Development of the Reporting Info-graphics and Visual Abstracts of Comparative studies (RIVA-C) Checklist and Guide

The RIVA-C checklist and guide is designed to improve the reporting of info-graphics summarising the findings of comparative studies of health and medical interventions, including retrospective observational studies, pre-post cohort studies, randomised controlled trials and systematic reviews.

- It does not apply to info-graphics summarising comparative studies using other designs (e.g. case studies, case series, cross-sectional observational studies).
- It does not apply to info-graphics summarising prognostic studies, diagnostic studies, and other types of research studies.

Guiding principles that apply to all checklist items

- These are guidelines and may not perfectly suit the needs of all info-graphics
- All info-graphics should include a way for readers to access the journal article (e.g. through a citation, DOI, URL, or QR code)
- Information requested from a checklist item may be presented using text and/or graphics
- Information requested from a checklist item may be presented as a footnote
- Information requested from a checklist item does not need to be duplicated in different sections of the info-graphic to satisfy the item (e.g. if the info-graphic presents the study population / participants in one section, it does not need to present the study population / participants in another)
- Each checklist item is accompanied by an 'Explanation and example(s)' section to help users implement the item.
- Information requested from a checklist item should be presented in a way that the intended audience would understand.

1 Present the study design

- The info-graphic should clearly present the design of the study it is summarising (e.g., randomised controlled trial, systematic review, prospective cohort study).
- The study design does not need to be repeated if it is mentioned in the title of the info-graphic or as part of the study citation in the info-graphic.

2 Present the population / participants, sample size and important characteristics describing the population / participants

- The info-graphic should clearly present the population / participants and characteristics important to understanding the population/participants and interpreting the results (e.g., sample size, diagnosis, age, gender, socioeconomic status, symptom duration, study setting, country).
- Info-graphics summarising randomised controlled trials or non-randomised studies should present the number of participants randomised/enrolled (overall and for each group). Info-graphics summarising single-group studies should present the number of participants enrolled in the study. Info-graphics summarising systematic reviews should present the number of studies included and number of participants from these studies who were randomised/enrolled (overall and for each group, if feasible).

3 Present the intervention(s), comparator(s) and important characteristics describing them

- The info-graphic should clearly present the intervention(s) and comparator(s) (e.g., placebo, no treatment, other treatments).
- It should also present characteristics important to understanding the intervention(s) and comparator(s) and interpreting the results (e.g., drug type and dose, intervention duration, who delivered the intervention).
- Some studies will not have a comparator and only need to present the above information for the intervention.

4 Present and clearly label the primary outcomes(s), including the scale, units and time point(s)

- The info-graphic should clearly present the primary outcome(s) (e.g., mortality, pain), including the scale (e.g., 0 worst – 100 best), units (e.g., mmHg), and time point(s) of assessment, if relevant.
- Presenting secondary outcomes is optional.
- If presenting primary and secondary outcomes, clearly label which outcomes are primary to reduce the risk of selective reporting.
- If the study did not nominate a primary outcome, make this clear in the info-graphic (e.g., as a footnote).

5 Present between-group effects with measures of precision (e.g. mean difference and 95% CI), using absolute effects where possible, to demonstrate the effect (or lack thereof) of the intervention on the primary outcome(s) and the certainty of the effect

- The info-graphic should clearly present the size (and certainty) of the effect on the primary outcomes(s) using point estimates and measures of precision for between-group differences (e.g. Risk Difference or Mean Difference with 95% Confidence Intervals).

- Between-group differences are differences in outcomes between the intervention and control group(s) and are preferred to within-group changes (e.g. change from baseline to post-intervention). Within-group changes produce a biased effect of the intervention for several reasons (e.g. doesn't control for natural history of a disease, regression to the mean, etc.)
- When there isn't a comparator, the info-graphic should clearly present the size (and certainty) of the effect on the primary outcome using point estimates and measures of precision for within-group changes (e.g. Risk Difference or Mean Difference with 95% CI).
- The info-graphic should include the outcome values in each group (e.g. Mean baseline vs. Mean of control) or at each time point where there isn't a comparator (e.g. Mean baseline vs. Mean post-intervention). However, we acknowledge this may not be feasible to include when multiple groups, outcomes or time points are presented.
- Absolute effects are preferred over relative effects (if available) as relative effects can make the magnitude of effect appear much greater than the absolute effects. For example, a decrease in risk from 1% to 0.5% equates to a 0.5% absolute and 50% relative decrease. It is acceptable to present both absolute and relative effects.
- The number of participants analysed (or percentage drop out) in each group or at each time point should be presented so readers can compare it to the number of participants randomised or enrolled. This information may not be feasible to include when multiple groups, outcomes or time points are presented.
- Presenting point estimates and measures of precision for secondary outcomes is optional.
- Point estimates and measures of precision can be presented using lay language.

6 When possible, present the magnitude of between-group effects for the primary outcome(s) in relation to justifiable thresholds for clinical importance

- The info-graphic should highlight whether the between-group effects of the intervention on the primary outcome(s) are clinically important, if justifiable thresholds exist. Justifiable thresholds are usually pre-specified by the authors (e.g. in the sample size calculation).
- This information can be integrated into the presentation of results (e.g. dotted line on a graph).

7 Present the frequency of serious adverse events in each group and some examples of the most common serious adverse events if possible

- The info-graphic should clearly present the frequency of serious adverse events in each group (e.g., serious adverse events: control = 10% vs. intervention = 5%) and some examples of the most common serious adverse events (e.g. pulmonary embolism: control = 5% vs. intervention = 2%).
- If a study does not report the overall frequency of serious adverse events in each group, adverse events can be reported in different ways (e.g., primary safety outcome in each group, all adverse events in each group, examples of common adverse events in each group or combined.)
- Presenting the frequency of minor adverse events in each group and some examples of the most common minor adverse events is optional, unless it is important to understanding the safety of an intervention.
- The info-graphic should highlight when a study did not report adverse events (despite measuring them), when a study did not measure them, or when no serious adverse events occurred.

8 Present the certainty of evidence for all effects presented in the info-graphic

- For all outcomes for which effects are reported in the info-graphic, the certainty of evidence should be reported also (if certainty was assessed in the original paper). If certainty of evidence was not assessed in the original paper, make this clear in the info-graphic (e.g., as a footnote).
- Presenting the certainty of evidence will allow readers to understand how certain they can be of the findings presented in the info-graphic or whether more research is needed.

9 When including a conclusion or take away message, ensure it is appropriate to the study population, intervention, comparator, and outcome

- A conclusion or take away message that is appropriate to the study population, intervention, comparator and outcomes will ensure findings are not over-generalised.
- A conclusion or take away message may not be necessary if other sections of the info-graphic present similar information.

10 When including a conclusion or take away message, ensure it focuses on the primary outcomes(s) and acknowledges potential harms of the intervention (as compared to the comparator)

- A conclusion or take away message that focuses on the primary outcomes(s) will reduce selective reporting of statistically significant results. Acknowledging potential harms of the intervention, as compared to the comparator (if this data is available), will allow readers to weigh up efficacy and safety.
- Presenting findings from secondary outcomes is optional, with the exception of data on harms which is often a secondary outcome.