Health Care Provider Performance Review

Presentation for the Institute of Medicine

Washington DC, January 28, 2015

Contact for this presentation:

Alexander K. Rowe, MD, MPH

Malaria Branch, Division of Parasitic Diseases and Malaria, Center for Global Health

Centers for Disease Control and Prevention

Mailstop A06

1600 Clifton Road

Atlanta, GA 30329

United States

Telephone: 1-404-718-4754

Fax: 1-404-718-4815

Email: axr9@cdc.gov

Saved as:

C:\alex\Improving_HW_performance\Analysis\Analysis for IOM\ppt\

HCPP 2015 Jan 28 IOM v6 (40 min version – no ITS methods).ppt

last updated: January 27, 2015

Reviewing evidence for different QI methods

What works? Preliminary results of a systematic review

Alexander K. Rowe

Malaria Branch,
Centers for Disease Control and Prevention

January 28, 2015

Acknowledgments

- Results in this presentation are derived from Health Care Provider Performance Review

Co-investigators

- Samantha Rowe (CDC)
- David H. Peters (Johns Hopkins University)
- Kathleen A. Holloway (World Health Organization)
- John Chalker (Management Sciences for Health)
- Dennis Ross-Degnan (Harvard Medical School)

Acknowledgments

- Sushama Acharya
- Charity Akpala
- Dinorah Calles
- Tashana Carty
- Nirali Chakraborty
- Helen Chin
- Adrijana Corluka
- Didi Cross
- Bhavya Doshi
- Onnalee Gomez
- Meg Griffith
- Karen Herman
- Atsumi Hirose
- Simon Lewin
- Qing Li
- Connie Liu
- Earl Long
- Jason McKnight
- Eliza McLeod
- Huseyin Naci
- Jan Odgaard-Jensen
- Dawn Osterholt
- Andy Oxman
- Magdalena Paczkowski
- Gabriel Ponce-de-Léon
- Nancy Pulsipher
- Atiq Rahman
- Monica Shah
- Banafsheh Siadat
- Sanja Stanojevic
- Laura Steinhardt
- Savitha Subramanian
- Megan Thompson
- Anil Thota
- Ryan Wiegand
- Jeff Willis
- Kindra Willis
- Shannon Wood
- Karen Wosje
- Abera Wouhib
- Alicia Wright
- Chunying Xie

- Special thanks to investigators who responded to queries
- Funding: Bill and Melinda Gates Foundation, CDC, World Bank

Background

- Improving health worker performance in low- and middle-income countries (LMICs) is essential for improving health and reducing deaths and illness
- Institute of Medicine and US Agency for International Development (USAID) interested in effectiveness of strategies to improve performance that are often funded by USAID
  1. Training
  2. Supervision
  3. Accreditation
  4. Improvement collaboratives
  5. Client-oriented provider efficient method
  6. Standards-based management and recognition

Background

- IOM contacted investigators of Health Care Provider Performance Review (HCPPR), a systematic review of all strategies to improve health care provider (HCP) performance in LMICs
- Objective: Use results from HCPPR to evaluate effectiveness of six targeted strategies

Methods

Note your methodological issues & suggestions

- Methods are complex
- Some methodological decisions were based on team's best judgment. We recognize that other choices could be justified.
- Write down your methodological concerns & suggestions and raise them during the discussion (or email them to me at: axr9@cdc.gov)
- We're going to repeat the analysis, and we can consider other methodological options. We can also produce sensitivity analyses that use other methods to see how much methods affect final results.

Methods: inclusion criteria for HCPPR

- Any study (with eligible study design) of effectiveness of any strategy to improve HCP performance in LMIC, on any health topic, in any language, published or not

- HCP. Any facility- or community-based health worker, pharmacists, shopkeepers who sell drugs, private sector

Methods: eligible study designs

- Pre-post with comparison (+/- randomization)
- Post-only with randomized controls
- Interrupted time series (≥3 data points before and after intervention)

Methods: literature search

1. Searched 15 electronic databases (e.g., CINAHL, EPOC specialized register, MEDLINE), which was completed in 2006
2. Reviewed personal libraries and asked colleagues for references and unpublished studies
3. Searched document inventories of 30 organizations involved with HCP performance for unpublished studies, which was completed in 2008
4. Hand search of bibliographies from 510 previous reviews and other articles
5. During review: 17 authors of included studies sent additional, new reports related to their studies

Methods: screening and data abstraction

- Titles and abstracts from search were screened
- Performed double, independent abstraction
- Data entered into Access database
- Queries often sent to study authors for clarifications, details on methods, context, etc.
- As a result, to some degree, HCPPR database contains more than what's in original reports (although database in no way replaces reports)

Defining strategies for IOM analysis

- Goal: Develop definition for each targeted strategy so studies of these strategies could be identified in HCPPR database
- Database has ~150 variables that code for presence of individual strategy components (e.g., training and supervision are separate components)
- Strategy definitions based on component variables
- NB: No universally-recognized taxonomy of strategies to improve HCP performance exists; thus all definitions are “working” definitions

Defining strategies for IOM analysis

1. High-intensity training only. Training >5 days (or ongoing training) with ≥ 1 interactive method (i.e., clinical practice, interactive sessions, or role play). No other components*.
2. Low-intensity training only. Any training that's not high-intensity training. No other components*.
3. Supervision only. Supervision. Excludes strategies that resemble supervision (e.g., audit and feedback). No other components.

* Excludes academic detailing and informal education by a peer. Also, training is allowed to have job aids or printed educational materials for HCPs.

Defining strategies for IOM analysis

4. Accreditation only. A strategy with only the component: “licensing, certification, accreditation, or registration”.
5. Improvement collaborative only. Improvement collaborative, as defined by authors of the report. No other components.
6. Client-oriented provider efficient (COPE) method only. Note that no COPE studies were in HCPPR database; thus, a “COPE-like” strategy was defined as having **all** the following components: provider self-assessment, continuous quality improvement (includes team-based problem solving), and peer-review. No other components.

Defining strategies for IOM analysis

7. Standards-based management and recognition (SBMR) only. Note that no SBMR studies were in HCPPR database; thus, an “SBMR-like” strategy was defined as having **all** the following components: standard HF specifications were introduced, HF received recognition after meeting certain criteria, HCP self-assessment, team-based problem solving, supervision, and low-intensity training (according to HCPPR’s definition, which also includes informal education by a peer).

Combined strategies (all based on previous definitions)

8. High-intensity training + supervision
9. Low-intensity training + supervision
10. Low-intensity training + improvement collaborative

Methods: study outcomes

- Studies used wide variety of outcomes; probably inappropriate to include all in same analysis (e.g., outcomes on mortality and history-taking)
- For more of an “apples–apples” comparison, this analysis only includes outcomes on processes of care expressed as a percentage (e.g., % of patients correctly assessed, diagnosed, treated, counseled, or referred)
- Results also stratified by HCP type: all HCPs (“Main group” studies) vs. lay health worker (LHW) predominant studies

Methods: risk of bias

- Based on methods from Cochrane Effective Practice and Organisation of Care (EPOC) group
- Risk of bias determined at study level
- Elements considered: study design, no. of clusters per arm, data completeness, similar outcome levels among study arms at baseline, outcome reliability, concealment of allocation for studies with randomization at patient level, whether intervention likely to affect data collection, presence of non-intervention changes (ITS), and <6 data points before or after intervention (ITS)
- Categories: low, moderate, high, very high risk

Methods: effect sizes

- Effect size in terms of %-point change
- Example formula for outcomes expressed as %:

  Effect size = $(FU - BL)_{intervention} - (FU - BL)_{control}$
- Ex: 25 %-pts = (50% – 20%) – (30% – 25%)

  30 %-pts – 5 %-pts

Methods: effect sizes

- Effect size in terms of %-point change
- Example formula for outcomes expressed as %:

  Effect size = $(FU - BL)_{intervention} - (FU - BL)_{control}$
- Ex: 25 %-pts = (50% – 20%) – (30% – 25%)
- Interpretation: 25 correctly treated patients per 100
- Calculated effect size such that positive values mean improvement
- Effect sizes for ITS calculated with similar approach but segmented regression modeling used

Methods: Primary analysis

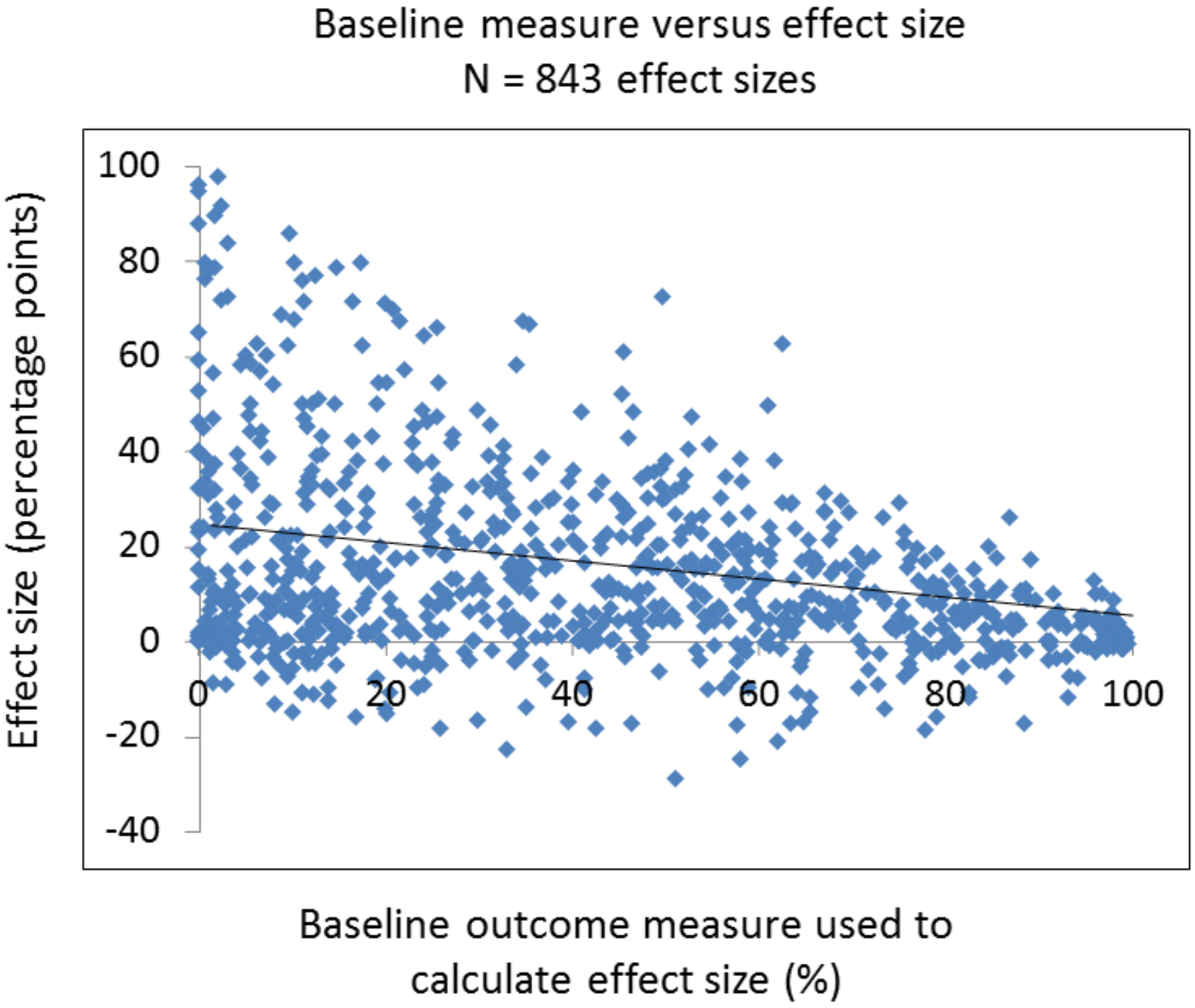
- Only include strategy vs. “no intervention” control comparisons (i.e., no head-to-head studies)
- Results from studies with >1 primary outcome summarized by median effect size (MES)

Methods: Primary analysis

- Only include strategy vs. “no intervention” control comparisons (i.e., no head-to-head studies)
- Results from studies with >1 primary outcome summarized by median effect size (MES)
- Compare MES distributions of various strategies: weighted medians, IQRs (unweighted if <5 studies)
- Weight = 1 + ln(no. of HCPs or service provision sites)
- To reduce confounding, effect sizes adjusted for differences in effect modifiers (i.e., factors that influence effect size, regardless of strategy): baseline performance & public HF setting

Methods: adjusting effect sizes

- Baseline performance. For every 10 %-point increase in baseline, effect size decreased by 2 %-points, on average (less room to improve…a "disadvantage", regardless of strategy).


Baseline measure versus effect size
N = 843 effect sizes
Effect size (percentage points)
100
80
60
40
20
0
-20
-40
0
20
40
60
80
100
Baseline outcome measure used to calculate effect size (%)

Methods: adjusting effect sizes

- Baseline performance. For every 10 %-point increase in baseline, effect size decreased by 2 %-points, on average (less room to improve…a "disadvantage", regardless of strategy).
- Example adjustment: Mean baseline = 41%. If baseline for effect size is 51% (i.e., 10 %-points above mean), then adjustment increases effect size by 2 %-points (removes "disadvantage").

Methods: adjusting effect sizes

- Baseline performance. For every 10 %-point increase in baseline, effect size decreased by 2 %-points, on average (less room to improve…a "disadvantage", regardless of strategy).
- Example adjustment: Mean baseline = 41%. If baseline for effect size is 51% (i.e., 10 %-points above mean), then adjustment increases effect size by 2 %-points (removes "disadvantage").
- Public HF setting. Mean effect size is 8 %-points higher than other settings, regardless of strategy

Methods: adjusting effect sizes

- Baseline performance. For every 10 %-point increase in baseline, effect size decreased by 2 %-points, on average (less room to improve…a "disadvantage", regardless of strategy).
- Example adjustment: Mean baseline = 41%. If baseline for effect size is 51% (i.e., 10 %-points above mean), then adjustment increases effect size by 2 %-points (removes "disadvantage").
- Public HF setting. Mean effect size is 8 %-points higher than other settings, regardless of strategy
- Goal: adjust results to partly "standard" context (what would results be if all had same baseline?)

Methods: more on confounding

- For strategies with greatest effectiveness, check for “confounding by limited variability” (i.e., are high effect sizes due to studies from settings unusually well suited for strategy?)

Methods: more on confounding

- For strategies with greatest effectiveness, check for “confounding by limited variability” (i.e., are high effect sizes due to studies from settings unusually well suited for strategy?)
- Broaden strategy definition to include more studies with same basic strategy, and see if results change; large decreases indicate bias; assumption that adding additional components would not decrease effectiveness

Methods: more on confounding

- For strategies with greatest effectiveness, check for "confounding by limited variability" (i.e., are high effect sizes due to studies from settings unusually well suited for strategy?)
- Broaden strategy definition to include more studies with same basic strategy, and see if results change; large decreases indicate bias; assumption that adding additional components would not decrease effectiveness
- Hypothetical example
  - 3 studies of licensing: 40, 50, 60 (median = 50 %-points)
  - Broaden definition to include licensing +/- other components: 40, 50, 60, plus four other studies (3, 7, 11, 17). Median = 17
  - Conclude confounding: "best" estimate of licensing = 17 %-pts

Methods: secondary analyses *(not yet done)*

- Secondary analyses
  - Meta-analysis & meta-regression: accounts for study size and summarizes effectiveness as means & CIs
  - Network meta-analysis: like meta-analysis, but it also includes results from head-to-head comparisons

Methods: secondary analyses *(not yet done)*

- Secondary analyses
  - Meta-analysis & meta-regression: accounts for study size and summarizes effectiveness as means & CIs
  - Network meta-analysis: like meta-analysis, but it also includes results from head-to-head comparisons
- Why aren't these primary analyses?
  - Concerns about validity of sample size, and thus analysis weights (main advantage of meta-analysis/regression)
  - Issue: Most studies use clustered designs (e.g., patients clustered within HFs), so one can't simply use (for example) no. of patients. Most studies don't include enough information to accurately estimate sample size

Preliminary results

Literature search and descriptive results of included studies

Literature search

- >105,000 citations screened
- 824 reports included in larger HCPPR
- 66% of reports published in scientific journals
- 489 studies included in larger HCPPR
- 66 studies included in IOM analysis, with 71 comparisons of active strategy versus “no intervention” control group or historical control group (for ITS studies)

Strategy	No. of comparisons
High-intensity training only	7
Low-intensity training only	35
Supervision only	6
Accreditation only	0
Improvement collaborative only	7
“COPE-like” strategy only	0
“SBMR-like” strategy only	0
High-intensity training + supervision	4
Low-intensity training + supervision	5
Low-intensity training + improvement collaborative	3

Strategy	No. of comparisons
High-intensity training only	7
Low-intensity training only	35
Supervision only	6
Improvement collaborative only	7
High-intensity training + supervision	4
Low-intensity training + supervision	5
Low-intensity training + improvement collaborative	3

Strategy	No. of comps	Risk of bias	
		Low/Mod.	High/Very high
High-intensity training only	7	**4**	**3**
Low-intensity training only	35		
Supervision only	6		
Improvement collaborative only	7		
High-intensity training + supervision	4		
Low-intensity training + supervision	5		
Low-intensity training + improvement collaborative	3		

Strategy	No. of comps	Risk of bias	
		Low/Mod.	High/Very high
High-intensity training only	7	**4**	**3**
Low-intensity training only	35	**15**	**20**
Supervision only	6		
Improvement collaborative only	7		
High-intensity training + supervision	4		
Low-intensity training + supervision	5		
Low-intensity training + improvement collaborative	3		

Strategy	No. of comps	Risk of bias	
		Low/Mod.	High/Very high
High-intensity training only	7	**4**	**3**
Low-intensity training only	35	**15**	**20**
Supervision only	6	**3**	**3**
Improvement collaborative only	7		
High-intensity training + supervision	4		
Low-intensity training + supervision	5		
Low-intensity training + improvement collaborative	3		

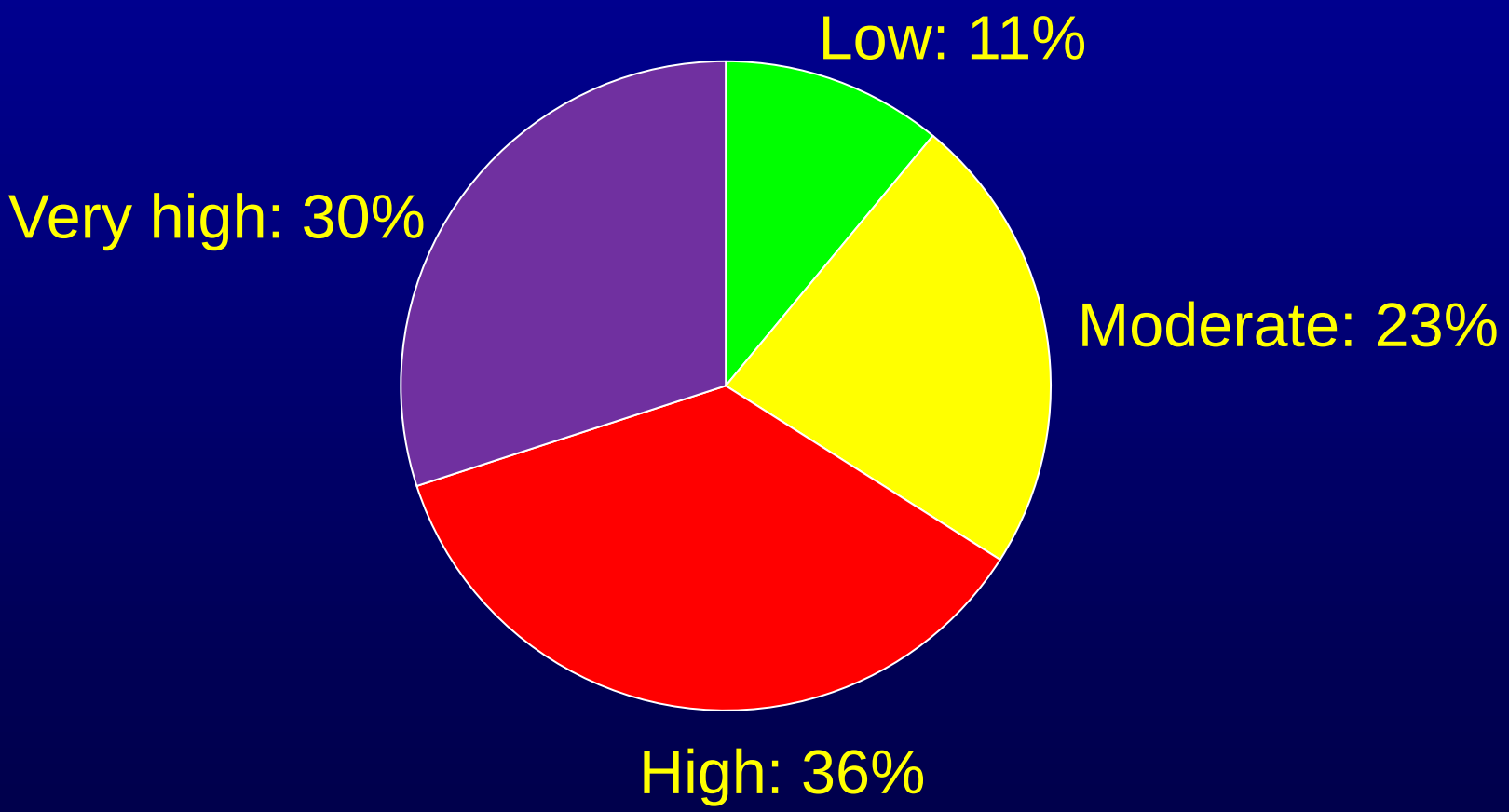
Strategy	No. of comps	Risk of bias	
		Low/Mod.	High/Very high
High-intensity training only	7	**4**	**3**
Low-intensity training only	35	**15**	**20**
Supervision only	6	**3**	**3**
Improvement collaborative only	7	**0**	**7**
High-intensity training + supervision	4		
Low-intensity training + supervision	5		
Low-intensity training + improvement collaborative	3		

Strategy	No. of comps	Risk of bias	
		Low/Mod.	High/Very high
High-intensity training only	7	**4**	**3**
Low-intensity training only	35	**15**	**20**
Supervision only	6	**3**	**3**
Improvement collaborative only	7	**0**	**7**
High-intensity training + supervision	4	**0**	**4**
Low-intensity training + supervision	5		
Low-intensity training + improvement collaborative	3		

Strategy	No. of comps	Risk of bias	
		Low/Mod.	High/Very high
High-intensity training only	7	**4**	**3**
Low-intensity training only	35	**15**	**20**
Supervision only	6	**3**	**3**
Improvement collaborative only	7	**0**	**7**
High-intensity training + supervision	4	**0**	**4**
Low-intensity training + supervision	5	**2**	**3**
Low-intensity training + improvement collaborative	3		

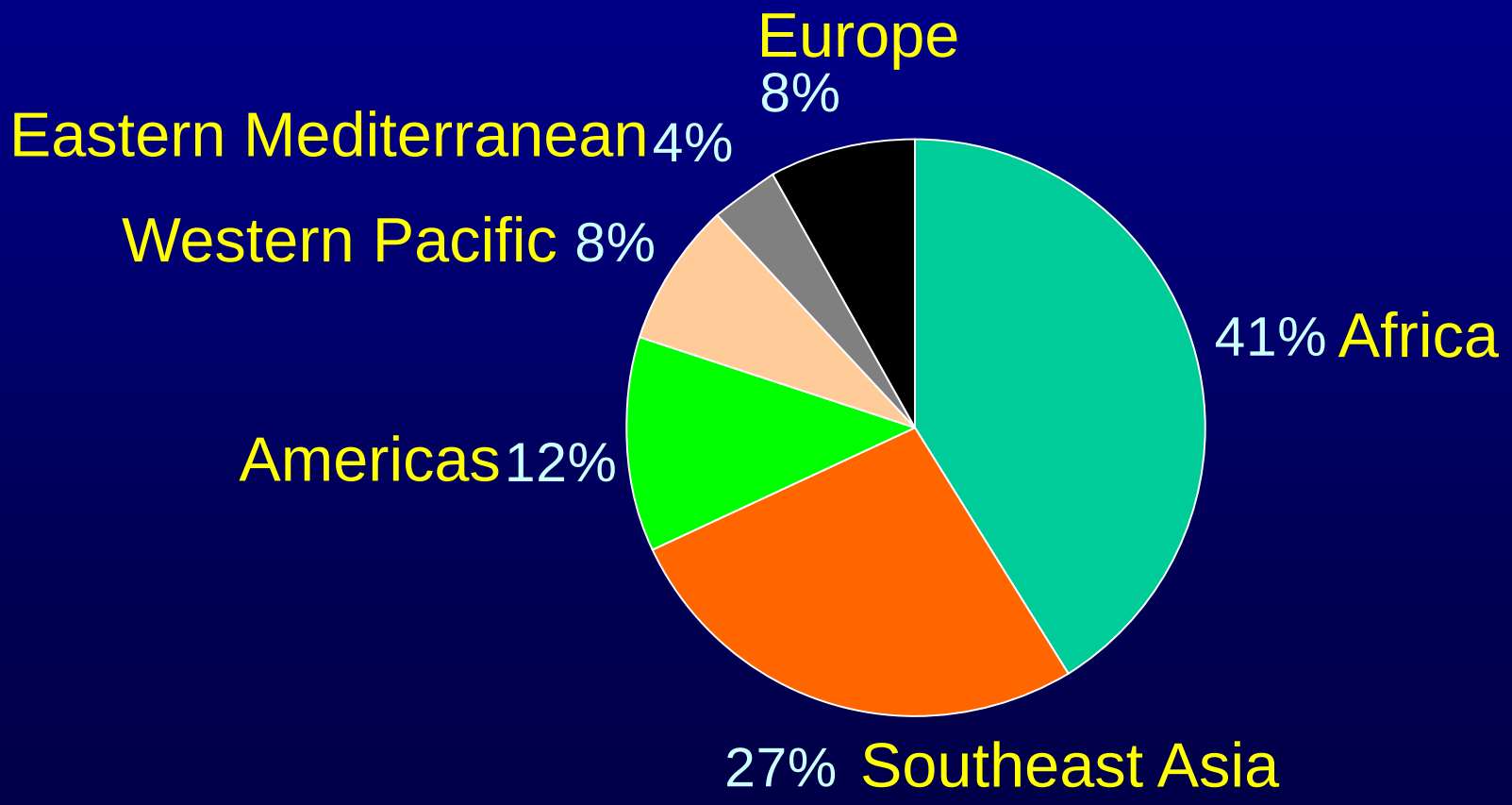
Strategy	No. of comps	Risk of bias	
		Low/Mod.	High/Very high
High-intensity training only	7	**4**	**3**
Low-intensity training only	35	**15**	**20**
Supervision only	6	**3**	**3**
Improvement collaborative only	7	**0**	**7**
High-intensity training + supervision	4	**0**	**4**
Low-intensity training + supervision	5	**2**	**3**
Low-intensity training + improvement collaborative	3	**0**	**3**

Overall risk of bias (N = 66 studies)



Study sites (N = 66 studies)

- 33 countries (some from multiple countries)
- 37 (56%) from low-income countries

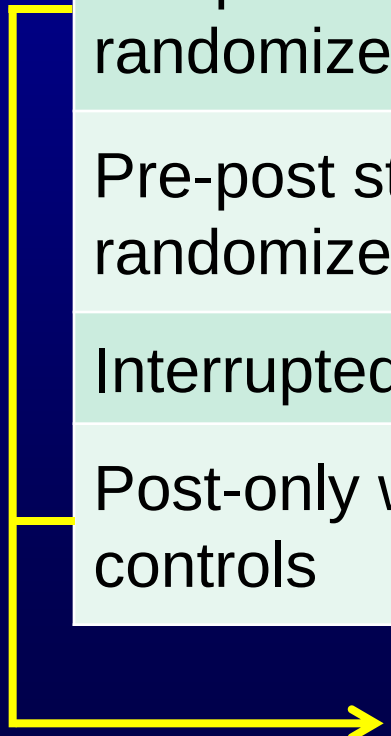


Study designs (N = 66 studies)

Study design	No. of studies (%)
Pre-post study with randomized controls	27 (41)
Pre-post study with non-randomized controls	22 (33)
Interrupted time series	13 (20)
Post-only with randomized controls	4 (6)

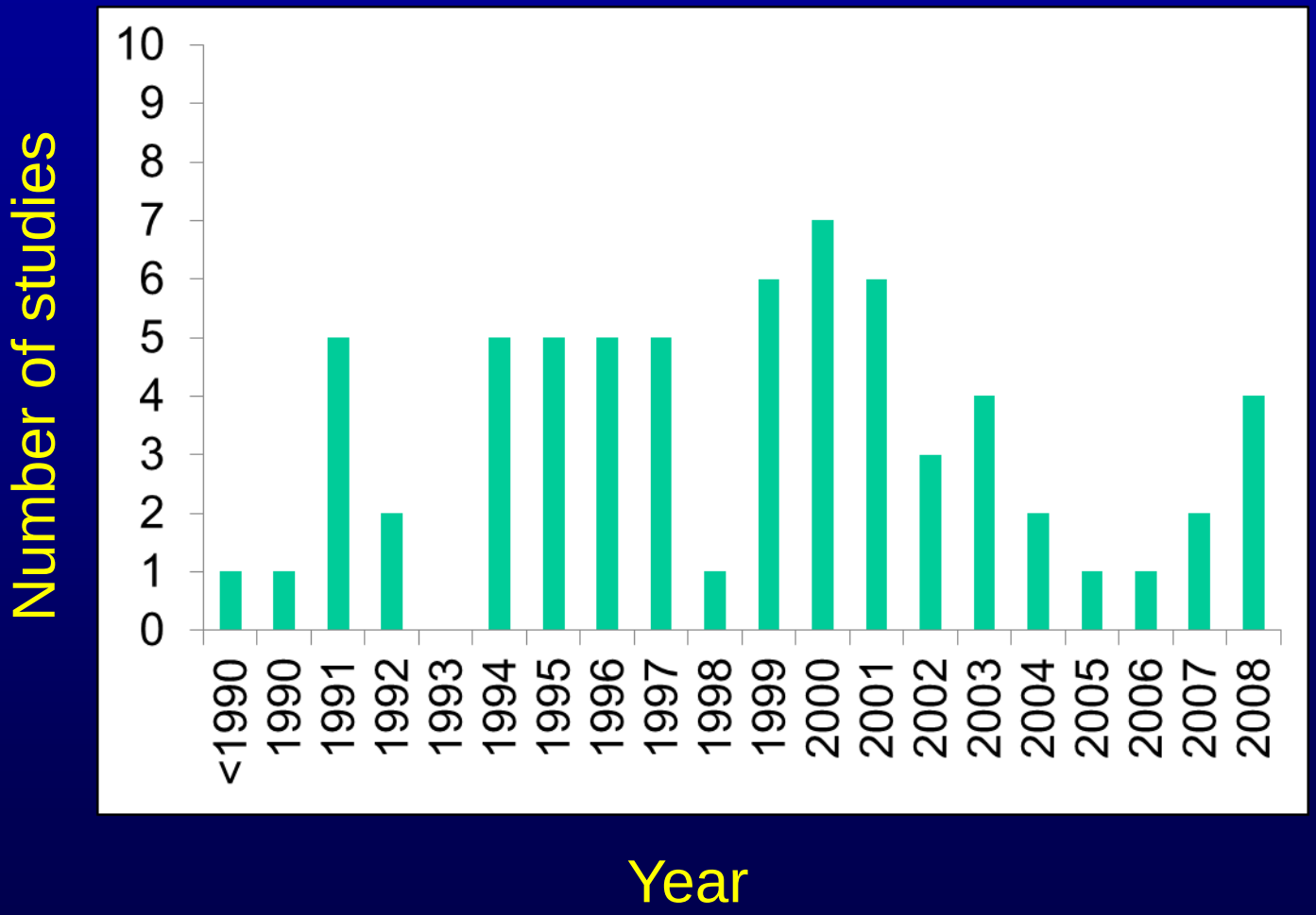
Study designs (N = 66 studies)

Study design	No. of studies (%)
Pre-post study with randomized controls	27 (41)
Pre-post study with non-randomized controls	22 (33)
Interrupted time series	13 (20)
Post-only with randomized controls	4 (6)



31 randomized controlled trials

Midpoint year of study (N = 66 studies)



Study setting (N = 66 studies)

Setting	No. of studies (%)
Urban or peri-urban area only	20 (30)
Rural area only	15 (23)
Mixed setting	19 (29)

Study setting (N = 66 studies)

Setting	No. of studies (%)
Urban or peri-urban area only	20 (30)
Rural area only	15 (23)
Mixed setting	19 (29)
Public or governmental only	40 (61)
Any private sector	14 (21)
Other (e.g., household)	12 (18)

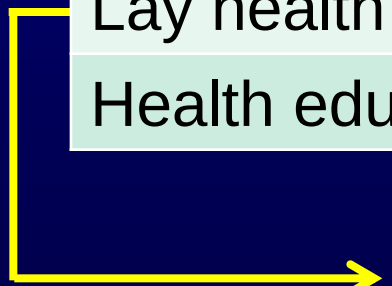
Study setting (N = 66 studies)

Setting	No. of studies (%)
Urban or peri-urban area only	20 (30)
Rural area only	15 (23)
Mixed setting	19 (29)
Public or governmental only	40 (61)
Any private sector	14 (21)
Other (e.g., household)	12 (18)
Outpatient health facilities (HF)	39 (59)
Hospital outpatient department	20 (30)
Hospital or HF inpatient ward	15 (23)
Community setting	8 (12)

Types of health care providers (HCPs)

(N = 66 studies, multiple HCP types allowed per study)

Type of HCP	No. of studies (%)
Nurse/midwife	36 (55)
Physician	35 (53)
Nurse/midwife aid	26 (39)
Pharmacist/lab worker	10 (15)
Paramedic	9 (14)
Lay health worker	8 (12)
Health educator	6 (9)



4 studies LHWs predominant

Health topics of the studies

(N = 66 studies; multiple topics allowed per study)

Health topic	No. of studies (%)
Multiple (or all) health conditions	27 (41)
Acute respiratory infections	10 (15)
Diarrhea	10 (15)
Pregnancy	8 (12)
HIV/AIDS +/- other STDs	8 (12)
Newborn health	4 (6)
Malaria	3 (5)
Malnutrition	3 (5)
Reproductive health (not pregnancy)	2 (3)
Tuberculosis	1 (2)

Data collection methods

(N = 66 studies; multiple methods allowed per study)

Method	No. of studies (%)
Record review	46 (70)
Interview with patient or caretaker	17 (26)
Interview with HCP	14 (21)
Observation of HCP-patient interaction	13 (20)
Questionnaire for HCP	10 (15)
Simulated client	4 (6)
Physical exam of patient	2 (3)

Results on cost and cost-effectiveness (N = 66 studies)

- Wide variety of cost and cost-effectiveness data reported; thus, no quantitative synthesis
- Descriptive results
  - 17 (26%) reported any information on strategy costs or other economic evaluations
  - 8 (12%) reported cost on at least 1 strategy component
  - 15 (23%) compared strategy costs of 2 or more study groups
  - 13 (20%) compared strategy costs of 2 or more study groups in terms of cost ratio (e.g., cost per service provided)

Preliminary results

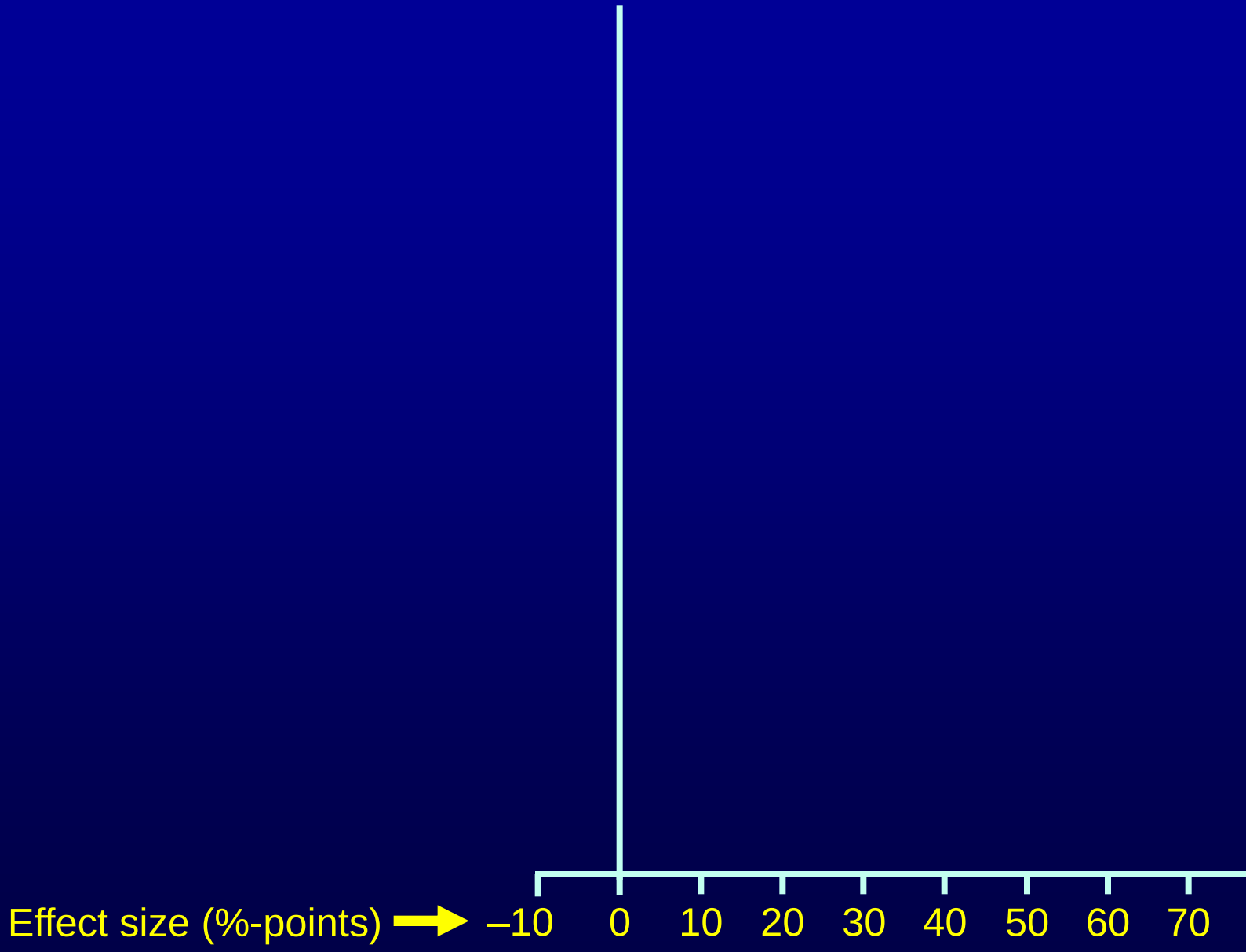
Effectiveness of strategies (processes of care—e.g., % of patients correctly treated)

Results from the Main group ("all HCP") group of studies

(i.e., not LHW-predominant studies)

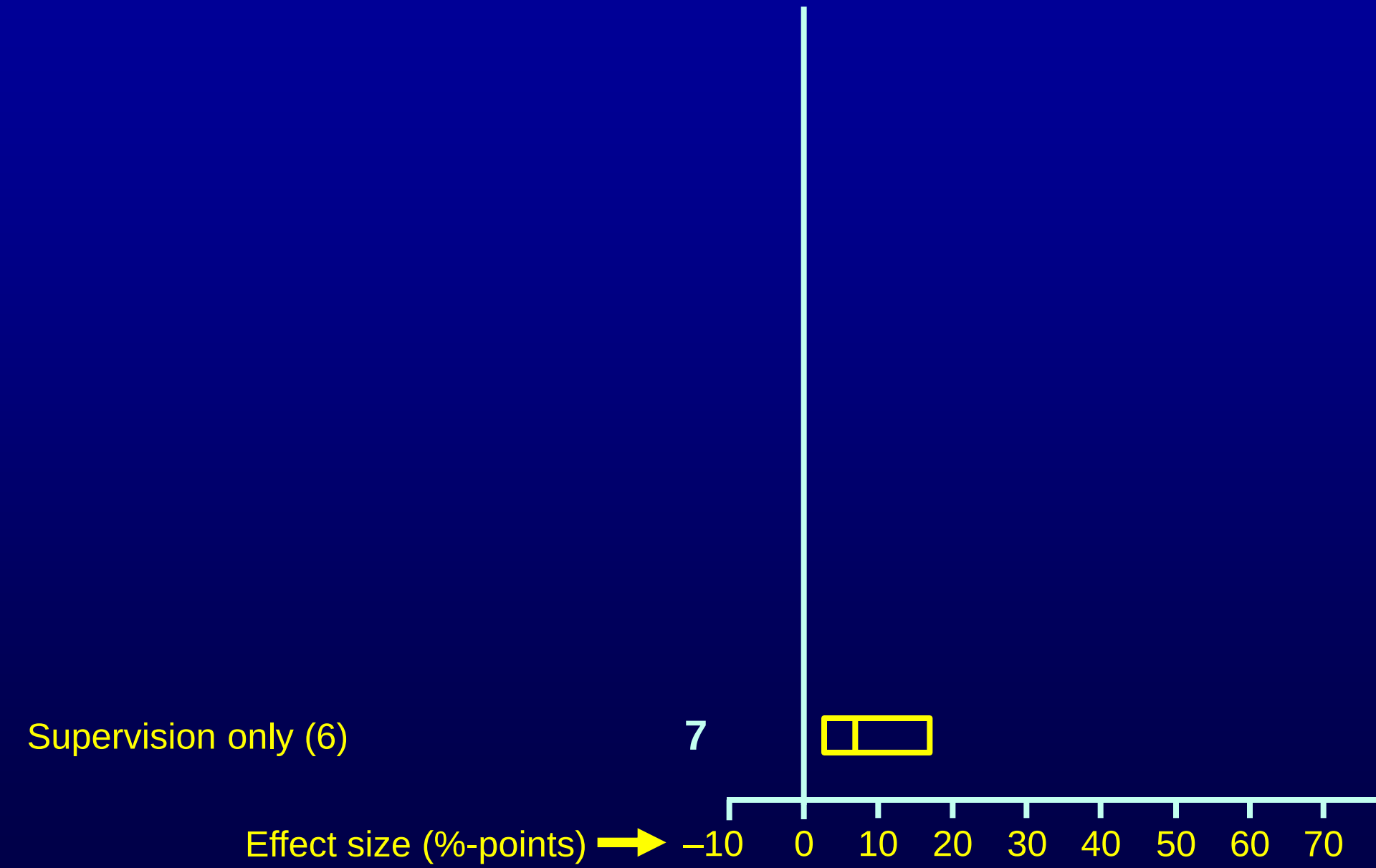
Strategy (no. of comp)

Weighted median adj. MES & IQR



Strategy (no. of comp)

Weighted median adj. MES & IQR

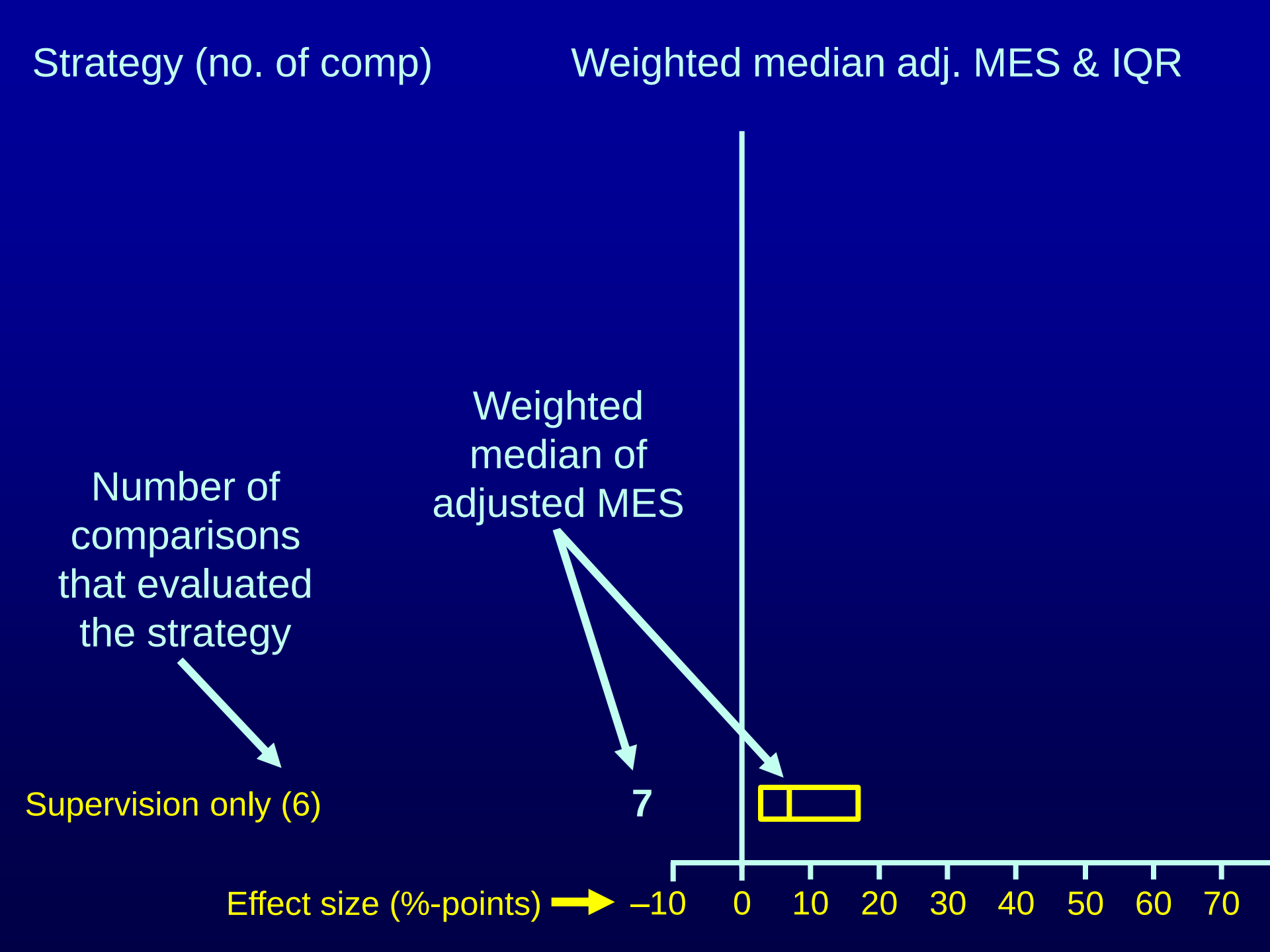


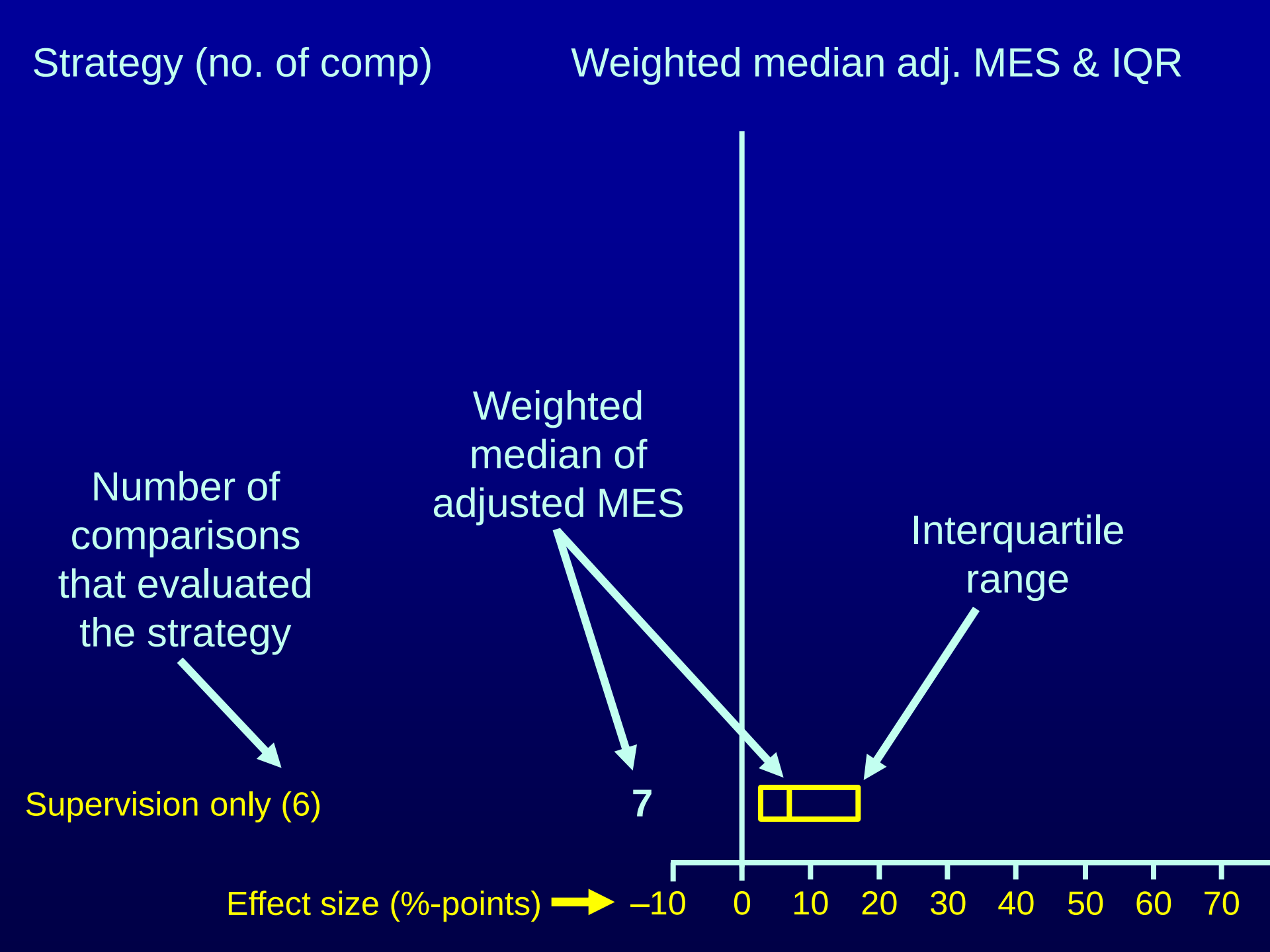
Strategy (no. of comp)

Weighted median adj. MES & IQR

Number of comparisons that evaluated the strategy

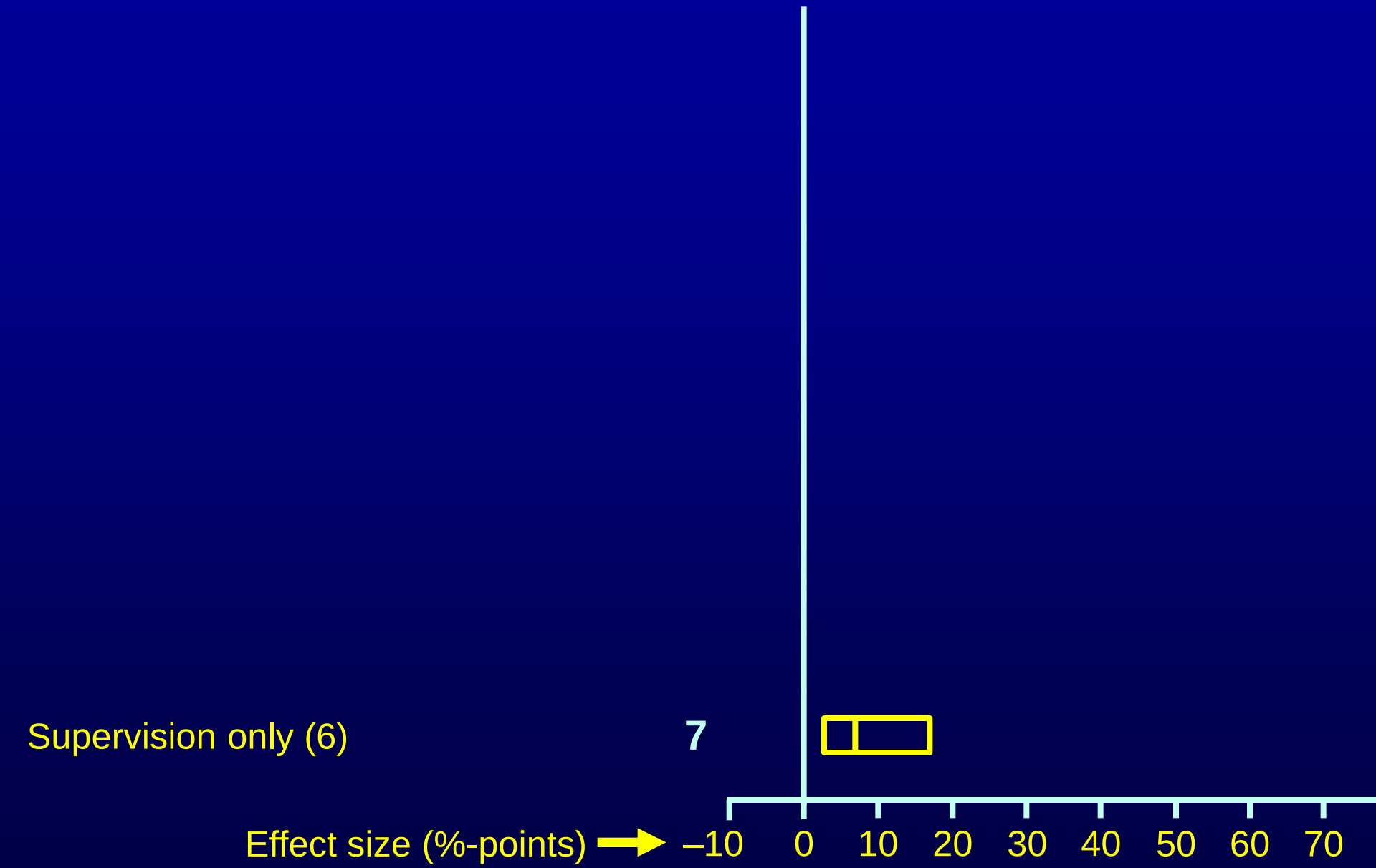
Supervision only (6)

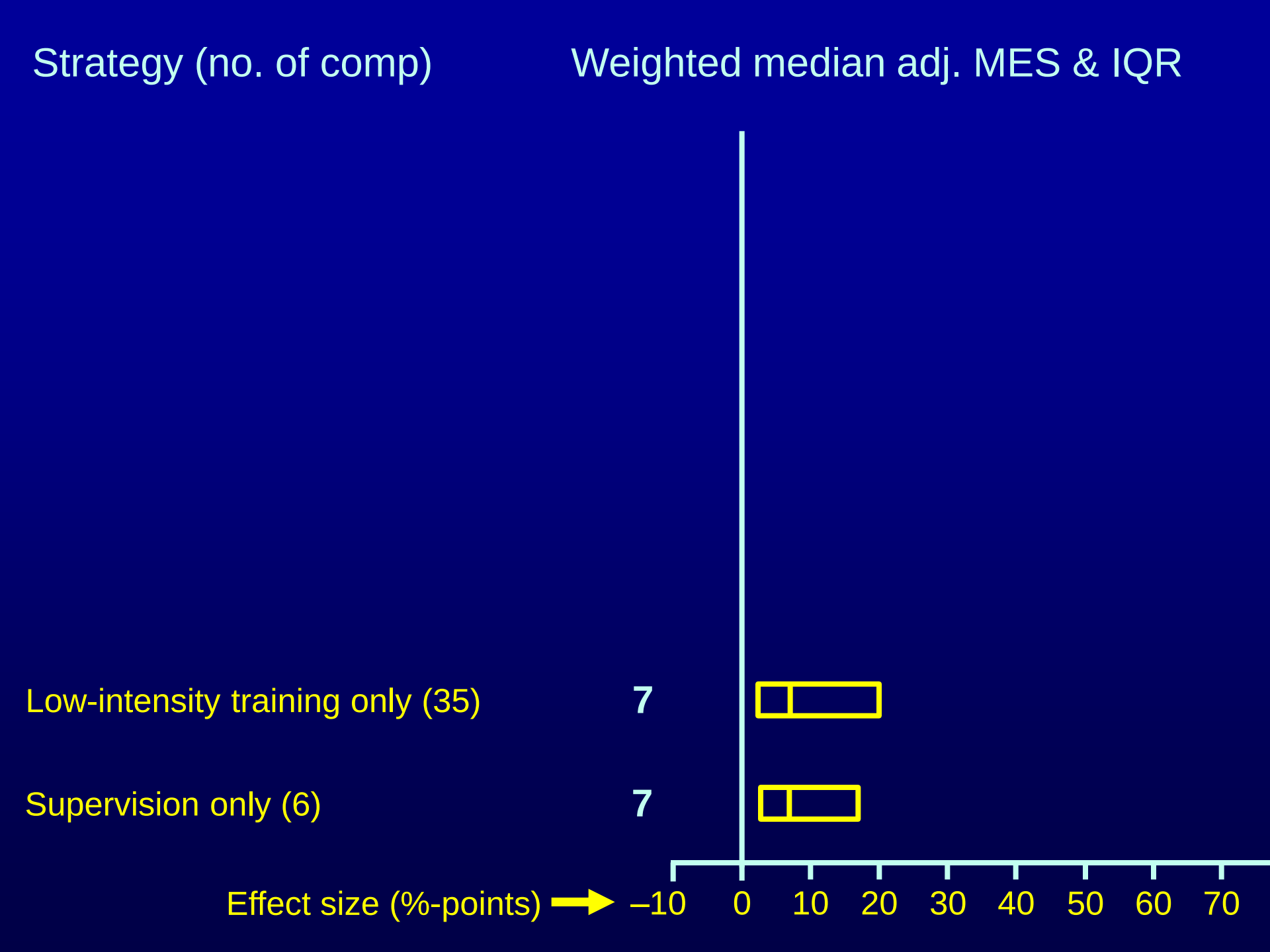

Strategy (no. of comp)
Weighted median adj. MES & IQR
Number of comparisons that evaluated the strategy
Weighted median of adjusted MES
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70


Strategy (no. of comp)
Weighted median adj. MES & IQR
Number of comparisons that evaluated the strategy
Weighted median of adjusted MES
Interquartile range
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70

Strategy (no. of comp)

Weighted median adj. MES & IQR

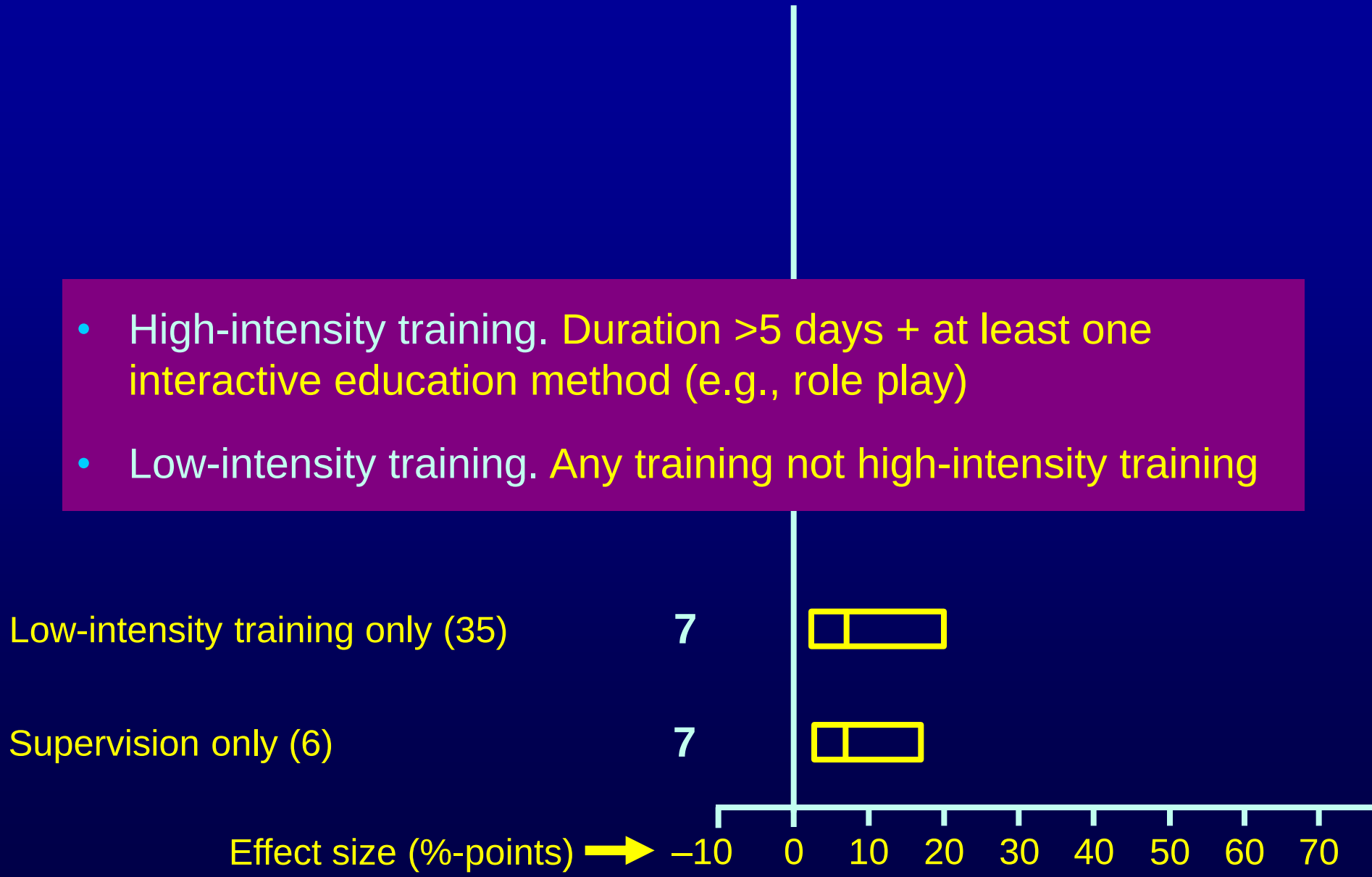


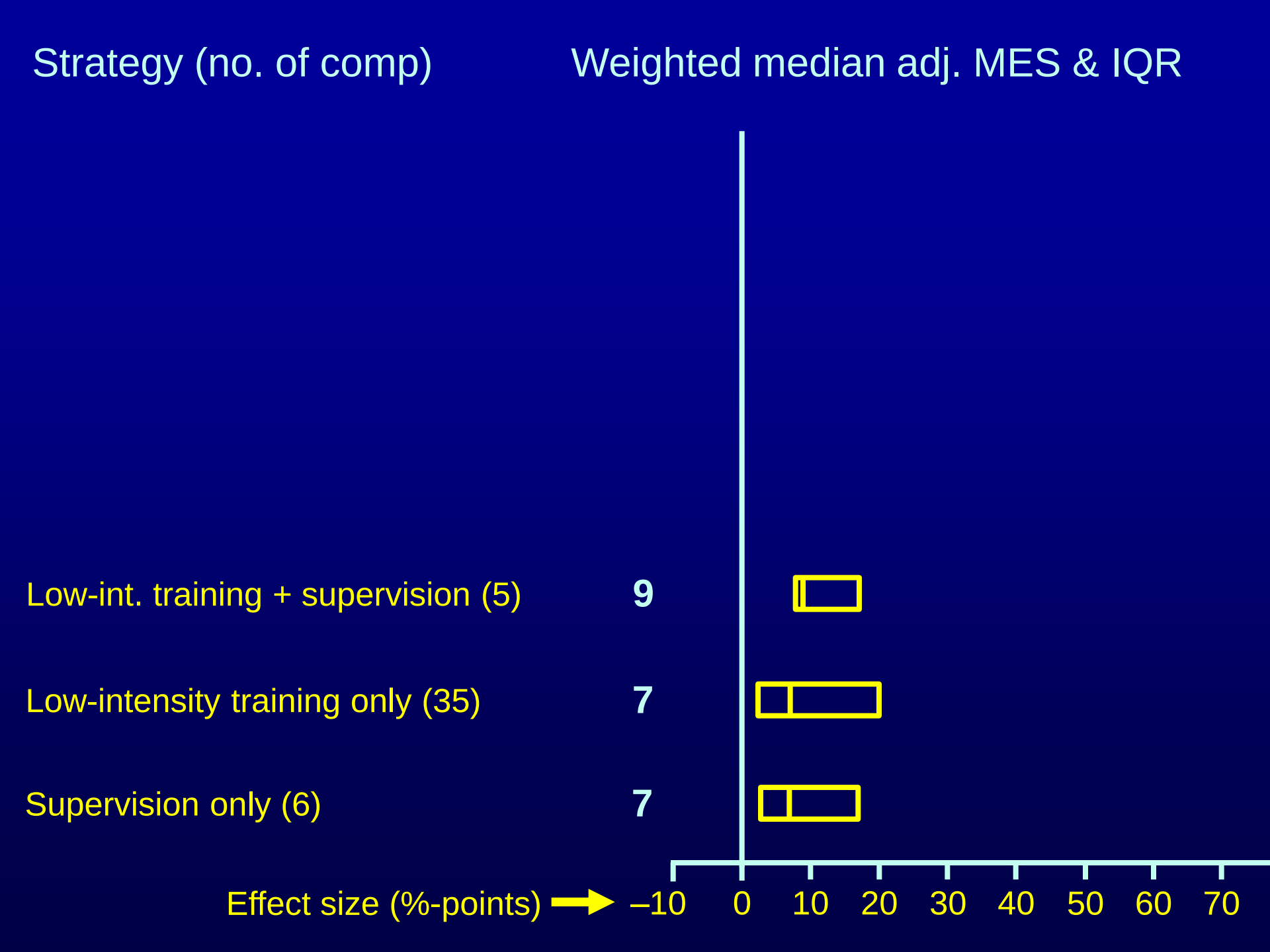

Strategy (no. of comp)
Weighted median adj. MES & IQR
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70

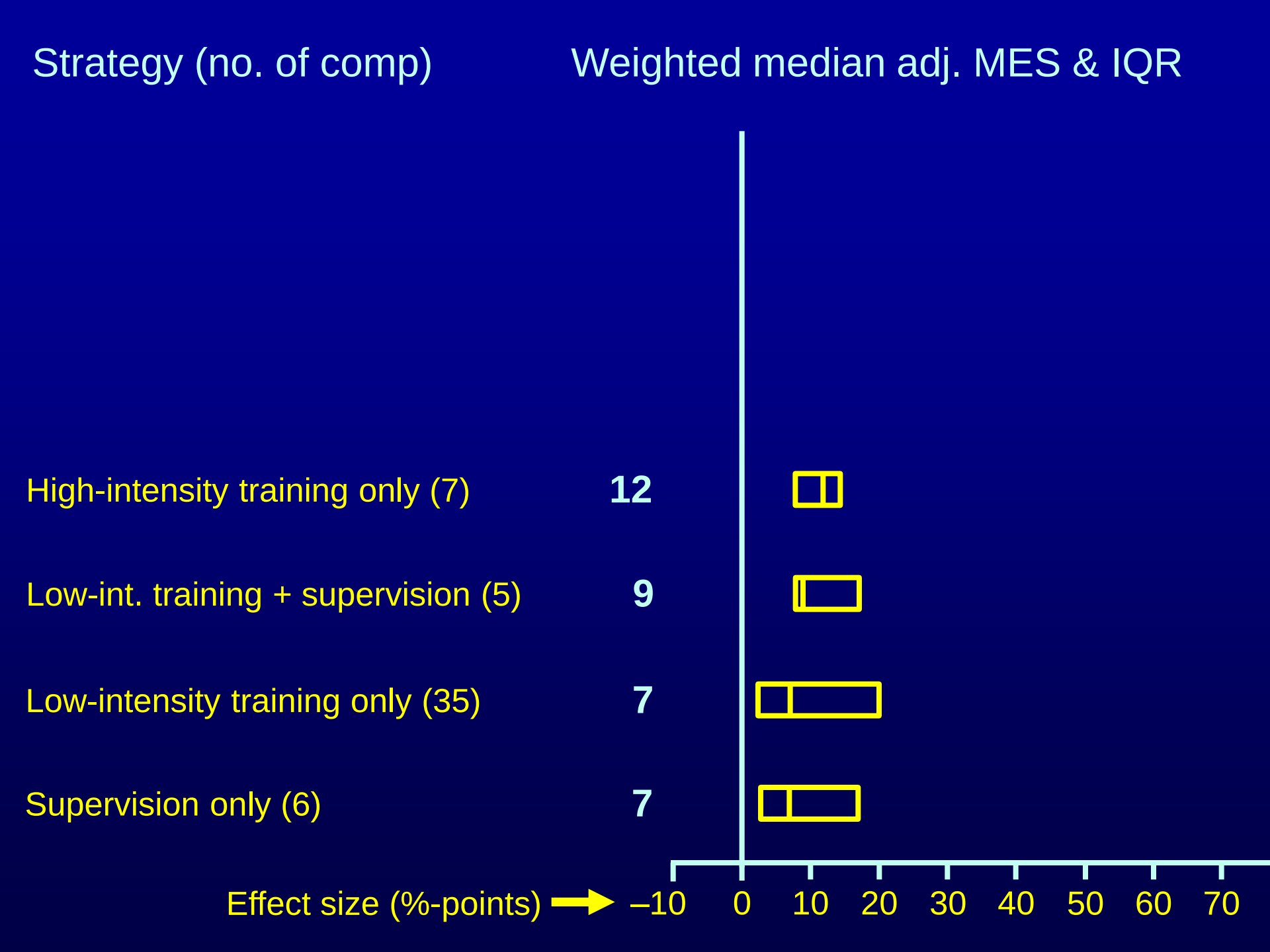
Strategy (no. of comp)

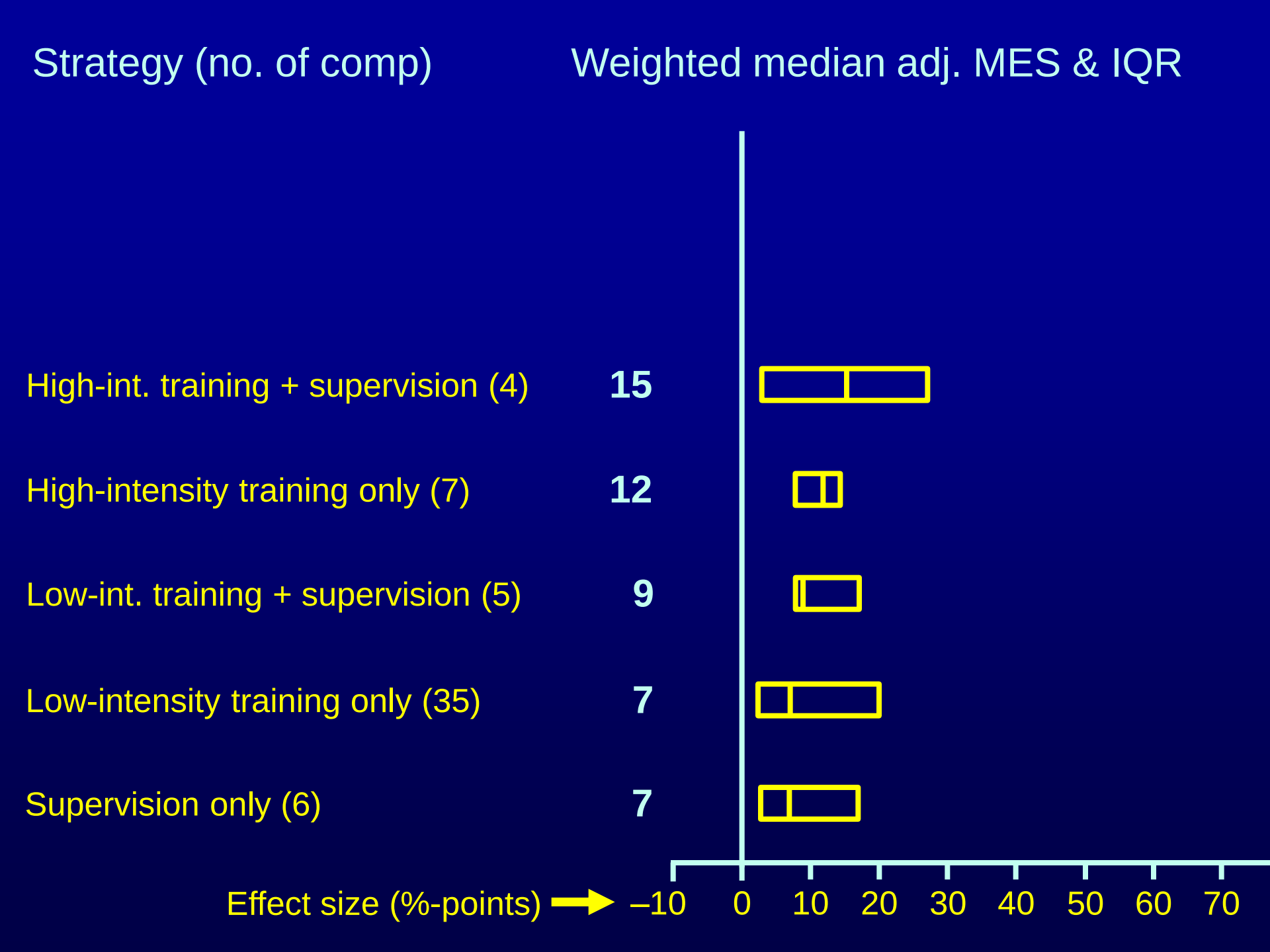
Weighted median adj. MES & IQR

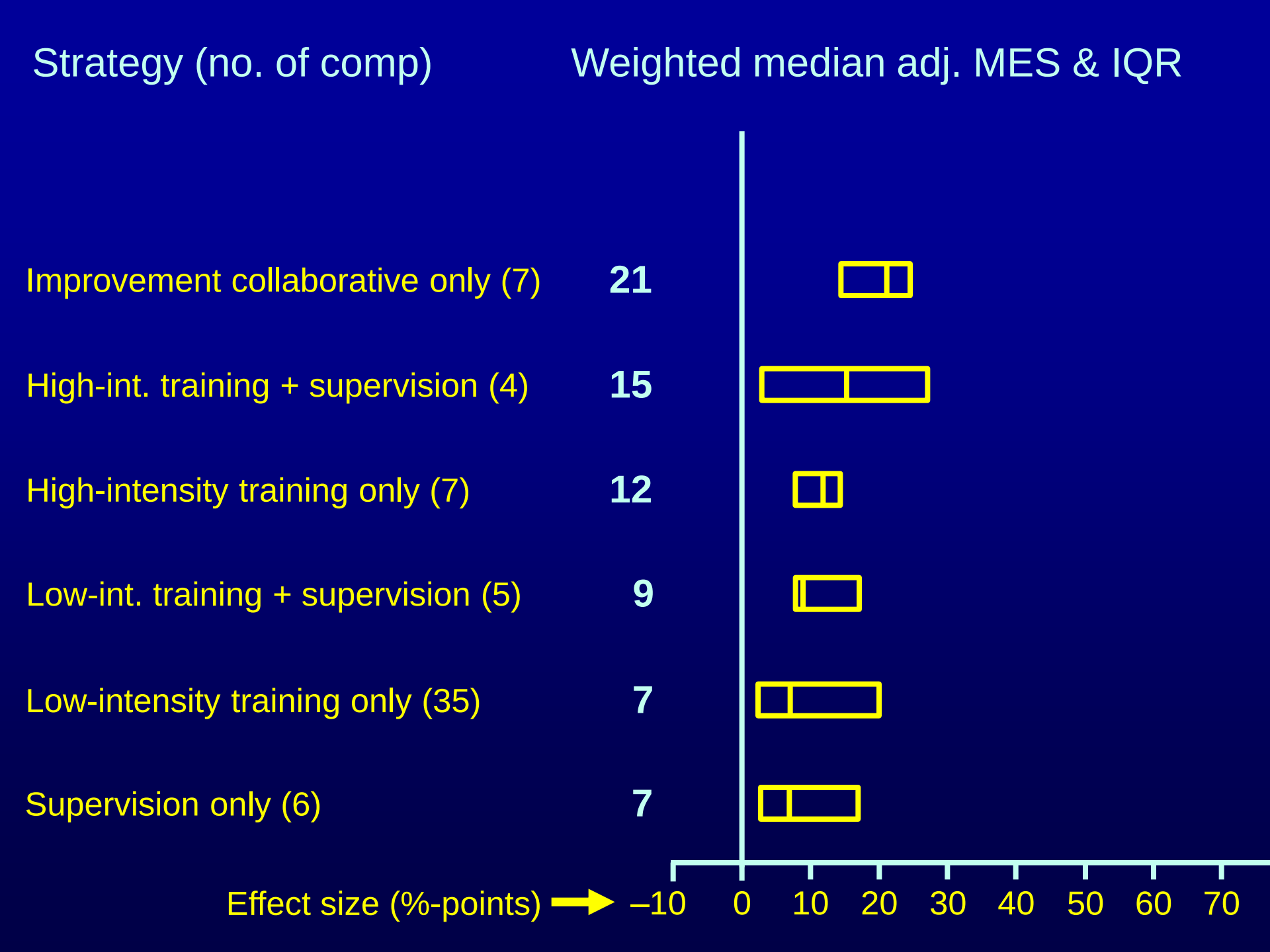
- High-intensity training. Duration >5 days + at least one interactive education method (e.g., role play)
- Low-intensity training. Any training not high-intensity training

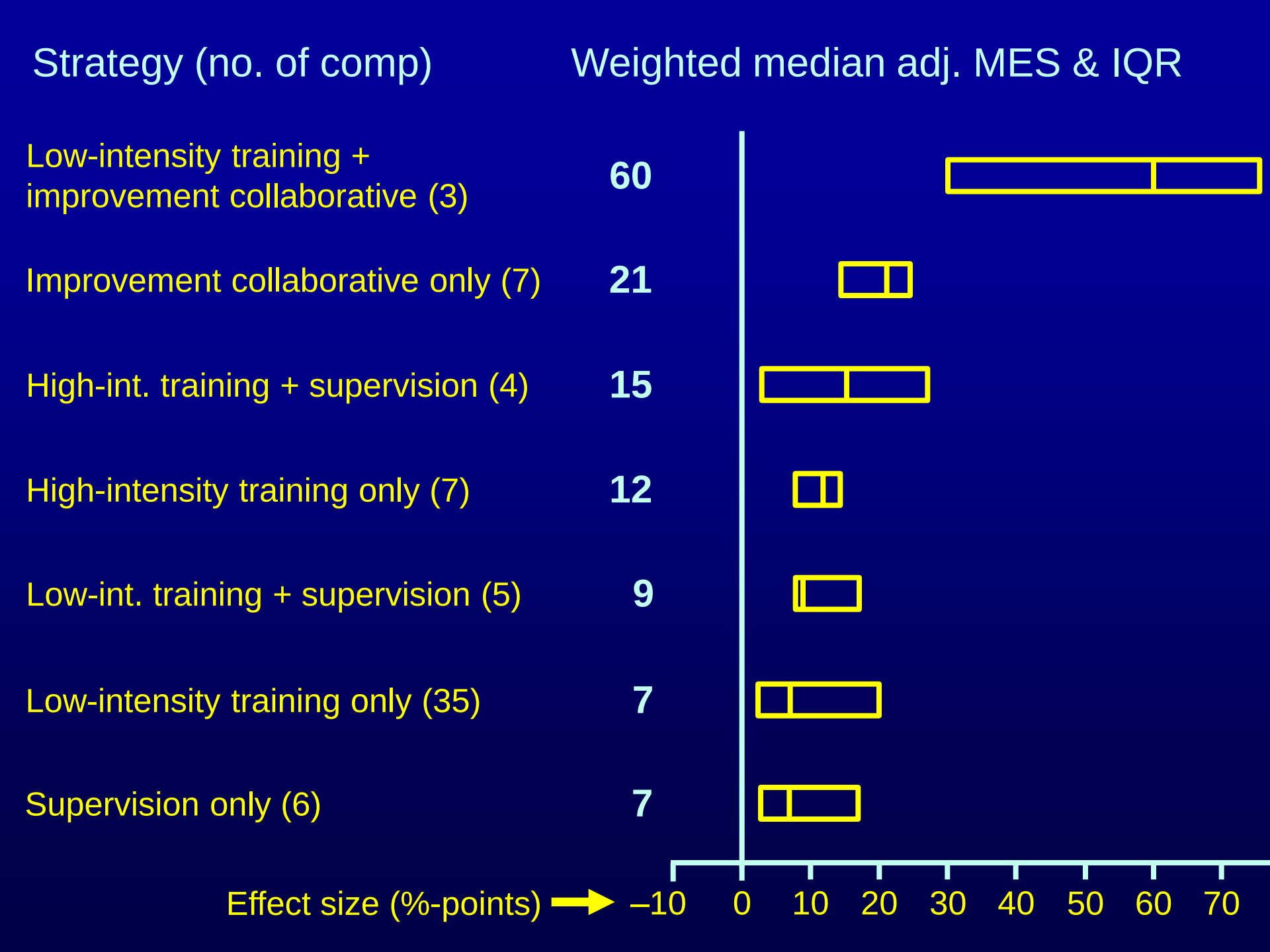



Strategy (no. of comp)
Weighted median adj. MES & IQR
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70


Strategy (no. of comp)
Weighted median adj. MES & IQR
High-intensity training only (7)
12
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70

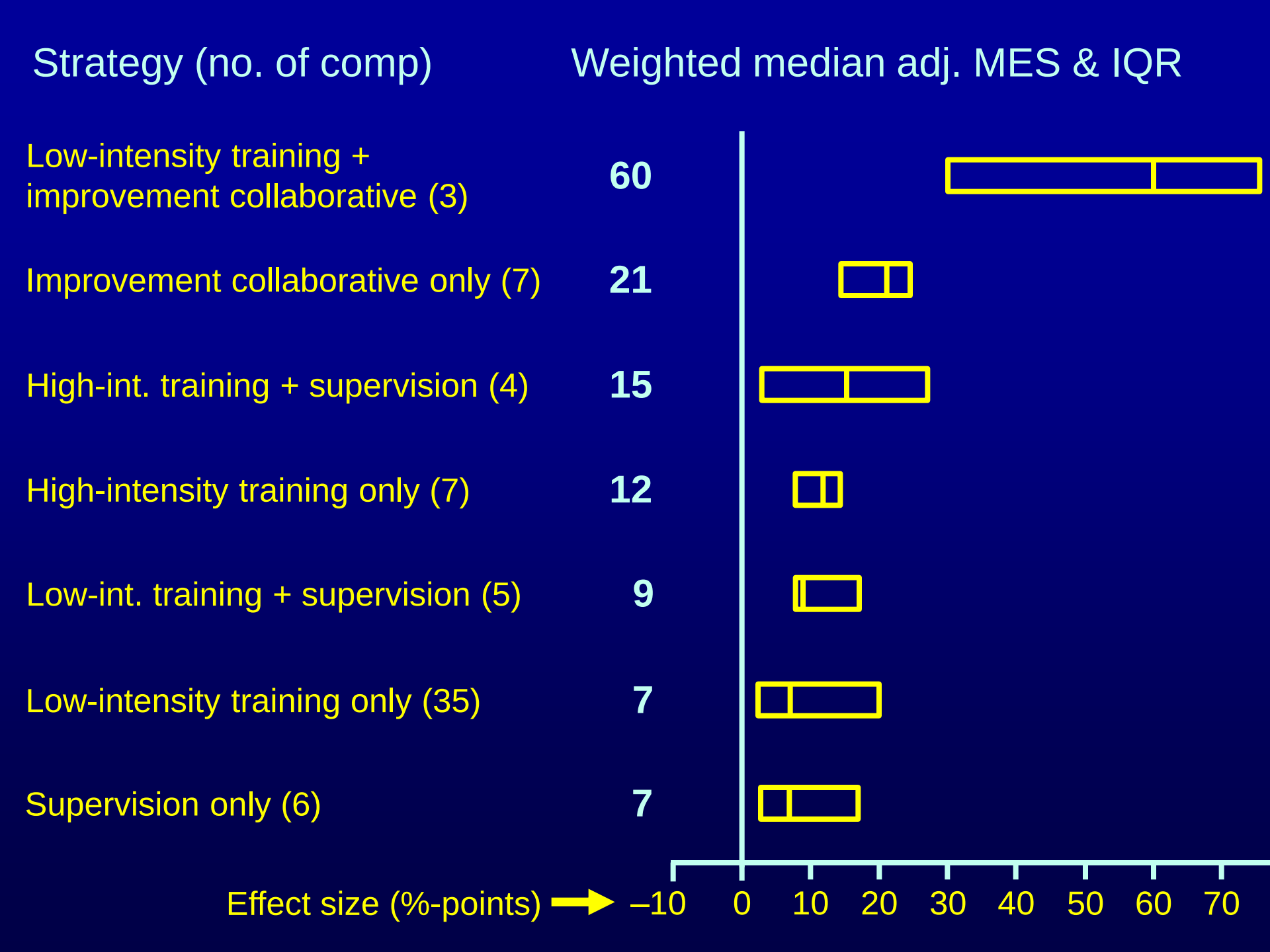

Strategy (no. of comp)
Weighted median adj. MES & IQR
High-int. training + supervision (4)
15
High-intensity training only (7)
12
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70

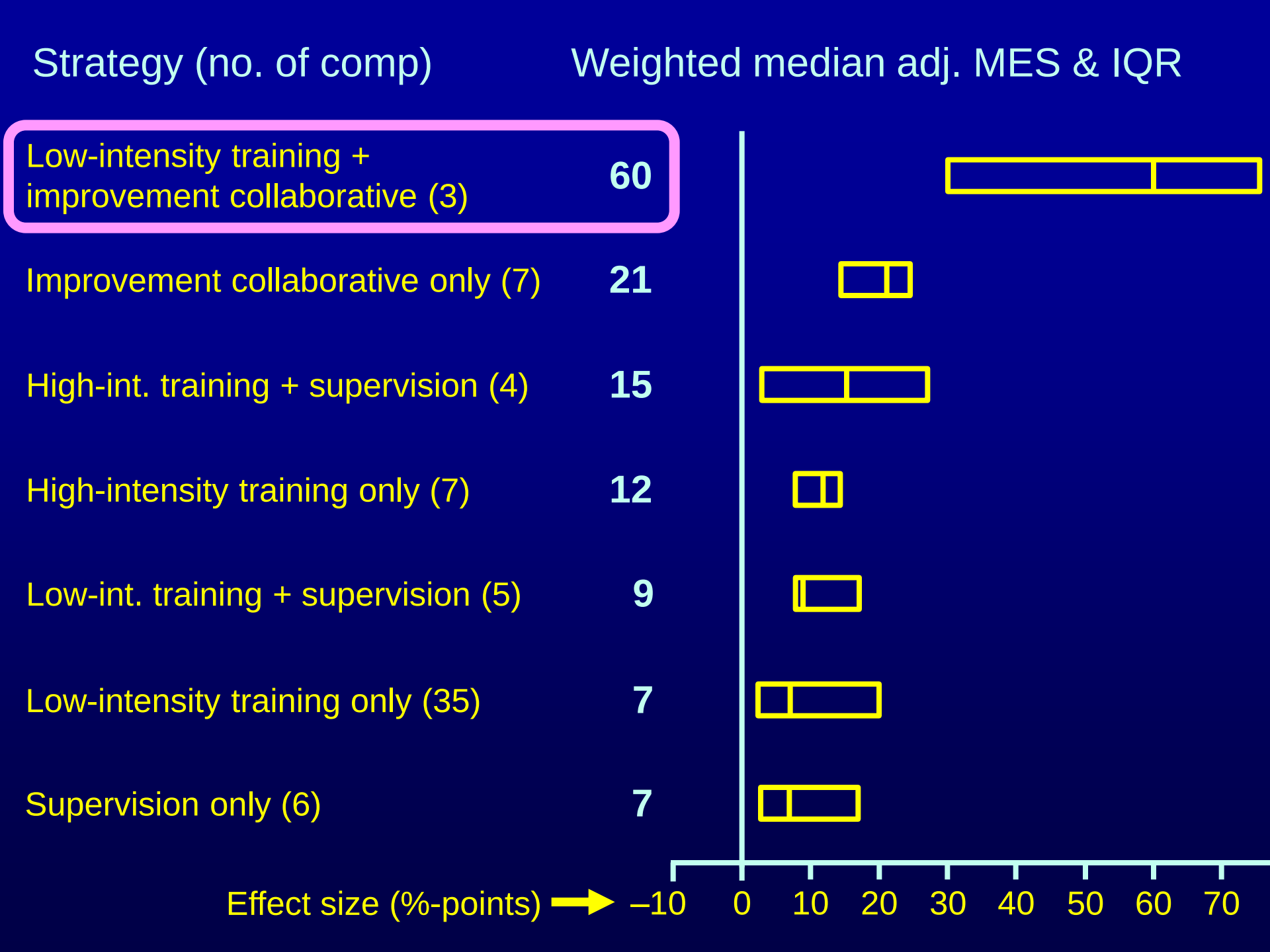

Strategy (no. of comp)
Weighted median adj. MES & IQR
Improvement collaborative only (7)
21
High-int. training + supervision (4)
15
High-intensity training only (7)
12
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70


Strategy (no. of comp)
Weighted median adj. MES & IQR
Low-intensity training + improvement collaborative (3)
60
Improvement collaborative only (7)
21
High-int. training + supervision (4)
15
High-intensity training only (7)
12
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70

Potential confounding

Issue 1. Confounding by limited variability


Strategy (no. of comp)
Weighted median adj. MES & IQR
Low-intensity training + improvement collaborative (3)
60
Improvement collaborative only (7)
21
High-int. training + supervision (4)
15
High-intensity training only (7)
12
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70


Strategy (no. of comp)
Weighted median adj. MES & IQR
Low-intensity training + improvement collaborative (3)
60
Improvement collaborative only (7)
21
High-int. training + supervision (4)
15
High-intensity training only (7)
12
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70

Confounding by limited variability

Strategy group	No. of comps	Median adj. MES (IQR)
Original definition Improvement collaborative + low-intensity training	3	**60** (30, 76)
Broadened definition		

Confounding by limited variability

Strategy group	No. of comps	Median adj. MES (IQR)
Original definition Improvement collaborative + low-intensity training	3	**60** (30, 76)
Broadened definition Group problem solving + low-intensity training +/- other components		

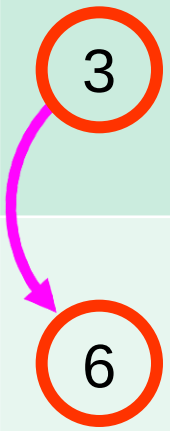
Confounding by limited variability

Strategy group	No. of comps	Median adj. MES (IQR)
Original definition Improvement collaborative + low-intensity training	3	**60** (30, 76)
Broadened definition Group problem solving + low-intensity training +/- other components		

- Broadening definition adds similar studies (to improve generalizability) and those studies have extra components
- Assume “extra” components unlikely to decrease effect size
- If effect size decreases, then likely cause is confounding

Confounding by limited variability

Strategy group	No. of comps	Median adj. MES (IQR)
Original definition Improvement collaborative + low-intensity training	3	**60** (30, 76)
Broadened definition Group problem solving + low-intensity training +/- other components	6	



- Broadening definition adds similar studies (to improve generalizability) and those studies have extra components
- Assume “extra” components unlikely to decrease effect size
- If effect size decreases, then likely cause is confounding

What were the 3 studies added to broaden definition of “group problem solving + low-intensity training”?

	Strategy (Comp_ID)
1.	**Training + continuous quality improvement** + community education meetings + home visits + printed materials for community (17970000112)
2.	**Training + team-based problem solving** + audit with feedback + peer review + group process + poster for HCP (60000112)
3.	**Training + problem solving meetings** + printed standard treatment guidelines + poster for HCP + audit with feedback (6300000112)

Confounding by limited variability

Strategy group	No. of comps	Median adj. MES (IQR)
Original definition Improvement collaborative + low-intensity training	3	**60** (30, 76)
Broadened definition Group problem solving + low-intensity training +/- other components	6	

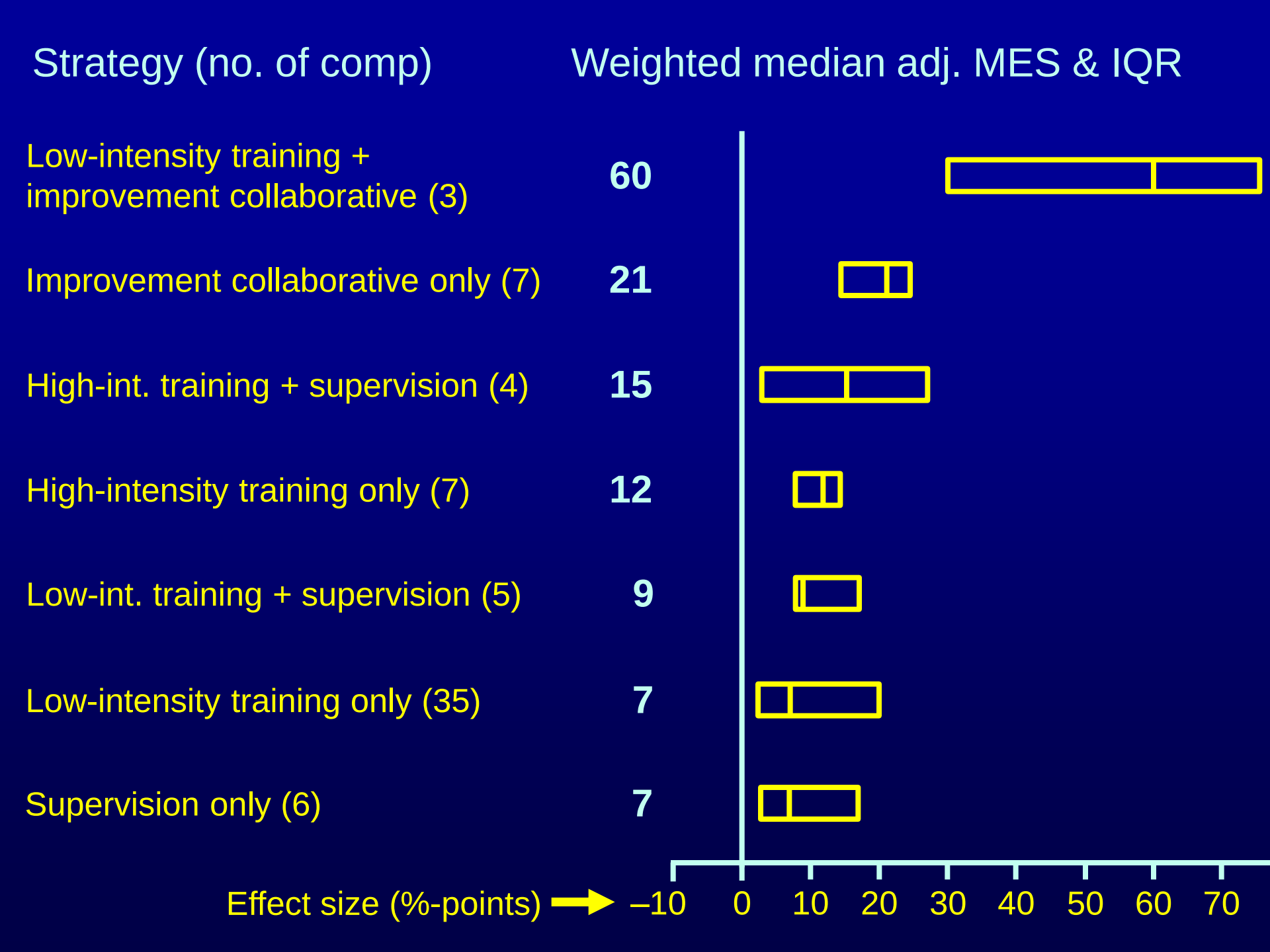
Confounding by limited variability

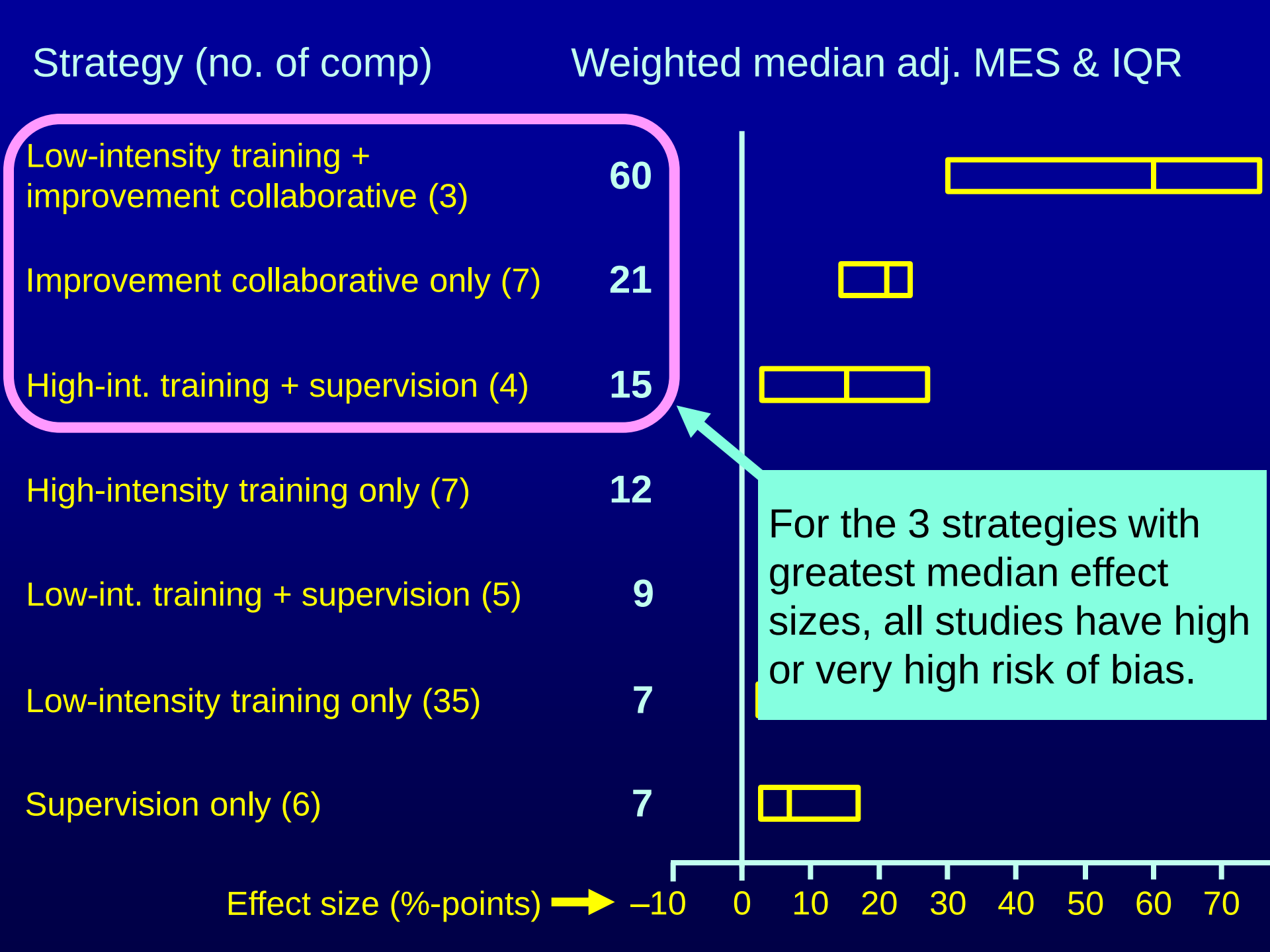
Strategy group	No. of comps	Median adj. MES (IQR)
Original definition Improvement collaborative + low-intensity training	3	**60** (30, 76)
Broadened definition Group problem solving + low-intensity training +/- other components	6	**11** (6, 60)

Bottom line. Results from broadened definition raise concerns about generalizability of results of 3 original studies.

Potential confounding

Issue 2. Risk of bias


Strategy (no. of comp)
Weighted median adj. MES & IQR
Low-intensity training + improvement collaborative (3)
60
Improvement collaborative only (7)
21
High-int. training + supervision (4)
15
High-intensity training only (7)
12
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
Effect size (%-points)
–10
0
10
20
30
40
50
60
70


Strategy (no. of comp)
Weighted median adj. MES & IQR
Low-intensity training + improvement collaborative (3)
60
Improvement collaborative only (7)
21
High-int. training + supervision (4)
15
High-intensity training only (7)
12
Low-int. training + supervision (5)
9
Low-intensity training only (35)
7
Supervision only (6)
7
For the 3 strategies with greatest median effect sizes, all studies have high or very high risk of bias.
Effect size (%-points)
–10
0
10
20
30
40
50
60
70

Context-specific analyses

Income category: low- versus middle-income countries

Bottom line: Not so useful because small sample sizes.

Results from studies that focused predominantly on lay health workers

Results

- 4 comparisons from 4 studies
- All from low-income countries, and all with high or very high risk of bias
- For high-intensity training only (N = 2 studies), median of adjusted MES = 10 %-pts
- For low-intensity training only (N = 1 study), adjusted MES = 14 %-pts
- For supervision only (N = 1 study), adjusted MES = 29 %-pts

Factors associated with effectiveness of training and supervision

Only summary results shown. Methods and detailed results can be presented at another time.

Summary of preliminary results

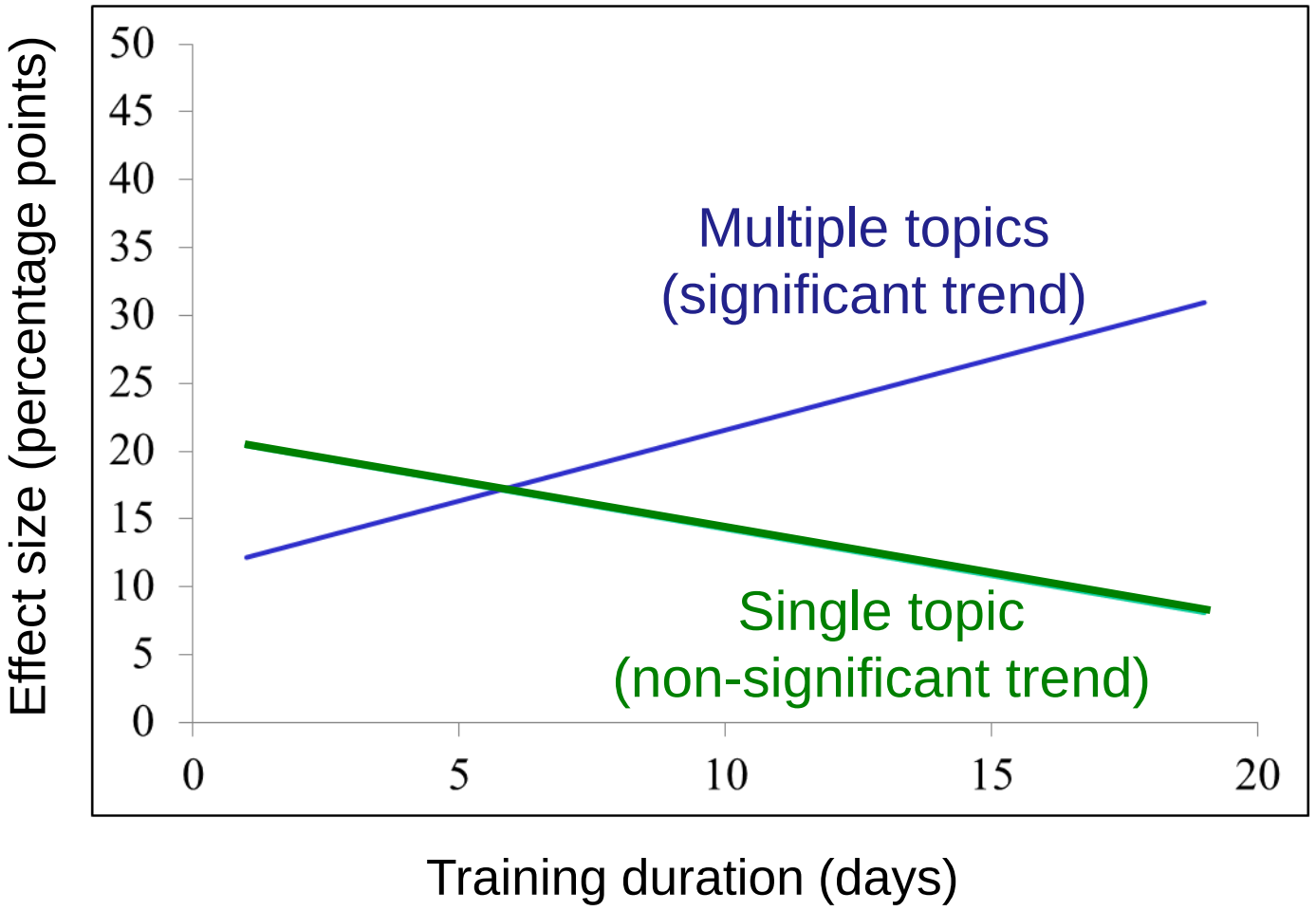
- Goal: Identify attributes of more effective training and supervision strategies (analyzed separately)
- Methods: Mixed linear reg. modeling of any strategy in full HCPPR database with training or supervision

Summary of preliminary results

- Goal: Identify attributes of more effective training and supervision strategies (analyzed separately)
- Methods: Mixed linear reg. modeling of any strategy in full HCPPR database with training or supervision
- Training
  - For single-topic, duration not assoc. with effectiveness
  - For multi-topic, effect size increased by 1–2 %-points per extra day; single- and multi-topic equiv. at 5 days

Training duration versus effect size, stratified by complexity of topic discussed during training

(N = 548 effect sizes from studies with training <20 days)



Note: Predicted effect sizes adjusted for other strategy components, clinical practice during training, and baseline.

Summary of preliminary results

- Goal: Identify attributes of more effective training and supervision strategies (analyzed separately)
- Methods: Mixed linear reg. modeling of any strategy in full HCPPR database with training or supervision
- Training
  - For single-topic, duration not assoc. with effectiveness
  - For multi-topic, effect size increased by 1–2 %-points per extra day; single- and multi-topic equiv. at 5 days
- Supervision: Supervision process that explicitly included feedback to HCPs was associated with 11 %-point improvement
- Limitations: For all models, many missing values; substantial risk of bias and confounding.

Limitations

Limitations

1. No studies of COPE, SBMR, or accreditation only in HCPPR database, which is out of date. Attempts to create “COPE-like” & “SBMR-like” strategies were unsuccessful. COPE & SBMR studies exist that are not in HCPPR. These should be examined.

Limitations

1. No studies of COPE, SBMR, or accreditation only in HCPPR database, which is out of date. Attempts to create “COPE-like” & “SBMR-like” strategies were unsuccessful. COPE & SBMR studies exist that are not in HCPPR. These should be examined.
2. Limitations of studies: lack of detail on strategy and context, lack of standardization, difficulty in assessing study precision and strength of implementation, high risk of bias, & confounding
3. Insufficient time to examine cost data, and results for other outcomes (e.g., health impact)

Preliminary conclusions and recommendations

Improving processes of care in settings that do not only include LHWs

1. Objective of analysis not fully achieved because no studies on 3 of 6 originally targeted strategies
   - Studies of COPE and SBMR not in HCPPR should be examined (new studies on improvement collaboratives, too)
   - For accreditation, it might be necessary to recognize that it is often implemented with other components (such studies are in HCPPR), and so it should be studied as part of multi-faceted interventions

Improving processes of care in settings that do not only include LHWs

2. Effect sizes for improvement collaboratives (especially with training) tended to be larger than those of other strategies. However, findings must be interpreted with caution because of high risk of bias and some evidence of limited generalizability (confounding by limited variability).

Improving processes of care in settings that do not only include LHWs

3. Training and supervision had modest effect sizes
    - With effect sizes ~10 %-pts, if baseline performance is 40%, these strategies will boost performance to ~50% (still large gap)
    - Combination of training + supervision tended to have higher effect sizes than either alone. However, results of category with largest effect sizes (high-intensity training + supervision) must be interpreted with caution because of high risk of bias.

Improving processes of care in settings that do not only include LHWs

4. To increase effectiveness of strategies that include training on multiple topics, it might be beneficial to have a duration of at least 5 days, with additional days potentially increasing effectiveness

5. To increase effectiveness of strategies with supervision, it might be beneficial for supervision process to explicitly include provision of feedback to HCPs

Improving processes of care in settings with predominantly LHWs

6. Very few studies; more needed (more actually exist—they're just not in database)
7. Effectiveness of training for LHWs similar to that for other HCPs
8. Effectiveness of supervision was greater; but only one study

General recommendations and concerns

1) More studies with stronger designs needed
2) If USAID and others are interested in which strategy is “best”, then conduct head-to-head trials (stronger evidence than indirect comparisons here)

General recommendations and concerns

1) More studies with stronger designs needed
2) If USAID and others are interested in which strategy is “best”, then conduct head-to-head trials (stronger evidence than indirect comparisons here)
3) Question/concern: Who should be conducting studies? Is there potential conflict of interest if an organization is evaluating a specialized strategy that they are paid to implement? Should evaluators be from a different “neutral” organization?

General recommendations and concerns

1) More studies with stronger designs needed
2) If USAID and others are interested in which strategy is “best”, then conduct head-to-head trials (stronger evidence than indirect comparisons here)
3) Question/concern: Who should be conducting studies? Is there potential conflict of interest if an organization is evaluating a specialized strategy that they are paid to implement? Should evaluators be from a different “neutral” organization?
4) Choice of strategy depends on many factors, such as cost, feasibility, and acceptability. These need to be better assessed.
5) Systematic reviews such as HCPPR are useful for gathering and synthesizing evidence

Proposed next steps

1. Make final (small) revisions on database (February)
2. Complete manuscript on HCPPR methods and descriptive results (March)
3. Examine reports on COPE, SBMR, and improvement collaboratives that are currently not in HCPPR; assess eligibility; and abstract eligible studies (April) Funding?
4. Conduct analysis with revised database for IOM, present results to IOM and stakeholders, and obtain feedback (May)
5. Finalize analysis and complete manuscript (June)

How can you get a copy of HCPPR database?

- We're working to get it on web. Until then….
- Send email to Samantha Rowe (say9@cdc.gov), including the following (so we have a sense of who's using the database—we won't share your info)
  1. Name
  2. Primary affiliation
  3. Contact information (physical address, email, phone)
  4. Country
- We'll send database (plus updated versions automatically)

Thanks for your attention!

Any questions or comments?

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333

Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

E-mail: cdcinfo@cdc.gov Web: http://www.cdc.gov