**Appendix 2 Hamilton Assessment Tool**

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| --- | --- | --- | --- | --- | --- |
| **A) SELECTION BIAS (EXTERNAL VALIDITY)** | **1** | **2** | **3** | **4** |   |
| Are the individuals/intervention sites selected to participate in the study likely to be representative of the target population? (For example, subjects for all control groups should be selected from the same hospital. The question should be answered Can't Tell for case control studies where there is no information concerning the source of patients included in the study) | Very likely | Somewhat likely | Not likely | Can't tell |  |
| What percentage of selected individuals agreed to participate? | 80% to 100% | 60% to 79% | Less than 60% agreement | Not applicable |  |
| **RATE THIS SECTION** |  |  |  |  |  |
| Strong: the selected individuals/sites are very likely to be representative of the target population (Q1 is 1) and there is greater than 80% participation (Q2 is 1) OR Q2 is 'Not applicable'. |
| Moderate: the selected individuals/sites are at least somewhat likely to be representative of the target population (Q1 is 1); and there is 60% to 79% participation (Q2 is 2). ‘Moderate’ may also be assigned if Q1 is 2 and Q2 is 4. |
| Weak: the selected individuals/sites are not likely to be representative of the target population (Q1 is 3); or there is less than 60% participation (Q2 is 3); or selection is not described (Q1 is 4); and the level of participation is not described (Q2 is 4). |
| **STUDY DESIGN**  |   |   |   |   |   |
|  Indicate the study design | Randomised control design | Controlled Before-and-After | Uncontrolled Before-and-After | Interrupted Time Series | Case control studies |
| Was the study described as randomised? If No, go to Confounder section | No | Yes |  |  |  |
| If Yes, was the method of randomization described? | No | Yes |  |  |  |
| If Yes, was the method appropriate? | No | Yes |  |  |  |
| If Controlled Before-After, did the study conduct a baseline assessment? | No | Yes |  |  |  |
| **RATE THIS SECTION** |  |  |  |  |  |
| Strong: will be assigned to those articles that described RCTs and CCTs |
| Moderate: will be assigned to those that described a cohort analytic study, a case control study, a cohort design, or an interrupted time series |
| Weak: will be assigned to those that used any other method or did not state the method used |
|  **CONFOUNDERS** |  |  |  |  |  |
|  In the selection of intervention sites, what was the basis for selecting a treatment facility site － high accident frequencies or some other general traffic rule? *(If other general traffic rule then Very Likely; if high accident frequencies then Not Likely)* | Yes | No | Can't tell |  |  |
| Was there an appropriate selection of intervention and control site? (For instance, if the treated facility is an intersection, the comparison site should be a similar intersection with respect to area type (commercial business district, urban, rural), intersection type (three-legged or four legged), traffic control (signalised, two-way stop-controlled, etc.), geometric design. | Yes | No | Can't tell |  |  |
|
| Were the selected treatment and reference/control sites matched for exposure effects (vehicular traffic volume)*?* | Yes | No | Can't tell |  |  |
| Were the selected treatment and reference/control sites matched for trend effects (warm/cold weather months, daylight versus dawn/night, traffic composition, enforcement level) | Yes | No | Can't tell |  |  |
| Was there a sufficient passage of transitional period following the infrastructure construction? (In Controlled Before and After, study, which does not specify the time period over which outcome were reported, the question should be answered as Can't tell. In Before and After studies, if the intervention site was not given a 'sufficient' passage of transitional period following the infrastructure construction, the answer is No. In case control studies, if the period between the intervention and outcomes is not same for cases and controls, answer is No) | Yes | No | Can't tell |  |  |
| Whether study controlled for restricted participant selection (restricted participant selection so that all groups had the same value for the confounder (e.g. restricting the study to male participants only) | Yes | No | Can't tell | Not Applicable |  |
| Indicate the percentage of relevant confounders that were controlled (either in the design (for example stratification; propensity score (matching); propensity score (variable)) or analysis (multivariable regression)) | 80% to 100% (most) | 60% to 79% (some) | Less than 60% (few or more) | Can't tell |  |
| **RATE THIS SECTION**  |  |  |  |  |  |
| Strong: (minimal risk of bias) for studies if they control 80% to 100% of the pre-specified confounders (site selection, exposure effect, adequate degree of similarity between control and intervention sites, outcome ascertainment) using a transparent and rigorous method. |  |
| Moderate: (moderate risk of bias) for studies if they control for 70% or most of the pre-specified confounders, but not using either a transparent or rigorous method. |  |
| Weak: (considerable risk of bias) for studies with inadequate control for confounders. |  |
| **BLINDING** | **Yes = 1** | **No = 2** | **Can't tell = 3** | **Not applicable** |  |
| Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants? | Yes | No | Can't tell |  |  |
|  Were the study participants aware of the research question? | Yes | No | Can't tell |  |  |
| **RATE THIS SECTION** |  |  |  |  |  |
| Strong: when Q1 is 2 and Q2 is 2 |  |  |  |  |  |
| Moderate: when Q1 is 2 and Q2 is 2 or Q1 is 3 or Q2 is 3 |  |  |  |  |  |
| Weak: when Q1 is 1 and Q2 is 1. |  |  |  |  |  |
| **DATA COLLECTION** | **Yes = 1** | **No = 2** | **Can't tell=3** |  |  |
|  Were the data collection tools shown to be valid? | Yes | No | Can't tell |  |  |
|  Were data collection tools shown to be reliable? | Yes | No | Can't tell |  |  |
|  Were the methods for measuring outcome changed between the 'before' and 'after' measurements | Yes | No | Can't tell |  |  |
| **RATE THIS SECTION** |  |  |  |  |  |
| Strong: The data collection tools have been shown to be valid (Q1 is 1); and the data collection tools have been shown to be reliable (Q2 is 1), and outcome assessment methods remain constant (Q3 is 1). |  |
| Moderate: The data collection tools have been shown to be valid (Q1 is 1); and the data collection tools have not been shown to be reliable (Q2 is 2); or reliability is not described (Q2 is 3); and outcome assessment methods remain constant or not described (Q3 is 1 or 3). |  |
| Weak: The data collection tools have not been shown to be valid and reliable (Q1 is 2, Q2 is 2); or both reliability and validity are not described (Q1 is 3 and Q2 is 3). Outcome assessment methods have changed (Q3 is 2) or not described (Q3 is 3). |  |
| **WITHDRAWALS AND DROP-OUTS** | **Yes = 1** | **No = 2** | **Can't tell = 3** | **Not applicable = 4** |  |
|  Were withdrawals and dropouts reported in terms of numbers or reasons per group or both? | Yes | No | Can't tell | Not applicable |  |
| Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest) | 80% to 100% | 60% to 79% | Less than 60% agreement | Not applicable |  |
| **RATE THIS SECTION** |  |  |  |  |  |
| Strong: will be assigned when the follow-up rate is 80% or greater (Q2 is 1) OR when "Not applicable" |  |
| Moderate: will be assigned when the follow-up rate is 60% to 79% (Q2 is 2) OR Q2 is 'Not applicable'. |  |
| Weak: will be assigned when a follow-up rate is less than 60% (Q2 is 3) or if the withdrawals and drop-outs were not described (Q1 is 2). |  |
|  **INTERVENTION INTEGRITY** |  |  |  |  |  |
| What percentage of participants received the allocated intervention or exposure of interest? | 80% to 100% | 60% to 79% | Less than 60% agreement | Can't tell |  |
|  Was the consistency of the intervention measured? | Yes | No | Can't tell |  |  |
| Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results? | Yes | No | Can't tell |  |  |
| **RATE THIS SECTION** |  |  |  |  |  |
| **ANALYSIS (INTERNAL VALIDITY-BIAS)** | **Yes = 1** | **No = 2** | **Can't tell = 3** |  |  |
| Indicate the unit of allocation |  |  |  |  |  |
|  Indicate the unit of analysis |  |  |  |  |  |
| Are the statistical methods/tests appropriate to assess the main outcomes? | Yes | No | Can't tell |  |  |
|  Is the analysis performed by intervention allocations status rather than actual intervention received? | Yes | No | Can't tell |  |  |
|  Were the methods for measuring outcome changed between the 'before' and 'after' measurements? | Yes | No | Can't tell |  |  |
| **RATE THIS SECTION** |  |  |  |  |  |
| Strong: the statistical methods have been shown to be appropriate (Q3 is 1); and the outcome measures used are accurate (Q4 is 1); and the outcome measures remained constant (Q5 is 2) |  |
| Moderate: the statistical methods have been shown to be appropriate (Q3 is 1); and the outcome measures used are accurate (Q4 is 2) or accuracy is not described (Q4 is 3); and the outcome measures remained constant (Q5 is 2 or 3) |  |
| Weak: the statistical methods have not been shown to be appropriate (Q3 is 2) or both reliability and validity are not described (Q3 is 3 and Q4 is 3); and the outcome measures changed (Q5 is 1) |  |
| **GLOBAL RATINGS FOR THIS PAPER** | STRONG = NO WEAK RATINGS | MODERATE = ONE WEAK RATING | WEAK = TWO OR MORE WEAK RATINGS |  |  |
| **OVERALL GRADE OF THE PAPER** | **A (STRONG)** | **B (MODERATE)** | **C (WEAK)** |  |  |
| **WITH BOTH REVIEWERS DISCUSSING THE RATINGS:** |  |  |  |  |  |
| Is there discrepancy between the two reviewers with respect to the components ratings? | Yes | No |  |  |  |
| If yes, indicate the reason for the discrepancy | 1 = Oversight | 2 = Differences in interpretation of criteria | 3 = Differences in interpretation of study |  |  |
| **Final decision of both reviewers** | 1 = Strong | 2 = Moderate | 3 = Weak |  |  |
| **OVERALL GRADE OF THE PAPER** | **A (STRONG)** | **B (MODERATE)** | **C (WEAK)** |  |  |
| ***Source:*** *Hamilton Assessment Tool (HAT). Also called EPHPP - Quality Assessment Tool for Quantitative Studies*  |  |  |