimates of first-year effects. *Journal of Policy Analysis and Management*, *30*(2), 233-255.

[15] Second Substitute House Bill 2536 from the 2012 legislative session directed WSIPP and EBPI to prepare a similar inventory for children's mental health, child welfare, and juvenile justice. The language in that bill did authorize updating the inventory on a periodic basis.

**September 2016**
**Updated Inventory of Evidence-Based, Research-Based, and Promising Practices**
**Intervention Services and Treatment for Adult Behavioral Health**

| Budget area | Program/intervention | Manual | Level of evidence | Benefit-cost percentage | Reason program does not meet evidence-based criteria (see full definitions below) | Percent minority |
|---|---|---|---|---|---|---|
| Mental Illness | Acceptance and Commitment Therapy for schizophrenia/psychosis | Yes | ◉ | 58% | Benefit-cost | 32% |
| | Acceptance and Commitment Therapy for adult anxiety | Yes | ● | 84% | | 39% |
| | Assertive community treatment (ACT) | Yes | ◉ | 12% | Benefit-cost | 32% |
| | Assisted outpatient treatment | Varies* | ⦸ | | Weight of evidence | 52% |
| | Cognitive behavioral therapy (CBT) for adult anxiety | Varies* | ◉ | 100% | Heterogeneity | 10% |
| | Cognitive behavioral therapy (CBT) for adult depression | Varies* | ◉ | 100% | Heterogeneity | 19% |
| | Cognitive behavioral therapy (CBT) for adult posttraumatic stress disorder (PTSD) | Varies* | ● | 100% | | 42% |
| | Cognitive behavioral therapy (CBT) for prodromal psychosis | Varies* | ◉ | | Benefits & costs cannot be estimated at this time | NR |
| | Cognitive behavioral therapy (CBT) for schizophrenia/psychosis | Yes | ◉ | 61% | Benefit-cost | 24% |
| | Collaborative primary care for depression | Varies* | ● | 100% | | 28% |
| | Collaborative primary care for anxiety | Varies* | ● | 98% | | 34% |
| | Collaborative primary care for depression with comorbid medical concerns | Varies* | ◉ | 92% | Heterogeneity | 18% |
| | Crisis Intervention Team | Yes | P | | Research on outcomes of interest not yet available | |
| | Critical Time Intervention for serious mental illness | Yes | ◉ | 13% | Benefit-cost | 81% |
| | Eye Movement Desensitization and Reprocessing (EMDR) for adult posttraumatic stress disorder (PTSD) | Yes | ● | 100% | | 32% |
| | Forensic Assertive Community Treatment (FACT) | No | P | 0% | Single evaluation | 39% |
| | Forensic Integrative Re-entry Support and Treatment (FIRST) | Yes | P | | Research on outcomes of interest not yet available | |
| | Forensic Intensive Supportive Housing (FISH) | Yes | P | | Research on outcomes of interest not yet available | |
| | Illness Management and Recovery (IMR) | Yes | P | 52% | Weight of evidence | 41% |
| | Individual Placement and Support (IPS) for individuals with serious mental illness | Yes | ◉ | 61% | Benefit-cost | 58% |
| | Integrated Cognitive Therapies Program for co-occurring mental illness and substance abuse | Yes | P | | Research on outcomes of interest not yet available | |
| | Integrated Dual Disorder Treatment (IDDT) | Yes | P | | Weight of evidence | 28% |
| | Integrated treatment for first-episode psychosis | Varies* | ◉ | | Benefits & costs cannot be estimated at this time | 73% |
| | Integrated treatment for prodromal psychosis | Varies* | ◉ | | Benefits & costs cannot be estimated at this time | NR |
| | Medicaid Health Homes | Yes | ◉ | | Single evaluation | 71% |
| | Mental health courts | Varies* | ● | 99% | | 41% |
| | Mobile crisis response | No | ◉ | 42% | Benefit-cost | 57% |
| | Motivational interviewing to enhance treatment engagement for serious mental illness | Varies* | ◉ | | Benefits & costs cannot be estimated at this time | 80% |
| | Peer Bridger | No | P | | Research on outcomes of interest not yet available | |
| | *Peer support for serious mental illness* | | | | | |
| | Peer support: Substitution of a peer specialist for a non-peer on the treatment team | Varies* | ◉ | 25% | Benefit-cost | 52% |
| | Peer support: Addition of a peer specialist to the treatment team | Varies* | ◉ | 9% | Benefit-cost | 56% |
| | Primary care in behavioral health settings | No | ◉ | 50% | Benefit-cost | 42% |
| | Primary care in integrated settings (Veteran's Administration, Kaiser Permanente) | No | ◉ | 52% | Benefit-cost | 44% |
| | Primary care in behavioral health settings (community-based settings) | No | ◉ | 28% | Benefit-cost | 39% |
| | Posttraumatic stress disorder (PTSD) prevention following trauma | Varies* | ● | 100% | | 31% |
| | Wellness Recovery Action Plan (WRAP) | Yes | P | | Weight of evidence | 45% |
| | Supported housing for chronically homeless adults | Varies* | ◉ | 0% | Benefit-cost | 64% |
| | Trauma Informed Care: Risking Connection | Yes | P | | Research on outcomes of interest not yet available | |

● Evidence-based ◉ Research-based **P** Promising **NR** Not reported See definitions and notes on page 3.

*Varies: This is a general program/intervention classification. Some programs within this classification have manuals and some do not. The results listed on the inventory represent a typical, or average, implementation. Additional research will need to be completed in order to establish the most effective sets of procedures within this general category.

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| Budget area | Program/intervention | Manual | Level of evidence | Benefit-cost percentage | Reason program does not meet evidence-based criteria (see full definitions below) | Percent minority |
|---|---|---|---|---|---|---|
| Substance Abuse | **Early intervention (at-risk drinking and substance use)** | | | | | |
| | Alcohol Literacy Challenge (for college students) | Yes | ◉ | 48% | Benefit-cost | 24% |
| | Brief Alcohol Screening and Intervention for College Students (BASICS): A Harm Reduction Approach | Yes | ◉ | 70% | Benefit-cost/heterogeneity | 15% |
| | Brief intervention in primary care | Yes | ● | 93% | | 33% |
| | Brief intervention in emergency department (SBIRT) | Yes | ● | 75% | | 36% |
| | Brief intervention in a medical hospital | Yes | ● | 75% | | 54% |
| | **Treatments for substance abuse or dependence** | | | | | |
| | 12-Step Facilitation Therapy | Yes | ◉ | 60% | Benefit-cost | 48% |
| | Anger management for substance abuse and mental health clients: Cognitive-behavioral therapy (CBT) | Yes | P | | Research on outcomes of interest not yet available | |
| | Behavioral Couples Therapy (marital) | Yes | P | | Weight of evidence | 29% |
| | Behavioral self-control training (BSCT) | Yes | ◉ | 24% | Benefit-cost | 24% |
| | Brief cognitive behavioral intervention for amphetamine users | Yes | ◉ | 60% | Benefit-cost/Heterogeneity | NR |
| | Brief marijuana dependence counseling | Yes | ● | 91% | | 52% |
| | Cognitive-behavioral coping skills therapy | Yes | ◉ | 60% | Benefit-cost | 36% |
| | Cognitive-behavioral coping skills therapy for opioid abuse | Yes | P | | Weight of evidence | 30% |
| | Community Reinforcement and Family Training (CRAFT) for engaging clients in treatment | Yes | ◉ | | Benefits & costs cannot be estimated at this time | 36% |
| | Community Reinforcement Approach (CRA) with vouchers | Yes | ◉ | 56% | Benefit-cost/heterogeneity | 3% |
| | *Contingency management* | | | | | |
| | Contingency management (higher-cost) for substance abuse | Yes (guidelines) | ● | 77% | | 48% |
| | Contingency management (higher-cost) for marijuana abuse | Yes (guidelines) | ● | 77% | | 48% |
| | Contingency management (lower-cost) for substance abuse | Yes (guidelines) | ◉ | 59% | Benefit-cost | 57% |
| | Contingency management (lower-cost) for marijuana abuse | Yes (guidelines) | ◉ | 51% | Benefit-cost | 50% |
| | Contingency management (lower-cost) for opioid abuse | Yes (guidelines) | ◉ | | Benefits & costs cannot be estimated at this time | 47% |
| | Day treatment with abstinence contingencies and vouchers | No | P | | Single evaluation | 96% |
| | Dialectical behavior therapy (DBT) for co-morbid substance abuse and serious mental illness | Yes | ◉ | | Weight of evidence | 22% |
| | Family Behavior Therapy (FBT) | Yes (for adolescents) | ◉ | 60% | Single evaluation | 9% |
| | Holistic Harm Reduction Program (HHRP+) | Yes | ◉ | 56% | Benefit-cost | 42% |
| | Individual drug counseling approach for the treatment of cocaine addiction | Yes | ◉ | 54% | Benefit-cost | 44% |
| | Matrix Model Intensive Outpatient Treatment Program (IOP) for stimulant abuse | Yes | ◉ | 52% | Benefit-cost | 52% |
| | Motivational Enhancement Therapy (MET) (problem drinkers) | Yes | P | 59% | Weight of evidence | 7% |
| | Motivational interviewing to enhance treatment engagement | Yes | ◉ | 62% | Benefit-cost | 49% |
| | Node-link mapping | Yes | P | | Weight of evidence | 61% |
| | Parent-Child Assistance Program | Yes | P | | Weight of evidence | 64% |
| | Peer support for substance abuse | No | ◉ | 51% | Benefit-cost | 86% |
| | Preventing Addiction-Related Suicide (PARS) | Yes | P | | Research on outcomes of interest not yet available | |
| | Relapse Prevention Therapy | Yes | ◉ | 58% | Benefit-cost | 77% |
| | Seeking Safety: A Psychotherapy for Trauma/PTSD and Substance Abuse | Yes | ◉ | 66% | Benefit-cost | 55% |
| | Supportive-expressive psychotherapy for substance abuse | Yes | P | 45% | Weight of evidence | 50% |
| | Wraparound for pregnant/postpartum women in substance abuse treatment | Yes | P | | Single evaluation | 58% |
| | Therapeutic community for non-offenders | Yes | P | | Research on outcomes of interest not yet available | |
| | **Medication-assisted treatment** | | | | | |
| | Buprenorphine/buprenorphine-naloxone (Suboxone and Subutex) treatment | Clinical guidelines | ◉ | 65% | Benefit-cost | 46% |
| | Methadone maintenance treatment | Clinical guidelines | ● | 89% | | 78% |

● Evidence-based ◉ Research-based **P** Promising **NR** Not reported See definitions and notes on page 3.

## Definitions and Notes:

**Reasons Programs May Not Meet Suggested Evidence-Based Criteria:**

Benefit-cost: The proposed definition of evidence-based practices requires that, when possible, a benefit-cost analysis be conducted. We use WSIPP's benefit-cost model to determine whether a program meets this criterion. Programs that do not have at least a 75% chance of a positive net present value do not meet the benefit-cost test. The WSIPP model uses Monte Carlo simulation to test the probability that benefits exceed costs. The 75% standard was deemed an appropriate measure of risk aversion.

Heterogeneity: To be designated as evidence-based under current law or the proposed definition, a program must have been tested on a "heterogeneous" population. We operationalized heterogeneity in two ways. First, the proportion of minority program participants must be greater than or equal to the minority proportion of adults 18 and over in Washington State. From the 2010 Census, of all adults in Washington, 76% were white and 24% minority. Thus, if the weighted average of program participants had at least 24% minorities then the program was considered to have been tested on a heterogeneous population.

Second, the heterogeneity criterion can also be achieved if at least one of the studies has been conducted on adults in Washington and a subgroup analysis demonstrates the program is effective for minorities ($p < 0.2$). Programs passing the second test are marked with a ^. Programs that do not meet either of these two criteria do not meet the heterogeneity definition. Programs whose evaluations do not meet either of these two criteria do not meet the heterogeneity definition.

Mixed results: If findings are mixed from different measures (e.g., undesirable outcomes for behavior measures and desirable outcomes for test scores), the program does not meet evidence-based criteria.

Research on outcomes of interest not yet available: The program has not yet been tested with a rigorous outcome evaluation.

Single evaluation: The program does not meet the minimum standard of multiple evaluations or one large multiple-site evaluation contained in the current or proposed definitions.

Weight of evidence: To meet the evidence-based definition, results from a random effects meta-analysis (p-value < 0.20) of multiple evaluations or one large multiple-site evaluation must indicate the practice achieves the desired outcome(s). To meet the research-based definition, one single-site evaluation must indicate the practice achieves the desired outcomes (p-value < 0.20).

**Level of Evidence:**

Evidence-based: A program or practice that has been tested in heterogeneous or intended populations with multiple randomized and/or statistically-controlled evaluations, or one large multiple-site randomized and/or statistically-controlled evaluation, where the weight of the evidence from a systematic review demonstrates sustained improvements in at least one outcome. Further, "evidence-based" means a program or practice that can be implemented with a set of procedures to allow successful replication in Washington and, when possible, has been determined to be cost-beneficial.

Research-based: A program or practice that has been tested with a single randomized and/or statistically-controlled evaluation demonstrating sustained desirable outcomes; or where the weight of the evidence from a systematic review supports sustained outcomes as identified in the term "evidence-based" in RCW (the above definition) but does not meet the full criteria for "evidence-based."

Promising practice: A program or practice that, based on statistical analyses or a well-established theory of change, shows potential for meeting the "evidence-based" or "research-based" criteria, which could include the use of a program that is evidence-based for outcomes other than the alternative use.

**Other Definitions:**

Benefit-cost percentage: The percent of the time where the monetary benefits exceed costs.

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Washington State Institute for Public Policy

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