

# Suicide among transport industry workers: A systematic review and meta-analysis<sup>1</sup>

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1. Supplementary material

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Table S1 – PRISMA Checklist

| Section and Topic             | Item # | Checklist item                                                                                                                                                                                                                                                                                       | Location where item is reported |
|-------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| <b>TITLE</b>                  |        |                                                                                                                                                                                                                                                                                                      |                                 |
| Title                         | 1      | Identify the report as a systematic review.                                                                                                                                                                                                                                                          | Title Page                      |
| <b>ABSTRACT</b>               |        |                                                                                                                                                                                                                                                                                                      |                                 |
| Abstract                      | 2      | See the PRISMA 2020 for Abstracts checklist.                                                                                                                                                                                                                                                         | After title page                |
| <b>INTRODUCTION</b>           |        |                                                                                                                                                                                                                                                                                                      |                                 |
| Rationale                     | 3      | Describe the rationale for the review in the context of existing knowledge.                                                                                                                                                                                                                          | p.1-2                           |
| Objectives                    | 4      | Provide an explicit statement of the objective(s) or question(s) the review addresses.                                                                                                                                                                                                               | p.2                             |
| <b>METHODS</b>                |        |                                                                                                                                                                                                                                                                                                      |                                 |
| Eligibility criteria          | 5      | Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.                                                                                                                                                                                          | p.2                             |
| Information sources           | 6      | Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.                                                                                            | p.2                             |
| Search strategy               | 7      | Present the full search strategies for all databases, registers and websites, including any filters and limits used.                                                                                                                                                                                 | p.2                             |
| Selection process             | 8      | Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.                     | p.2                             |
| Data collection process       | 9      | Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process. | p.2-3                           |
| Data items                    | 10a    | List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.                        | p.2-3                           |
|                               | 10b    | List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.                                                                                         | p.2-3                           |
| Study risk of bias assessment | 11     | Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.                                    | p.2-3                           |
| Effect measures               | 12     | Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.                                                                                                                                                                  | p.2-3                           |
| Synthesis methods             | 13a    | Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).                                                                                 | p.3                             |

| Section and Topic             | Item # | Checklist item                                                                                                                                                                                                                                                                       | Location where item is reported |
|-------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
|                               | 13b    | Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.                                                                                                                                | p.3                             |
|                               | 13c    | Describe any methods used to tabulate or visually display results of individual studies and syntheses.                                                                                                                                                                               | p.2-3                           |
|                               | 13d    | Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.                          | p.3                             |
|                               | 13e    | Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).                                                                                                                                                 | p.3                             |
|                               | 13f    | Describe any sensitivity analyses conducted to assess robustness of the synthesized results.                                                                                                                                                                                         | p.3                             |
| Reporting bias assessment     | 14     | Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).                                                                                                                                                              | NA                              |
| Certainty assessment          | 15     | Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.                                                                                                                                                                                | NA (discussed p.9)              |
| <b>RESULTS</b>                |        |                                                                                                                                                                                                                                                                                      |                                 |
| Study selection               | 16a    | Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.                                                                                         | p.3-4                           |
|                               | 16b    | Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.                                                                                                                                                          | p.3-4                           |
| Study characteristics         | 17     | Cite each included study and present its characteristics.                                                                                                                                                                                                                            | p.3-4                           |
| Risk of bias in studies       | 18     | Present assessments of risk of bias for each included study.                                                                                                                                                                                                                         | p.4-5 (discussed p.10)          |
| Results of individual studies | 19     | For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.                                                     | p.4-6                           |
| Results of syntheses          | 20a    | For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.                                                                                                                                                                               | Supp Table                      |
|                               | 20b    | Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect. | p.4-6                           |
|                               | 20c    | Present results of all investigations of possible causes of heterogeneity among study results.                                                                                                                                                                                       | p.4-6                           |
|                               | 20d    | Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.                                                                                                                                                                           | p.4                             |
| Reporting biases              | 21     | Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.                                                                                                                                                              | NA                              |
| Certainty of evidence         | 22     | Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.                                                                                                                                                                                  | NA (discussed p.9)              |
| <b>DISCUSSION</b>             |        |                                                                                                                                                                                                                                                                                      |                                 |
| Discussion                    | 23a    | Provide a general interpretation of the results in the context of other evidence.                                                                                                                                                                                                    | p.5-10                          |
|                               | 23b    | Discuss any limitations of the evidence included in the review.                                                                                                                                                                                                                      | p.9                             |
|                               | 23c    | Discuss any limitations of the review processes used.                                                                                                                                                                                                                                | p.9-10                          |
|                               | 23d    | Discuss implications of the results for practice, policy, and future research.                                                                                                                                                                                                       | p.8-9                           |
| <b>OTHER INFORMATION</b>      |        |                                                                                                                                                                                                                                                                                      |                                 |
| Registration and protocol     | 24a    | Provide registration information for the review, including register name and registration number, or state that the review was not registered.                                                                                                                                       | p.2                             |

| Section and Topic                              | Item # | Checklist item                                                                                                                                                                                                                             | Location where item is reported |
|------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
|                                                | 24b    | Indicate where the review protocol can be accessed, or state that a protocol was not prepared.                                                                                                                                             | p.2                             |
|                                                | 24c    | Describe and explain any amendments to information provided at registration or in the protocol.                                                                                                                                            | NA                              |
| Support                                        | 25     | Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.                                                                                                              | Before references               |
| Competing interests                            | 26     | Declare any competing interests of review authors.                                                                                                                                                                                         | Before references               |
| Availability of data, code and other materials | 27     | Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review. | Before references               |

*From:* Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Table S2 Overview and characteristics of studies included in the review (n=23)

| Authors & Year               | Transport Sector         | Occupations                                                                              | Country         | Data Period & Sample                                                                                                                             | Occupational Classification/ Definition                                       | Suicide definition                                                                   | Design                    | Effect Measure and/or analysis                                                  | Sample size(s)                                                                                                                                 | Comparison/ Population or Reference Group                                                                                                                                                                                                                                                                                                    | Quality Rating♦ |
|------------------------------|--------------------------|------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Agerbo et al 2007</b>     | General transport/ mixed | Drivers and mobile plant operators; Motor vehicle drivers; Transport and other labourers | Denmark         | 1991-1997; Danish residents aged 15-60 (i.e., working age) who died by suicide. Must have resided in Denmark throughout the two preceding years. | Danish version of the International Classification of Occupations (DISCO-88). | ICD-8 (E950-E959); ICD-10 (X60-X84). NOT including 'open verdicts'.                  | Nested case-control study | Rate Ratios (RR); analysed using conditional logistic regression.               | N=3195 (suicide cases, n=898 females)<br>N=63900 controls                                                                                      | A random sample of 20 controls for each person who died by suicide, of the same gender who were born in the same year and who were alive when the case died by suicide.<br><br>Primary education teaching professionals chosen as 'reference category' in analysis because this occupation is relatively large, well-defined, and universal. | 19 (High)       |
| <b>Andersen et al (2010)</b> | General transport/ mixed | Transport workers (including drivers, road and rail drivers)                             | Australia (QLD) | 1990-2006; All suicides across occupational groups in QLD (15-64 years)                                                                          | Australian Standard Classification of Occupations (ASCO-2)                    | Based on Decision Tree model, identified as 'probable' and 'beyond reasonable doubt' | Case series               | Crude suicide rate (calculated using ABS data for 2001); Rate ratios with 95%CI | 7652 (total cases identified as 'probable' and 'beyond reasonable doubt' aged 15-64 years; n=6087 males)<br><br>n=3010 ('Employed Population') | Employed population (aged 15-64 years) in QLD                                                                                                                                                                                                                                                                                                | 18 (High)       |

|                            |                 |                                                                       |                  |                                                                                                                                                                                                          |                                                                                                                                                          |                                                                                                                             |                            |                                                                   |                                                                                                                                                                                                                                                                            |                                                             |           |
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|                            |                 |                                                                       |                  |                                                                                                                                                                                                          |                                                                                                                                                          |                                                                                                                             |                            |                                                                   | were currently employed at time of death (n=1960 had occupation other than those of interest, and 123 could not be identified).                                                                                                                                            |                                                             |           |
| <b>Ballard (2002)</b>      | Aviation        | Cockpit crew, cabin attendants                                        | Italy            | 1 January 1965-31 December 1996 (observation period); and follow-up procedure between January 1999 and June 2000; all Italian-born flight personnel in active service with the Italian national airline. | Airline personnel records: Cockpit crews and cabin attendants.                                                                                           | ICD-8 and ICD-9 classification of underlying causes of death (depending on time of death and revision of ICD system in use) | Retrospective cohort study | SMR with exact 95% CI calculated from exact Poisson probabilities | Male cockpit crew members (n=3022), male flight cabin flight attendants (n=3418), female cabin attendants (n=3428)                                                                                                                                                         | Italian general population                                  | 15 (Med)  |
| <b>Brandt et al (1994)</b> | Maritime        | Merchant seafarers (Deck crew and officers, Engine crew and officers) | Denmark          | 1970-1985; Danish male seafarers                                                                                                                                                                         | Seamen identified from census, including those at sick-leave or occasionally unemployed; and seafarers as registered by the Danish Seafarers Tax Office. | ICD-8 (E950-E959)                                                                                                           | Retrospective cohort study | Mortality Rate Ratios (MRR) and adjusted MRRs.                    | 1,292,337 all men enrolled. 116,368 total deaths. Deck officers: 3906 (50542 person years) and 395 deaths. Deck crew: 5646 (75228 person years) and 594 deaths. Engine officers: 3442 (45426 person years), 340 deaths. Engine crew: 977 (11901 person years), 174 deaths. | Men aged 20-65 years who were 'economically active' in 1970 | 18 (High) |
| <b>Guidotti (1992)</b>     | Transit/Driving | Bus drivers                                                           | Canada (Alberta) | 1927-1985/1987; bus drivers of Edmonton Transit who either died while employed                                                                                                                           | Based on Transit Union (ATU) Local 569, which                                                                                                            | ICD-9 (950-959); and 'suicide by                                                                                            | Retrospective cohort study | Proportionate Mortality Ratio (PMR)                               | 219 (total deaths all males). However,                                                                                                                                                                                                                                     | General male population of the Alberta province             | 13 (Med)  |

|                                 |                         |                                                                                                                                                                                  |             |                                                                                                                                                       |                                                                                                         |                                                                                              |                            |                                                                   |                                                                                                                                                  |                                                                                   |           |
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|                                 |                         |                                                                                                                                                                                  |             | or retired after 20 years of service who are registered for the union's death benefits programme.                                                     | represents around 1400 workers, mostly bus drivers in the city of Edmonton.                             | gas poisoning' (ICD-9 951-952)                                                               |                            |                                                                   | death certificates obtained for 216, between 1927-1987<br>Median age at death: 71 years (range: 20-99 years).                                    | ('non-Indians', as 'there have been few non-white transit workers in this union') |           |
| <b>Guseva Canu et al 2019</b>   | General transport/mixed | Ship and aircraft controllers/technicians, Material recording and transport clerks, Locomotive engine drivers and related, motor vehicle drivers, garbage collectors and related | Switzerland | 1990 & 2000-2014; adults aged 18-65 years registered in the 1990 or 2000 census and the Swiss National Cohort                                         | Nomenclature Suisse des Professions (NSP/Swiss classification of occupations) RECODED into ISCO -88     | For deaths from 1990-1994 = ICD-8 (950-958); For deaths from 1995 onwards = ICD-10 (X60-X84) | Prospective cohort study   | Direct age-standardized mortality rates (DSR) and SMR             | N = 5834618 (49% women)<br><br>At study endpoint, n = 238504 had died, n = 19863 of whom by suicide                                              | General Swiss adult population (General population of working age)                | 19 (High) |
| <b>Hansen &amp; Jensen 1998</b> | Maritime                | Seafaring/navigation and radio/ ship engineer                                                                                                                                    | Denmark     | 1986-1993; Danish women employed as a seafarer during the study period                                                                                | Danish Maritime Authority Personnel Records                                                             | ICD-8 (E950-959)                                                                             | Retrospective cohort study | Standardised mortality ratio (SMR)                                | N = 6788 total cohort; n = 9 suicides of which n = 2 were in a traditional seafaring role (n=7 in food preparation not extracted for this study) | General population of Danish women (age and specific mortality)                   | 14 (Med)  |
| <b>Kposowa et al 1999</b>       | General transport/mixed | Transport equipment operatives                                                                                                                                                   | USA         | 1979-1989; individuals aged 15 and above, non-Hispanic whites, non-Hispanic African Americans, and Hispanic males and females. (noninstitutionalised) | Unclear classification system.<br><br>(A list of industries and sub-occupations were derived and coded) | ICD-9 (E950-E959)                                                                            | Prospective cohort study   | Hazard Ratio (but defined as relative risk/ RR) (using Cox model) | N = 471922, n suicides = 545                                                                                                                     | Farmers and farm managers                                                         | 18 (High) |

|                                        |                             |                                                                                                                                                                                               |                 |                                                                                                         |                                                                                                                                        |                                                               |             |                                                                                                                  |                                                                                                                               |                                                                                                             |           |
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| <b>Labovitz &amp; Hagedorn, 1971**</b> | General transport/<br>mixed | Locomotive engineers, Motormen Street subway and elevated railway, taxicab and chauffeurs, truck and tractor drivers, delivery and routemen                                                   | USA             | 1950; US males employed in 36 occupations (occupations that have sufficient data on suicide)            | Duncan's comparisons of occupational categories used in 1947 survey to the detailed occupational classification in the US Census 1950. | Unclear                                                       | Case series | Suicide rates, Spearman's rho and Pearson's <i>r</i>                                                             | NR                                                                                                                            | Unclear                                                                                                     | 8 (Low)   |
| <b>Meltzer et al 2008*</b>             | Transit/<br>Driving         | Van drivers                                                                                                                                                                                   | England & Wales | 2001-2005; men and women aged 20-64 years                                                               | Standard Occupational Classification 2000 (SOC 2000)                                                                                   | ICD-10                                                        | Case series | Proportional Mortality Ratio (PMR) and Standardised Mortality Ratio (SMR)                                        | n suicides in all occupation groups: 14332                                                                                    | General population of England and Wales                                                                     | 14 (Med)  |
| <b>Milner et al (2015)*</b>            | Transit/<br>Driving         | Road and rail drivers                                                                                                                                                                         | Australia       | 2001-2010; All deaths recorded as intentional self-harm in males in driving occupations (road and rail) | Australian and New Zealand Standard Classification of Occupations sub-group major group '73-Road and Rail drivers'                     | Cases officially recorded as 'intentional self-harm' in NCIS. | Case series | Age standardised suicide rates per 100,000; Incidence rate ratios (IRR) with 95% CI using Mantell Haenszel rates | 26471 total individual cases; 513 suicides among Road and Rail drivers (n=502/ 98% males -- only males included in analysis). | General working population in all other occupations coded according to ANZSCO.                              | 18 (High) |
| <b>Milner et al (2017)*</b>            | Transit/<br>Driving         | Access to carbon monoxide (Automobile drivers, bus and coach drivers, delivery drivers, truck drivers, vehicle body builders/ trimmers and painters, panel beaters and automotive engineering | Australia       | 2001-2012; all employed adults with a known occupation who were 15 years or older at the time of death. | Australian and New Zealand Standard Classification of Occupations (ANZSCO) - four-digit level.                                         | ICD-10 (X60-X84)                                              | Case series | Rates per 100,000 persons; negative binomial regression (coefficients in Incidence Rate Ratios/ IRRs)            | N = 10150 (n=8600 males; n=1550 females)                                                                                      | Population estimates of different ANZSCO occupational groups based on 2006 census data (mid-point of study) | 18 (High) |

|                                             |                         |                                                            |         |                                                                                                                             |                                                                                    |                                                                                       |                            |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                |           |
|---------------------------------------------|-------------------------|------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------|
| <b>Mustard et al 2010</b>                   | General transport/mixed | Transport operators (air, rail, water, motor, other)       | Canada  | 1991-2001; occupationally active and inactive men and women aged 30-69 years at baseline which represents 15% of population | 1980 Standard Occupation Classifications (for occupation groups --80 minor groups) | ICD-9 for deaths occurring from 1991-1999; ICD-10 for deaths occurring from 2000-2001 | Prospective cohort study   | Crude mortality rate, adjusted-SMR (direct method), and standardised Risk Ratio (SRR)                          | <p>occupationally active men n = 929300</p> <p>occupationally active women n = 774800</p> <p>occupationally active N = 1704100</p> <p>occupationally inactive men n = 133100</p> <p>occupationally inactive women n = 264300</p> <p>occupationally inactive N = 397500</p> <p>n=1932 suicides in occupationally active men; n=424 suicides in non-active men &amp; n=428 suicides in occupationally active women, n=227 in non-active women</p> | All occupationally active and inactive men and women (Mid-year population estimates from 1991) | 17 (High) |
| <b>Rafnasson &amp; Gunnarsdottir (1993)</b> | Maritime                | Merchant seamen (including fishermen and merchant sailors) | Iceland | 1966-1989; seamen (including fishermen and merchant sailors)                                                                | Based on membership of a seamen pension fund from 1958 to 1986.                    | ICD-7 (E963, E970-E979)                                                               | Retrospective cohort study | Standardised mortality ratios (SMRs) with 95% Cis assuming a Poisson distribution; Spearman's rank correlation | 27884 seamen: 2226 (total deaths): 144 (suicide deaths)                                                                                                                                                                                                                                                                                                                                                                                         | General population                                                                             | 14 (Med)  |

|                             |                         |                                                                                                             |                 |                                                                                                                                                                                                           |                                                                                                                                                                                                 |                                                                                                                                                                                                     |                          |                                                                                                      |                                                                                                                                                                                                                                                        |                                                                                                                    |           |
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|                             |                         |                                                                                                             |                 |                                                                                                                                                                                                           |                                                                                                                                                                                                 |                                                                                                                                                                                                     |                          | with one-tailed p-values.                                                                            |                                                                                                                                                                                                                                                        |                                                                                                                    |           |
| <b>Roberts et al (2013)</b> | General transport/mixed | Forklift drivers, dockers and stevedores, rail transport operators, driving instructors, merchant seafarers | England & Wales | 1979-1980, 1982-1983, and 2001-2005; suicide deaths across all occupations                                                                                                                                | The 2000 Standard Occupational Classification (SOC 2000) (for 2001-2005 period); the 1980 International Standard Classification of Occupation (ISCO-1980) (for 1979-1980 and 1982-1983 period). | ICD-9 (E980-E989, E950-E959) for 1979-1980 and 1982-1983 period; ICD-10 (Y10-33.8, Y34, X60-X84) for 2001-2005.                                                                                     | Case series              | Suicide rate per 100,000; Standardised Mortality Ratios (SMRs), Proportional Mortality Ratios (PMRs) | Unclear - the study did not report total N, and only presented results for 50 'high risk occupations' and 30 'highest risk occupations'.<br><br>Occupations with small number of suicides (<5) were excluded and the actual numbers were not reported. | General British population (age-matched)                                                                           | 11 (Low)  |
| <b>Schmid et al 2020*</b>   | General transport/mixed | Drivers and mobile plant operators, transport and other labourers                                           | Switzerland     | 1990-2014; all adults aged 18-65 at the 1990 or 2000 census, excluding unemployed, job-seeking, and those with unknown occupation (sample 1); those deceased by suicide within each occupation (sample 2) | Swiss classification of occupations recoded into four-digit ISCO 88; for this study the two-digit ISCO 88 was used.                                                                             | Deaths from 1990-1994 = ICD-8 (950-958).<br><br>Deaths from 1995 onwards = ICD-10 (X60-X84).<br><br>Only including cases where suicides were 'principal cause' of death, EXCLUDING assisted suicide | Prospective cohort study | Standardised mortality ratios (SMR)                                                                  | N = 5834618 (49% women)<br><br>n= 19863 died by suicide (sample 1)<br><br>n suicides with available occupation = 13331 (sample 2)                                                                                                                      | Swiss general population                                                                                           | 18 (High) |
| <b>Stack, 2001**</b>        | Transit/Driving         | Truck drivers                                                                                               | USA (21 states) | 1990; working men and women in 32 selected occupations                                                                                                                                                    | Standard federal occupational codes (US Public Health Service, 1994); selected occupations with having at least 50                                                                              | Coroner's report, unclear 'definition'.                                                                                                                                                             | Case series              | Odds Ratio; bivariate and multivariate logistic regression                                           | n suicides = 9499, n deaths from other causes = 127687                                                                                                                                                                                                 | The rest of working-age population (Deaths by all other causes during the study period in working age population.) | 9 (Low)   |

|                             |                         |                                    |                |                                                                                |                                                                                       |                  |             |                                                                                                                                                                     |                                                                                                                                                                                                               |                                                                                                          |           |
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|                             |                         |                                    |                |                                                                                | suicides (some occupations were combined to have enough suicides)                     |                  |             |                                                                                                                                                                     |                                                                                                                                                                                                               |                                                                                                          |           |
| <b>Stallones et al 2013</b> | General transport/mixed | Transportation and material moving | USA (Colorado) | 2004-2006; white men and women in Colorado aged 16 and above                   | 2000 Standard Occupation Classifications                                              | ICD-10           | Case series | Age-adjusted suicide rates per 100,000                                                                                                                              | N=2352 suicides<br>n Males = 1536<br><br>n Females = 337                                                                                                                                                      | US 2000 population (as standard population)                                                              | 16 (Med)  |
| <b>Too et al (2020)</b>     | Transit/Driving         | Road and rail drivers              | Australia      | 2001-2016; all individuals died by suicide who were employed at time of death. | Australian and New Zealand Standard Classification of Occupations)                    | ICD-10 (X60-X84) | Ecological  | Suicide rates (using 2011 Census data); spatial, temporal, and spatial-temporal suicide clusters analysis; Poisson discrete scan statistic; Monte Carlo stimulation | 14317 (total deaths by suicide across all occupation groups)                                                                                                                                                  | Population estimates by occupation by postal code obtained from the Australian Bureau of Statistics 2011 | 17 (High) |
| <b>Wada et al 2016</b>      | General transport/mixed | Transport and machine operation    | Japan          | 2010; Japanese men of working age (25-59 years old)                            | Based on reports from the deceased person's family, recorded in the vital statistics. | ICD-10           | Case series | Age-adjusted incident relative risk (IRR)                                                                                                                           | Suicide deaths N = 11551.<br><br>Excluded n (not employed) = 4356;<br>n(without occupational data) = 2297;<br>n (without industry data) = 2507.<br><br>N analysed = 4898 (occupations), and 4688 (industries) | Sales occupation                                                                                         | 16 (Med)  |

|                                            |                         |                                                      |             |                                                                                                                                                                                               |                                                                                                            |                                                                                                                        |                          |                                                                                                                  |                                                                                                                                |                                                                                                                          |           |
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| <b>Windsor-Shellard &amp; Gunnell 2019</b> | General transport/mixed | Forklift truck drivers                               | England     | 2011-2015; individuals aged 20-64 years for each occupation category (employed at time of death; or out of work due to retirement, being unemployed, or being sick--based on last occupation) | Standard Occupation Classification (SOC2010) - 9 major categories and 350+ individual occupations included | ICD-10 (X60-X84)                                                                                                       | Case series              | Indirect-Standardised Mortality Ratio (Indirect SMR); restricted analysis to occupations with at least 20 deaths | 13232 suicide deaths among people aged 20-64 years who had an occupation recorded on the death certificate; 81% (n=10688) men. | General population/ all 'usual residents of England' aged 20-64 years.                                                   | 19 (High) |
| <b>Wild et al 2021*</b>                    | General transport/mixed | Motor vehicle drivers, transport and other labourers | Switzerland | 1990-2014; working women aged 18-65 living in Switzerland                                                                                                                                     | 4-digit ISCO 1988 (originally), but then aggregated using the 2 digits.                                    | Not described but uses a cohort described in Guseva Canu et al 2019 & Schmid et al 2020                                | Prospective cohort study | Adjusted RRs                                                                                                     | Total women N = 1771940<br><br>n = 2526 deaths by suicide (overall suicide rate: 10.1/100,000)                                 | One occupation = office clerks (for calculating RR); One sector = Trade, repair car/domestic articles; All other workers | 18 (High) |
| <b>Yamauchi et al (2018)</b>               | General transport/mixed | Transport and postal                                 | Japan       | January 2010-March 2015; cases involving compensation for mental disorders and suicides across occupation groups                                                                              | Japan Standard Industrial Classification (JSIC) by the Ministry of Internal Affairs and Communication      | Based on 'medicolegal examinations by licensed physicians and police investigations' (for compensation claims purpose) | Case series              | Incidence Rates (IR) per 1 million employees.                                                                    | 1990 (total included subjects) --> 379 suicide cases. 17 women (4%), 362 men (96%)                                             | n/a                                                                                                                      | 12 (Low)  |

**NB:** n/a = not analysed or not applicable; nr = not reported; IR = incidence rates; SMR = standardised mortality ratio; CMR = crude mortality ratio; PMR = proportional mortality ratio; ICD = international classification of diseases; 95% CI = 95% confidence interval; RR = rate ratio; IRR = incidence rate ratio; MRR = mortality rate ratio

\* Not included in any of the final meta-analyses given overlap in data with more suitable articles

\*\* Not included in any of the final meta-analyses given insufficient information for calculating effects compared to the general or employed population

♦ Quality assessment is based upon a modified version (Reardon et al., 2017) of a generic quality appraisal tool suitable for the array of study designs identified in this study developed by Kmet and colleagues (2004).

Table S3 Overview of the final quality assessment (n=23)

| Study                      | Question/<br>Objective<br>sufficiently<br>described? | Study design<br>evident and<br>appropriate? | Method of subject/<br>comparison group<br>selection or source of<br>information/ input<br>variables described<br>and appropriate? | Subject (and<br>comparison<br>group, if<br>applicable)<br>characteristics<br>sufficiently<br>described? | Outcome and<br>exposure<br>measure(s) well<br>defined and<br>robust to<br>measurement /<br>misclassification<br>bias? Means<br>of assessment<br>reported? | Sample size<br>appropriate? | Analytic<br>methods<br>described/<br>justified and<br>appropriate? | Controlled<br>confounders? | Results<br>reported in<br>sufficient<br>detail? | Conclusions<br>supported by<br>the results? | Total |
|----------------------------|------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------|----------------------------|-------------------------------------------------|---------------------------------------------|-------|
| Agerbo et al<br>2007       | 2                                                    | 2                                           | 2                                                                                                                                 | 2                                                                                                       | 2                                                                                                                                                         | 2                           | 2                                                                  | 2                          | 1                                               | 2                                           | 19    |
| Andersen et al<br>2010     | 2                                                    | 2                                           | 2                                                                                                                                 | 2                                                                                                       | 1                                                                                                                                                         | 2                           | 2                                                                  | 1                          | 2                                               | 2                                           | 18    |
| Ballard et al<br>2002      | 1                                                    | 2                                           | 1                                                                                                                                 | 1                                                                                                       | 2                                                                                                                                                         | 1                           | 2                                                                  | 1                          | 2                                               | 2                                           | 15    |
| Brandt et al<br>1994       | 1                                                    | 2                                           | 2                                                                                                                                 | 2                                                                                                       | 2                                                                                                                                                         | 2                           | 2                                                                  | 1                          | 2                                               | 2                                           | 18    |
| Guidotti 1992              | 2                                                    | 1                                           | 1                                                                                                                                 | 1                                                                                                       | 1                                                                                                                                                         | 1                           | 1                                                                  | 1                          | 2                                               | 2                                           | 13    |
| Guseva Canu et<br>al. 2019 | 2                                                    | 2                                           | 2                                                                                                                                 | 2                                                                                                       | 2                                                                                                                                                         | 2                           | 2                                                                  | 1                          | 2                                               | 2                                           | 19    |
| Hansen &<br>Jensen 1998    | 2                                                    | 2                                           | 2                                                                                                                                 | 0                                                                                                       | 2                                                                                                                                                         | 1                           | 2                                                                  | 1                          | 1                                               | 1                                           | 14    |
| Kposowa,<br>1999           | 2                                                    | 2                                           | 2                                                                                                                                 | 1                                                                                                       | 2                                                                                                                                                         | 2                           | 2                                                                  | 1                          | 2                                               | 2                                           | 18    |
| Labovitz et al<br>1971**   | 1                                                    | 1                                           | 0                                                                                                                                 | 1                                                                                                       | 1                                                                                                                                                         | 0                           | 1                                                                  | 0                          | 1                                               | 2                                           | 8     |
| Meltzer et al.<br>2008*    | 2                                                    | 2                                           | 1                                                                                                                                 | 1                                                                                                       | 2                                                                                                                                                         | 1                           | 2                                                                  | 1                          | 1                                               | 1                                           | 14    |
| Milner et al<br>2015*      | 2                                                    | 2                                           | 2                                                                                                                                 | 2                                                                                                       | 1                                                                                                                                                         | 2                           | 2                                                                  | 1                          | 2                                               | 2                                           | 18    |
| Milner et al<br>2017*      | 2                                                    | 2                                           | 1                                                                                                                                 | 2                                                                                                       | 2                                                                                                                                                         | 2                           | 1                                                                  | 2                          | 2                                               | 2                                           | 18    |
| Mustard et al.<br>2010     | 2                                                    | 2                                           | 2                                                                                                                                 | 2                                                                                                       | 2                                                                                                                                                         | 2                           | 1                                                                  | 1                          | 1                                               | 2                                           | 17    |
| Rafnasson et al<br>1993    | 2                                                    | 2                                           | 1                                                                                                                                 | 1                                                                                                       | 2                                                                                                                                                         | 1                           | 1                                                                  | 1                          | 1                                               | 2                                           | 14    |
| Roberts et al<br>2013      | 2                                                    | 1                                           | 1                                                                                                                                 | 0                                                                                                       | 2                                                                                                                                                         | 0                           | 1                                                                  | 1                          | 1                                               | 2                                           | 11    |
| Too et al 2020             | 2                                                    | 2                                           | 2                                                                                                                                 | 1                                                                                                       | 2                                                                                                                                                         | 2                           | 2                                                                  | 1                          | 1                                               | 2                                           | 17    |
| Schmid et al.<br>2020*     | 2                                                    | 2                                           | 2                                                                                                                                 | 2                                                                                                       | 2                                                                                                                                                         | 2                           | 2                                                                  | 0                          | 2                                               | 2                                           | 18    |
| Stack, 2001**              | 1                                                    | 1                                           | 1                                                                                                                                 | 0                                                                                                       | 0                                                                                                                                                         | 1                           | 1                                                                  | 1                          | 1                                               | 2                                           | 9     |
| Stallones et al.<br>2013   | 2                                                    | 2                                           | 1                                                                                                                                 | 2                                                                                                       | 2                                                                                                                                                         | 1                           | 1                                                                  | 1                          | 2                                               | 2                                           | 16    |
| Wada et al.<br>2016        | 2                                                    | 2                                           | 1                                                                                                                                 | 1                                                                                                       | 2                                                                                                                                                         | 2                           | 2                                                                  | 1                          | 1                                               | 2                                           | 16    |
| Wild et al.<br>2021*       | 2                                                    | 2                                           | 2                                                                                                                                 | 2                                                                                                       | 1                                                                                                                                                         | 2                           | 2                                                                  | 1                          | 2                                               | 2                                           | 18    |

|                                     |   |   |   |   |   |   |   |   |   |   |    |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|----|
| <b>Windsor-Shellard et al. 2019</b> | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 19 |
| <b>Yamauchi et al 2018</b>          | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 12 |

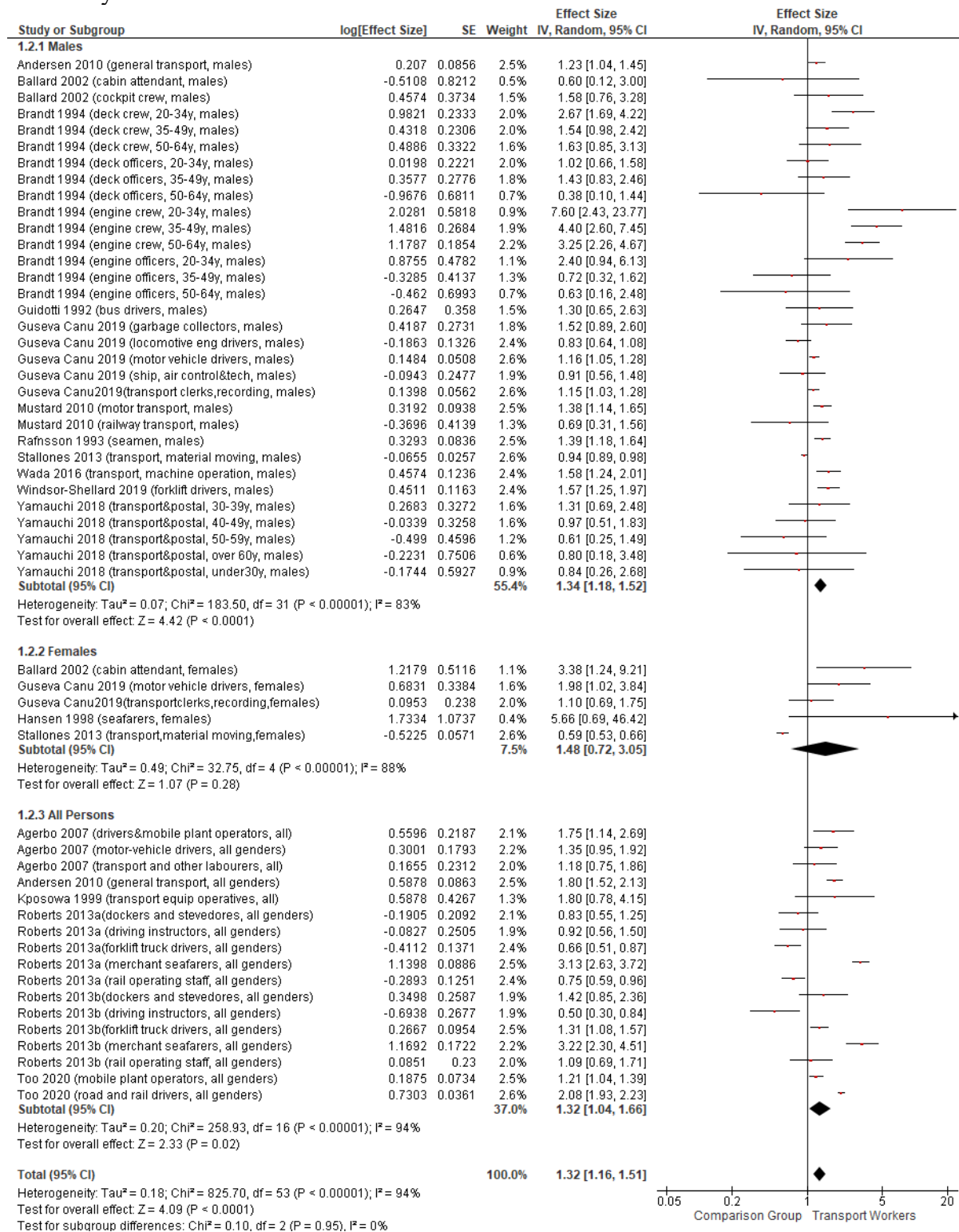
NB: Quality assessment is based upon a modified version (Reardon et al., 2017) of a generic quality appraisal tool suitable for the array of study designs identified in this study developed by Kmet and colleagues (2004).

\* Not included in any of the final meta-analyses given overlap in data with more suitable articles

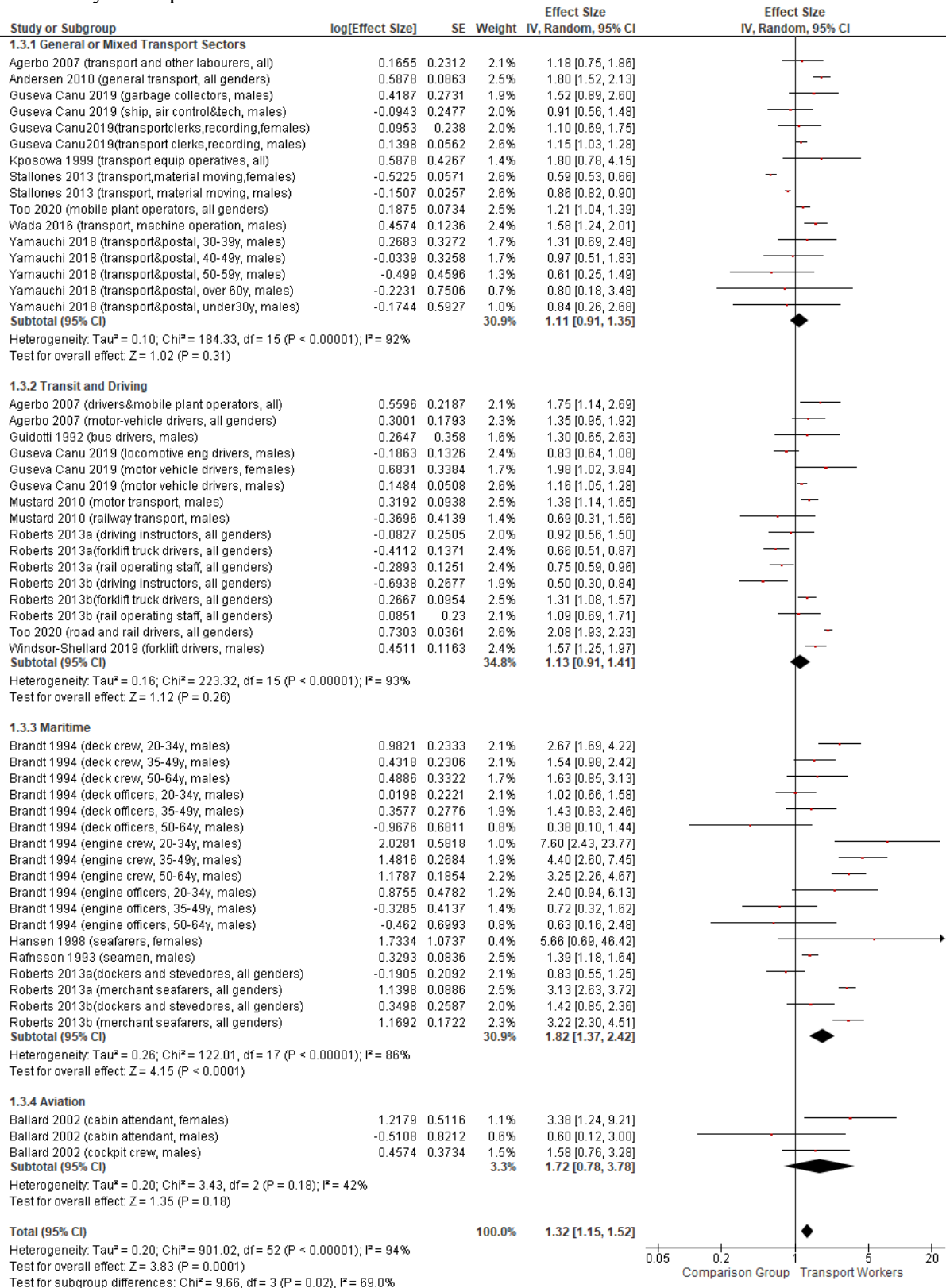
\*\* Not included in any of the final meta-analyses given insufficient information for calculating effects compared to the general or employed population

# Supplementary Figures – Subgroup Analyses

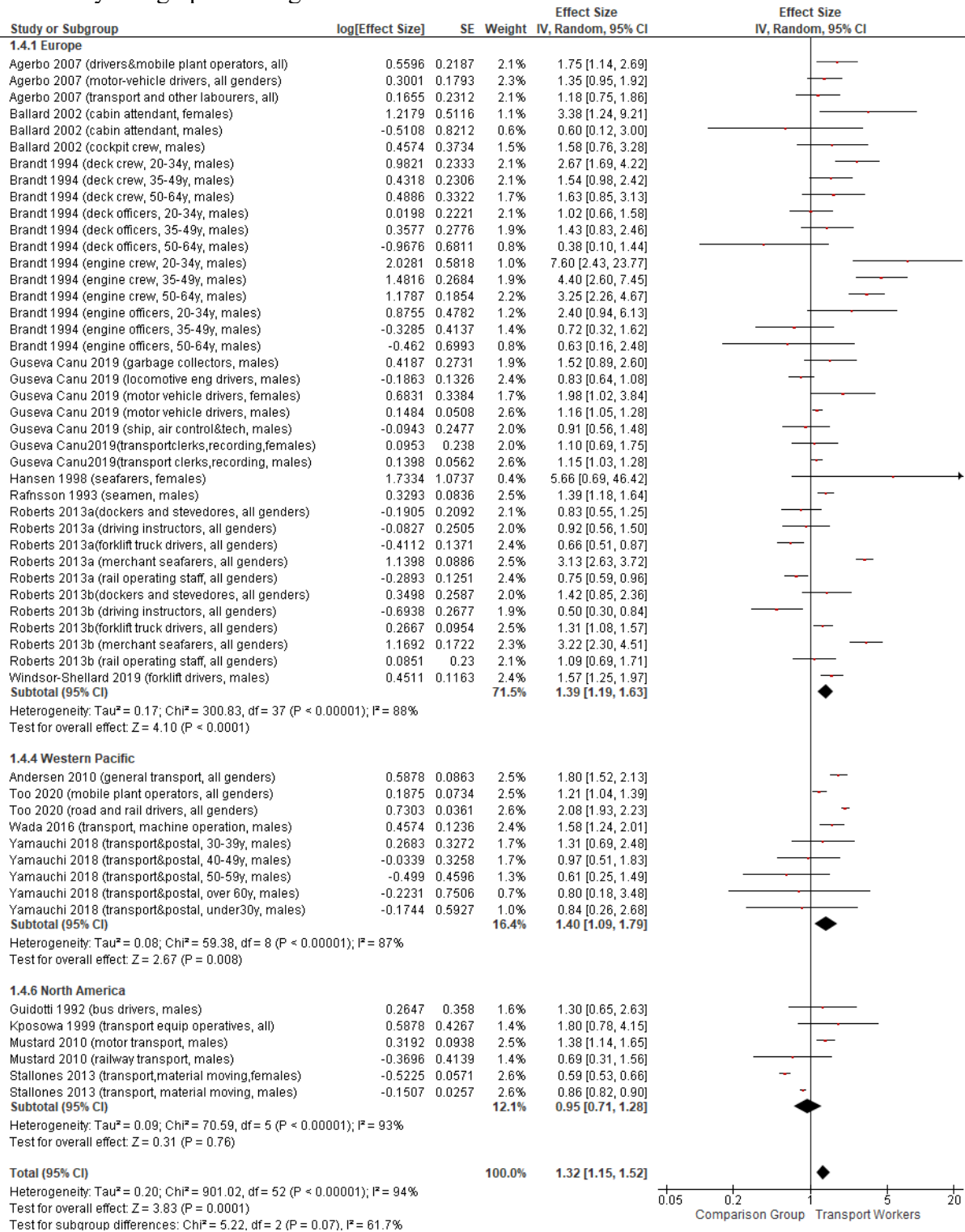
## A. By Gender



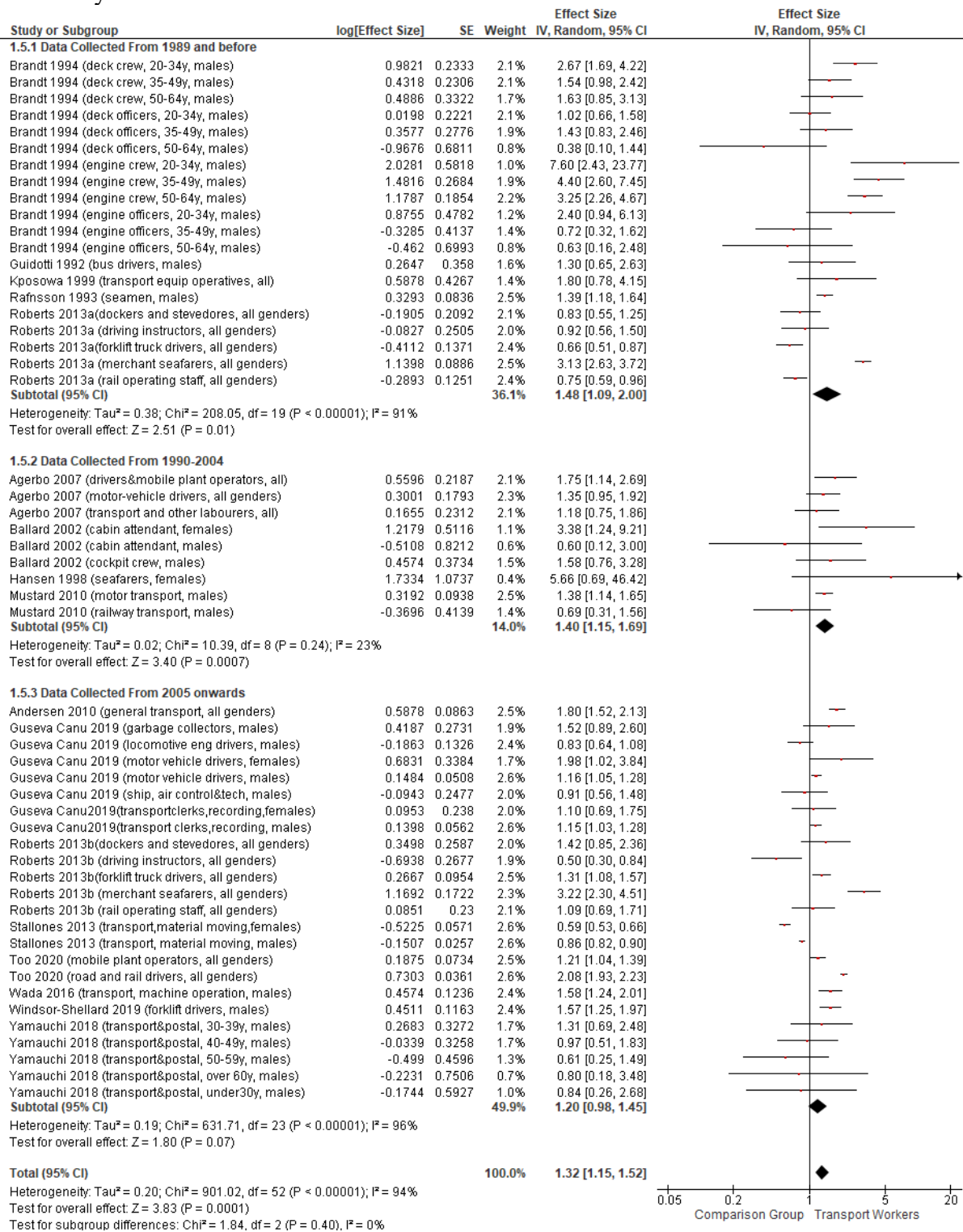
## B. By Transport sector



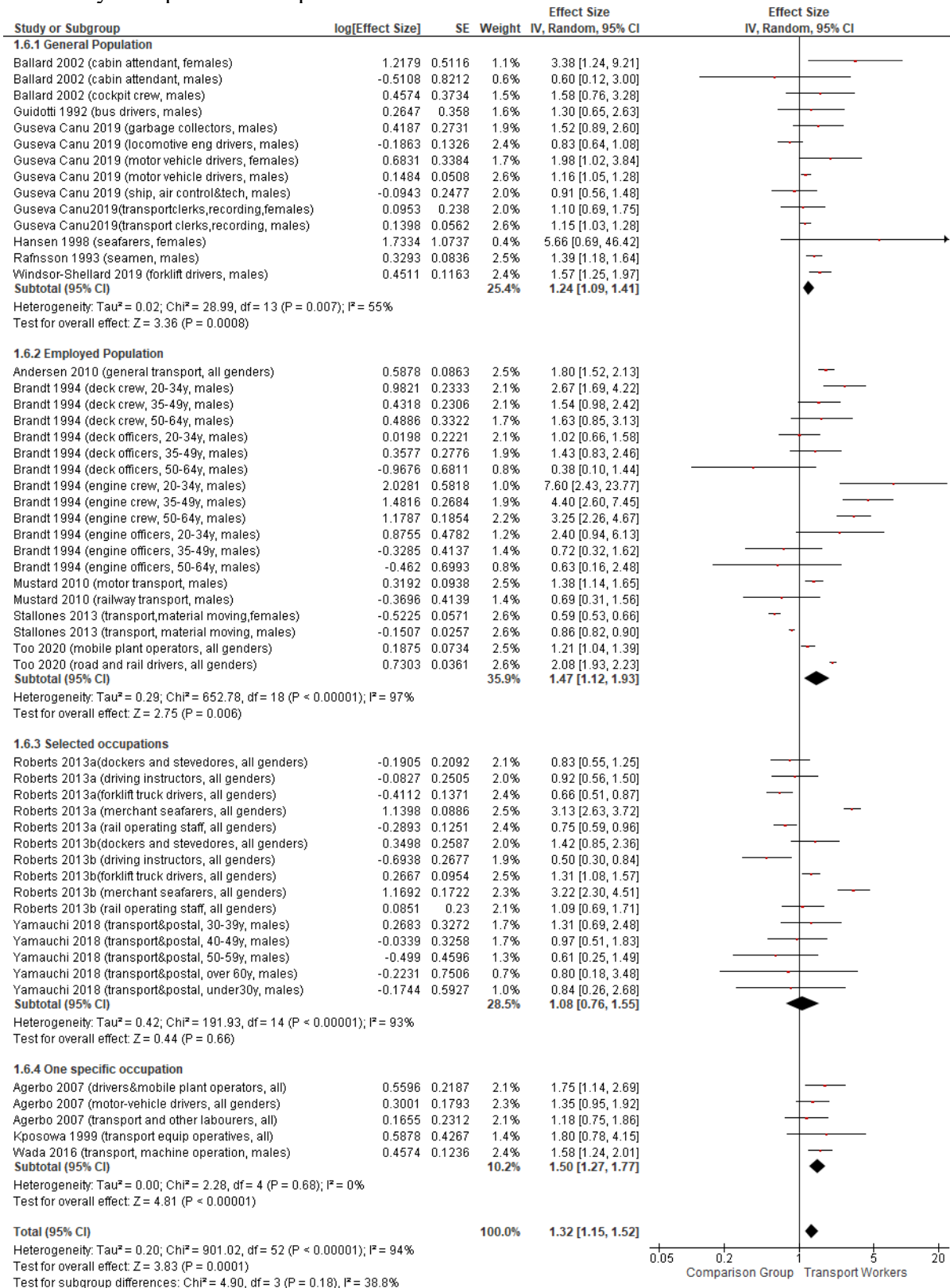
## C. By Geographical Region



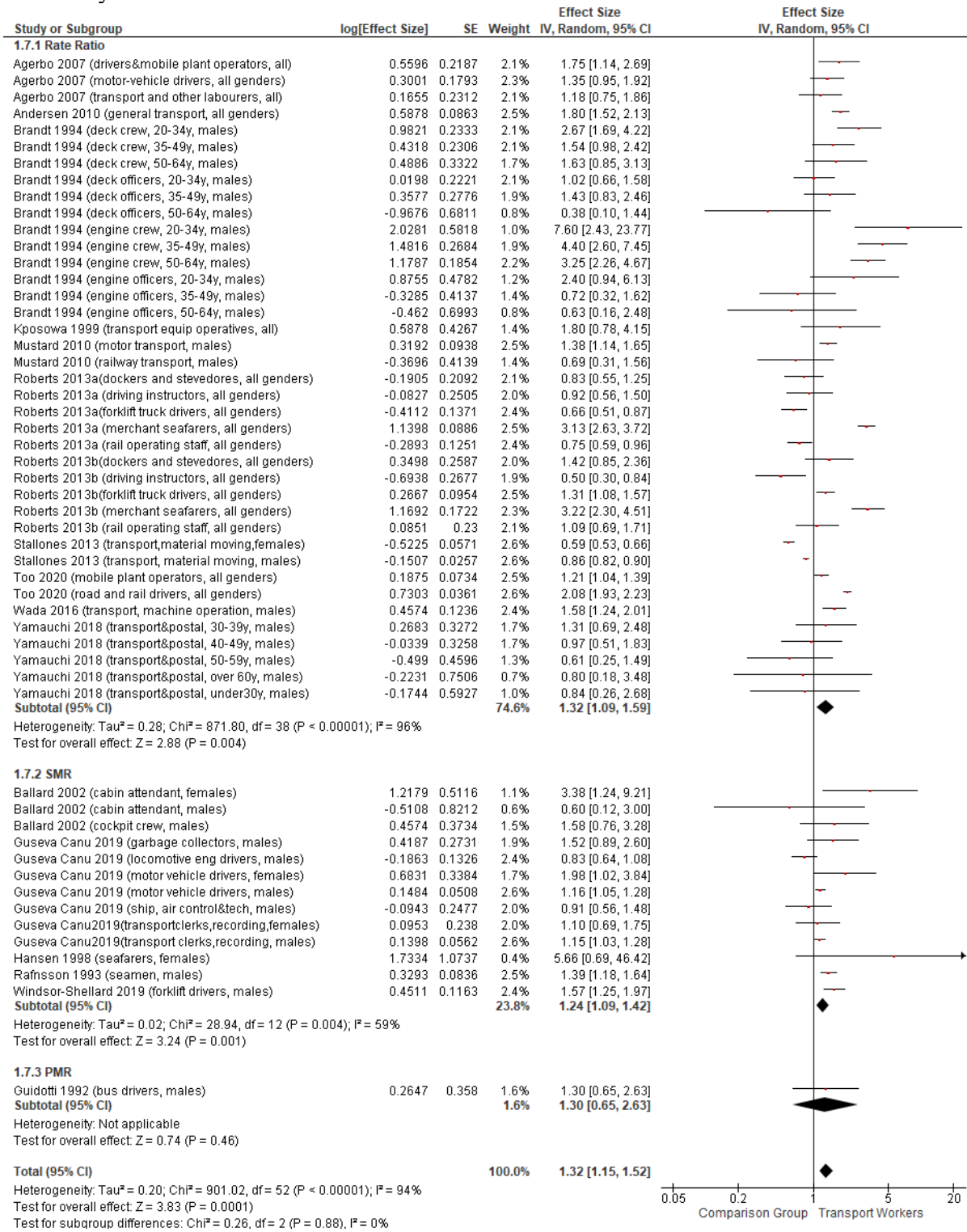
## D. By Data Collection Period



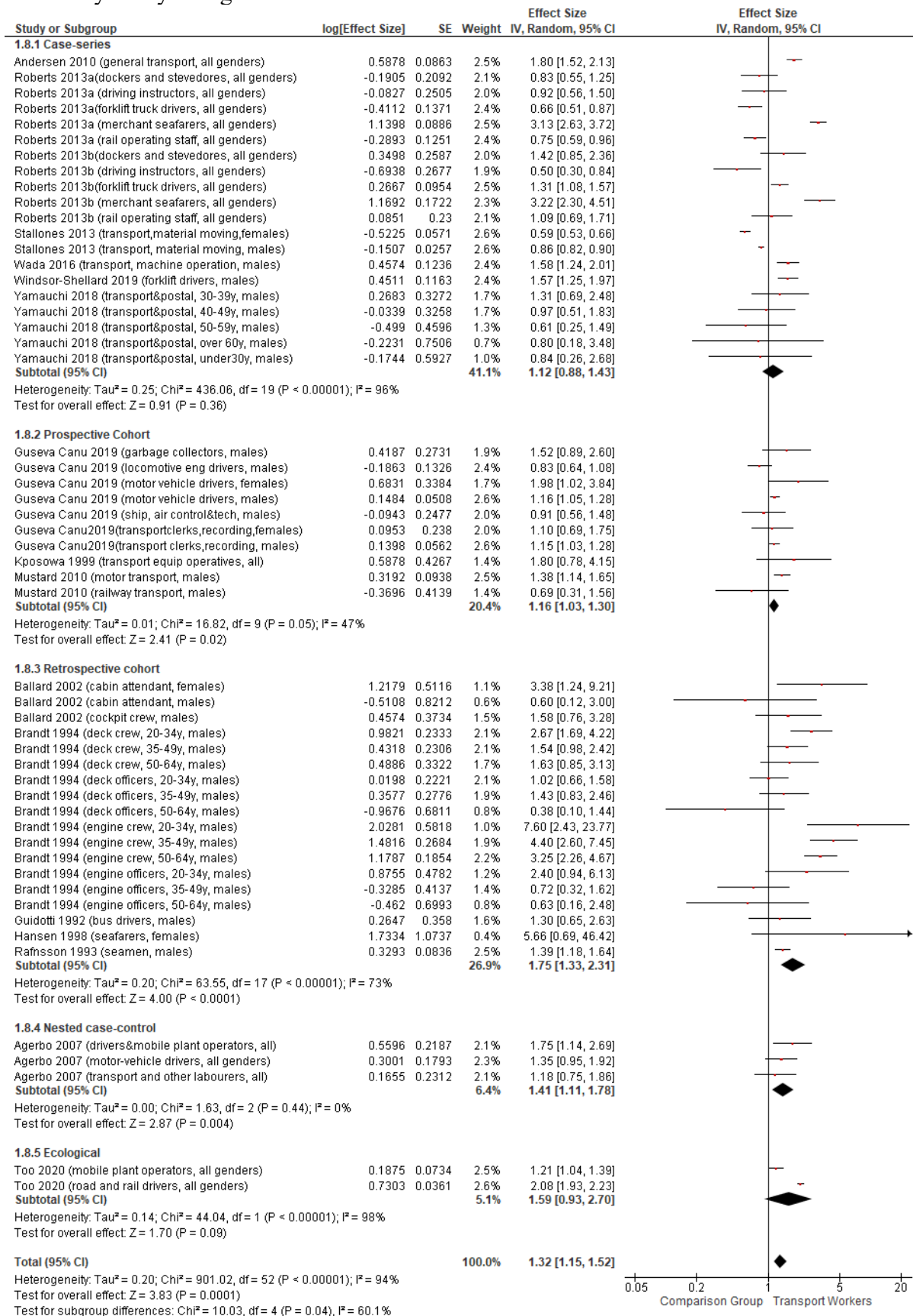
## E. By Comparison Group



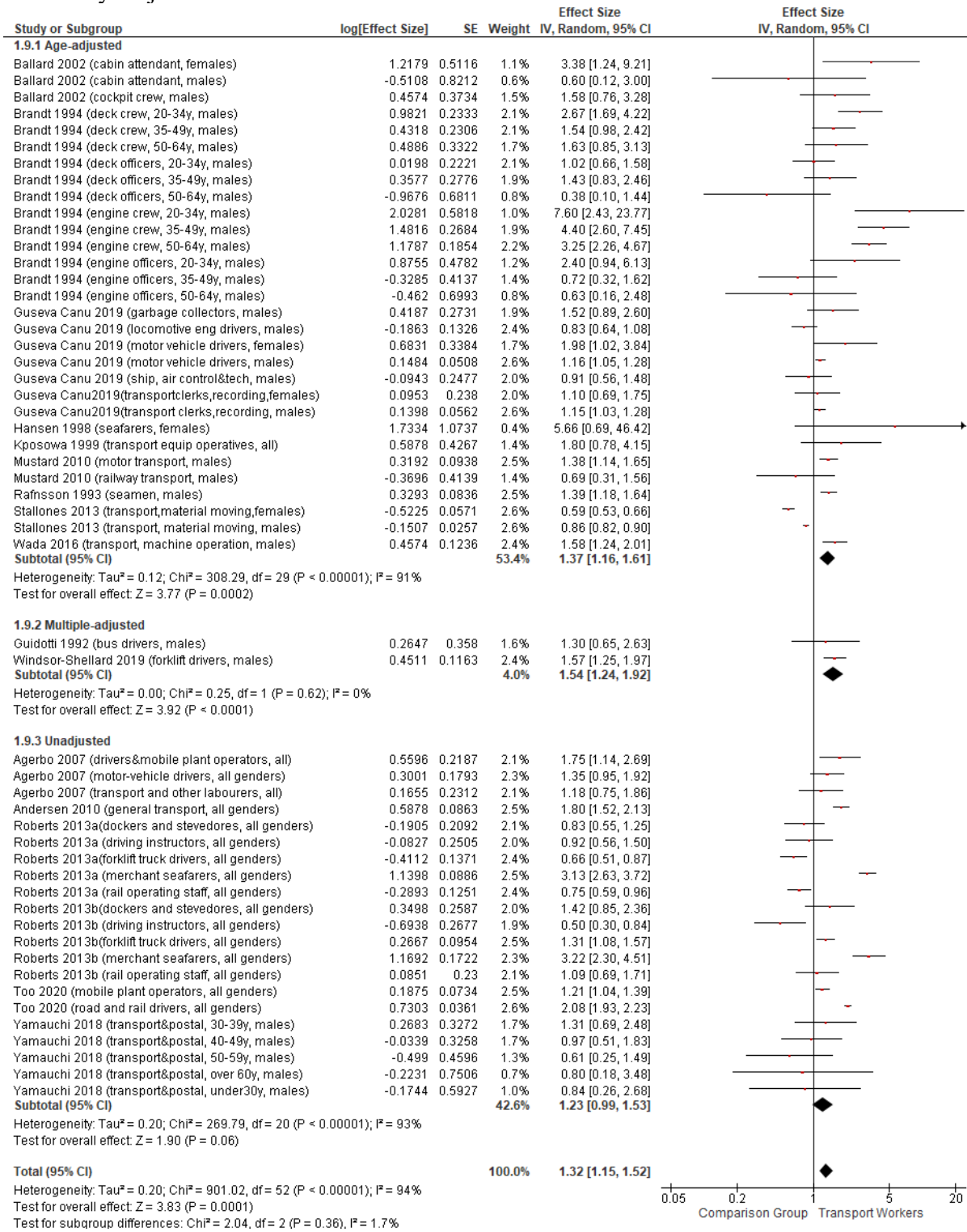
## F. By Effect Measure



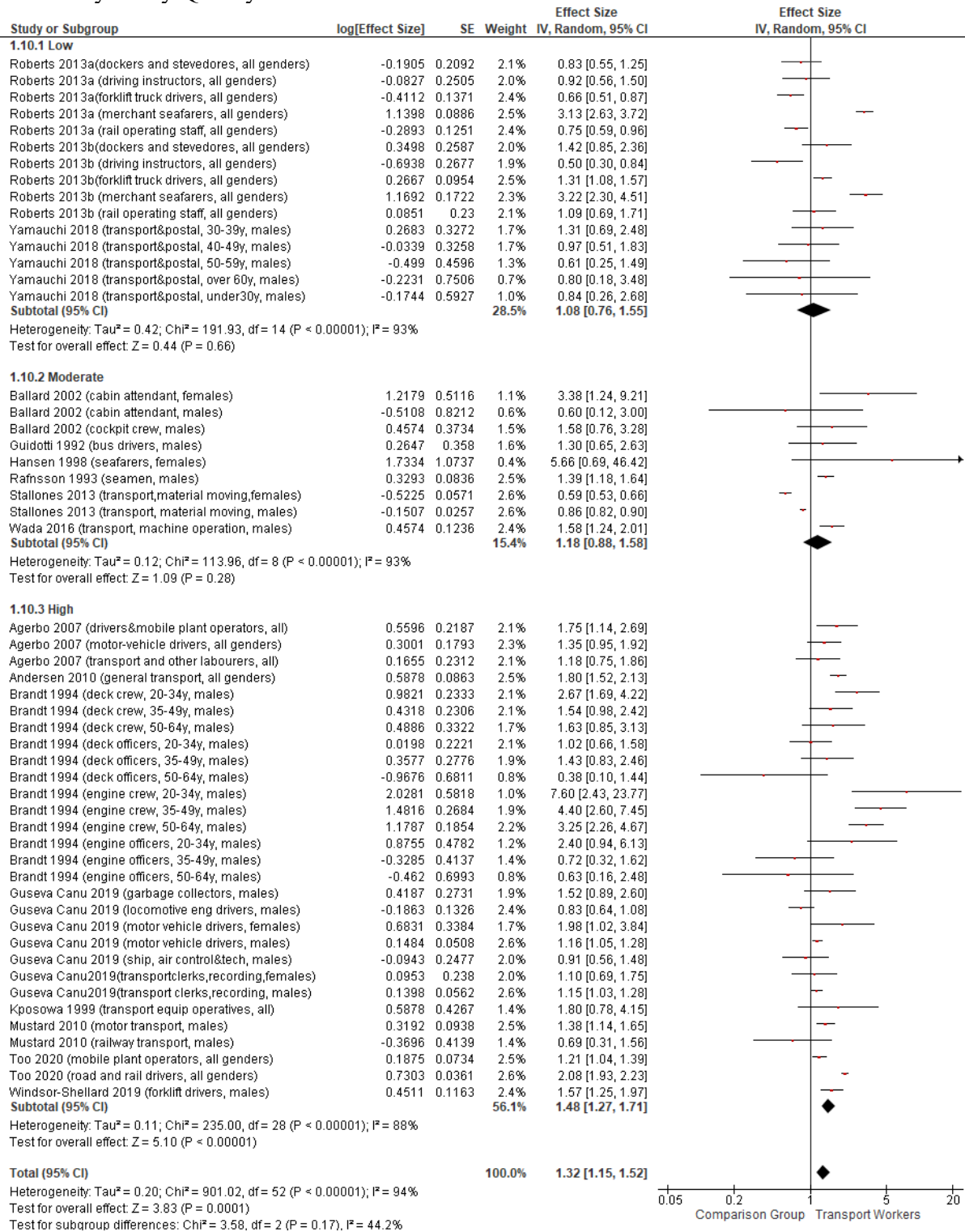
## G. By Study Design



## H. By Adjustment



## I. By Study Quality



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