

Virtual workshop series on GRADE methodology in supporting decision-making

Workshop 1- GRADE Methodology

30th October 2023

Understanding GRADE

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UNIVERSITY
OF BEIRUT**



Disclosures

No benefits from industry

Consultations related to guideline development

Member of the GRADE working group

Acknowledgments

Ms. Joanne Khabsa for helping with preparing for the presentation

Understanding GRADE

- Overview of GRADE methodology
- Key principles and concepts
- Evidence to Decision Frameworks

Guidelines

“Guidelines are systematically developed evidence-based statements which assist providers, recipients and other stakeholders to make informed decisions about appropriate health interventions.”

WHO 2003, 2007, 2014

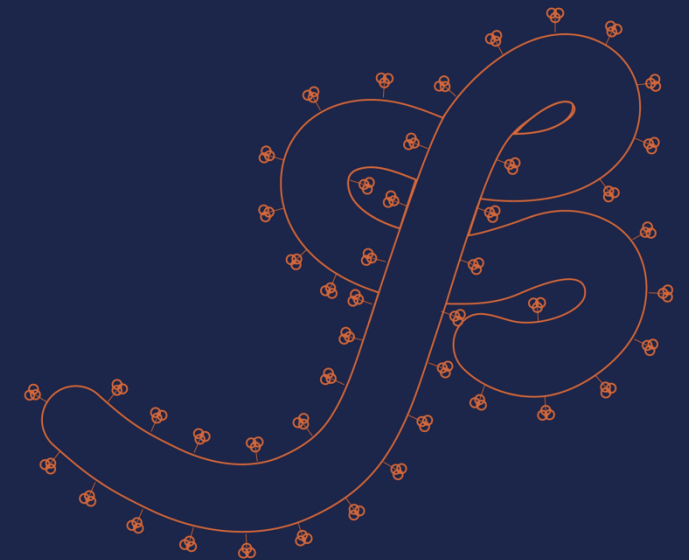
Three approaches to guideline development

- Standard development of own guidelines
- Adoption of source guidelines
- Adaptation of source guidelines

The guideline

Infection prevention and
control guideline for Ebola
and Marburg disease

August 2023



The recommendation

Conditional recommendation for , Very low certainty evidence

WHO **suggests** health and care workers who have had an exposure to *Ebolavirus* or *Marburgvirus* be excluded from work for 21 days.

The recommendation

- The recommendation statement represents the answer to a priority question of the target users

The recommendation

Conditional recommendation for , Very low certainty evidence

WHO **suggests** health and care workers who have had an exposure to *Ebolavirus* or *Marburgvirus* be excluded from work for 21 days.

The recommendation

Conditional recommendation for , Very low certainty evidence

WHO suggests health and care workers who have had an exposure to *Ebolavirus* or *Marburgvirus* be excluded from work for 21 days.

The question

Should healthcare workers who have had an exposure to *Ebolavirus* or *Marburgvirus*, be excluded from work versus not excluded from work?

Questions and recommendations

- **Question:**

Should **Population**, receive **Intervention** versus **Comparator**?

Questions and recommendations

- **Question:**

Should **Population**, receive **Intervention** versus **Comparator**?

- **Recommendation:**

WHO recommends **Population**, receives **Intervention** versus **Comparator**

Beyond flipping the question into an answer

- Strength of recommendation
- Remarks
- Implementation considerations

Conditional recommendation for , Very low certainty evidence

WHO **suggests** health and care workers who have had an exposure to *Ebolavirus* or *Marburgvirus* be excluded from work for 21 days.

Remarks:

Exclusion is likely to be adopted when:

- *The health and care worker has not been previously vaccinated within the recommended time frame.*
 - *The exposure is assessed to be a high risk for transmission.*
 - *The health-care facility has adequate staffing available to provide health services if workers are excluded from work.*
 - *There is a low risk of stigmatization for the health and care worker.*
-

Implementation considerations

- Health-care facilities that exclude health and care workers who have had an exposure at work should consider the following implementation measures:
 - conduct an assessment of the type of exposure
 - implement a process to monitor the health and care worker for symptom development
 - where resources (laboratory) exist, consider adding testing of exposed health and care workers to shorten the exclusion time frame
 - pay health and care workers who are excluded from work
 - offer community and health and care worker sensitization and engagement to reduce stigmatization
 - assess impact on equity
 - evaluate the situation - it may be dynamic and the number of workers might change throughout the outbreak

- The decision to exclude health and care workers who have had an exposure to *Ebolavirus* or *Marburgvirus* needs to be flexible to adapt to the evolving situation of an outbreak and the operational considerations for health-service delivery.
- Date of exclusion of the HW should be 21 days from the last exposure to *Ebolavirus* or *Marburgvirus*.
 - For example, if the last date of exposure was January 1, then this would count as day = 0. Therefore, a full 21 days would be January 22 and the HW could return to work on January 23. If they were to develop symptoms during this period, they should be assessed fully by a medical provider (ideally at a TC) and their work exclusion would be extended if they were found to be infected with *Ebolavirus* or *Marburgvirus*.
- HWs who are excluded from work as a result of an exposure should self-quarantine and be followed daily.
- Exposed health workers should be provided instructions on self-monitoring for signs and symptoms of Ebola disease or Marburg disease infection for 21 days post exposure and instructed to seek immediate medical attention if symptoms develop.
- Vaccination should be offered where available (for health workers not already vaccinated) in accordance with current guidelines.

Developing recommendations is a decision making process

Decision making process

- Who is making the decision
- The options being considered
- Factors based on which decision is made
- Data based on which those factors are judged

Who is making the decision

- Panel members
 - Representing different stakeholders
 - Managing conflicts of interest

The options being considered

- **Question:**

Should **Population**, receive **Intervention** versus **Comparator**?

- **Recommendation:**

WHO recommends **Population**, receives **Intervention** versus **Comparator**

Factors based on which decision is made

1

Desirable Effects ⓘ

How substantial are the desirable anticipated effects?

2

Undesirable Effects ⓘ

How substantial are the undesirable anticipated effects?

3

Certainty of evidence ⓘ

What is the overall certainty of the evidence of effects?

4

Values ⓘ

Is there important uncertainty about or variability in how much people value the main outcomes?

5

Balance of effects ⓘ

Does the balance between desirable and undesirable effects favor the intervention or the comparison?

6

Resources required ⓘ

How large are the resource requirements (costs)?

7

Equity ⓘ

What would be the impact on health equity?

8

Acceptability ⓘ

Is the intervention acceptable to key stakeholders?

9

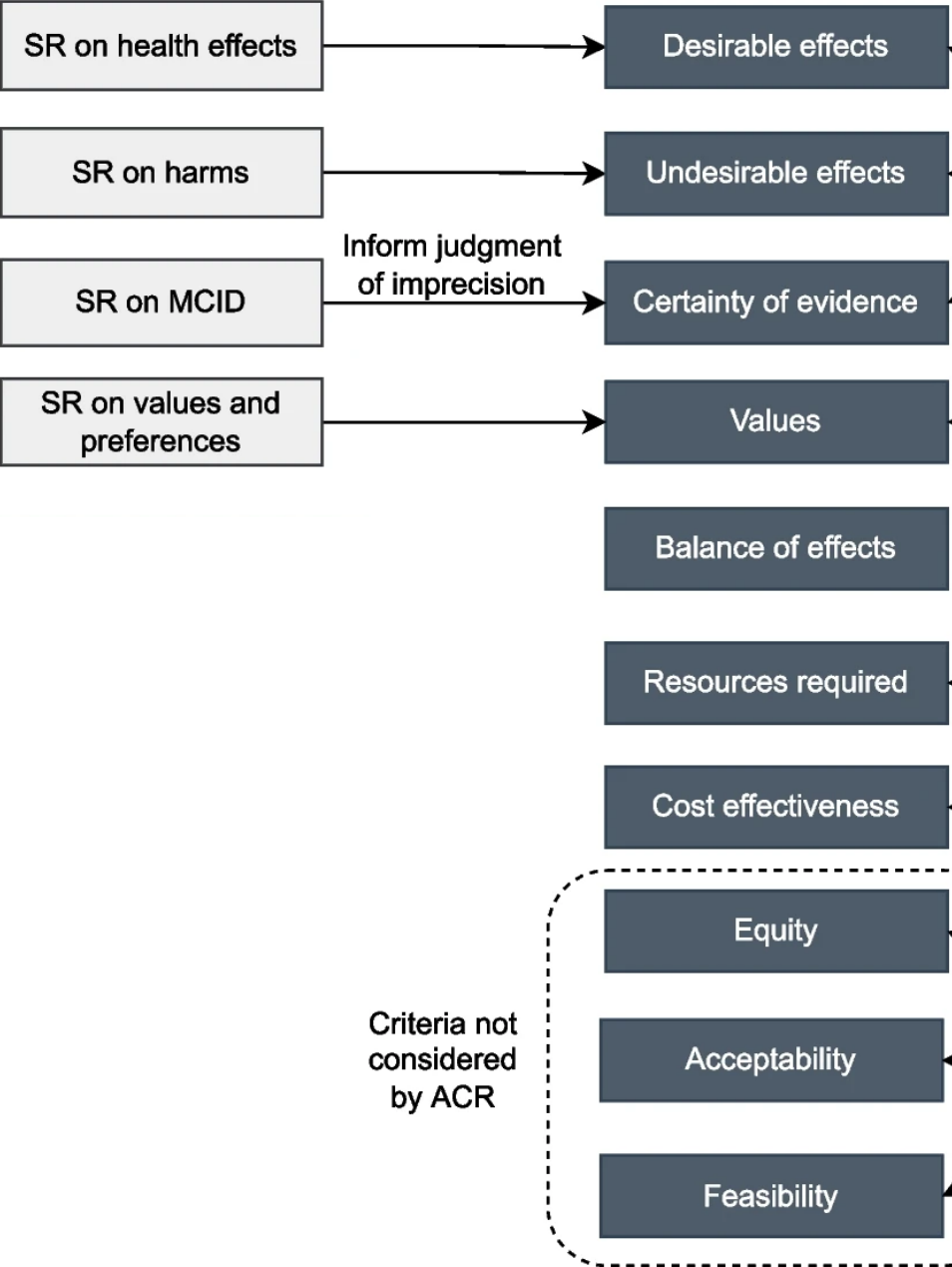
Feasibility ⓘ

Is the intervention feasible to implement?

Evidence on health effects

Evidence on contextual factors

Data based on which those factors are judged

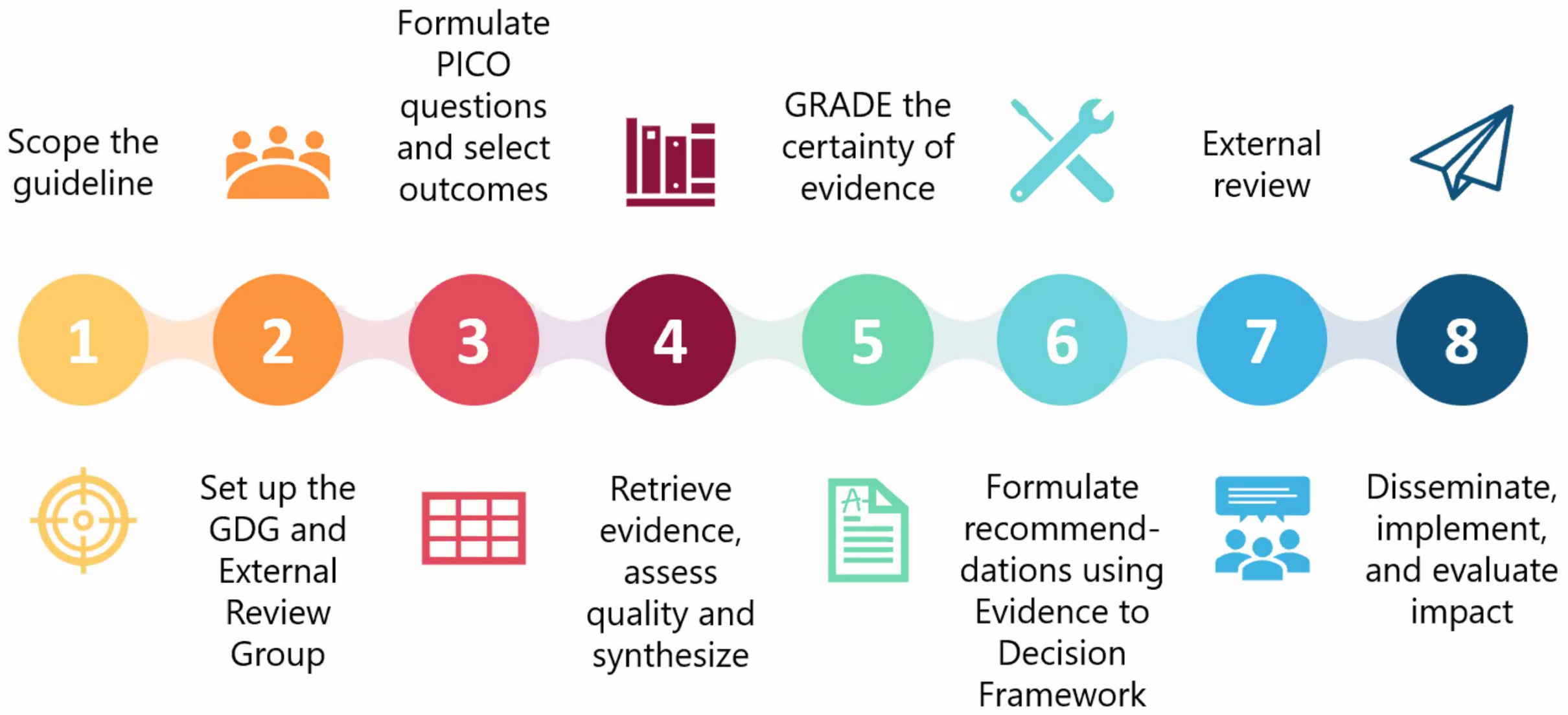


Decision making process

- Who is making the decision
- The options being considered
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Typical approach to developing guidelines?

Overview of the Process of Guideline Development



Grades of Recommendation Assessment, Development and Evaluation



RATING QUALITY OF EVIDENCE AND STRENGTH OF RECOMMENDATIONS

GRADE: an emerging consensus on rating quality of evidence and strength of recommendations

Guidelines are inconsistent in how they rate the quality of evidence and the strength of recommendations. This article explores the advantages of the GRADE system, which is increasingly being adopted by organisations worldwide

www.gradeworkinggroup.org

2008 BMJ series

2011 JCE series

Adopted by more than 200 organizations



GRADE framework

- Relies on a systematic, explicit and transparent approach
- Emphasizes:
 - Certainty of evidence assessment
 - Contextualization

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Evidence on health effects

Evidence on contextual factors

Balance of benefits & harms



benefits clearly
outweigh downsides



**strong recommendation
for a given action**



benefits probably or a little
outweigh downsides



**weak recommendation
for a given action**



downsides probably or a little
outweigh benefits



**weak recommendation
against a given action**



downsides clearly
outweigh benefits



**strong recommendation
against a given action**

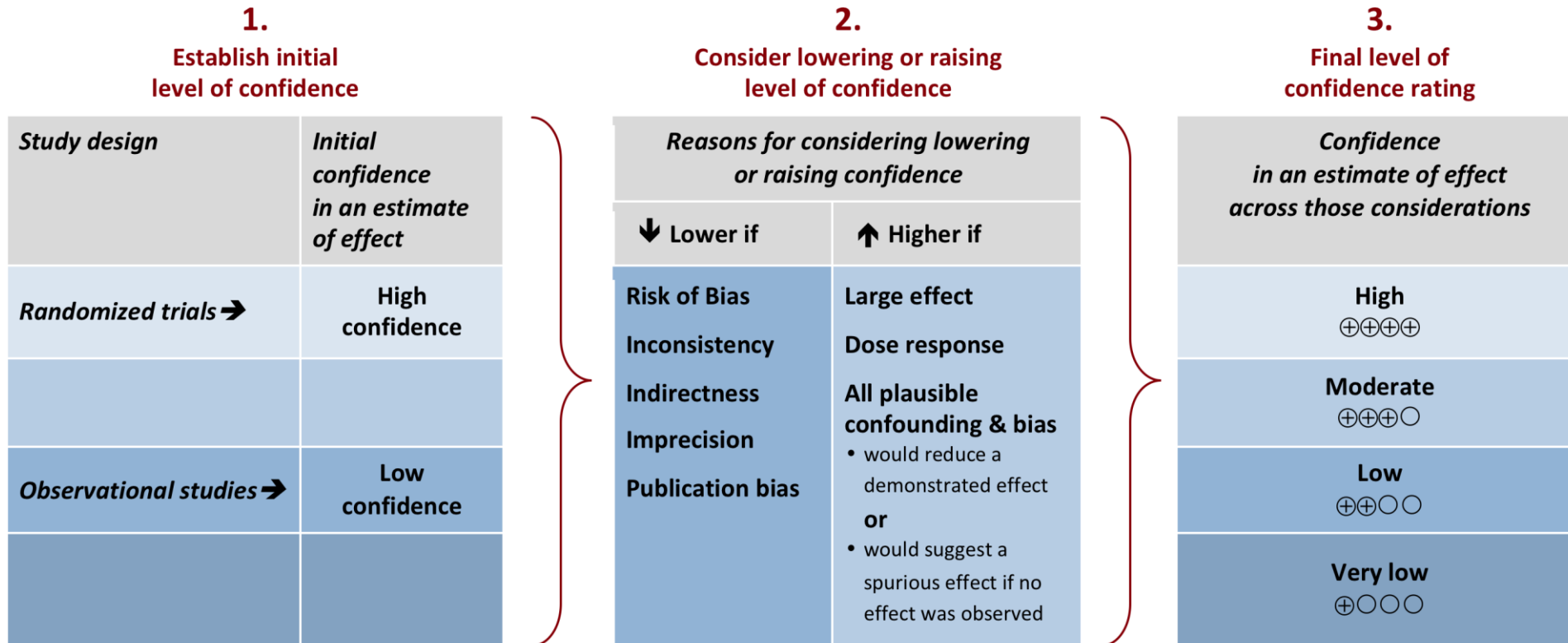
Balance of benefits & harms

- The larger the difference between benefits and harms → the more likely the recommendation will be strong
- The smaller the difference between benefits and harms → the more likely the recommendation will be conditional

Certainty of evidence

- Extent to which the confidence in the estimate of effect is adequate to support decision

Certainty of evidence



Certainty of evidence

- The higher the certainty of evidence → the more likely the recommendation will be strong
- The lower the certainty of evidence → the more likely the recommendation will be conditional

Values and preferences

- The lower the variability and uncertainty in values associated with outcomes relevant to a policy are → the more likely the recommendation will be strong
- The greater the variability and uncertainty in values associated with outcomes relevant to a policy are → the more likely the recommendation will be conditional

Resource use

- Most of the interventions have resource implications : type, availability, amount
- Many of the resource implications are major
- Cost, opportunity cost

Resource use

- The lower the resources required for a policy are → the more likely the recommendation will be strong
- The higher the resources required for a policy are → the more likely the recommendation will be conditional

Equity

- The greater the positive effect on equity of a policy is → the more likely the recommendation will be strong
- The greater the negative effect on equity of a policy is → the more likely the recommendation will be conditional



Acceptability

- The more acceptable to key stakeholders a policy is → the more likely the recommendation will be strong
- The less feasible to key stakeholders a policy is → the more likely the recommendation will be conditional

Feasibility

- The more feasible a policy is → the more likely the recommendation will be strong
- The less feasible a policy is → the more likely the recommendation will be conditional

1

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How substantial are the desirable anticipated effects?

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Feasibility ⓘ

Is the intervention feasible to implement?

Evidence on health effects

Evidence on contextual factors

Practically

1

Desirable Effects 

How substantial are the desirable anticipated effects?

JUDGEMENT



- Trivial
- Small
- Moderate
- Large
-
- Varies
- Don't know

Detailed judgements

RESEARCH EVIDENCE

| Outcomes | Anticipated absolute effects* (95% CI) | | Relative effect (95% CI) | Number of participants/person-years (studies) | Certainty of the evidence (GRADE) | Comments |
|---|--|---|---------------------------------|---|-----------------------------------|--|
| | Risk/rate with no screening | Risk/rate with Screening of windows, ceilings, doors and/or eaves | | | | |
| Clinical malaria incidence caused by <i>P falciparum</i> Follow-up: 6 months | 91 per 1000 person-years | 35 per 1000 person-years (16 to 70) | Rate ratio: 0.38 (0.18 to 0.82) | 219.3 person-years (1 RCT) ^a | ⊕⊕⊕⊕ LOW ^{b,c,d} | Screening may reduce clinical <i>P falciparum</i> malaria. <i>Due to risk of bias and imprecision</i> |
| Malaria parasite prevalence Follow-up: 1 year | 234 per 1000 | 196 per 1000 (140 to 274) | Risk ratio: 0.84 (0.60 to 1.17) | 713 participants (1 RCT) ^e | ⊕⊕⊕⊕ LOW ^{f,g} | Screening may have a small effect on malaria parasite prevalence. <i>Due to imprecision</i> |
| Anaemia prevalence Follow-up: 1 year | 211 per 1000 | 128 per 1000 (88 to 187) | Risk ratio: 0.61 (0.42 to 0.89) | 705 participants (1 RCT) ^e | ⊕⊕⊕⊕ MODERATE ^h | Screening probably reduces anaemia prevalence. <i>Due to imprecision</i> |
| Entomological Inoculation Rate (EIR) Follow-up: range 6 months to 2 years | In one study, the mean difference in EIR between the control houses and treatment houses ranged from 0.45 to 1.50 (CIs ranged from -0.46 to 2.41), depending on the study year and treatment arm; in a second study, there was a mean difference in EIR of 4.57 (95% CI 3.81 to 5.33). | | - | (2 RCTs) | ⊕⊕⊕⊕ LOW ⁱ | Screening may reduce EIR. <i>Due to imprecision</i> |

ADDITIONAL CONSIDERATIONS

| CRITERIA | | SUMMARY OF JUDGEMENTS | | | | | | IMPORTANCE FOR DECISION |
|-----------------------|---|--|--|--|---|---------------------|---------------------|-------------------------|
| DESIRABLE EFFECTS | Trivial | Small | Moderate | | Large | Varies | Don't know | |
| UNDESIRABLE EFFECTS | Large | Moderate | Small | | Trivial | Varies | Don't know | |
| CERTAINTY OF EVIDENCE | Very low | Low | | Moderate | High | No included studies | | |
| VALUES | Important uncertainty or variability | Possibly important uncertainty or variability | Probably no important uncertainty or variability | | No important uncertainty or variability | | | |
| BALANCE OF EFFECTS | Favors the comparison  | Probably favors the comparison  | Does not favor either the intervention or the comparison  | Probably favors the intervention  | Favors the intervention  | Varies | Don't know | |
| RESOURCES REQUIRED | Large costs  | Moderate costs  | Negligible costs and savings  | Moderate savings  | Large savings  | Varies | Don't know | |
| COST EFFECTIVENESS | Favors the comparison  | Probably favors the comparison  | Does not favor either the intervention or the comparison  | Probably favors the intervention  | Favors the intervention  | Varies | No included studies | |
| EQUITY | Reduced  | Probably reduced  | Probably no impact  | Probably increased  | Increased  | Varies | Don't know | |
| ACCEPTABILITY | No | Probably no | Probably yes | | Yes | Varies | Don't know | |
| FEASIBILITY | No | Probably no | Probably yes | Yes | Varies | Don't know | | |

TYPE OF RECOMMENDATION

Strong recommendation against the option

Conditional recommendation against the option

Conditional recommendation for either the option or the comparison

Conditional recommendation for the option

Strong recommendation for the option

Conditional recommendation for , Very low certainty evidence

WHO **suggests** health and care workers who have had an exposure to *Ebolavirus* or *Marburgvirus* be excluded from work for 21 days.

Remarks:

Exclusion is likely to be adopted when:

- *The health and care worker has not been previously vaccinated within the recommended time frame.*
 - *The exposure is assessed to be a high risk for transmission.*
 - *The health-care facility has adequate staffing available to provide health services if workers are excluded from work.*
 - *There is a low risk of stigmatization for the health and care worker.*
-

Understanding GRADE

- Overview of GRADE methodology
- Key principles and concepts
- Evidence to Decision Frameworks

GRADE EtD in practice

- Key considerations in the development of EtD frameworks
- Case studies in the use of GRADE EtD

Outline

- Importance of contextual factors
- What are the contextual factors
- How to gather information on contextual factors
- How to use contextual factors in the guideline process

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Importance of contextual factors

- WHO handbook: One of the roles of the guideline development group (GDG) is to “formulate recommendations taking into account benefits, harms, values and preferences, feasibility, equity, acceptability, resource requirements and other factors, as appropriate” (1).

Importance of contextual factors

- 4 examples to illustrate the importance of contextual factors

Importance of contextual factors (example 1)

Developing a recommendation requires judging the balance of health effects (i.e., desirable effects versus undesirable effects)

Importance of contextual factors (example 1)

- For patients with condition X, intervention A (compared with no intervention A) leads to:
 - 10 less deaths per 1000 patients (over one year)
 - 20 more episodes of diarrhea per 1000 patients (over one year)
- Would you judge the balance of health effects as favoring A or not favoring A?

Importance of contextual factors (example 2)

Importance of contextual factors (example 2)

- Patients with cancer X, chemotherapy A leads to:
 - Improved survival (3 months)
 - Worsening quality of life
- For which of the following 2 groups are you more likely to judge the balance of effects as favoring chemotherapy A?
 - Patients with cancer X seeking cure?
 - Patients with cancer X seeking palliative care?

Importance of contextual factors (example 2)

- Developing a recommendation requires judging the balance of health effects (i.e., desirable effects versus undesirable effects)
- Judging the balance of health effects requires consideration of the relative valuation of outcomes
- Valuation of outcomes can vary between individuals, religious groups, countries, etc.

Importance of contextual factors (example 3)

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- Intervention reduces mortality by half (Relative Risk Reduction 50%)
- What is the reduction in mortality if the baseline risk (incidence) is:
 1. 400,000 per 1000,000 →

Importance of contextual factors (example 3)

- Intervention reduces mortality by half (Relative Risk Reduction 50%)
- What is the reduction in mortality if the baseline risk (incidence) is:
 1. 400,000 per 1000,000 → 200,000 avert death

Importance of contextual factors (example 3)

- Intervention reduces mortality by half (Relative Risk Reduction 50%)
- What is the reduction in mortality if the baseline risk (incidence) is:
 1. 400,000 per 1000,000 → 200,000 avert death
 2. 4000 per 1000,000 →

Importance of contextual factors (example 3)

- Intervention reduces mortality by half (Relative Risk Reduction 50%)
- What is the reduction in mortality if the baseline risk (incidence) is:
 1. 400,000 per 1,000,000 → 200,000 avert death
 2. 4,000 per 1,000,000 → 2,000 avert death

Importance of contextual factors (example 3)

- Intervention reduces mortality by half (Relative Risk Reduction 50%)
- What is the reduction in mortality if the baseline risk (incidence) is:
 1. 400,000 per 1000,000 → 200,000 avert death
 2. 4000 per 1000,000 → 2000 avert death
 3. 4 per 1000.000 →

Importance of contextual factors (example 3)

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- What is the reduction in mortality if the baseline risk (incidence) is:
 1. 400,000 per 1000,000 → 200,000 avert death
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Importance of contextual factors (example 3)

- Intervention reduces mortality by half (Relative Risk Reduction 50%)
- What is the reduction in mortality if the baseline risk (incidence) is:
 1. 400,000 per 1000,000 → 200,000 avert death
 2. 4000 per 1000,000 → 2000 avert death
 3. 4 per 1000.000 → 2 avert death
- In which of the 3 cases are you more likely to recommend the intervention?

Importance of contextual factors (example 3)

- Quantifying the effect of an intervention on an outcome requires the consideration of its baseline risk (incidence)
- The lower the incidence, the lower the absolute effect, the less likely the recommendation to be in favor

Importance of contextual factors (example 4)

Importance of contextual factors (example 4)

- In patients with condition X, intervention A (compared with no intervention A) is judged to have a favorable balance of health effects
- Under each of the following scenario
 1. If A widely acceptable
 2. If A is widely unacceptable
 3. If A is acceptable in some but not all settings in your jurisdiction
- Would you recommend A to:
 - All
 - Some
 - None

Importance of contextual factors (example 4)

- In patients with condition X, intervention A (compared with no intervention A) is judged to have a favorable balance of health effects
- Under each of the following scenario
 1. If A widely acceptable
 2. If A is widely unacceptable
 3. If A is acceptable in some but not all settings in your jurisdiction
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Importance of contextual factors (example 4)

- In patients with condition X, intervention A (compared with no intervention A) is judged to have a favorable balance of health effects
- Under each of the following scenario
 1. If A widely acceptable
 2. If A is widely unacceptable
 3. If A is acceptable in some but not all settings in your jurisdiction
- Would you recommend A to:
 - All
 - Some
 - None

Importance of contextual factors (example 4)

- A management option could be effective and safe, but
 - Not acceptable to key stakeholders
 - Not feasible
 - Not affordable
- This would limit its 'implementability' and subsequently limit the expected desirable consequences

Importance of contextual factors

- Consider whether acceptability (or feasibility, or cost) varies across settings within the jurisdiction
 - condition to consider these factors setting when interpreting the recommendation

Contextual factors become more important when the certainty of evidence about health effects is low or very low

Also consider the implications for the implementation considerations

Outline

- Importance of contextual factors
- What are the contextual factors
- How to gather information on contextual factors
- How to use contextual factors in the guideline process

What are the contextual factors

- Outcomes
 - Valuation of outcomes
 - Baseline risk of outcomes
- Interventions
 - Resource use
 - Acceptability
 - Feasibility

Valuation of outcomes

- Generate a list of outcomes of interest
 - efficacy and safety
 - morbidity, mortality, and patient-reported outcomes (e.g., quality of life).

Valuation of outcomes

- For guideline panelists to judge the extent of the desirable effects, they need to consider both the effect of the intervention on each relevant outcomes, as well as the valuation of those outcomes

Valuation of outcomes

- Influenced by several characteristics
 - Severity of the outcome experience
 - Duration
 - Reversibility
 - Sequelae
 - Consequences (e.g., reduction in productivity).

What are the contextual factors

- Outcomes
 - Valuation of outcomes
 - Baseline risk of outcomes
- Interventions
 - Resource use
 - Acceptability
 - Feasibility

Incidence of outcomes

Resource use

- May relate to:
 - Healthcare resources (e.g., costs of the intervention, healthcare workers' time, hospital visits, home visits);
 - Non-healthcare resources (e.g., social welfare services);
 - Patient and informal caregiver resources (e.g., time of caregiver in providing care)
- It is important to determine the perspective the resource use is being considered from (i.e., who pays)

Resource use

- It is optimal to list resources (e.g., the number and types of machines needed) as opposed to simply providing their monetary value.

Impact on equity

- Health equity: “the absence of unfair and avoidable or remediable differences in health among population groups defined socially, economically, demographically or geographically”

Impact on equity

- Subgroups for whom equity might be particularly relevant are typically defined in relation to PROGRESS:
 - Place of residence
 - Race/ethnicity/culture/language
 - Occupation
 - Gender/sex
 - Religion
 - Education
 - Socioeconomic status
 - Social capital

Acceptability

- Perception among stakeholders that a given intervention is appropriate, agreeable, tolerable, or satisfactory
- Acceptability of an intervention should be judged regardless of its potential to cause benefit or harm (avoid double counting)

Acceptability

- Affected by
 - the characteristics of the intervention (e.g. complexity or comfort related to the intervention of interest)
 - the person's culture, preferences, beliefs, and experiences related to the intervention
- Example, when considering a vaccination intervention, issues with acceptability could be affected by:
 - the perception of the vaccine and disease, the process to get vaccinated
 - Individual's beliefs, experiences and trust in health providers, and the media

Feasibility

- The extent to which an intervention can be successfully carried out within a given setting
- Feasibility considers barriers and facilitators to implementing the intervention, resources needed (e.g., human resources), sustainability, availability, accessibility, and the potential for integration of an intervention within an existing health program

Outline

- Importance of contextual factors
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Sources of information

- What are potential sources of information for the contextual factors?

Sources of information

- What are potential sources of information for the contextual factors?

Sources of information

- Baseline risks/incidence of outcomes
 - Repositories, databases
- Other contextual factors
 - Input of panel members
 - Consultation with stakeholder groups
 - Systematic review of the literature
 - Primary research

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Evidence to Decision Framework

- GRADE evidence-to-decision (EtD) tables
 - ‘Use evidence in a structured and transparent way to inform decisions”
 - Account for factors important for developing recommendations, including ‘health effects’ and ‘contextual factors’

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Is there important uncertainty about or variability in how much people value the main outcomes?

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Does the balance between desirable and undesirable effects favor the intervention or the comparison?

Evidence on health effects

6

Resources required ⓘ

How large are the resource requirements (costs)?

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Equity ⓘ

What would be the impact on health equity?

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Acceptability ⓘ

Is the intervention acceptable to key stakeholders?

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Feasibility ⓘ

Is the intervention feasible to implement?

Evidence on contextual factors

Case study

Infection prevention and
control guideline for Ebola
and Marburg disease

August 2023



Recommendation question

- Should healthcare workers with contact with patients who have Ebola disease or Marburg disease **cover their head and neck skin in addition to covering their mucous membranes** or **only cover their mucous membranes?**



JUDGEMENT

- Trivial
- Small
- Moderate
- Large
-
- Varies
- Don't know

[Detailed judgements](#)

RESEARCH EVIDENCE

The systematic review did not identify any evidence for the effects of covering the head and neck skin and mucous membranes (compared to covering only the mucous membranes) on the following outcomes:

- Infection with Ebola or Marburg

Two crossover randomized controlled trials that simulated contamination events for HCWs while doffing PPE ensembles with and without neck covering

- Low to very low certainty of evidence that PPE ensembles with head/neck covering resulted in less contamination than PPE with no cover for the head and neck.

ADDITIONAL CONSIDERATIONS

ANY SETTING

Risk of transmission is theoretical but likely limited.
Risk would increase with:

- broken skin; how to ensure there is no broken skin (e.g., due to shaving, mosquito bite?)
- in 'wet areas'

Risk would decrease in individuals who are vaccinated.

Effectiveness might decrease with

- non-compatible pieces of PPE
- variation of practice (whether and how to cover head and neck skin) within the ETU

Effectiveness might vary with training and type of PPE

There are no standards for hoods (e.g., ISO, NIOSH); unregulated

- Trivial: 2/14 (14%)
- Small: 6/14 (43%)
- Moderate: 5/14 (36%)
- Large: 0/14 (0%)
- Varies: 1/14 (7%)
- Don't know: 0/14 (0%)



JUDGEMENT

- Large
- Moderate
- Small
- Trivial
-
- Varies
- Don't know

[Detailed judgements](#)

RESEARCH EVIDENCE

Two simulation studies that addressed outcomes related to heat stress for health care workers (HCW) donning extra head/neck covering PPE (hoods):

- Very low certainty evidence that PPE ensembles with additional head/neck covering increased both physiological and subjective measures of heat exhaustion, compared to PPE with no cover of the head and neck.

Two crossover randomized controlled trials that simulated contamination events for HCWs while doffing PPE ensembles with and without neck covering

- Low to very low certainty evidence that PPE ensembles that covered the head/neck resulted in more human errors during donning/doffing of equipment, compared to ensembles without head/neck cover.

ADDITIONAL CONSIDERATIONS

Psychological effect; sense of safety?
Heat can lead to more errors (due to fog on goggles)

- Large: 3/14 (21%)
- Moderate: 8/14 (57%)
- Small: 3/14 (21%)
- Trivial: 0/14 (0%)
- Varies: 0/14 (0%)
- Don't know: 0/14 (0%)

3

Certainty of evidence

What is the overall certainty of the evidence of effects?



JUDGEMENT

- Very low
- Low
- Moderate
- High

- No included studies

Detailed judgements

RESEARCH EVIDENCE

ADDITIONAL CONSIDERATIONS

Is there important uncertainty about or variability in how much people value the main outcomes?

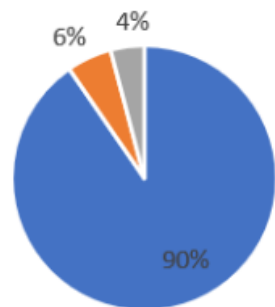
JUDGEMENT

- Important uncertainty or variability
- Possibly important uncertainty or variability
- Probably no important uncertainty or variability
- No important uncertainty or variability

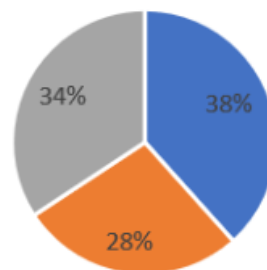
Detailed judgements

RESEARCH EVIDENCE

Stakeholder mixed methods study



EVD transmission



Adverse effects from PPE use

■ Critical
 ■ Important
 ■ Less important

ADDITIONAL CONSIDERATIONS

- Important uncertainty or variability: 1/14 (7%)
- Possibly important uncertainty or variability: 2/14 (14%)
- Probably no important uncertainty or variability: 3/14 (21%)
- No important uncertainty or variability: 8/14 (57%)

- Concern about EVD transmission
 - EVD can be fatal while AEs are less serious
 - AEs can be prevented, and managed
 - Incidence of EVD transmission is higher than the incidence of AEs

- Concern about AEs
 - AEs can cause inappropriate use of PPE, which will expose HCWs to EVD
 - AEs can be dangerous (e.g., dehydration, overheating)

5

Balance of effects 

Does the balance between desirable and undesirable effects favor the intervention or the comparison?

JUDGEMENT

- Favors the comparison
- Probably favors the comparison
- Does not favor either the intervention or the comparison
- Probably favors the intervention
- Favors the intervention

- Varies
- Don't know

[Detailed judgements](#)**RESEARCH EVIDENCE****ADDITIONAL CONSIDERATIONS**

High value on preventing transmission?

IPC standards

- Favors the comparison: 1/15 (7%)
- Probably favors the comparison: 7/15 (47%)
- Does not favor either the intervention or the comparison: 1/15 (7%)
- Probably favors the intervention: 6/15 (40%)
- Favors the intervention: 0/15 (0%)
- Varies: 0/15 (0%)
- Don't know: 0/15 (0%)

JUDGEMENT

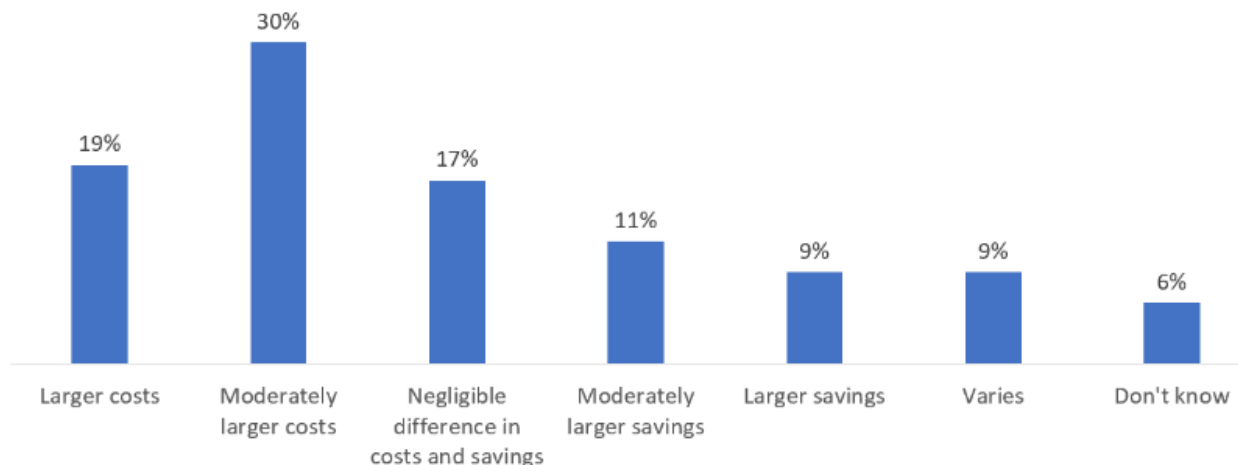
- Large costs
 Moderate costs
 Negligible costs and savings
 Moderate savings
 Large savings

 Varies
 Don't know

Detailed judgements

RESEARCH EVIDENCE

Stakeholder mixed methods study



ADDITIONAL CONSIDERATIONS

Coverall with attached hood vs. separate hood?
Cost

Waste management

- Large costs: 0/15 (0%)
- Moderate costs: 7/15 (47%)
- Negligible costs and savings: 5/15 (33%)
- Moderate savings: 0/15 (0%)
- Large savings: 0/15 (0%)
- Varies: 2/15 (13%)
- Don't know: 1/15 (7%)

- Larger costs/moderately larger costs: more PPE being used, waste management associated with disposal
- Negligible difference in costs and savings: most PPEs have a hood
- Larger savings/moderately larger savings: difference in cost is minimal compared to benefits of decreasing transmission
- Varies: depends on whether integrated hoods used, depends on the supplier

7

Cost effectiveness 

Does the cost-effectiveness of the intervention favor the intervention or the comparison?

JUDGEMENT

- Favors the comparison
- Probably favors the comparison
- Does not favor either the intervention or the comparison
- Probably favors the intervention
- Favors the intervention

- Varies
- No included studies

[Detailed judgements](#)**RESEARCH EVIDENCE**

The systematic review did not identify any evidence.

ADDITIONAL CONSIDERATIONS

- Favors the comparison: 2/14 (14%)
- Probably favors the comparison: 1/14 (7%)
- Does not favor either the intervention or the comparison: 1/14 (7%)
- Probably favors the intervention: 3/14 (21%)
- Favors the intervention: 0/14 (0%)
- Varies: 0/14 (0%)
- No included studies: 7/14 (50%)

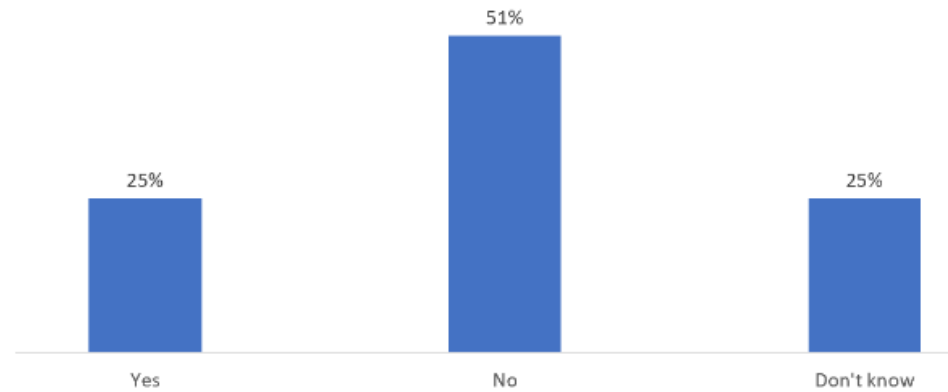
JUDGEMENT

- Reduced
- Probably reduced
- Probably no impact
- Probably increased
- Increased
-
- Varies
- Don't know

[Detailed judgements](#)

RESEARCH EVIDENCE

Stakeholder mixed methods study



Groups affected

- Low resource countries
- Rural areas
- Different types of health care providers
- Certain religious groups
- Women with certain hairstyles

ADDITIONAL CONSIDERATIONS

Reduced access for certain groups/settings

Possibility of harm when head and neck skin covering is not fitted to certain groups

- Reduced: 1/14 (7%)
- Probably reduced: 5/14 (36%)
- Probably no impact: 1/14 (7%)
- Probably increased: 3/14 (21%)
- Increased: 0/14 (0%)
- Varies: 2/14 (14%)
- Don't know: 2/14 (14%)



JUDGEMENT

- No
- Probably no
- Probably yes
- Yes
-
- Varies
- Don't know

[Detailed judgements](#)

RESEARCH EVIDENCE

Systematic review

- Boon et al. 2014 conducted a survey of 44 frontline physicians and nurses seeking their perspectives about PPE use during the 2014-2016 EVD outbreak in West Africa. **Heat and dehydration were a major issue** for 64% of the surveyees using a hood. In terms of preferences, a hood was perceived as pausing extremely low risk or low risk in term of safety by 93% (38/41) of surveyees, none or minor impairment in term of communication by 58% (18/42), no reduction or minor reduction in term of the ability to provide patient care by 60% (18/30), no issues or minor issues in term of personal wellbeing (heat or dehydration) by 13% (4/30), and comfortable or fairly comfortable by 53% (16/30).
- Coca et al. 2015 conducted a simulation study using a thermal manikin to assess the time to achievement of a critical core temperature of 39°C while wearing 4 different PPE ensembles similar to those recommended by the World Health Organization and Médecins Sans Frontières at 2 different ambient conditions: temperature/humidity of 32°C/92% relative to 26°C/80%). The results suggest that **encapsulation of the head and neck region resulted in higher model-predicted subjective impressions of heat sensation.**
- Coca et al. 2017 conducted a simulation study with six healthy individuals in an environmental chamber (32°C, 92% relative humidity) while walking (3 Metabolic equivalent of tasks, 2.5 mph, 0% incline) on a treadmill for 60 minutes. All subjects wore medical scrubs and PPE items. Ensemble E1 had a face shield, **no hood**, and fluid-resistant surgical gown; E2 additionally included goggles, coverall, and separate **hood**; and E3 also contained a highly impermeable coverall, separate **hood**, and surgical mask cover over the N95 respirator. They showed that **heart rate and core temperature at the end of the exercise were significantly higher for E2 and E3 than for E1. Subjective perceptions of heat and exertion were significantly higher for E2 and E3 than for E1.**
- Grélot et al. 2016 assessed thermal strain of 25 HWs in the 2014 Ebola virus disease outbreak. The PPE was used in accordance with the World Health Organization regulations. Its ensemble was comprised of waterproof garments from head to toe (DuPont Tychem), European standard EN 143-approved class 2 respirators (3M Company), 2-layered gloves, **surgical hoods** covering the head and neck, leg-covering waterproof boot covers, and waterproof aprons covering the torso to the level of the mid-calf. They report a mean (standard deviation) working ambient temperature of 29.6°C (2.0°C) and a mean relative humidity of 65.4% (10.3%), a mean time wearing PPE of 65.7 (13.5) minutes, and a mean core body temperature increase of 0.46°C (0.20°C). Four HCWs (16%, 4/25) reached or exceeded a mean core body temperature of $\geq 38.5^\circ\text{C}$. **The results suggest that HWs wearing PPE for approximately 1 hour exhibited moderate but safe thermal strain.**
- Sprecher et al. 2015 report on a meeting convened by Médecins Sans Frontières in 2014 to address concerns with PPE. Meeting participants included representatives from stakeholder organizations. According to the meeting deliberation, **polyethylene fabric hoods that fully covered the head and neck became favored over surgical head covering.** The meeting attendants called for better evidence in the selection of PPE.

ADDITIONAL CONSIDERATIONS

Some practices are 'engrained'

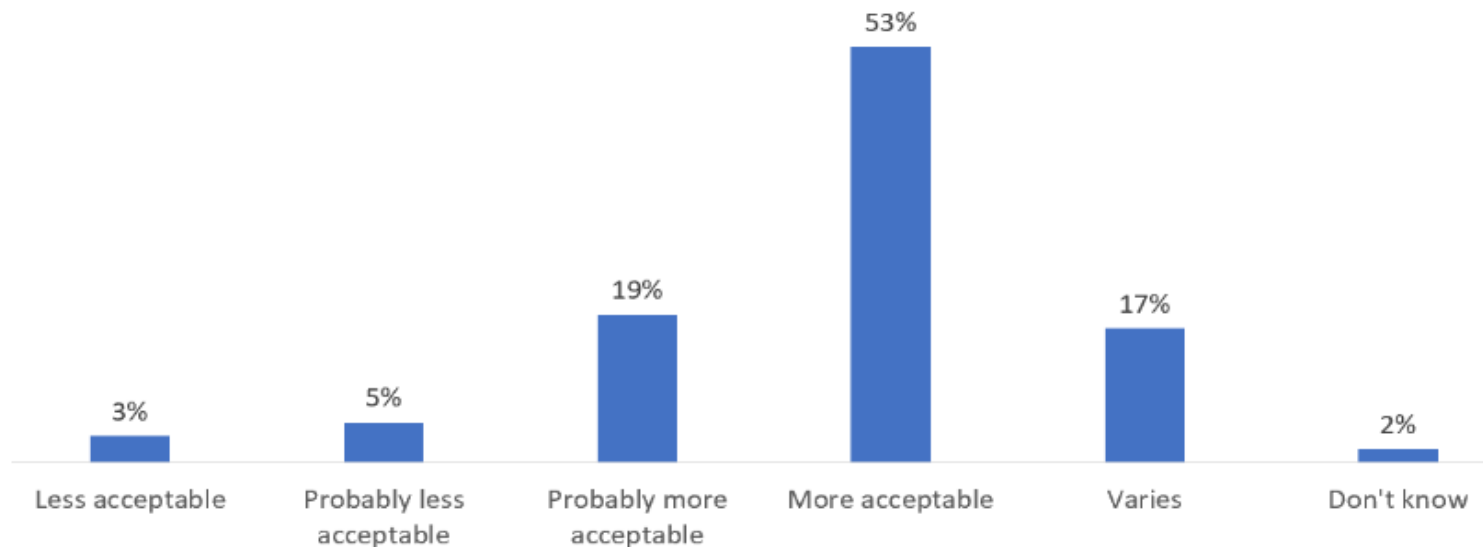
- No: 0/14 (0%)
- Probably no: 0/14 (0%)
- Probably yes: 5/14 (36%)
- Yes: 7/14 (50%)
- Varies: 2/14 (14%)
- Don't know: 0/14 (0%)

JUDGEMENT

- No
- Probably no
- Probably yes
- Yes
-
- Varies
- Don't know

[Detailed judgements](#)

Stakeholder mixed methods study



More acceptable/probably more acceptable (72% of survey participants; 5/6 of interview participants)

- Psychological effect (feeling of safety)
- Reduced transmission of EVD
- Protect from other diseases

Less acceptable/probably less acceptable (8% of survey participants; 1/6 interview participants)

- Covering head and neck not needed if the skin is intact
- Covering head and neck would scare the patient

Varies (17% of survey participants)

- Risk should be evaluated

ADDITIONAL CONSIDERATIONS

Some practices are 'engrained'

- No: 0/14 (0%)
- Probably no: 0/14 (0%)
- Probably yes: 5/14 (36%)
- Yes: 7/14 (50%)
- Varies: 2/14 (14%)
- Don't know: 0/14 (0%)



JUDGEMENT

- No
 Probably no
 Probably yes
 Yes

 Varies
 Don't know

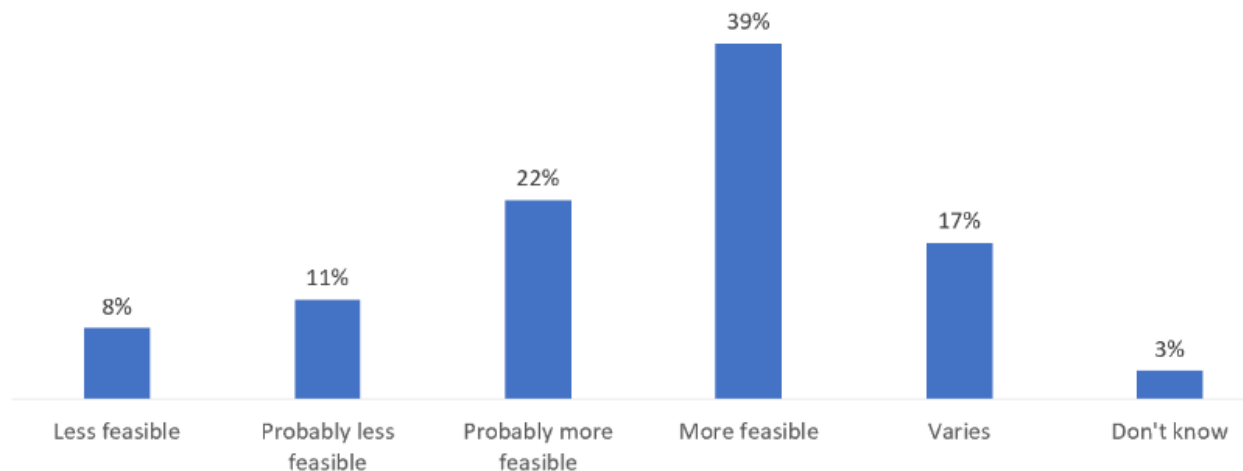
Detailed judgements

RESEARCH EVIDENCE

Systematic review

- Zamora et al. 2006 conducted a prospective, randomized, controlled crossover study to compare two PPE ensembles. The PPE ensemble E-RCP (enhance respiratory and contact precautions) included a head covering (without covering the neck skin), goggles and a face shield. The PAPR system in use had outer and inner protective layers. Donning and removing the PAPR system took longer than donning and removing E-RCP garments ($p < 0.0001$).

Stakeholder mixed methods study



ADDITIONAL CONSIDERATIONS





















There might be compatibility issues between the different pieces of PPE (donors providing different types/brands)

Hoods might be difficult to access

There are no standards for hoods (e.g., ISO, NIOSH); unregulated

- No: 0/14 (0%)
- Probably no: 0/14 (0%)
- Probably yes: 8/14 (57%)
- Yes: 6/14 (43%)
- Varies: 0/14 (0%)
- Don't know: 0/14 (0%)

- More feasible/probably more feasible: can be done easily
- Less feasible/probably less feasible: donning and doffing takes more time, is more complicated, and costly; compliance issues
- Varies: different availability by setting

| CRITERIA | SUMMARY OF JUDGEMENTS | | | | | | IMPORTANCE FOR DECISION | |
|-----------------------|---|--|--|--|---|------------|-------------------------|--|
| DESIRABLE EFFECTS | Trivial | Small | Moderate | Large | Varies | Don't know | | |
| UNDESIRABLE EFFECTS | Large | Moderate | Small | Trivial | Varies | Don't know | | |
| CERTAINTY OF EVIDENCE | Very low | Low | Moderate | High | No included studies | | | |
| VALUES | Important uncertainty or variability | Possibly important uncertainty or variability | Probably no important uncertainty or variability | No important uncertainty or variability | | | | |
| BALANCE OF EFFECTS | Favors the comparison  | Probably favors the comparison  | Does not favor either the intervention or the comparison  | Probably favors the intervention  | Favors the intervention  | Varies | Don't know | |
| RESOURCES REQUIRED | Large costs  | Moderate costs  | Negligible costs and savings  | Moderate savings  | Large savings  | Varies | Don't know | |
| COST EFFECTIVENESS | Favors the comparison  | Probably favors the comparison  | Does not favor either the intervention or the comparison  | Probably favors the intervention  | Favors the intervention  | Varies | No included studies | |
| EQUITY | Reduced  | Probably reduced  | Probably no impact  | Probably increased  | Increased  | Varies | Don't know | |
| ACCEPTABILITY | No | Probably no | Probably yes | Yes | | Varies | Don't know | |
| FEASIBILITY | No | Probably no | Probably yes | | Yes | Varies | Don't know | |

TYPE OF RECOMMENDATION

Strong recommendation
against the intervention



Conditional
recommendation against the
intervention



Conditional
recommendation for either
the intervention or the
comparison



**Conditional
recommendation for the
intervention**



Strong recommendation for
the intervention



Recommendation

WHO **suggests** covering head and neck skin and mucous membranes over covering only mucous membranes in health workers in direct contact and/or indirect contact with patients with EVD or Marburg virus in any setting (**conditional** recommendation, based on very low certainty evidence)

Recommendation

WHO **suggests** covering head and neck skin and mucous membranes over covering only mucous membranes in health workers in direct contact and/or indirect contact with patients with EVD or Marburg virus in any setting (**conditional** recommendation, based on very low certainty evidence)

Decision to cover head and neck skin in addition to covering mucous membranes should be based on risk assessment

Groups more likely to benefit from covering head and neck skin in addition to covering mucous membranes include:

- *individuals with broken skin*
- *individuals working in wet areas*
- *individuals not vaccinated against the circulating species ???*

It is important to:

- consider the compatibility of different pieces of PPE
- ensure a common practice across team members
- provide proper training on the use of PPE
- make available PPE that is appropriate for people with certain hairstyles or beards or who wear headscarfs

In summary

- GRADE methodology stresses:
 - An structured approach
 - An evidence informed approach
 - Transparency
- Evidence to Decision (EtD) framework emphasizes:
 - Contextual factors
 - Consensus approach

Thank you!!