Are social isolation, lack of social support or loneliness risk factors for cardiovascular disease in Australia and New Zealand? A systematic review and meta-analysis

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Abstract
Background: An international systematic review concluded that individuals with poor social health (social isolation, lack of social support or loneliness) are 30% more likely to develop coronary heart disease (CHD) and stroke. Notably, the two included Australian papers reported no association between social health and CHD or stroke.

Objective: We undertook a systematic review and meta-analysis to investigate the association between social isolation, lack of social support and loneliness and cardiovascular disease (CVD) incidence among people living in Australia and New Zealand.

Methods: Four electronic databases were systematically searched for longitudinal studies published until June 2020. Two reviewers undertook title/abstract screen and one reviewer undertook full-text screen and data extraction. Quality was assessed using the Newcastle – Ottawa Quality Assessment Scale.

Results: Of the 725 unique records retrieved, five papers met our inclusion criteria. These papers reported data from three Australian longitudinal datasets, with a total of 2137 CHD and 590 stroke events recorded over follow-up periods ranging from 3 to 16 years. Reports of two CHD and two stroke outcomes were suitable for meta-analysis. The included papers reported no association between social health and incidence of CVD in all fully adjusted models and most unadjusted models.

Conclusions: Our systematic review is inconclusive as it identified only a few studies, which relied heavily on self-reported CVD. Further studies using medical diagnosis of CVD, and assessing the potential influence of residential remoteness, are needed to better understand the relationship between social health and CVD incidence in Australia and New Zealand.

Keywords: cardiovascular diseases, interpersonal relations, loneliness, social isolation, social support

Abbreviations: CVD, cardiovascular disease; DSSI, Duke Social Support Index; MOSS, 19-point Medical Outcomes Study Social Support Survey; SSI, Social Support Index.

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INTRODUCTION

In Australia, cardiovascular disease (CVD) dominates as the greatest cause of Australia's morbidity, mortality and healthcare expenditure. Similarly, in New Zealand CVD is a leading cause of premature mortality and monopolises nearly a quarter of health expenditure on noncommunicable diseases. In 2003, an Expert Working Group of the National Heart Foundation of Australia concluded from a systematic review that there is strong and consistent evidence of an independent causal association between social isolation and the causes and prognosis of coronary heart disease (CHD). Yet our understanding of the link between social health and CVD is limited, especially compared to other key CVD risk factors highlighted by the National Heart Foundation of Australia, including elevated cholesterol or blood pressure, diabetes, significant family history, smoking, poor nutrition, physical inactivity, adiposity and depression. Social health refers to an individual's ability to form satisfying and meaningful relationships, their ability to adapt in social situations, and their interactions with and support from other people, institutions and services. The concepts of social isolation, social support and loneliness are often discussed in relation to social health. Social isolation is "an objective state in which a person has minimal contact with others and low involvement in local community life". Social support is a subjective measure of how social connections are operationalised, and loneliness "is a subjective, unwelcome experience of lack of or loss of companionship". Assessment of social health varies and the inconsistency is a common limitation of this research area. However, there is a helpful framework to compare and contrast common tools. Furthermore, a recent theoretical debate has emerged to separate the concepts of social isolation, social support and loneliness, as they likely have different implications for health and well-being. Before the COVID-19 outbreak, 50% of Australians reported feeling lonely at least 1 day a week, 25% reported currently experiencing an episode of loneliness, and 10% reported that they lack social support. Prevalence rates seemed to be slightly lower in New Zealand; 36% reported feeling lonely at least 1 day a week and 14% reported feeling lonely all, most or some of the time.

A number of conceptual frameworks illustrate the pathways between social health and health, with several being particularly relevant to our review as they describe the link between poor social health and CVD. The main, broad pathway that tends to be described is from poor social health, through molecular mechanisms, health behaviours, and chronic disease risk-factors, leading to chronic mental and physical ill-health and mortality; with each step being impacted by socio-demographics, the sociological environment, and personality. For example, being socially isolated or feeling lonely can overstimulate the body's stress response through increased levels of the stress hormone cortisol, raise blood pressure and decrease blood flow to vital organs through higher tonic vascular resistance, impair the immune system's ability to fight infections through lower production of white blood cells, and reduce sleep quality leading to less restorative sleep and daytime fatigue. People with poor social health also tend to have more unhealthy lifestyles, such as undertaking less physical activity or eating unhealthily, which increases their risk of CVD. Additionally, a bi-directional pathway is also described "with health and social relationships interacting to influence each other, in virtuous circles or spirals of despair". The bi-directional pathway also incorporates the health selection model, which explains how deterioration in health (such as a CVD event or decline in cognitive functioning) may limit or reduce social involvement, which leads to greater ill-health. Hence, poor social health likely impacts health and well-being over the life-course.

In 2016, an international systematic review of 23 studies concluded that individuals with poor social health were 30% more likely to develop CHD and stroke. The systematic review included 181,006 participants, aged 18 years and over, mainly from Europe (38%) or North America (33%), followed from 1965 to 1996 for 3-21 years. Notably, the systematic review only included two Australian papers, which reported that a combined measure of social isolation and social support was not associated with CHD or stroke in fully adjusted models. No eligible studies were identified from New Zealand. Given the unique geographical spread of the Australian and New Zealand populations, along with differences in political and cultural support systems (especially in terms of social systems and health care), research undertaken in other countries may not be generalisable. With the rise of CVD in Australia and New Zealand, along with the emerging knowledge of the role of social health in CVD, it is important to further the understanding of these issues in order to better address and mitigate them.

The aim of this systematic review is to investigate the association of social isolation, lack of social support and loneliness with CVD incidence among people living in Australia and New Zealand.

METHODS

This systematic review and meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. Our protocol was followed unless otherwise defined (Prospero CRD42018093503).

Criteria

We included longitudinal observational data. We included studies conducted in the general population (not clinical location or for specific health reasons), generalisable to people living in Australia and New Zealand of all ages. We included the social health measures of social isolation, social support and loneliness. The primary outcome was incidence of CVD, obtained through self-report or medical records.

Search methods

We searched four databases from the earliest record to 21st June 2020 (Appendix A). There were no language or date restrictions.
One author (AZZP) scanned the references of included studies, and several relevant review articles identified in the initial search, for additional studies and found one additional article. The first authors of each included paper were asked if they knew of any additional studies which might be relevant. No additional studies were supplied.

### 2.3 Data collection and analysis

Papers were provided an ID based on the first author’s last name and year of publication. Two people (authors or contributors Noria Akbari, Aghnia Naim) undertook an initial screening of titles and abstracts independently, with discrepancies included in the full-text screen. There were no relevant non-English articles or conference abstracts. One author (RF) screened all full-text papers and performed data extraction. A second author (AZZP) checked the extracted data. Two authors (RF & AZZP) independently assessed the quality of included studies using the Newcastle–Ottawa Quality Assessment Scale, with discrepancies resolved with independent assessment by a third author (FB). A score of eight or nine was deemed as a low risk of bias. In our protocol we stated the use of the STROBE Statement, however it was developed as a guideline for reporting observational studies rather than assessing quality.

### 2.4 Data synthesis

Meta-analysis followed the Cochrane Collaboration guidance, with at least two studies required. We converted odds ratios and hazard ratios to relative risks. We initially misunderstood the available methodology, and were unable to convert the findings from a continuous exposure to a categorical exposure (as recorded in our protocol). Statistical heterogeneity was evaluated by using the $I^2$ statistic and the metan STATA command for the 95% confidence intervals, and funnel plots and Egger’s test were used to assess publication bias (added since protocol). We intended to report by CVD category as assessment of CVD was self-report and the follow-up was not long enough (defined as 5-year or more).

### 3 RESULTS

#### 3.1 Description of studies

Five papers met our inclusion criteria (Figure 1, Table 1), which encompassed the two Australian studies included in the international systematic review. All samples were part of large Australian longitudinal cohort studies of non-institutionalised adults. Three papers (Strodl 2003, Strodl 2008, Byles 2015) used wave 2 data from the Australian Longitudinal Study on Women’s Health (ALSWH) cohort born between 1921 and 1926 (aged 70 years or more at baseline). ALSWH was established in 1996 as a nationally representative cohort, with recruitment through Medicare records, people living in rural/remote double sampled and women too ill to participate excluded. Strodl 2003 and Strodl 2008 further restricted the sample by excluding prevalent CHD or prevalent stroke at baseline (wave 2), while Byles 2015 stratified by prevalent or incidence of stroke. The ALSWH collected the Duke Social Support Index (DSSI) which incorporates both aspects of social isolation and social support.

One included paper (Simons 2013) used data from the Dubbo Study which was established in 1988 as a representative sample of community-dwelling people born before 1930 (aged 60 years at baseline) living in Dubbo, New South Wales. As Simons 2013 was a short report, the author recommended obtaining study details from prior publications. Dubbo Study participants were recruited through general practitioners and electoral records, and excluded people too ill or disabled to attend data collection. Simons 2013 did not put further restrictions on the sample, and included people with prevalent CHD and stroke at baseline. The Dubbo Study collected the 19-point Medical Outcomes Study Social Support Survey (MOSSS) which assesses social support.

One included paper (Sahle 2020) used data from the Household, Income and Labour Dynamics in Australia (HILDA) cohort which was established in 2001 as a nationally representative sample of households occupying private dwellings. HILDA households were recruited using census data and participants needed to be aged 21 years or older. Sahle 2020 further excluded prevalent self-reported non-communicable disease (including heart disease and circulatory diseases) at baseline (2003 survey). HILDA collected the Social Support Index (SSI) which assesses loneliness.

#### 3.2 Risk of bias

All studies were rated as high risk of bias, with NOS scores ranging between four and seven stars (Appendix C). All studies lost a point in the “Comparability” category for not adjusting for our list of most important factors. Most studies lost a point in the “Outcome” category as assessment of CVD was self-report and the follow-up was not long enough (defined as 5-year or more).

#### 3.3 Findings

The five included papers reported six CVD outcomes; two studies assessed CHD (Strodl 2003 and Simons 2013), three studies assessed stroke (Strodl 2008, Byles 2015 and Simons 2013), and one study assessed heart disease (Sahle 2020). Social health was not associated with incidence of CVD in fully adjusted models and most unadjusted models.
Methodological considerations were required prior to meta-analysis. Strodl 2008 and Byles 2015 used the same source data, follow-up period, social health exposure and CVD outcome. We chose Strodl 2008 (rather than Byles 2015) in the meta-analysis as their analysis considered the social health exposure as a potential predictor of the incidence of CVD outcome. The four remaining included papers chose to assess the exposure as either categorical (n = 3; Strodl 2003, Strodl 2008, Simons 2013) or continuous (n = 1; Sahle 2020). At protocol stage we misinterpreted the available biostatistical methodology and conversion from continuous to categorical is not possible.

Hence, the paper reporting the social health exposure as continuous (Sahle 2020) was excluded from meta-analysis. Three papers (Strodl 2003, Strodl 2008, Simons 2013) remained, with four outcomes, which was sufficient for meta-analysis.

For the first meta-analysis method, we converted odds ratios or hazard ratios into relative risk (Figure 2A), demonstrating no association between social health and CVD. We speculate that including the non-statistically significant findings from Sahle 2020 (excluded from our meta-analysis based on exposure assessed as continuous), would not alter our finding. However, caution is required when interpreting Figure 2 due to a number of assumptions that were required to compile these results. Strodl 2003 and Strodl 2008 initially
TABLE 1  Characteristics and relevant findings of the five included papers

| ID          | Sample                          | Eligibility                                                                 | Demographics                                                                 | Social health                                      |
|-------------|---------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------|
| Strodl 2003  | ALSWH 1996 Baseline, 3 y follow-up (1999); Australia; n = 6994 to 7759 depending on missing data | No prevalent CHD at baseline; did not die, withdraw or lost by wave 2 (1999) of ALSWH 1921-1926 cohort recruited via Medicare database, with rural/remote double sampled, and excluded women too ill to participate | 100% female; Age 70-75 y; Education: 31% no formal, 16% tertiary; 40% major city [Calculated T1] | Duke Social Support Scale (DSSS) 11 items, categorised as low-fair (<=26), high (27-29) and very high (30-33); via mail |
| Strodl 2008  | ALSWH 1996 Baseline, 3 y follow-up (1999); Australia; n = 7839 to 9113 depending on missing data | No prevalent stroke at baseline; did not die, withdraw or lost by wave 2 (1999) of ALSWH 1921-1926 cohort recruited via Medicare database, with rural/remote double sampled, and excluded women too ill to participate | 100% female; Age 70-75 y; Education: 32% no formal, 16% tertiary; 40% metropolitan [Calculated T1] | Duke Social Support Scale (DSSS) 11 items, categorised as low-fair (<=26), high (27-29) and very high (30-33); via mail |
| Byles 2015   | ALSWH 1996 Baseline, 3 y follow-up (1999); Australia; n = 10 434 | Did not die or withdraw by wave 2 (1999) of ALSWH 1921-1926 cohort recruited via Medicare database, with rural/remote double sampled, and excluded women too ill to participate | 100% female; Age 70-75 y; 74.9 + 1.45D; Education: 32.4% no formal, 3.8% university; 61.3% metropolitan [Calculated T2] | Duke Social Support Scale (DSSS), 11 items; via mail |
| Simons 2013  | Dubbo 1988-1989 Baseline, 8 y 6 16 y follow-up; Dubbo, New South Wales, Australia; n = 2805 | Prior CHD or stroke permitted. From the Dubbo Study non-institutionalised, not too ill or disabled to attend at initiation in 1988-1989, born <1930, recruited through GPs and electoral records | Simons 2011: 56.0% female; Age >60 y; F: 69.6 + 7.3, M: 68.6 + 6.7 Simons 1991: Education: Primary F: 3%; M: 5%; Tertiary F: 1%; M: 4%; Socioeconomic status (0-100) mean F: 33.4, M: 32.8 | 19-point Medical Outcomes Study Social Support Survey. *Poor social support* categorised as expressed reservation about their social support situation (19.6%); via face-to-face interview |
| Sahle 2020   | HILDA 2003 Baseline, 10 y follow-up (annually till 2013); Australia, nationally representative; n = 11 637 | Without self-reported non- communicable disease (including heart disease, circulatory diseases), aged ≥21 y and have psychosocial measures from HILDA non-institutionalised at initiation in 2001 | 51.9% female; Age ≥21 y; F: 44.3 + 15.9, M: 43.9 + 15.6; Education NR; SEIFA reported in deciles (~10% in each category) | The Social Support Index (SSI), (range ~30, +30) sum of 10 statements, higher scores suggest lower loneliness; via mail |

Abbreviations: ALSWH, Australian Longitudinal Study on Women’s Health; CHD, coronary heart disease; Dubbo, The Dubbo Study; F, female; HILDA, household, income and labour dynamics in Australia; M, male; y, years.

*Author identified (relevant) biases and limitations.
| Cardiovascular disease | Adjustment; Stratifications | Relevant findings | Limitations |
|------------------------|-----------------------------|------------------|-------------|
| Self-reported symptomatic CHD through "a doctor had told them in the previous 3 y that they had a diagnosis of heart disease such as angina or heart attack", via mail; 3 y incidence | Partner status, time pressure, mental health index, perceived stress, remoteness, education; NR (female only) | Among 7759 women initially aged 70-75, low-fair DSSS scores predicted the new diagnosis of symptomatic CHD over the 3-y period in univariable analyses (events = 489; compared to very high DSSS; low-fair OR 1.41, 95% CI 1.11-1.79 P <= .001; high OR 1.13, 95% CI 0.91-1.39 P > .05) but not after adjusting for other psychosocial variables (results not reported) | Self-reported CHD without clinical verification |
| Self-reported stroke through "if a doctor had told them in the previous 3 y that they had had a stroke", via mail survey; 3 y incidence | None as univariable not statistically significant. If it were; hypertension, heart disease, diabetes, risk for malnutrition, obesity, activity level alcohol status; NR (female only) | Among 8907 women initially aged 70-75, there was no association between DSSS categories and 3-y incidence of stroke (events = 170; compared to very high DSSI; low-fair OR 0.88, 95% CI 0.62-1.25; high incorrect in paper OR 0.76, 95% CI 0.52-1.12). | Self-reported stroke without clinical verification; Survivor bias as survived to age 70-75 and excluded stroke death during observation; residual confounding through unmeasured depression; 3 y follow-up possibly underpowered |
| Self-reported stroke, via mail survey; baseline prevalent and 3 y incidence | NR; NR (female only) | [Calculated from T2] Among 10 434 women initially aged 70-75, women without self-reported stroke were more likely to have higher DSSS scores at baseline (n = 9738; DSSS 32.1 + 5.3SD) compared to women with prevalent stroke at baseline (n = 407; DSSI 30.8 + 5.5SD, P < .001) or incidence of stroke over 3 y (n = 289; DSSS 30.1 + 6.5SD, P < .001) | Self-reported stroke without clinical verification; Survivor bias as survived to age 70-75, those with a disability less likely to participate, excluded stroke death during observation |
| CHD and ischemic stroke incidence. Prevalence through self-report or resting ECG. Incidence based on clinical diagnosis | (1) age, sex, and marital status (2) conventional predictors of CVD: smoking, alcohol, hypertension, diabetes, impaired peak expiratory flow, prior coronary heart disease, prior stroke, atrial fibrillation, physical disability, self-rated health; NR | Among 2805 Australians aged 60+ followed for 16 y, social support (MOSS) did not precint CHD events (CHD; 8 y HR 1.08, 95% CI 0.91-1.29; 16 y events = 1088, HR 1.03, 95% CI 0.88-1.20) or ischemic stroke (IS; 8 y HR 1.24, 95% CI 0.93-1.65; 16 y events = 420, HR 1.20, 95% CI 0.88-1.42) at 8 or 16 y after adjustment for age, sex, and marital status (model 1) or conventional predictors of CVD (model 2; CHD: 8 y HR 1.01, 95% CI 0.83-1.21; 16 y HR 0.97, 95% CI 0.82-1.14; IS 8 y HR 1.10, 95% CI 0.81-1.50; 16 y HR 1.03, 95% CI 0.80-1.33). Events not reported | Measurement of social support (eg subjective feelings vs. objective living arrangements) remains unclear; Healthy survivorship as 27% declined as "too old, too tired or too unwell"; Characteristics assumed to be stable during observation period |
| Self-reported heart disease via mail survey; prevalent and 3 y incidence | (1) sociodemographic (age, marital status, education, Statistics Socio-Economic Indexes), (2) 1 + lifestyle (smoking, alcohol, dietary pattern, physical activity), (3) 2 + BMI, high blood pressure, and (4) 3 + health-related quality of life and co-existing psychosocial factors; Stratified by gender | Among 11 637 adults aged >21 y, 3.6% of women (51.9% of sample) and 5.0% of men self-reported heart disease over 10 y. Social support (SSI) was not associated with heart disease among women (events = 247; univariable OR 0.99, 95% CI 0.95, 1.03; adjusted OR 0.99, 95% CI 0.96, 1.03) or men (events = 313; univariable OR 0.98, 95% CI 0.96, 1.00; adjusted OR 0.99, 95% CI 0.98, 1.04) before or after adjustment for confounders | Self-reported stroke without clinical verification; residual confounding through unmeasured variables; not generalisable to homeless or institutionalised |
assessed DSSI as three categories, but to make it more comparable to Simons 2013, we re-categorised the data into two categories (“very high-high” vs. “low-fair”) and therefore unadjusted estimates are presented. Through this process we noticed that in Strodl 2008, Table 1, the numbers for high DSSI did not align with the odds ratio and speculate that the reference category was incorrectly reverted. As Simons 2013 did not provide the prevalence of those not-exposed (ie ‘good’) we used the Strodl 2003 and Strodl 2008 estimates for the ‘very high-high’ category. We chose the longest follow-up period, which was 16 years for Simons 2013 (who also reported 8 years).

For the second meta-analysis method, we used the effect estimates reported in the three included studies (Figure 2B), which also demonstrated no association between social health and CVD. Again, caution is required regarding interpretation for Strodl 2003 which did not provide the non-statistically significant adjusted findings, hence the unadjusted statistically significant findings are presented.

Across the four outcomes there was substantial heterogeneity (Figure 2A $I^2 = 54.5,$% 95% CI: 0.0%-85.6%; Figure 2B $I^2 = 61.1,$% 95% CI: 0%-87.8%) but the difference did not reach statistical significance ($P > .05$). There was no strong evidence of publication bias (Appendix D) or small study effects (Egger’s test, $P = .919$).

3.4.1 Sub-analyses

No association was observed regardless of CVD subtype (CHD or stroke) or data source (ALSWH or Dubbo) (Figure 2). Further sub-analyses were not possible as they would likely reflect data source differences rather than differences by gender, baseline year, or years of follow-up. No study provided stratification by partner status and all studies recruited people living in Australia.

4 DISCUSSION

The five included papers reported six CVD outcomes and represented three Australian longitudinal cohort studies. The included papers reported no association between social health and incidence of CVD in fully adjusted models, and most unadjusted models. Notably, all included papers were assessed as high risk of bias, mainly due to lack of adjustment for important confounders, self-report of CVD and short follow-up.

Since our systematic search in June 2020, we have identified only one further publication that would have been included in this review. Freak-Poli et al. followed 11,486 relatively healthy Australians over the age of 70 years from the ASPirin in Reducing Events in the Elderly (ASPREE) trial for an average of 4.5 years. Overall, older healthy Australians with poor social health (either socially isolated, had low social support or were lonely) were 42% more likely to develop CVD and twice as likely to die from CVD. This was unchanged after accounting for already established CVD risk factors of age, gender, tobacco smoking, systolic blood pressure, high-density lipoprotein, non-HDL, diabetes, serum creatinine, and antihypertensive drug use. When looking at the components of social health separately, social isolation (66% greater risk) and low social support (twice the risk), but not loneliness, predicted incidence of CVD. When assessing CVD types separately, all measures of poor social health predicted ischemic stroke, and inconsistent patterns for heart failure hospitalization and myocardial infarction. Freak-Poli et al. also assessed interaction effects with other CVD risk-factors and reported that the relationship between poor social health and incidence of CVD was stronger among older Australians who smoked tobacco, lived in a major city, or were aged 70-75 years (rather than the 75+ years age category). Importantly, CVD was a prespecified secondary endpoint of the main ASPREE trial, and was diagnosed with adjudication by an expert committee. Social isolation and social support were assessed using questions from the Revised Lubben Social Network Scale, while loneliness was assessed through one question from the Center for Epidemiological Studies – Depression (CESD) Scale. While Freak-Poli et al. findings overcome the use of self-reported CVD, the generalisability is limited to healthy older adults as the participants did not have CVD, dementia, significant physical disability, or any other disease likely to cause death in the next 5 years. Hence further studies assessing the relationship between social health and CVD in Australia and New Zealand are required.

Despite our inconclusive findings, one excluded study provides evidence that the international patterns between poor social health and CVD are relevant to New Zealanders. Caspi et al. and Danese et al. were excluded as their outcome was cardiovascular multifactorial risk status, rather than incidence of CVD. The longitudinal study followed 1037 babies from birth to age 32 years (thus far) and assessed whether social isolation measured at 5, 7, 9, 11 and 26 years was associated with CVD risk. This substantive longitudinal study demonstrated that childhood isolation was associated with adult cardiovascular multifactorial risk status at age 32, independent of other childhood indicators (socioeconomic status, IQ, overweight), health behaviours (physical activity, smoking, alcohol use), and exposure to stressful life events. Social isolation across all ages (childhood, adolescence and adulthood) had a cumulative and dose-response relationship with adult cardiovascular multifactorial risk at age 26 (RR: 2.58, 95% CI: 1.46-4.56). The relationship between social isolation across the life-course and age-related disease risk factors in this cohort was also observed at 32 years.

Future research needs to assess the contribution of Australia’s and New Zealand’s unique geographical spread, which may be masking the relationship between poor social health and incidence of CVD in the included studies. We know that people living in remote areas of Australia are more likely to have prevalent CVD and die from CVD, however, we are uncertain of how remoteness affects social health in Australia and New Zealand and whether remoteness influences the relationship between poor social health and CVD. International research has identified that several geographic factors are connected to poor social health, including transport disadvantage, reduced access to services and community infrastructure.
increased crime, and lower population density. international research also suggests that people who live in rural, outer metropolitan fringe or lower socio-economic locations are at greater risk of social isolation and loneliness. aligned with international research, the Australian Department of Health and Ageing reported “Many people in rural and remote Australia are socially isolated, with less face-to-face contact with family, friends and other support networks.” however, contradictory to these findings, social isolation among older Australians is highest “in the largest urban [city] regions and in sparsely populated states and territories.” finding support this as the relationship between poor social health and incidence of CVD was stronger among older healthy Australians who lived in a major city, compared to older healthy Australians living in inner regional areas. other research has suggested that social isolation patterns in Australia seem to go beyond a simple rural/urban divide. “Across Australia, there was no appreciable difference in the level of social isolation amongst older Australians” between metropolitan and non-metropolitan regions ...
emerges between regions when the data are mapped. 

Therefore further research is required to assess social health prevalence based on geographical location, and the implications for CVD risk.

### 4.1 Comparison to international literature

The few papers we included provided findings that contradict the international systematic review reporting that poor social relationships are associated with a 29% and 32% increase in risk of CHD and stroke incidence respectively. As part of the 23 included papers, Valtorta et al included two Australian papers (Strodl 2003 and Strodl 2006), which were also included in our review. We are unsure if Simons 2013 was identified by Valtorta et al, but it was potentially excluded as eligibility criteria was unclear in the short report. From Simons 2013’s referenced paper, author correspondence and prior papers, we observed that participants with prevalent CHD and stroke at baseline were included in Simons 2013’s sample, and prior events were adjusted for in the main analysis. Hence, inclusion in our review does not differ from Valtorta et al’s inclusion criteria. Byles 2015 and Sahle 2020, found in our review, were likely published after Valtorta et al’s search date.

There seems to be very little difference between Valtorta et al 2016 international systematic review and our current systematic review. Although Valtorta et al state "loneliness and social isolation" in the title, the search terms included "loneliness, social isolation, social relationships, social support, social network." Valtorta et al limited the CVD outcomes to CHD and stroke, however, we did not find any additional overall CVD outcome in our broader search. Similarly to our study, Valtorta et al placed no restriction on the study population, but only longitudinal studies were eligible in order to investigate temporal relationships. Our included papers analysed relatively large samples, initiated across three different decades, which were followed for between 3 and 16 years. Valtorta et al and our study both included papers which assessed the temporal relationships through logistic regression or Cox proportional hazards modelling, and limited the meta-analyses to papers which assessed the social health exposure as categorical.

We were only able to identify two slight distinctions between our systematic review and Valtorta et al’s international systematic review. First, while both included papers assessing CVD through self-report (as well as medical diagnosis), the proportion of included papers which used the self-reported method differed. In our study, all papers relied on baseline self-report prevalent CVD and only one study (Simons 2013) assessed incidence of CVD through clinical diagnosis. Valtorta et al reported that four of the 23 included papers relied on self-reported CVD. Hence, 80% of our included papers relied on self-reported incidence of CVD data, which is a lot higher than Valtorta et al’s 17%. Second, when meta-analyses were limited to studies that were in a format suitable for pooling we both removed papers that reported null findings. In our review, we excluded one study (Sahle 2020) from meta-analysis which accounted for 26% of our CHD events and we speculate that inclusion of this additional null association study would not affect our findings. However, Valtorta et al excluded four studies from meta-analyses which were from unique datasets, of which three reported null findings at multivariable adjustment. The null findings were in relatively large samples (n = 2334, n = 4251, and n = 9758) but only accounted for 9% of the CHD events and 3% of the stroke events. The influence of these excluded studies on Valtorta et al’s statistically significant findings is unclear.

### 4.2 Strengths and limitations

Our review mirrored the methodology of an international systematic review, which allowed direct comparison of findings. Inclusion of longitudinal data provided directional assessment of social health as a risk factor for incidence of CVD, reducing the issue of reverse causation. Conversion of odds ratios and hazard ratios to relative risks allowed direct comparison between studies, however we did misinterpret at protocol stage that biostatistical methodology is not available for conversion from continuous to categorical ratios. We improved upon the protocol by using a specified quality assessment tool for the risk of bias and assessing publication bias.

The main limitation was the small number of eligible studies, which came from only three longitudinal data sets, reported three CVD sub-types (CHD, stroke and heart disease) with no overall CVD outcome, relied heavily on self-reported CVD data, with only one assessing loneliness, resulting in inconclusive findings and the inability to conduct sub-group analyses. No studies stratified by gender or partner status, limiting intended reporting. Finally, the data captured in this review was collected prior to the Coronavirus Disease 2019 (COVID-19) pandemic, which has disrupted people’s lifestyle including health behaviours and healthcare delivery. The Cardiac Society of Australia and New Zealand (CSANZ) position statement discusses how the pandemic may have influenced social health in regards to CVD outcomes.

### 4.3 Conclusion

Our systematic review is inconclusive regarding the association between social isolation, lack of social support and loneliness and CVD incidence among people living in Australia and New Zealand. We identified five eligible papers from three longitudinal Australian cohort studies. No eligible studies were identified from New Zealand, highlighting a huge deficit in current research, as even research in Australia may not be generalisable due to different social, political and cultural systems. Included papers reported no association between social health and incidence of CVD in fully adjusted models, and most unadjusted models. The included papers relied heavily on self-reported CVD prevalence and incidence, hence further studies in Australia using medical diagnosis of CVD (through medical records, death certificates or national registers) are required. Additionally, further research should explore whether Australia’s
and New Zealand’s unique geographical population spread plays a role in the relationship between social health and CVD.

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CONFLICT OF INTEREST
None declared. The data collection, analysis and interpretation of data; the writing of the manuscript; and the decision to submit the manuscript for publication were solely at the discretion of the researchers, independent of funders.

AUTHOR CONTRIBUTIONS
RF, AZZP and JH contributed to data screening and data extraction. RF and AZZP undertook quality appraisal. RF undertook calculations for meta-analysis. RF and FB undertook critical interpretation of the data. RF wrote the manuscript. All authors contributed to, as well as, approved the final manuscript.

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APPENDIX A

SEARCH STRATEGIES

(A) Embase from the earliest record to 21st June 2020

Appendix 1: Search strategies

1a. Embase from the earliest record to 21st June 2020

| Search Term                      | Results | Status   | Display Results | More |
|----------------------------------|---------|----------|----------------|------|
| 1 social isolation               | 24245   | Advanced | Display Results | More |
| 2 social segregation             | 184     | Advanced | Display Results | More |
| 3 social distance                | 2940    | Advanced | Display Results | More |
| 4 loneliness                     | 8325    | Advanced | Display Results | More |
| 5 psychosocial deprivation       | 147     | Advanced | Display Results | More |
| 6 social participation           | 6133    | Advanced | Display Results | More |
| 7 community participation        | 2284    | Advanced | Display Results | More |
| 8 community integration          | 1032    | Advanced | Display Results | More |
| 9 social isolat.*.mp.            | 27891   | Advanced | Display Results | More |
| 10 social* interact.*.mp.        | 67044   | Advanced | Display Results | More |
| 11 social* support.*.mp.         | 162137  | Advanced | Display Results | More |
| 12 social* disconnect.*.mp.      | 166     | Advanced | Display Results | More |
| 13 social* separat.*.mp.         | 258     | Advanced | Display Results | More |
| 14 social* segregat.*.mp.        | 250     | Advanced | Display Results | More |
| 15 social* exclu.*.mp.           | 3245    | Advanced | Display Results | More |
| 16 social* marginalis*.*.mp.     | 114     | Advanced | Display Results | More |
| 17 social* alienat.*.mp.         | 250     | Advanced | Display Results | More |
| 18 social* communicat.*.mp.      | 4562    | Advanced | Display Results | More |
| 19 social* divid.*.mp.           | 28      | Advanced | Display Results | More |
| 20 social* seclu.*.mp.           | 13      | Advanced | Display Results | More |
| 21 social* detach.*.mp.          | 46      | Advanced | Display Results | More |
| 22 support system.mp.            | 32422   | Advanced | Display Results | More |
| 23 support network.mp.           | 1924    | Advanced | Display Results | More |
| 24 solitude.mp.                  | 624     | Advanced | Display Results | More |
| 25 social* cohesi*.mp.           | 1535    | Advanced | Display Results | More |
| 26 social* fee.*.mp.             | 1020    | Advanced | Display Results | More |
| 27 social* embedd.*.mp.          | 213     | Advanced | Display Results | More |
| 28 social* integrat.*.mp.        | 3784    | Advanced | Display Results | More |
| 29 exp Australia/                | 171731  | Advanced | Display Results | More |
| 30 exp New Zealand/              | 60011   | Advanced | Display Results | More |
| 31 Australia*.mp.                | 272765  | Advanced | Display Results | More |
| 32 New Zealand*.mp.              | 114136  | Advanced | Display Results | More |
| 33 Maori.*.mp.                   | 4602    | Advanced | Display Results | More |
| 34 Aboriginal*.mp.               | 11502   | Advanced | Display Results | More |
| 35 Torres Strait Islander*.mp.   | 2181    | Advanced | Display Results | More |
| 36 Indigenous*.mp.               | 43496   | Advanced | Display Results | More |
| 37 | ATSI.mp. | 124 | Advanced | Display Results | More ▼ |
| 38 | social support/ | 90575 | Advanced | Display Results | More ▼ |
| 39 | aotearoa*.mp. | 498 | Advanced | Display Results | More ▼ |
| 40 | cardiovascular disease/ | 277325 | Advanced | Display Results | More ▼ |
| 41 | cardiovascular disease*.tw. | 245963 | Advanced | Display Results | More ▼ |
| 42 | cardiovascular.mp. | 1053499 | Advanced | Display Results | More ▼ |
| 43 | CVD.mp. | 56675 | Advanced | Display Results | More ▼ |
| 44 | heart disease/ | 127875 | Advanced | Display Results | More ▼ |
| 45 | coronary disease.mp. | 28643 | Advanced | Display Results | More ▼ |
| 46 | coronary heart disease*.mp. | 72891 | Advanced | Display Results | More ▼ |
| 47 | myocardial infarction*.mp. | 302976 | Advanced | Display Results | More ▼ |
| 48 | heart attack*.mp. | 8271 | Advanced | Display Results | More ▼ |
| 49 | stroke.mp. | 449558 | Advanced | Display Results | More ▼ |
| 50 | heart failure/ | 249444 | Advanced | Display Results | More ▼ |
| 51 | coronary artery disease/ | 206945 | Advanced | Display Results | More ▼ |
| 52 | myocardial ischemia.mp. | 41760 | Advanced | Display Results | More ▼ |
| 53 | myocardial ischaemia.mp. | 7433 | Advanced | Display Results | More ▼ |
| 54 | hypertensive heart disease*.mp. | 2825 | Advanced | Display Results | More ▼ |
| 55 | angina.mp. | 120049 | Advanced | Display Results | More ▼ |
| 56 | angina pectoris/ | 66267 | Advanced | Display Results | More ▼ |
| 57 | vascular disease/ | 69541 | Advanced | Display Results | More ▼ |
| 58 | ((Cardiovascular or cardio-vascular) adj3 (disease* or disorder* or condition*)).tw. | 276084 | Advanced | Display Results | More ▼ |
| 59 | ((Coronary or heart or cardiac or myocardii*) adj3 (disease* or disorder* or condition* or infant*)).tw. | 700503 | Advanced | Display Results | More ▼ |
| 60 | brain ischemia/ | 142426 | Advanced | Display Results | More ▼ |
| 61 | brain ischaemia.mp. | 723 | Advanced | Display Results | More ▼ |
| 62 | cerebrovascular accident/ | 208472 | Advanced | Display Results | More ▼ |
| 63 | social*.distan*.mp. | 4183 | Advanced | Display Results | More ▼ |
| 64 | 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 38 or 63 | 248241 | Advanced | Display Results | More ▼ |
| 65 | 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 39 | 380014 | Advanced | Display Results | More ▼ |
| 66 | 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 | 2330475 | Advanced | Display Results | More ▼ |
| 67 | 64 and 65 and 66 | 395 | Advanced | Display Results | More ▼ |
(B) Medline from the earliest record to 21st June 2020

| 1 | Social Isolation/ | 13200 | Advanced | Display Results | More |
| 2 | Social Segregation/ | 131 | Advanced | Display Results | More |
| 3 | Social Distance/ | 2878 | Advanced | Display Results | More |
| 4 | Social Alienation/ | 1388 | Advanced | Display Results | More |
| 5 | Loneliness/ | 3661 | Advanced | Display Results | More |
| 6 | Psychosocial Deprivation/ | 1996 | Advanced | Display Results | More |
| 7 | Social Participation/ or Community Participation/ | 19419 | Advanced | Display Results | More |
| 8 | Community Integration/ | 344 | Advanced | Display Results | More |
| 9 | Social isolate*.mp. | 16835 | Advanced | Display Results | More |
| 10 | social interact*.mp. | 16446 | Advanced | Display Results | More |
| 11 | social support*.mp. | 82978 | Advanced | Display Results | More |
| 12 | social disconnect*.mp. | 93 | Advanced | Display Results | More |
| 13 | social separat*.mp. | 182 | Advanced | Display Results | More |
| 14 | social segregat*.mp. | 189 | Advanced | Display Results | More |
| 15 | social exclu*.mp. | 1572 | Advanced | Display Results | More |
| 16 | social marginalis*.mp. | 64 | Advanced | Display Results | More |
| 17 | social alienat*.mp. | 1472 | Advanced | Display Results | More |
| 18 | social communicat*.mp. | 2601 | Advanced | Display Results | More |
| 19 | social divid*.mp. | 22 | Advanced | Display Results | More |
| 20 | social secu*.mp. | 6 | Advanced | Display Results | More |
| 21 | social detach*.mp. | 32 | Advanced | Display Results | More |
| 22 | support system.mp. | 6617 | Advanced | Display Results | More |
| 23 | support network.mp. | 1143 | Advanced | Display Results | More |
| 24 | solitude.mp. | 344 | Advanced | Display Results | More |
| 25 | social cohes*.mp. | 1087 | Advanced | Display Results | More |
| 26 | social tie*.mp. | 736 | Advanced | Display Results | More |
| 27 | social embed*.mp. | 157 | Advanced | Display Results | More |
| 28 | social integrat*.mp. | 2354 | Advanced | Display Results | More |
| 29 | exp Australia/ | 143439 | Advanced | Display Results | More |
| 30 | exp New Zealand/ | 39132 | Advanced | Display Results | More |
| 31 | Australia*.mp. | 163573 | Advanced | Display Results | More |
| 32 | New Zealand*.mp. | 65043 | Advanced | Display Results | More |
| 33 | Maori*.mp. | 3103 | Advanced | Display Results | More |
| 34 | Aboriginal*.mp. | 7886 | Advanced | Display Results | More |
| 35 | Torres Strait Islander*.mp. | 1310 | Advanced | Display Results | More |
| 36 | Indigenous*.mp. | 28570 | Advanced | Display Results | More |
37  ATSI.mp.  54  Advanced  Display Results  More  
38  Social Support*  70251  Advanced  Display Results  More  
39  aclearao* .mp.  322  Advanced  Display Results  More  
40  Cardiovascular Diseases/  147352  Advanced  Display Results  More  
41  cardiovascular disease*.tw.  143104  Advanced  Display Results  More  
42  cardiovascular.mp.  508330  Advanced  Display Results  More  
43  CVD.mp.  27658  Advanced  Display Results  More  
44  Heart Diseases/  66218  Advanced  Display Results  More  
45  Coronary Disease/  130707  Advanced  Display Results  More  
46  coronary heart disease*.mp.  46536  Advanced  Display Results  More  
47  Myocardial Infarction/  165144  Advanced  Display Results  More  
48  heart attack*.mp.  4859  Advanced  Display Results  More  
49  Stroke/  100731  Advanced  Display Results  More  
50  Heart Failure/  117748  Advanced  Display Results  More  
51  Coronary Artery Disease/  61642  Advanced  Display Results  More  
52  Myocardial Ischemia/  38554  Advanced  Display Results  More  
53  myocardial ischaemia.mp.  4848  Advanced  Display Results  More  
54  hypertensive heart disease*.mp.  1480  Advanced  Display Results  More  
55  Angina Pectoris/  32432  Advanced  Display Results  More  
56  angina.mp.  66079  Advanced  Display Results  More  
57  Vascular Diseases/  36395  Advanced  Display Results  More  
58  ((cardiovascular or cardio-vascular) adj3 (disease* or disorder* or condition*).tw.  156501  Advanced  Display Results  More  
59  ((Coronary or heart or cardiac or myocardium) adj3 (disease* or disorder* or condition* or infarct*).tw.  416503  Advanced  Display Results  More  
60  Brain Ischemia/  51871  Advanced  Display Results  More  
61  brain ischaemia.mp.  460  Advanced  Display Results  More  
62  cerebrovascular accident*.tw.  6018  Advanced  Display Results  More  
63  social* distant*.mp.  3702  Advanced  Display Results  More  
64  1 or 2 or 3 or 4 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39  152554  Advanced  Display Results  More  
65  29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39  258302  Advanced  Display Results  More  
66  40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62  1258000  Advanced  Display Results  More  
67  64 and 65 and 66  135  Advanced  Display Results  More  

(C) Scopus from the earliest record to 21st June 2020

1c. Scopus from the earliest record to 21st June 2020

431 document results

(TITLE-ABS-KEY "social* isolat*" OR "social* interact*" OR "social* support") OR TITLE-ABS-KEY "social* disconnec*" OR "social* separat*" OR "social* segregat*" OR TITLE-ABS-KEY "social* exclu*" OR "social* distant*" OR "social* marginalis*" OR TITLE-ABS-KEY "social* alienat*" OR "social* communicat*" OR "social* divid*" OR TITLE-ABS-KEY "social* seclu*" OR "social* detach*" OR "support system") OR TITLE-ABS-KEY "support network" OR "loneliness" OR "solitude") OR TITLE-ABS-KEY "psychosocial deprivation" OR "social participation" OR "community participation") OR TITLE-ABS-KEY "social* cohesi*" OR "social* tie*" OR "social* embedd*") OR TITLE-ABS-KEY "community integration" OR "social* integrat*") AND ((TITLE-ABS-KEY "australia*" OR "new zealand*") OR TITLE-ABS-KEY "moe*" OR "aboriginal*" OR indigenous*) OR TITLE-ABS-KEY "(tobacco or smoking) or (alcohol or drinking) or (obesity or overweight) OR TITLE-ABS-KEY "(cancer) OR (cancer* or tumour* or neoplasm*)") AND ((TITLE-ABS-KEY "cardiovascular disease*" OR "cardiovascular") OR "cerebrovascular disease*) OR "heart disease") OR ("coronary disease") OR ("hypertensive heart disease") OR TITLE-ABS-KEY "(angina* or "angina pectoris") OR ("vascular disease") OR TITLE-ABS-KEY "(cardiovascular or cardio-vascular) adj3 (disease* or disorder* or condition*)") OR TITLE-ABS-KEY "(Coronary or heart or cardiac or myocardium) adj3 (disease* or disorder* or condition* or infarct*)") OR TITLE-ABS-KEY "(brain ischemia* or "brain ischaemia" or "cerebrovascular accident")")
1d. Web of Science from the earliest record to 21st June 2020

| Set | Results | Save History / Create Alert | Open Saved History | Edit Sets | Combine Sets | Delete Sets |
|-----|---------|-----------------------------|-------------------|-----------|---------------|-------------|
| #7  | 168     |                             |                   | Edit      | ○             | ○           |
|     | #5 AND #3 AND #2 | Indexes:SCI-EXPANDED, SSIC, AMHCU, CPIC-S, CPC-SSH, BRIC-S, BKCI-SSH, ESCI, CC-P-EXPANDED, IC Timespan:All years | | | | |
| #6  | 82      |                             |                   | Edit      | ○             | ○           |
|     | #5 AND #4 | Indexes:SCI-EXPANDED, SSIC, AMHCU, CPIC-S, CPC-SSH, BRIC-S, BKCI-SSH, ESCI, CC-P-EXPANDED, IC Timespan:All years | | | | |
| #5  | 1,567,406 | TOPIC: ("cardiovascular disease" OR "cardiovascular" OR CVD) OR TOPIC: ("heart disease" OR "coronary disease" OR "coronary heart disease") OR TOPIC: ("myocardial infarction" OR "heart attack" OR stroke OR "heart failure") OR TOPIC: ("coronary artery disease" OR "myocardial ischemia" OR "myocardial ischaemia" OR "hypertensive heart disease") OR TOPIC: ("angina" OR "angina pectoris" OR "vascular disease") OR TOPIC: ("Cardiovascular or cardio-vascular" adj3 ("disease" or disorder* or condition* or "disorder") OR TOPIC: ("coronary or heart or cardiac or myocardial") adj3 ("disease" or disorder* or condition* or "disorder") OR TOPIC: ("brain ischemia" OR "brain ischaemia" OR "cardiovascular accident") | Edit | ○ | ○ |
|     |         | Indexes:SCI-EXPANDED, SSIC, AMHCU, CPIC-S, CPC-SSH, BRIC-S, BKCI-SSH, ESCI, CC-P-EXPANDED, IC Timespan:All years | | | | |
| #4  | 1,498   |                             |                   | Edit      | ○             | ○           |
|     | #3 AND #2 AND #1 | Indexes:SCI-EXPANDED, SSIC, AMHCU, CPIC-S, CPC-SSH, BRIC-S, BKCI-SSH, ESCI, CC-P-EXPANDED, IC Timespan:All years | | | | |
| #3  | 602,203 | TS="(australia" OR "new zealand") OR TS="(maori" OR aboriginal" OR indigenous") OR TS="(torres strait islander" OR ati OR aotearoa") | Edit | ○ | ○ |
|     |         | Indexes:SCI-EXPANDED, SSIC, AMHCU, CPIC-S, CPC-SSH, BRIC-S, BKCI-SSH, ESCI, CC-P-EXPANDED, IC Timespan:All years | | | | |
| #2  | 230,539 | TOPIC: ("social" hypot† OR "social" intersect† OR "social" support† OR "social" support† OR "social" support† OR "social" support† | Edit | ○ | ○ |
|     |         | OR TOPIC: ("social" connect† OR "social" separat† OR "social" segregat†) OR TOPIC: ("social" exclu† OR "social" distant† OR "social" marginal†) OR TOPIC: ("social" alienat† OR "social" communicat† OR "social" divid†) OR TOPIC: ("social" sect† OR "social" detach† OR "social" support†) OR TOPIC: ("support network" OR "loneliness" OR "solitude") OR TOPIC: ("psychosocial deprivation" OR "social participation" OR "community participation") OR TOPIC: ("social" cohesion† OR "social" tie† OR "social" embed†) OR TOPIC: ("community integration" OR "social" integrat†) | | | | |
|     |         | Indexes:SCI-EXPANDED, SSIC, AMHCU, CPIC-S, CPC-SSH, BRIC-S, BKCI-SSH, ESCI, CC-P-EXPANDED, IC Timespan:All years | | | | |
| #1  | 3,508,781 | TS="(old adult" OR aged OR elderly OR "aged 80") OR TS="(late adult" OR geriatrics OR "geriatric community" OR "geriatric population") OR TS="(aged 80, and over" OR "frail elderly") OR TS="(old" citizen") OR "senior citizen") | Edit | ○ | ○ |
|     |         | Indexes:SCI-EXPANDED, SSIC, AMHCU, CPIC-S, CPC-SSH, BRIC-S, BKCI-SSH, ESCI, CC-P-EXPANDED, IC Timespan:All years | | | | |
## APPENDIX B

### EXCLUDED STUDIES

| Study | Title                                                                 | Authors                                                                 | DOI                                                      | Exclusion reason                |
|-------|----------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------|
| Abbott 2010 | Barriers and enhancers to dietary behaviour change for Aboriginal people attending a diabetes cooking course | Abbott, P.; Davison, J.; Moore, L.; Rubinstein, R.                      | 10.1186/s12916-019-1463-x                                 | 03. Not CVD                     |
| Abimbola 2019 | The NASSS framework for ex-post theorisation of technology-supported change in healthcare: worked example of the TORPEDO programme | Abimbola, S.; Patel, B.; Peiris, D.; Patel, A.; Harris, M.; Usherwood, T.; Greenhalgh, T. | 10.1007/s0038-009-7113-x         | 02. Not social health           |
| Adams 2009 | Effects of area deprivation on health risks and outcomes: a multilevel, cross-sectional, Australian population study | Adams, R. J.; Howard, N.; Tucker, G.; Appleton, S.; Taylor, A. W.; Chittleborough, C.; Gill, T.; Ruffin, R. E.; Wilson, D. H. | 10.1016/j.archger.2012.04.005 | 02. Not social health           |
| Albarqouni 2019 | External validation and comparison of four cardiovascular risk prediction models with data from the Australian Diabetes, Obesity and Lifestyle study | Albarqouni, L.; Doust, J. A.; Magliano, D.; Barr, E. L. M.; Shaw, J. E.; Glasziou, P. P. | 10.5694/mja2.12061                  | 02. Not social health           |
| Alfonso 2012 | Perception of worsening health predicts mortality in older men: the Health in Men Study (HIMS) | Alfonso, H.; Beer, C.; Yeap, B. B.; Hankey, G. J.; Flicker, L.; Almeida, O. P. | 10.1016/j.archger.2012.04.005 | 06. Social health not assessed as a predictor of CVD |
| Al- Ganmi | Medication adherence and predictive factors in patients with cardiovascular disease: a cross-sectional study | Al- Ganmi, A. H. A.; Alotaibi, A.; Gholidze, L.; Perry, L.             | 10.1111/nhs.12681              | 04. CVD prevalence              |
| Allen 2013 | Quality of life impact of cardiovascular and affective conditions among older residents from urban and rural communities | Allen, J.; Inder, K. J.; Harris, M. L.; Lewin, T. J.; Attia, J. R.; Kelly, B. J. | 10.1186/1477-7525-11-140         | 06. Social health not assessed as a predictor of CVD |
| Allisey 2016 | An application of an extended effort-reward imbalance model to police absenteeism behaviour | Allisey, A.; Rodwell, J.; Noblet, A.                                    | 10.1108/pr-06-2014-0125           | 03. Not CVD                     |
| Almeida 2005 | Depression and smoking amongst older general practice patients | Almeida, O. P.; Pfaff, J.                                               | 10.1016/j.jad.2005.02.014         | 03. Not CVD                     |
| Almeida 2011 | A practical approach to assess depression risk and to guide risk reduction strategies in later life | Almeida, O. P.; Alfonso, H.; Pirkis, J.; Kerse, N.; Sim, M.; Flicker, L.; Snowdon, J.; Draper, B.; Byrne, G.; Goldney, R.; Lautenschlager, N. T.; Stocks, N.; Scazufoa, M.; Huisman, M.; Araya, R.; Pfaff, J. | 10.1017/S1041610210001870 | 06. Social health not assessed as a predictor of CVD |
| Almeida 2011 | Complaints of difficulty to fall asleep increase the risk of depression in later life: the health in men study | Almeida, O. P.; Alfonso, H.; Yeap, B. B.; Hankey, G.; Flicker, L.      | 10.1016/j.jad.2011.05.045         | 06. Social health not assessed as a predictor of CVD |
| Almeida 2012 | Cardiovascular disease, depression and mortality: the Health in Men Study | Almeida, O. P.; Alfonso, H.; Flicker, L.; Hankey, G. J.; Norman, P. E. | 10.1097/JGP.0b013e318211c1ed      | 06. Social health not assessed as a predictor of CVD |
| Almeida 2013 | Cardiovascular diseases do not influence the mental health outcome of older men with depression over 6 y | Almeida, O. P.; Alfonso, H.; Yeap, B. B.; Hankey, G. J.; Flicker, L. | 10.1016/j.jad.2012.06.043            | 06. Social health not assessed as a predictor of CVD |
| Anderson 1995 | A population-based assessment of the impact and burden of caregiving for long-term stroke survivors | Anderson, C. S.; Linto, J.; Stewart-Wynne, E. G.                       |                                           | 06. Social health not assessed as a predictor of CVD |
| Anderson 1996 | Validation of the Short Form 36 (SF-36) health survey questionnaire among stroke patients | Anderson, C.; Laubscher, S.; Burns, R.                                |                                           | 04. CVD Prevalence              |
| Study       | Title                                                                 | Authors                                                                 | DOI                                      | Exclusion reason                              |
|------------|----------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------|----------------------------------------------|
| Anderson 2004 | The postmodern heart: War veterans' experiences of invasive cardiac technology | Anderson, C. C.                                                        | 10.1111/j.1365-2648.2004.02985.x        | 06. Social health not assessed as a predictor of CVD |
| Anderson 2006 | The effects of a multimodal intervention trial to promote lifestyle factors associated with the prevention of cardiovascular disease in menopausal and postmenopausal Australian women | Anderson, D.; Mizzari, K.; Kain, V.; Webster, J.                         | 10.1080/07399330500506543               | 06. Social health not assessed as a predictor of CVD |
| Andrew 2013 | Long-term unmet needs of community dwelling stroke survivors and carers in Australia | Andrew, N. E.; Kilkenny, M.; Naylor, R.; Purvis, T.; Cadilhac, D. A.    | 10.1159/000353129                       | 03. Not CVD                                  |
| Andrew 2013 | Differences in long-term unmet needs between younger and older stroke survivors | Andrew, N. E.; Kilkenny, M.; Naylor, R.; Purvis, T.; Cadilhac, D. A.    | 10.1111/ijs.12142                       | 04. CVD prevalence                           |
| Andrew 2013 | Understanding the factors associated with unmet needs in Australian stroke survivors | Andrew, N. E.; Kilkenny, M.; Naylor, R.; Purvis, T.; Cadilhac, D. A.    | 10.1111/ijs.12142                       | 04. CVD prevalence                           |
| Andrew 2013 | The impact of stroke survivor disability on the long-term needs of carers | Andrew, N. E.; Kilkenny, M.; Naylor, R.; Purvis, T.; Lalor, E.; Cadilhac, D. A. | 10.1111/ijs.12172                       | 04. CVD prevalence                           |
| Andrew 2014 | Understanding long-term unmet needs in Australian survivors of stroke | Andrew, N. E.; Kilkenny, M.; Naylor, R.; Purvis, T.; Lalor, E.; Moloczij, N.; Cadilhac, D. A. | 10.1111/ijs.12325                       | 06. Social health not assessed as a predictor of CVD |
| Aoun 2017  | Bereavement support for family caregivers: The gap between guidelines and practice in palliative care | Aoun, S. M.; Rumbold, B.; Howting, D.; Bolleter, A.; Breen, L. J.         | 10.1371/journal.pone.0184750            | 03. Not CVD                                  |
| Armstrong 2012 | Living withaphasia: three Indigenous Australian stories | Armstrong, E.; Hersh, D.; Hayward, C.; Fraser, J.; Brown, M.              | 10.3109/17549507.2011.663790            | 03. Not CVD                                  |
| Arndt 2009 | “Others had similar problems and you were not alone”: Evaluation of an open-group mutual aid model in cardiac rehabilitation | Arndt, M.; Murchie, F.; Schemb, A. M.; Davidson, P. M.                   | 10.1097/JCN.0b013e181a1c236              | 04. CVD prevalence                           |
| Arrol 2009 | Managing cardiovascular risk in the future | Arroll, B.; Elley, C. R.; Fitton, A.; Lebovitz, H.                       | 10.1002/9781444303353.ch12               | 02. Not social health                        |
| Aslani 2011 | A community pharmacist delivered adherence support service for dyslipidaemia | Aslani, P.; Rose, G.; Chen, T. F.; Whitehead, P. A.; Krass, I.           | 10.1093/eurpub/ckq118                    | 03. Not CVD                                  |
| Aspin 2012  | Strategic approaches to enhanced health service delivery for Aboriginal and Torres Strait Islander people with chronic illness: a qualitative study | Aspin, C.; Brown, N.; Jowsey, T.; Yen, L.; Leeder, S.                    | 10.1186/1472-6963-12-143                | 03. Not CVD                                  |
| Astley 2011 | Health resource variability in the achievement of optimal performance and clinical outcome | Astley, C. M.; MacDougall, C. J.; Davidson, P. M.; Chew, D. P.           | 10.1161/CIRCOUTCOMES.110.960229         | 02. Not social health                        |
| Attard 2012 | The comparative effects of multi-modality aphasia therapy and constraint-induced aphasia therapy-plus treatments for severe chronic Broca's aphasia: a pilot study | Attard, M.; Rose, M.; Lanyon, L.                                        |                                           | 03. Not CVD                                  |
| Azzopardi 2009 | Health-related quality of life 2 y after coronary artery bypass graft surgery | Azzopardi, S.; Lee, G.                                                   | 10.1097/JCN.0b013e31819b2125            | 06. Social health not assessed as a predictor of CVD |
| Badcock 2018 | Loneliness in psychotic illness and its association with cardiometabolic disorders | Badcock, J. C.; Mackinnon, A.; Waterreus, A.; Watts, G. F.; Castle, D.; McGrath, J. J.; Morgan, V. A. | 10.1016/j.schres.2018.09.021             | 03. Not CVD                                  |
| Study  | Title                                                                 | Authors                                                                 | DOI                                      | Exclusion reason       |
|--------|----------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------|------------------------|
| Badcock 2019 | Loneliness in psychotic illness and its association with cardiometabolic disorders | Badcock, J. C.; Mackinnon, A.; Waterreus, A.; Watts, G. F.; Castle, D.; McGrath, J. J.; Morgan, V. A. | 10.1016/j.schres.2018.09.021 | 03. Not CVD            |
| Bagot 2017 | Integrating acute stroke telemedicine consultations into specialists' usual practice: a qualitative analysis comparing the experience of Australia and the United Kingdom | Bagot, K. L.; Cadilhac, D. A.; Bladin, C. F.; Watkins, C. L.; Vu, M.; Donnan, G. A.; Dewey, H. M.; Emsley, H. C. A.; Davies, D. P.; Day, E.; Ford, G. A.; Price, C. I.; May, C. R.; McLoughlin, A. S. R.; Gibson, J. M. E.; Lightbody, C. E. | 10.1186/s12913-017-2694-1 | 06. Social health not assessed as a predictor of CVD |
| Bailie 2017 | Improving preventive health care in Aboriginal and Torres Strait Islander primary care settings | Bailie, J.; Matthews, V.; Laycock, A.; Schultz, R.; Burgess, C. P.; Peiris, D.; Larkins, S.; Bailie, R. | 10.1186/s12992-017-0267-z | 03. Not CVD            |
| Baker 2019 | Risk factors for acute rheumatic fever: literature review and protocol for a case-control study in New Zealand | Baker, M. G.; Gurney, J.; Oliver, J.; Moreland, N. J.; Williamson, D. A.; Piersie, N.; Wilson, N.; Merriman, T. R.; Percival, T.; Murray, C.; Jackson, C.; Edwards, R.; Page, L. F.; Mow, F. C.; Chong, A.; Gribben, B.; Lennon, D. | 10.3390/ijerph16224515 | 08. Review             |
| Bannink 2006 | Web-based assessment of cardiovascular disease risk in routine primary care practice in New Zealand: the first 18,000 patients (PREDICT CVD-1) | Bannink, L.; Wells, S.; Broad, J.; Riddell, T.; Jackson, R. | 10.3390/ijerph16224515 | 02. Not social health |
| Barker 2005 | Upper limb recovery after stroke: the stroke survivors' perspective | Barker, RN; Brauer, S. G. | 10.1080/14768230600976240 | 04. CVD prevalence |
| Bean 2007 | Ethnic differences in illness perceptions, self-efficacy and diabetes self-care | Bean, D.; Cundy, T.; Petrie, K. J. | 10.3390/ijerph16224515 | 03. Not CVD            |
| Beard 2009 | Influence of socioeconomic and cultural factors on rural health | Beard, J. R.; Tomaska, N.; Earnest, A.; Summerhayes, R.; Morgan, G. | 10.1111/j.1440-1584.2008.01030.x | 03. Not CVD            |
| Beckley 2007 | The influence of the quality and quantity of social support in the promotion of community participation following stroke | Beckley, MN | 10.1111/j.1440-1630.2007.00643.x | 01. Not AUS/NZ         |
| Beesley 2011 | Art after stroke: the qualitative experience of community dwelling stroke survivors in a group art programme | Beesley, K.; White, J. H.; Alston, M. K.; Sweetapple, A. L.; Pollack, M. | 10.3109/09638288.2011.571333 | 07. Intervention |
| Billah 2014 | AusSCORE II in predicting 30-d mortality after isolated coronary artery bypass grafting in Australia and New Zealand | Billah, B.; Huq, M. M.; Smith, J. A.; Sufi, F.; Tran, L.; Shardey, G. C.; Reid, C. M. | 10.1016/j.jtcvs.2014.02.027 | 02. Not social health |
| Blacker 2010 | Evaluation of the effectiveness of an acceptance and commitment therapy (ACT) group program to improve coping and quality of life for individuals post stroke | Blacker, D. J.; Byrnes, M. L.; Beilby, J. M. | 10.1111/j.1747-4949.2010.00458-4.x | 07. Intervention |
| Blacker 2019 | Indigenous stroke care: differences, challenges and a need for change | Blacker, D.; Armstrong, E. | 10.1111/imj.14399 | 04. CVD prevalence |
| Blomqvist 2018 | Enabling healthy living: Experiences of people with severe mental illness in psychiatric outpatient services | Blomqvist, M.; Sandgren, A.; Carlsson, I. M.; Jormfeldt, H. | 10.1111/imj.12313 | 03. Not CVD            |
| Study Title Authors DOI Exclusion reason |
|-----------------------------------------|---------------------------------|
| Dietary intervention for people with mental illness in South Australia Bogomolova, S.; Zarnowiecki, D.; Wilson, A.; Fielder, A.; Procter, N.; Itsiopoulos, C.; O’Dea, K.; Strachan, J.; Ballestrin, M.; Champion, A.; Parletta, N. 10.1093/heapro/daw055 03. Not CVD |
| Implementing cardiovascular disease prevention guidelines to translate evidence-based medicine and shared decision making into general practice: theory-based intervention development, qualitative piloting and quantitative feasibility Bonner, C.; Fajardo, M. A.; Doust, J.; McCaffery, K.; Trevena, L. 10.1186/s13012-019-0927-x 02. Not social health |
| Physical activity preferences, preferred sources of assistance, and perceived barriers to increased activity among physically inactive Australians Booth, M. L.; Bauman, A.; Owen, N.; Gore, C. J. 03. Not CVD |
| Developing tools to predict outcomes following cardiovascular surgery Boult, M.; Fitzpatrick, K.; Barnes, M.; Maddern, G.; Fitridge, R. 10.1111/j.1445-2197.2010.05644.x 02. Not social health |
| Validation study of GRACE risk scores in indigenous and non-indigenous patients hospitalized with acute coronary syndrome Bradshaw, P. J.; Katzenellenbogen, J. M.; Sanfilippo, F. M.; Hobbs, M. S. T.; Thompson, P. L.; Thompson, S. C. 10.1186/s12872-015-0138-6 02. Not social health |
| A call to action on Maori cardiovascular health Bramley, D.; Riddell, T.; Crengle, S.; Curtis, E.; Harwood, M.; Nehua, D.; Reid, P. 02. Not social health |
| Improving physical activity after stroke via treadmill training and self management (IMPACT): a protocol for a randomised controlled trial Brauer, S. G.; Kuys, S. S.; Paratz, J. D.; Ada, L. 10.1186/s12883-018-1015-6 02. Not social health |
| An evaluation of the telehealth facilitation of diabetes and cardiovascular care in remote Australian Indigenous communities: protocol for the telehealth eye and associated medical services network [TEAMSnet] project, a pre-post study design Brazionis, L.; Jenkins, A.; Keech, A.; Ryan, C.; Bursell, S. E.; T. EAMSnet Study Group 10.1186/s12913-016-1967-4 03. Not CVD |
| Zero end-digit preference in recorded blood pressure and its impact on classification of patients for pharmacologic management in primary care: PREDICT-CVD-6 Broad, J.; Wells, S.; Marshall, R.; Jackson, R. 10.3399/096016407782317964 02. Not social health |
| Rates of depression at 3 and 15 mo poststroke and their relationship with cognitive decline: The Sydney stroke study Brodaty, H.; Withall, A.; Altendorf, A.; Sachdev, P. S. 10.1097/JGP.0b013e3180590bca 04. CVD prevalence |
| Uncovering the determinants of cardiovascular disease among indigenous people Brown, A. D.; Morrissey, M. J.; Sherwood, J. M. 10.1080/13575850500485485 06. Social health not assessed as a predictor of CVD |
| Making a good time*: the role of friendship in living successfully with aphasia Brown, K.; Davidson, B.; Worrall, L. E.; Howe, T. 10.3109/17549507.2012.692814 03. Not CVD |
| Chronic disease patients’ experiences with accessing health care in rural and remote areas: a systematic review and qualitative meta-synthesis Brundisini, F.; Giacomini, M.; DeJean, D.; Vanstone, M.; Winsor, S.; Smith, A. 01. Not AUS/NZ |
| Mibbinbah and spirit healing: Fostering safe, friendly spaces for indigenous males in Australia Bulman, J.; Hayes, R. 10.3149/jmh.1001.6 03. Not CVD |
| Study  | Title                                                                 | Authors                                                                 | DOI                                          | Exclusion reason          |
|-------|----------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------|----------------------------|
| Bunani 2012 | The association between social support and psychosocial factors upon mortality and quality of life | Bunani, A. D.; Sedgewick, J. M.; Lehbi, A. M. | 10.1111/j.1440-1797.2012.01633.x | 01. Not AUS/NZ            |
| Bunker 2003 | “Stress” and coronary heart disease: psychosocial risk factors | Bunker, S. J.; Colquhoun, D. M.; Esler, MD; Hickie, I. B.; Hunt, D.; Jelinek, V. M.; Oldenburg, B. F.; Peach, H. G.; Ruth, D.; Tennant, C. C.; Tonkin, A. M. | 10.1111/j.1440-1797.2012.01633.x | 08. Review                |
| Burgess 2015 | Strengthening cardiovascular disease prevention in remote indigenous communities in Australia’s northern territory | Burgess, C. P.; Sinclair, G.; Ramjan, M.; Coffey, P. J.; Connors, C. M.; Katekar, L. V. | 10.1016/j.hlc.2014.11.008 | 07. Intervention          |
| Butland 2019 | Health behaviours of rural Australians following percutaneous coronary intervention: a systematic scoping review | Butland, M.; Corones-Watkins, K.; Evanson, A. D.; Cooke, M. | 10.22605/RRH4854 | 08. Review                |
| Byard 2002 | Incapacitation or death of a socially isolated parent or carer could result in the death of dependent children | Byard, R. W. | 10.1046/j.1440-1754.2002.00025.x | 03. Not CVD                |
| Byles 2014 | Psychological distress and comorbid physical conditions: disease or disability? | Byles, J. E.; Robinson, I.; Banks, E.; Gibson, R.; Leigh, L.; Rodgers, B.; Curryer, C.; Jorm, L. | 10.1002/da.22162 | 06. Social health not assessed as a predictor of CVD |
| Cadden 2007 | Educating nurses about cardiac monitoring in a stroke unit | Cadden, S. M. |                                  | 02. Not social health      |
| Cadilhac 2017 | Improving discharge care: The potential of a new organisational intervention to improve discharge after hospitalisation for acute stroke, a controlled before-after pilot study | Cadilhac, D. A.; Andrew, N. E.; Stroil Salama, E.; Hill, K.; Middleton, S.; Horton, E.; Meade, I.; Kühle, S.; Nelson, M. R.; Grimley, R. | 10.1136/bmjopen-2017-016010 | 07. Intervention          |
| Cameron 2010 | Does cognitive impairment predict poor self-care in patients with heart failure? | Cameron, J.; Worrall-Carter, L.; Page, K.; Riegel, B.; Lo, S. K.; Stewart, S. | 10.1093/eurjhf/hfq042 | 04. CVD prevalence        |
| Cameron 2016 | Carers' views on patient self-care in chronic heart failure | Cameron, J.; Rhodes, K. L.; Ski, C. F.; Thompson, D. R. | 10.1111/jocn.13124 | 04. CVD prevalence        |
| Cameron 2016 | Psychosocial adjustment of patients living with an internal cardioverter defibrillator | Cameron, J.; Mc Evedy, S.; Lugg, E.; Mariani, J.; Ski, C. F.; Thompson, D. R.; Hammash, M. H.; Moser, D. K. | 10.1093/eurheartj/ehw433 | 04. CVD prevalence        |
| Campbell 1994 | Disease, impairment, disability and social handicap: a community based study of people aged 70 y and Over | Campbell, A. J.; Busby, W. J.; Robertson, M. C.; Lum, C. L.; Langlois, J. A.; Morgan, F. C. | 10.3109/09638289409166015 | 06. Social health not assessed as a predictor of CVD |
| Canuto 2011 | Study protocol: a pragmatic randomised controlled trial of a 12-wk physical activity and nutritional education program for overweight Aboriginal and Torres Strait Islander women | Canuto, K. J.; McDermott, R. A.; Cargo, M.; Esterman, A. J. | 10.1186/1471-2458-11-655 | 03. Not CVD                |
| Cape 1994 | The influence of clinical problems, age and social support on outcomes for elderly persons referred to regional aged care assessment teams | Cape, R. D.; Gibson, S. J. |                                  | 03. Not CVD                |
| Caperchione 2011 | Physical activity behaviours of Culturally and Linguistically Diverse (CALD) women living in Australia: a qualitative study of socio-cultural influences | Caperchione, C. M.; Kolt, G. S.; Tennent, R.; Mummery, W. K. | 10.1186/1471-2458-11-26 | 03. Not CVD                |
| Caspi 2006 | Socially isolated children 20 y later - risk of cardiovascular disease | Caspi, A.; Harrington, H.; Moffitt, T. E.; Milne, B. J.; Poulton, R. | 10.1001/archpedi.160.8.805 | 03. Not CVD                |
| Study          | Title                                                                 | Authors                                                                 | DOI                                      | Exclusion reason                                                                 |
|---------------|----------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------|
| Cassel 1974   | Hypertension and cardiovascular disease in migrants: a potential source of clues? | Cassel, J.                                                             |                                          | 06. Social health not assessed as a predictor of CVD                              |
| Chan 1285     | Ethnic and socioeconomic disparities in the prevalence of cardiovascular disease in New Zealand | Chan, W. C.; Wright, C.; Riddell, T.; Wells, S.; Kerr, A. J.; Gala, G.; Jackson, R. | 10.1136/bmj.39455.596181.25             | 02. Not social health                                                            |
| Chan 2008     | Ethnic and socioeconomic disparities in the prevalence of cardiovascular disease in New Zealand | Chan, W. C.; Wright, C.; Riddell, T.; Wells, S.; Kerr, A. J.; Gala, G.; Jackson, R. | 10.11016/s0002-8703(03)00481-2           | 04. CVD prevalence                                                               |
| Cheok 2003    | Identification, course, and treatment of depression after admission for a cardiac condition: Rationale and patient characteristics for the Identifying Depression As a Comorbid Condition (IDACC) project | Cheok, F.; Schrader, G.; Banham, D.; Marker, J.; Hordacre, A. L.         |                                          | 04. CVD prevalence                                                               |
| Clark 1998    | The effects of depression and abnormal illness behaviour on outcome following rehabilitation from stroke | Clark, M. S.; Smith, D. S.                                             | 10.1191/026921598669567216             | 02. Not social health                                                            |
| Clark 1999    | Psychological correlates of outcome following rehabilitation from stroke | Clark, M. S.; Smith, D. S.                                             | 10.1191/02692159967399613              | 02. Not social health                                                            |
| Clark 1999    | Changes in family functioning for stroke rehabilitation patients and their families | Clark, M. S.; Smith, D. S.                                             | 10.1097/00004356-199909000-0003         | 06. Social health not assessed as a predictor of CVD                             |
| Clark 2003    | A randomized controlled trial of an education and counselling intervention for families after stroke | Clark, M. S.; Rubenach, S.; Winsor, A.                                  |                                          | 07. Intervention                                                                |
| Clark 2010    | Home based cardiac rehabilitation                                      | Clark, A. M.                                                           | 10.1136/bmj.b5510                       | 08. Review                                                                      |
| Clark 2015    | Development and feasibility testing of an education program to improve knowledge and self-care among Aboriginal and Torres Strait Islander patients with heart failure | Clark, R. A.; Fredericks, B.; Buitendyk, N. J.; Adams, M. J.; Howie-Esquiel, J.; Dracup, K. A.; Berry, N. M.; Atherton, J.; Johnson, S. |                                          | 02. Not social health                                                            |
| Cleland 2010  | Individual, social and environmental correlates of physical activity among women living in socioeconomically disadvantaged neighbourhoods | Cleland, V.; Ball, K.; Hume, C.; Timperio, A.; King, A. C.; Crawford, D. | 10.1016/j.socscimed.2010.02.028         | 03. Not CVD                                                                     |
| Courtney 2009 | Fewer emergency readmissions and better quality of life for older adults at risk of hospital readmission: a randomized controlled trial to determine the effectiveness of a 24-wk exercise and telephone follow-up program | Courtney, M.; Edwards, H.; Chang, A.; Parker, A.; Finlayson, K.; Hamilton, K. | 10.111/j.1532-5415.2009.02138.x         | 07. Intervention                                                                |
| Cruice 2010   | Health-related quality of life in people with aphasia: Implications for fluency disorders quality of life research | Cruice, M.; Worrall, L.; Hickson, L.                                   | 10.1016/j.jfludis.2010.05.008           | 03. Not CVD                                                                     |
| Daly 2000     | Health status, perceptions of coping, and social support immediately after discharge of survivors of acute myocardial infarction | Daly, J.; Elliott, D.; Cameron-Traub, E.; Salamonson, Y.; Davidson, P.; Jackson, D.; Chin, C.; Wade, V. |                                          | 06. Social health not assessed as a predictor of CVD                             |
| Danese 2009   | Adverse childhood experiences and adult risk factors for age-related disease: depression, inflammation, and clustering of metabolic risk markers | Danese, A.; Moffitt, T. E.; Harrington, H.; Milne, B. J.; Polanczyk, G.; Pariante, C. M.; Poulton, R.; Caspi, A. | 10.1001/archpediatrics.2009.214        | 03. Not CVD                                                                     |
| Study       | Title                                                                 | Authors                                                                                           | DOI                                                                 | Exclusion reason                  |
|------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------|
| Daniel 2011| Environmental risk conditions and pathways to cardiometabolic diseases in indigenous populations | Daniel, M.; Lekkas, P.; Cargo, M.; Stankov, I.; Brown, A.                                         | 10.1144/annurev.publhealth.012809.103557                              | 08. Review                       |
| Davidson 2003 | Identifying the communication activities of older people with aphasia: evidence from naturalistic observation | Davidson, B.; Worrall, L.; Hickson, L.                                                             |                                                                      | 03. Not CVD                      |
| Davidson 2004 | Integrated, collaborative palliative care in heart failure: the St. George Heart Failure Service experience 1999-2002 | Davidson, P.; Paull, G.; Introna, K.; Cockburn, J.; Davis, J. M.; Rees, D.; Gorman, D.; Magann, L.; Lafferty, M.; Dracup, K. |                                                                      | 06. Social health not assessed as a predictor of CVD |
| Davidson 2005 | Activities of home-based heart failure nurse specialists: a modified narrative analysis | Davidson, P.; Paull, G.; Rees, D.; Daly, J.; Cockburn, J.                                          |                                                                      | 04. CVD Prevalence               |
| Davidson 2006 | Social communication in older age: lessons from people with aphasia | Davidson, B.; Worrall, L.; Hickson, L.                                                             | 10.1310/0GGQ-CJDX-N2BR-W7W4                                          | 03. Not CVD                      |
| Davidson 2008 | Social participation for older people with aphasia: the impact of communication disability on friendships | Davidson, B.; Howe, T.; Worrall, L.; Hickson, L.; Toger, L.                                         | 10.1310/tsr1504-325                                                   | 03. Not CVD                      |
| Dean 2009   | Exercise intervention to prevent falls and enhance mobility in community dwellers after stroke: a protocol for a randomised controlled trial | Dean, C. M.; Rissel, C.; Sharkey, M.; Sherrington, C.; Cumming, R. G.; Barker, R. N.; Lord, S. R.; O'Rourke, S. D.; Kirkham, C. | 10.1186/1471-2377-9-38                                                 | 07. Intervention                |
| Dean 2014   | Treadmill training provides greater benefit to the subgroup of community-dwelling people after stroke who walk faster than 0.4 m/s: a randomised trial | Dean, C. M.; Ada, L.; Lindley, R. I.                                                               | 10.1016/j.physiolbehav.2014.03.004                                   | 07. Intervention                |
| Dengler 2011 | The heart beads program                                               | Dengler, K. A.; Scarfe, G.; Redshaw, S.; Wilson, V.                                               | 10.1111/j.1744-6155.2010.00273.x                                      | 04. CVD prevalence               |
| Denham 2019 | "This is our life now. our new normal": a qualitative study of the unmet needs of carers of stroke survivors | Denham, A.; Wynne, O.; Baker, A. L.; Spratt, N. J.; Turner, A.; Magin, P.; Janssen, H.; English, C.; Loh, M.; Bonevski, B. | 10.1177/1747493019858233                                              | 04. CVD prevalence               |
| DiBenedetto 2010 | A biopsychosocial model for depressive symptoms following acute coronary syndromes | Di Benedetto, M.; Bums, G. L.; Lindner, H.; Kent, S.                                               | 10.1080/08870440903019535                                             | 04. CVD prevalence               |
| Dollard 2004 | Broadening the reach of cardiac rehabilitation to rural and remote Australia | Dollard, J.; Smith, J.; R. Thompson D; Stewart, S.                                                   |                                                                      | 08. Review                       |
| D’Onise 2012 | Does an early childhood intervention affect cardiometabolic risk in adulthood? Evidence from a longitudinal study of preschool attendance in South Australia | D’Onise, K.; Lynch, J. W.; McMellott, R. A.                                                         | 10.1016/j.puhe.2012.04.012                                             | 03. Not CVD                      |
| Dracup 2006 | A nursing intervention to reduce prehospital delay in acute coronary syndrome: a randomized clinical trial | Dracup, K.; McKinley, S.; Riegel, B.; Mieschke, H.; Doering, L. V.; Moser, D. K.                     |                                                                      | 07. Intervention                |
| Draper 2007 | Stress in caregivers of aphasic stroke patients: a randomized controlled trial | Draper, B.; Bowring, G.; Thompson, C.; Thompson, C.; Van Heyst, J.; Conroy, P.; Thompson, J.      | 10.1177/0269215506071251                                              | 07. Intervention                |
| DuPlessis 2018 | Traversing the liminal: what can Fontan adults' transition experiences and perspectives teach us about optimizing healthcare? | Du Plessis, K.; Peters, R.; Culnane, E.; D’Udekem, Y.                                              | 10.1515/ijamh-2018-0020                                               | 04. CVD prevalence               |
| Study | Title | Authors | DOI | Exclusion reason |
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| Dyall 2008 | Stroke: A picture of health disparities in New Zealand | Dyall, L.; Feigin, V.; Brown, P.; Roberts, M. | 10.1071/AH09795 | 04. CVD prevalence |
| Essue 2010 | Informal care and the self-management partnership: implications for Australian health policy and practice | Essue, B. M.; Jowsey, T.; Jeon, Y. H.; Mirzaei, M.; Pearce-Brown, C. L.; Aspin, C.; Usherwood, T. P. | 10.1207/S15324796ABM2601-01 | 04. CVD prevalence |
| Fernandez 2008 | Cardiac rehabilitation coordinators’ perceptions of patient-related barriers to implementing cardiac evidence-based guidelines | Fernandez, R. S.; Davidson, P.; Griffiths, R. | 10.1097/01.JCN.0000317450.64778.0a0 | 04. CVD prevalence |
| Fernandez 2008 | Sociodemographic predictors and reasons for participation in an outpatient cardiac rehabilitation programme following percutaneous coronary intervention | Fernandez, R. S.; Salamonson, Y.; Griffiths, R.; Juergens, C.; Davidson, P. | 10.1111/j.1440-172X.2008.00685.x | 04. CVD prevalence |
| Ferry 2004 | Towards a safer culture: clinical pathways in acute coronary syndromes and stroke | Ferry, C. T.; Fitzpatrick, M. A.; Long, P. W.; Levi, C. R.; Bishop, R. O. | | 02. Not social health |
| Field 2002 | A case study in strategic change: developing a strategic research program to address cardiovascular disease and related disorders in aboriginal and Torres Strait Islander peoples and rural and remote settings | Field, P.; Wakerman, J. | | 02. Not social health |
| Finch 2017 | Undetected and underserved: the untold story of patients who had a minor stroke: equity of access is particularly concerning for minor stroke | Finch, E. C.; Foster, M. M.; Fleming, J.; Aitken, P. D.; Williams, I.; Cruwys, T.; Worrall, L. | 10.5694/mja16.01009 | 08. Review |
| Fini 2014 | How physically active are people following stroke? | Fini, N. A.; Holland, A. E.; Keating, J.; Simek, J.; Bernhardt, J. | 10.1111/ijs.12297 | 08. Review |
| Fullagar 2003 | Governing women’s active leisure: the gendered effects of calculative rationalities within Australian health policy | Fullagar, S. P. | 10.1080/0958159031000100206 | 03. Not CVD |
| Gallagher 2003 | Effects of a telephone counseling intervention on psychosocial adjustment in women following a cardiac event | Gallagher, R.; McKinley, S.; Dracup, K. | | 07. Intervention |
| Gallagher 2012 | Weight management issues and strategies for people with high cardiovascular risk undertaking an Australian weight loss program: a focus group study | Gallagher, R.; Kirkness, A.; Armari, E.; Davidson, P. M. | 10.1111/j.1442-2018.2011.00651.x | 03. Not CVD |
| Gallagher 2016 | Quality of life, social support and cognitive impairment in heart failure patients without diagnosed dementia | Gallagher, R.; Sullivan, A.; Burke, R.; Hales, S.; Sharpe, P.; Tofler, G. | 10.1111/ijn.12402 | 04. CVD prevalence |
| Garcia 2019 | The roles of dispositional coping style and social support in helping people with respiratory disease cope with a breathlessness crisis | Garcia, M. V.; Luckett, T.; Johnson, M.; Hutchinson, A.; Lal, S.; Phillips, J. L. | 10.1111/jan.14039 | 03. Not CVD |
| Garofalo 2012 | Pre-hospital delay in acute coronary syndromes: PREDICT CVD-18 | Garofalo, D.; Grey, C.; Lee, M.; Exeter, D.; Kerr, A. J. | | 02. Not social health |
| Gaskin 2015 | Parents experiences of going home with their infant following first stage cardiac surgery for single ventricle heart condition | Gaskin, K. L.; Hutchinson, S. | 10.1136/archdischild-2015-308599.20 | 01. Not AUS/NZ |
| Study  | Title                                                                 | Authors                                           | DOI                                               | Exclusion reason |
|--------|----------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------|------------------|
| Gaskin 2015 | Transition from hospital to home: psychosocial adaptation and adjustment in parents of infants with single ventricle heart conditions | Gaskin, K. L.; Hutchinson, S.                      | 10.1136/archdischild-2015-308599.11             | 01. Not AUS/NZ   |
| Gassner 2003 | Aerobic exercise and the post myocardial infarction patient: a review of the literature | Gassner, L. A.; Dunn, S.; Piller, N.               | 10.1016/S0147-9563%2803%2900039-6                 | 02. Not social health |
| Gill 2016 | Feeling angry about current health status: using a population survey to determine the association with demographic, health and social factors | Gill, T. K.; Price, K.; Dal Grande, E.; Daly, A.; Taylor, A. W. | 10.1186/s12889-016-3232-5                          | 03. Not CVD       |
| Gliksman 1995 | Social support, marital status and living arrangement correlates of cardiovascular disease risk factors in the elderly | Gliksman, MD; Lazarus, R.; Wilson, A.; Leeder, S. R. | 10.1016/0277-9536%2804%2900149-N                   | 03. Not CVD       |
| Glozier 2013 | Psychosocial risk factors for coronary heart disease | Glozier, N.; Tofler, G. H.; Colquhoun, D. M.; Bunker, S. J.; Clarke, D. M.; Hare, D. L.; Hickie, I. B.; Tatoulis, J.; Thompson, D. R.; Wilson, A.; Branagan, M. G. | 10.1186/s12889-016-3232-5                          | 06. Social health not assessed as a predictor of CVD |
| Glozier 2014 | The national heart foundation of Australia consensus statement on psychosocial risk factors for coronary heart disease | Glozier, N.; Tofler, G. H.; Colquhoun, D. M.; Bunker, S. J.; Clarke, D. M.; Hare, D. L.; Hickie, I. B.; Tatoulis, J.; Thompson, D. R.; Branagan, M. | 10.1016/j.heart.2014.03.1930                     | 06. Social health not assessed as a predictor of CVD |
| Graven 2011 | From rehabilitation to recovery: protocol for a randomised controlled trial evaluating a goal-based intervention to reduce depression and facilitate participation post-stroke | Graven, C.; Brock, K.; Hill, K.; Ames, D.; Cotton, S.; Joubert, L. | 10.1186/1471-2377-11-73                          | 07. Intervention  |
| Graves 2009 | Cost-effectiveness of an intervention to reduce emergency re-admissions to hospital among older patients | Graves, N.; Courtney, M.; Edwards, H.; Chang, A.; Parker, A.; Finlayson, K. | 10.1371/journal.pone.0007455                     | 07. Intervention  |
| Grey 2010 | A comparative analysis of cardiovascular disease risk profiles of five Pacific ethnic groups assessed in New Zealand primary care practice: PREDICT CVD-13 | Grey, C.; Wells, S.; Riddell, T.; Pylypchuk, R.; Marshall, R.; Drury, P.; Elley, R.; Ameratunga, S.; Gentles, D.; Erick-Peleti, S.; Bell, F.; Kerr, A.; Jackson, R. | 10.3109/17549507.2012.692813                      | 02. Not social health |
| Grey 2010 | A comparative analysis of the cardiovascular disease risk factor profiles of Pacific peoples and Europeans living in New Zealand assessed in routine primary care: PREDICT CVD-11 | Grey, C.; Wells, S.; Riddell, T.; Kerr, A.; Gentles, D.; Pylypchuk, R.; Marshall, R.; Ameratunga, S.; Drury, P.; Elley, R.; Kyle, C.; Exeter, D.; Jackson, R. | 10.3109/17549507.2012.692813                      | 02. Not Social Health |
| Grohn 2012 | The first 3-mo post-stroke: what facilitates successfully living with aphasia? | Grohn, B.; Worrall, L. E.; Simmons-Mackie, N.; Brown, K. | 10.3233/978-1-6499-645-3-150                      | 03. Not CVD       |
| Gu 2016 | Identifying ehealth opportunities to support medication adherence - findings of a focus group study | Gu, Y.; Kennedy, J.; Warren, J.; Ahn, A. B.; Harwood, M.; Neuwelt, P.; Ammenwerth, E.; Schreier, G.; Horbst, A.; Hayn, D. | 10.1177/1545968312449454                          | 04. CVD prevalence |
| Hagan 2007 | Financial, family, and social factors impacting on cardiac rehabilitation attendance | Hagan, N. A.; Botti, M. A.; Watts, R. J.          |                                                  | 04. CVD Prevalence |
| Hakkennes 2012 | Selection for inpatient rehabilitation following severe stroke: an observational study | Hakkennes, S.; Brock, K.; Hill, K.; Churilov, L. | 10.1177/1545968312449454                          | 04. CVD prevalence |
| Study          | Title                                                                 | Authors                                                                 | DOI                          | Exclusion reason |
|---------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------|------------------|
| Hall 2015     | Improving longer term outcomes post stroke: exploring the barriers and facilitators that influence unmet need, life quality and participation after stroke | Hall, J.; Hawkins, R.; Dickerson, J.; Crocker, T.; McEachan, R.; Forster, A. | 10.1111/ijs.12585           | 01. Not AUS/NZ    |
| Hammash 2019  | Perceived control and quality of life among recipients of implantable cardioverter defibrillator | Hammash, M.; McEvedy, S. M.; Wright, J.; Cameron, J.; Miller, J.; Ski, C. F.; Thompson, D. R.; Biddle, M. J.; Wimsatt, A.; Schrader, M.; Smith, R. V.; Chung, M. L.; Moser, D. K. | 10.1016/j.aucc.2018.08.005 | 04. CVD prevalence |
| Hammond 2008  | Factors associated with persistent risk of depression in older people following discharge from an acute cardiac unit | Hammond, A. J.; Yu, S.; Esa, K.; Jabbour, J.; Wakefield, L.; Ryan, P.; Visvanathan, R. | 10.1017/S1041610208007138    | 04. CVD Prevalence |
| Hancock 2017  | Rational clinical evaluation of suspected acute coronary syndromes: the value of more information | Hancock, D. G.; Chuang, M. Y. A.; Bystrom, R.; Halabi, A.; Jones, R.; Horsfall, M.; Cullen, L.; Parsonage, W. A.; Chew, D. P. | 10.1111/1742-6723.12819     | 02. Not social health |
| Hand 1996     | Older adults with lifelong intellectual handicap in New Zealand: prevalence, disabilities and implications for regional health authorities | Hand, J. E.; Reid, P. M. |                             | 03. Not CVD       |
| Harris 2010   | How do we manage patients who become unemployed? | Harris, M. F.; Harris, E.; Shortus, T. D. |                             | 03. Not CVD       |
| Hawkes 2009   | Randomised controlled trial of a secondary prevention program for myocardial infarction patients (ProActive Heart): study protocol. Secondary prevention program for myocardial infarction patients | Hawkes, A. L.; Atherton, J.; Barr, C. B.; Scuffham, P.; Eadie, K.; Miller, N. H.; Oldenburg, B. | 10.1186/1471-2261-9-16     | 07. Intervention |
| Hawkes 2013   | Predictors of physical and mental health-related quality of life outcomes among myocardial infarction patients | Hawkes, A. L.; Patrao, T. A.; Ware, R.; Atherton, J. J.; Taylor, C. B.; Oldenburg, B. F. | 10.1186/1471-2261-13-69     | 04. CVD prevalence |
| Hawthorne 2008| Perceived social isolation in a community sample: its prevalence and correlates with aspects of peoples' lives | Hawthorne, G. | 10.1007/s00127-007-0279-8 | 03. Not CVD       |
| Haynes 2019   | Community-based participatory action research on rheumatic heart disease in an Australian Aboriginal homeland: evaluation of the ‘On track watch’ project | Haynes, E.; Marawili, M.; Marika, B. M.; Mitchell, A. G.; Phillips, J.; Bessarab, D.; Walker, R.; Cook, J.; Ralph, A. P. | 10.1016/j.evalprogplan.2019.02.010 | 02. Not social health |
| Hayward 2013  | Factors influencing the consultants’ decision to admit a stroke survivor to and then continue or cease inpatient stroke rehabilitation: a statewide survey | Hayward, K. S.; Aitken, P. D.; Barker, R. N.; Brauer, S. G. | 10.1111/ijs.12143          | 04. CVD prevalence |
| Hayward 2014  | Admission to and continuation of inpatient stroke rehabilitation in Queensland, Australia: a survey of factors that contribute to the consultant’s decision | Hayward, K. S.; Aitken, P. D.; Barker, RN; Brauer, S. G. | 10.1017/BrImp.2014.12       | 04. CVD prevalence |
| Hein 2013     | Myocardial infarction in singapore: ethnic variation in evidence-based therapy and its association with socioeconomic status, social network size and perceived stress level | Hein, T.; Loo, G.; Tai, B. C.; Phua, Q. H.; Chan, M. Y.; Poh, K. K.; Chia, B. L.; Richards, M.; Lee, C. H. | 10.1016/j.hlc.2013.04.119   | 01. Not AUS/NZ    |
| Hepburn-Brown 2019 | Early decision-making in acute pulmonary embolism: a retrospective clinical audit | Hepburn-Brown, M.; Irving, L.; Hammerschlag, G. | 10.1111/imj.14042          | 02. Not social health |
| Study     | Title                                                                 | Authors                                                                 | DOI                                      | Exclusion reason |
|-----------|-----------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------|-----------------|
| Hodge 2013 | Social connectedness and predictors of successful ageing              | Hodge, A. M.; English, D. R.; Giles, G. G.; Flicker, L.                 | 10.1016/j.maturitas.2013.05.002         | 03. Not CVD     |
| Horwood 2015 | Examining motivations and barriers for attending maintenance community-based cardiac rehabilitation using the health-belief model | Horwood, H.; Williams, M. J. A.; Mandic, S.                             | 10.1016/j.hlc.2015.03.023               | 04. CVD prevalence |
| Howe 2012 | ‘You needed to rehab... families as well: family members’ own goals for aphasia rehabilitation | Howe, T.; Davidson, B.; Worrall, L.; Hersh, D.; Ferguson, A.; Sherratt, S.; Gilbert, J. | 03. Not CVD     |
| Hsu-Hage 2001 | A qualitative investigation into the use of health services among Melbourne Chinese | Hsu-Hage, B. H. H.; Tang, K. C.; Li, R. J.; Lin, V.; Chow, T.; Thien, F. | 03. Not CVD     |
| Hua 2017 | Validation and recalibration of the Framingham cardiovascular disease risk models in an Australian Indigenous cohort | Hua, X.; McDermott, R.; Lung, T.; Weritong, M.; Tran-Duy, A.; Li, M.; Clarke, P. | 10.1177/2047487317722913 | 02. Not social health |
| Huffman 2010 | Cardiovascular health in indigenous communities: successful programs | Huffman, MD; Galloway, J. M.                                           | 10.1016/j.hlc.2010.02.013               | 04. CVD prevalence |
| Hutchinson 2015 | Relationship between health-related quality of life, comorbidities and acute health care utilisation, in adults with chronic conditions | Hutchinson, A. F.; Graco, M.; Rasekaba, T. M.; Parikh, S.; Berlowitz, D. J.; Lim, W. K. | 10.1186/s12955-015-0260-2 | 06. Social health not assessed as a predictor of CVD |
| Hyun 2017 | Gender inequalities in cardiovascular risk factor assessment and management in primary healthcare | Hyun, K. K.; Redfern, J.; Patel, A.; Peiris, D.; Brieger, D.; Sullivan, D.; Harris, M.; Usherwood, T.; MacMahon, S.; Lyford, M.; Woodward, M. | 10.1136/heartjnl-2016-310216 | 02. Not social health |
| Ilett 2010 | Selecting patients for rehabilitation after acute stroke: are there variations in practice? | Ilett, P. A.; Brock, K. A.; Graven, C. J.; Cotton, S. M.               | 10.1016/j.apmr.2009.11.028             | 04. CVD prevalence |
| Ingles 2007 | Sudden cardiac death in the young: a clinical genetic approach | Ingles, J.; Semsarian, C.                                              |                                          | 02. Not social health |
| Ingles 2014 | Medication non-compliance in patients with hypertrophic cardiomyopathy | Ingles, J.; Johnson, R.; Driscoll, E.; Sarina, T.; Semsarian, C.       | 10.1177/1474515114521363               | 04. CVD prevalence |
| Iyngkaran 2016 | Self managing heart failure in remote australia - translating concepts into clinical practice | Iyngkaran, P.; Toukhsati, S. R.; Harris, M.; Connors, C.; Kangaharan, N.; Ilton, M.; Nagel, T.; Moser, D. K.; Batterby, M. | 10.2174/1573403x126661607031 | 08. Review |
| Jackson 2017 | Psychosocial screening and assessment practice within cardiac rehabilitation: a survey of cardiac rehabilitation coordinators in Australia | Jackson, A. C.; Le Grande, M. R.; Higgins, R. O.; Rogerson, M.; Murphy, B. M. | 10.1016/j.hlc.2016.04.018 | 04. CVD prevalence |
| Jacobs 2011 | Does being elderly and living alone impact on outcomes following participation in a cardiac rehabilitation program? | Jacobs, D.; Young-Whitford, A.; Campbell, N.; Chong, S.; Jalaludin, B.; Davidson, P.; Quinn, W. | 10.1016/j.hlc.2011.05.606 | 04. CVD prevalence |
| Jeacocke 2002 | Adopting guideline review criteria as part of a regional project to improve heart failure management in general practice | Jeacocke, D.; Sprogis, A.; Lowe, J.; Heller, R. | 10.1108/14664100210427615 | 02. Not social health |
| Study    | Title                                                                 | Authors                                                                 | DOI                             | Exclusion reason |
|----------|----------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------|------------------|
| Jeon 2010| Achieving a balanced life in the face of chronic illness             | Jeon, Y. H.; Jowsey, T.; Yen, L.; Glasgow, N. J.; Essue, B.; Kljakovic, M.; Pearce-Brown, C.; Mirzaei, M.; Usherwood, T.; Jan, S.; Kraus, S. G.; Aspin, C. | 10.1016/j.hlc.2010.02.015   | 03. Not CVD      |
| Jeremy 2010 | Improving cardiovascular care for indigenous populations       | Jeremy, R.; Tonkin, A.; White, H.; Riddell, T.; Brieger, D.; Walsh, W.; Zeitz, C.; Brown, A.; Kritharides, L. | 10.1016/j.hlc.2010.02.015   | 08. Review      |
| Kahl 2016| Quality of life in adults with congenital heart disease: What matters? | Kahl, K. G.; Westhoff-Bleck, M.                                          | 10.21037/jtd.2016.10.66        | 02. Not social health |
| Karageorge 2020 | Previous experience and walking capacity predict community outings after stroke: an observational study | Karageorge, A.; Vargas, J.; Ada, L.; Kelly, P. J.; McCluskey, A. | 10.1080/0993985.2018.1484829  | 04. CVD prevalence |
| Kahl 2016| Quality of life in adults with congenital heart disease: What matters? | Kahl, K. G.; Westhoff-Bleck, M.                                          | 10.21037/jtd.2016.10.66        | 02. Not social health |
| Kahl 2016| Quality of life in adults with congenital heart disease: What matters? | Kahl, K. G.; Westhoff-Bleck, M.                                          | 10.21037/jtd.2016.10.66        | 02. Not social health |
| Karageorge 2020 | Previous experience and walking capacity predict community outings after stroke: an observational study | Karageorge, A.; Vargas, J.; Ada, L.; Kelly, P. J.; McCluskey, A. | 10.1080/0993985.2018.1484829  | 04. CVD prevalence |
| KarataÅŸ 2017 | Perceived social support and psychosocial adjustment in patients with coronary heart disease | KarataÅŸ, T.; BostanoÅŸlu, H.                                      | 10.1111/j.in.12558             | 01. Not AUS/NZ    |
| Kendall 2007| Recovery following stroke: the role of self-management education    | Kendall, E.; Catalano, T.; Kuipers, P.; Posner, N.; Buys, N.; Charker, J. | 10.1016/j.socscimed.2006.09.012 | 07. Intervention |
| Kenealy 2012| A 'whole of system' approach to compare options for CVD interventions in Counties Manukau | Kenealy, T.; Rees, D.; Sheridan, N.; Moffitt, A.; Tibby, S.; Homer, J. | 10.1111/j.1753-6405.2011.00812.x | 02. Not social health |
| Kennedy 2012| Factors influencing selection for rehabilitation after stroke: a questionnaire using case scenarios to investigate physician perspectives and level of agreement | Kennedy, G. M.; Brock, K. A.; Lunt, A. W.; Black, S. F. | 10.1016/j.apmr.2011.11.036   | 04. CVD prevalence |
| Kerr 2019| A unified national cardiovascular disease (CVD) risk generator is required to address equity in the management of CVD risk in clinical practice in New Zealand | Kerr, A.; Wells, S.; Moffitt, A.; Lund, M.; Kreichbaum, J.; Harwood, M.; Jackson, R. | 10.1016/j.brlmp.2014.18      | 02. Not social health |
| Killey 2014| Paths to work after stroke in Australia                              | Killey, J.; Gustafsson, L.; Hoyle, M.                                  | 10.1017/Brlmp.2014.18          | 02. Not social health |
| Kiropoulos 2012 | Increased psychosocial stress in Greek-born immigrants compared to Anglo-Australians with coronary heart disease: the healthy heart, healthy mind study | Kiropoulos, L. A.; Meredith, I.; Tonkin, A.; Clarke, D.; Antonis, P.; Plunkett, J. | 10.1016/j.hlc.2012.07.018   | 06. Social health not assessed as a predictor of CVD |
| Knight 2017| Developing a synthetic national population to investigate the impact of different cardiovascular disease risk management strategies; a derivation and validation study | Knight, J.; Wells, S.; Marshall, R.; Exeter, D.; Jackson, R. | 10.1371/journal.pone.0173170  | 02. Not social health |
| Korda 2017| Variation in readmission and mortality following hospitalisation with a diagnosis of heart failure: prospective cohort study using linked data | Korda, R. J.; Du, W.; Day, C.; Page, K.; Macdonald, P. S.; Banks, E. | 10.1186/s12913-017-2152-0      | 04. CVD prevalence |
| Kowal 2010| Enduring dilemmas of Indigenous health. "You're always hearing about the stats... death happens so often": new perspectives on barriers to Aboriginal participation in cardiac rehabilitation. Comment | Kowal, E. E.; Paradies, Y. C.                                           | 10.1016/j.hlc.2010.02.017     | 04. CVD prevalence |
| Kritharides 2010 | Overview and determinants of cardiovascular disease in indigenous populations | Kritharides, L.; Brown, A.; Brieger, D.; Ridell, T.; Zeitz, C.; Jeremy, R.; Tonkin, A.; Walsh, W.; White, H. | 10.1016/j.hlc.2010.02.017     | 06. Social health not assessed as a predictor of CVD |
| Study | Title                                                                 | Authors                                                                 | DOI                                      | Exclusion reason |
|-------|----------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------|------------------|
| Lanyon 2018 | Exploring participant perspectives of community aphasia group participation: from "I know where I belong now" to "Some people didn't really fit in"
 | Lanyon, L.; Worrall, L.; Rose, M.                                      | 10.1080/02687038.2017.1396574                                        | 03. Not CVD                                              |
| Lauckner 2016 | Peer support for people with chronic conditions in rural areas: a scoping review
 | Lauckner, H. M.; Hutchinson, S. L.                                    |                                                                        | 03. Not CVD                                              |
| Lauder 2006 | A comparison of health behaviours in lonely and non-lonely populations
 | Lauder, W.; Mummery, K.; Jones, M.; Capernichie, C.                    | 10.1080/13548500500266607                                              | 03. Not CVD                                              |
| Lauder 2006 | Social capital, age and religiosity in people who are lonely
 | Lauder, W.; Mummery, K.; Sharkey, S.                                  |                                                                        | 03. Not CVD                                              |
| Lawrence 2017 | Yoga for stroke rehabilitation
 | Lawrence, M.; Celestino, F. T.; Matozinho, H. H.; S.; Govan, L.; Booth, J.; Beecher, J. | 10.1002/14651858.CD011483.pub2                      | 07. Intervention  |
| Leigh 2004 | The clinical support systems program
 | Leigh, J. A.; Long, P. W.; Phillips, P. A.; Mortimer, R. H.           |                                                                        | 03. Not CVD                                              |
| Leung 2010 | Geographic issues in cardiac rehabilitation utilization: a narrative review
 | Leung, Y. W.; Brual, J.; Macpherson, A.; Grace, S. L.                  | 10.1016/j.healthplace.2010.08.004                                      | 01. Not AUS/NZ                                          |
| Li 2016 | Impact of socioeconomic and risk factors on cardiovascular disease and type II diabetes in Australia: comparison of results from longitudinal and cross-sectional designs
 | Li, J. J.; Kinfu, Y.                                                  | 10.1136/bmjopen-2015-010 215                                             | 02. Not social health                                    |
| Liu 2016 | Risk factors for obstructive sleep apnea are prevalent in people with psychosis and correlate with impaired social functioning and poor physical health
 | Liu, D.; Myles, H.; Foley, D. L.; Watts, G. F.; Morgan, V. A.; Castle, D.; Waterreus, A.; Mackinnon, A.; Galletly, C. A. | 10.3389/fpsyt.2016.00139                                 | 06. Social health not assessed as a predictor of CVD |
| Lo 2012 | Pediatric stroke outcome measure predicts cognitive and functional deficits after childhood ischemic stroke
 | Lo, W.; Gordon, A.; Greenham, M.; Gomes, A.; Hajek, C.; Mackay, M.; Yeates, K. O.; Anderson, V. | 04. CVD prevalence                                      |                                |
| Lobstein 2004 | Obesity in children and young people: a crisis in public health
 | Lobstein, T.; Baur, L.; Uauy, R.                                      |                                                                        | 03. Not CVD                                              |
| Longman 2012 | Frequent hospital admission of older people with chronic disease: a cross-sectional survey with telephone follow-up and data linkage
 | Longman, J. M.; I Rolfe, M.; Passey, M.; Heathcote, K. E.; Ewald, D. P.; Dunn, T.; Barclay, L. M.; Morgan, G. G. | 10.1186/1472-6963-12-373                                  | 06. Social health not assessed as a predictor of CVD |
| Lord 2008 | How feasible is the attainment of community ambulation after stroke? A pilot randomized controlled trial to evaluate community-based physiotherapy in subacute stroke
 | Lord, S.; McPherson, K. M.; McNaughton, H. K.; Rochester, L.; Weatherall, M. | 10.1177/0269215507081922                                  | 07. Intervention  |
| Lovell 2010 | Telehealth technologies for managing chronic disease - experiences from Australia and the UK
 | Lovell, N. H.; Redmond, S. J.; Basilakis, J.; Shany, T.; Celler, B. G. | 10.1109/IEMBS.2010.5626312                                   | 02. Not social health                                    |
| Lynch 2016 | Education-only versus a multifaceted intervention for improving assessment of rehabilitation needs after stroke; a cluster randomised trial
 | Lynch, E. A.; Cadilhac, D. A.; Luker, J. A.; Hillier, S. L.            | 10.1186/s13012-016-0487-2                                            | 02. Not social health                                    |
| Lynch 2018 | Activity monitors for increasing physical activity in adult stroke survivors
 | Lynch, E. A.; Jones, T. M.; Simpson, D. B.; Fini, N. A.; Kuy, S. S.; Borschmann, K.; Kramer, S.; Johnson, L.; Callisaya, M. L.; Mahendran, N.; Janssen, H.; English, C. | 10.1002/14651858.CD012543.pub2                      | 07. Intervention  |
| Study        | Title                                                                 | Authors                                                                 | DOI                                   | Exclusion reason |
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| Macniven 2012 | Barriers and enablers to physical activity among older Australians who think they are insufficiently active | Macniven, R.; Pye, V.; Merom, D.; Milat, A.; Monger, C.; Bauman, A.; Van Der Ploeg, H. | 10.1016/j.jsams.2012.11.110         | 03. Not CVD     |
| Madsen 2013   | This is a forever project: supporting lifestyle changes in a regional Queensland community-based cardiac rehabilitation program | Madsen, W.                                                              | 10.1071/PY11137                      | 04. CVD prevalence |
| Maneze 2018   | Negotiating health and chronic illness in Filipino-Australians: a qualitative study with implications for health promotion | Maneze, D.; Ramjan, L.; DiGiacomo, M.; Everett, B.; Davidson, P. M.; Salamonson, Y. | 10.1080/13557858.2017.1294656       | 03. Not CVD     |
| Marmot 2000   | Social determinants of health: from observation to policy             | Marmot, M.                                                             |                                       | 03. Not CVD     |
| Marsden 2010  | A multidisciplinary group programme in rural settings for community-dwelling chronic stroke survivors and their carers: a pilot randomized controlled trial | Marsden, D.; Quinn, R.; Pond, N.; Golle生机, R.; Nellon, C.; White, J.; Mc Elduff, P.; Polack, M. | 10.1177/0269215509344268           | 07. Intervention |
| McCluskey 2015 | Compliance with Australian stroke guideline recommendations for outdoor mobility and transport training by post-inpatient rehabilitation services: an observational cohort study | McCluskey, A.; Ada, L.; Kelly, P. J.; Middleton, S.; Goodall, S.; Grimshaw, J. M.; Logan, P.; Longworth, M.; Karageorge, A. | 10.1186/s12913-015-0952-7           | 02. Not social health |
| Mlde 2017     | Unpacking high self-discharge rates for aboriginal cardiac patients   | Mlde, K.; Kelly, J.; Dowling, A.; Keech, W.; Brown, A.                  | 10.1016/j.hlc.2017.06.683           | 04. CVD Prevalence |
| McKenna 2009  | Comparison of time use, role participation and life satisfaction of older people after stroke with a sample without stroke | McKenna, K.; Liddle, J.; Brown, A.; Lee, K.; Gustafsson, L.             | 10.1111/j.1440-1630.2007.00728.x     | 02. Not social health |
| McLachlan 2010 | Equity of access to CVD risk management using electronic clinical decision support in the coronary care unit | McLachlan, A.; Wells, S.; Furness, S.; Jackson, R.; Kerr, A.             | 10.1016/j.ejcnurse.2010.01.007      | 02. Not social health |
| McLaughlin 2000 | Travelling sales: an occupational hazard?                            | McLaughlin, M.; Holley, L.                                             |                                       | 03. Not CVD     |
| Meyer 2013    | Differentiating between trust and dependence of patients with coronary heart disease: furthering the sociology of trust | Meyer, S. B.; Ward, P. R.                                               | 10.1080/13698575.2013.776017       | 02. Not social health |
| Milligan 1997 | Health-related behaviours and psycho-social characteristics of 18 y-old Australians | Milligan, R. A.; Burke, V.; Beilin, L. J.; Richards, J.; Dunbar, D.; Spencer, M.; Balde, E.; Gracey, M. P. |                                       | 03. Not CVD     |
| Mitchell 1992 | A cross-cultural assessment of perceived health problems in the elderly | Mitchell, R. A.; Imperial, E.; Zhuo, D.; Lu, Y.; Watts, G.; Kelleher, P.; Brunker, P.; Gass, G.; Cue, R.; Cross, J. |                                       | 06. Social health not assessed as a predictor of CVD |
| Mitchell 2014 | The healthy neighbourhood audit instrument: understanding the environmental and socio-cultural conditions to support healthy, happy and resilient residential communities | Mitchell, E.; Thompson, S.; Rowley, S.; Ong, R.; Markkanen, S.; Australian Government, Department of Families Housing Community Services; Indigenous Affairs; Community Housing Coalition, W. A.; Government of Western Australia, Department of Housing; Shelter, W. A.; Stockland, |                                       | 03. Not CVD     |
| Study | Title | Authors | DOI | Exclusion reason |
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| Moorley 2015 | Life after stroke: releasing the cultural hostage | Moorley, C. | 10.1111/ijs.12584 | 01. Not AUS/NZ |
| Morris 1991 | The relationship between the perception of social support and post-stroke depression in hospitalized patients | Morris, P.; Robinson, R. C.; Raphael, B.; Bishop, D. | | 04. CVD prevalence |
| Murphy 2013 | Are poor health behaviours in anxious and depressed cardiac patients explained by sociodemographic factors? | Murphy, B.; Luedeman, D.; Elliott, P.; Judd, F.; Humphreys, J.; Edington, J.; Jackson, A.; Myburgh, C.; Egan, L.; Wensel, A.; Sherlock, D. W.; Malan, N. T. | 10.1177/2047487312449593 | 02. Not CVD |
| Murphy 2014 | Red flags for persistent or worsening anxiety and depression after an acute cardiac event: a 6-month longitudinal study in regional and rural Australia | Murphy, C.; Egan, L.; Egan, E.; Egan, S.; Myburgh, C.; Egan, L.; Wensel, A.; Sherlock, D. W.; Malan, N. T. | 10.1016/j.jhl.2014.03.374 | 07. CVD prevalence |
| Myburgh 2018 | Coping and cardiac troponin T: a risk for hypertension and sub-clinical ECG left ventricular hypertrophy: the SABRA Study | Myburgh, C.; Egan, L.; Wensel, A.; Sherlock, D. W.; Malan, N. T. | 10.1046/j.1365-2648.2000.01517.x | 07. Intervention |
| Myburgh 2019 | Developing cardiovascular risk prediction models for Australia | Myburgh, C.; Egan, L.; Wensel, A.; Sherlock, D. W.; Malan, N. T. | 10.1164/mja2.50030 | 07. Intervention |
| O’Mara 2012 | The spirit of the tent embassy: 40 y on indigenous self-determination is essential to health and wellbeing | O’Mara, P. | 10.5694/mja12.10829 | 03. Not CVD |
| O’Mara 2010 | Stroke maintenance exercise group: pilot study on daily functioning in long-term stroke survivors | O’Mara, P.; Laidlaw, M.; Shoot, D.; Patel, A.; Patel, B.; Usherwood, T.; Harris, M.; Panaretto, K.; Lyford, M.; Patel, A.; Peiris, D. | 10.1016/j.jhlc.2010.03.2002 | 07. Intervention |
| O’Mara 2013 | Understanding the impact of a multifaceted quality improvement intervention in Australian primary healthcare: a protocol for a process evaluation | O’Mara, P.; Laidlaw, M.; Shoot, D.; Patel, A.; Patel, B.; Usherwood, T.; Harris, M.; Panaretto, K.; Lyford, M.; Patel, A.; Peiris, D. | 10.1186/s13012-014-0830-x | 07. Intervention |
| Patel 2014 | Impact of sustained use of a multifaceted computerized quality improvement intervention in Australian primary healthcare care: the TIPS study process evaluation | Patel, B.; Peiris, D.; Usherwood, T.; Li, Q.; Harris, M.; Panaretto, K.; Lyford, M.; Patel, A.; Patel, A.; Peiris, D. | 10.1161/HJ1917.1000293 | 07. Intervention |
| Patel 2017 | What drives adoption of a computerised, multifaceted quality improvement intervention for cardiovascular disease risk management in busy healthcare settings? A mixed methods analysis using normalisation process theory | Patel, B.; Usherwood, T.; Harris, M.; Patel, A.; Peiris, D.; Panaretto, K.; Zwar, N.; Patel, A. | 10.1016/j.jhlc.2017.03.2002 | 02. Not social health |
| Patterson 2019 | What drives adoption of a computerised, multifaceted quality improvement intervention for cardiovascular disease risk management in busy healthcare settings? A mixed methods analysis using normalisation process theory | Patterson, S.; Ross-Edwards, B.; Gill, H. L.; Patterson, S.; Patterson, S. A.; Ross-Edwards, B. | 10.1111/j.1747-1587.2007.00421.x | 07. Intervention |
| Patterson 2010 | Long-term stroke survivor’s needs and perceptions of an exercise maintenance model of care | Patterson, S.; Ross-Edwards, B.; Gill, H. L.; Patterson, S. A.; Ross-Edwards, B. | 10.1111/j.1747-1587.2007.00421.x | 07. Intervention |
| Study      | Title                                                                 | Authors                                                                 | DOI                                | Exclusion reason       |
|------------|------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------|------------------------|
| Peiris 2009| An electronic clinical decision support tool to assist primary care providers in cardiovascular disease risk management: development and mixed methods evaluation | Peiris, D. P.; Joshi, R.; Webster, R. J.; Groenestein, P.; Usherwood, T. P.; Heeley, E.; Turnbull, F. M.; Lipman, A.; Patel, A. | 10.1016/j.heart.2009.07.116 | 02. Not social health  |
| Peiris 2014| Effect of a multi-faceted quality improvement intervention to improve cardiovascular disease risk identification and management in Australian Primary Health Care: the torpedo cluster-randomised trial | Peiris, D.; Usherwood, T.; Panaretto, K.; Harris, M.; Hunt, J.; Zwar, N.; Redfern, J.; Cass, A.; Colagiuri, S.; Hayman, N.; Patel, A. | 10.1016/j.heart.2014.03.1317 | 07. Intervention      |
| Peiris 2015| Effect of a computer-guided, quality improvement program for cardiovascular disease risk management in primary health care: the treatment of cardiovascular risk using electronic decision support cluster-randomized trial | Peiris, D.; Usherwood, T.; Panaretto, K.; Harris, M.; Hunt, J.; Redfern, J.; Zwar, N.; Colagiuri, S.; Hayman, N.; Lo, S.; Patel, B.; Lyford, M.; Macmahon, S.; Neal, B.; Sullivan, D.; Cass, A.; Jackson, R.; Patel, A. | 10.1161/CIRCUITCOMES.114.001235 | 07. Intervention      |
| Penn 2017  | Intercultural aphasia: new models of understanding for Indigenous populations | Penn, C.; Armstrong, E. | 10.1080/02687038.2016.1213788 | 03. Not CVD             |
| Petrie 1996| Role of patients' view of their illness in predicting return to work and functioning after myocardial infarction: longitudinal study | Petrie, K. J.; Weinman, J.; Sharpe, N.; Buckley, J. |                                      | 04. CVD prevalence     |
| Pettman 2008| Self-management for obesity and cardio-metabolic fitness: description and evaluation of the lifestyle modification program of a randomised controlled trial | Pettman, T. L.; Misan, G. M. H.; Owen, K.; Warren, K.; Coates, A. M.; Buckley, J. D.; Howe, P. R. C. | 10.1186/1479-5868-5-53 | 07. Intervention      |
| Pier 2008  | Identifying the health and mental health information needs of people with coronary heart disease, with and without depression | Pier, C.; Shandley, K. A.; Fisher, J. L.; Burstein, F.; Nelson, M. R.; Piterman, L. |                                      | 04. CVD prevalence     |
| Pit 2010   | Health problems and retirement due to ill-health among Australian retirees aged 45-64 y | Pit, S. W.; Shrestha, R.; Schofield, D.; Passey, M. | 10.1016/j.healthpol.2009.09.003 | 03. Not CVD             |
| Pitama 2011| A Kaupapa Maori approach to a community cohort study of heart disease in New Zealand | Pitama, S.; Wells, J. E.; Faatoese, A.; Tikao-Mason, K.; Robertson, P.; Huria, T.; Gillies, T.; Doughty, R.; Whalley, G.; Troughton, R.; Sheerin, I.; Richards, M.; Cameron, V. A. | 10.1111/j.1753-6405.2011.00702.x | 02. Not social health  |
| Provance 2019| Assessing patient preferences for shared decision-making in peripheral artery disease: insights from the PORTRAIT Registry | Provance, J. B.; Spurtus, J. A.; Decker, C.; Jones, P. G.; Smolderen, K. G. | 10.1161/CIRCUITCOMES.119.005730 | 01. Not AUS/NZ          |
| Quigley 2019| Are we there yet? Exploring the journey to quality stroke care for Aboriginal and Torres Strait Islander peoples in rural and remote Queensland | Quigley, R.; Mann, J.; Robertson, J.; Bonython-Ericson, S. | 10.22605/RRH4850 | 04. CVD prevalence     |
| Quirk 2018 | Predictors of physical activity among rural adults following cardiac rehabilitation | Quirk, J.; Parfitt, G.; Ferrar, K.; Davison, K.; Dolman, J. | 10.1037/rep0000232 | 04. CVD prevalence     |
| Rabanal 2018| Performance of a Framingham cardiovascular risk model among Indians and Europeans in New Zealand and the role of body mass index and social deprivation | Rabanal, K. S.; Meyer, H. E.; Plyypchuk, R.; Mehta, S.; Selmer, R. M.; Jackson, R. T. | 10.1136/openhrt-2018-000821 | 02. Not social health  |
| Study          | Title                                                                 | Authors                                                                                           | DOI                                      | Exclusion reason          |
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| Ramsamy 2017  | A retrospective audit of post discharge outcome for patients supported by 'acute coronary syndrome support network' to remote communities in the northern territory of australia | Ramsamy, L.; Lau, S.; Abeyaratne, A.; Haste, M.; Kangaharan, N. | 10.1016/j.hlc.2017.06.664          | 02. Not social health     |
| Ray 2001      | Self-reported heart health behaviour patterns in a rural context      | Ray, R.                                                                                           |                                          | 03. Not CVD               |
| Reilly 2008   | Identifying psychosocial mediators of health amongst indigenous Australians for the Heart Health Project | Reilly, R. E.; Doyle, J.; Bretherton, D.; Rowley, K. G.; Harvey, J. L.; Briggs, P.; Charles, S.; Calleja, J.; Patten, R.; Atkinson, V. | 10.1080/13557850801903046          | 04. CVD prevalence        |
| Riddell 2012  | Cluster randomized controlled trial of a peer support program for people with diabetes: study protocol for the Australasian peers for progress study | Riddell, M. A.; Renwick, C.; Wolfe, R.; Colgan, S.; Dunbar, J.; Hagger, V.; Absetz, P.; Oldenburg, B. | 10.1186/1471-2458-12-843          | 03. Not CVD               |
| Riddell 2016  | Cardiovascular risk outcome and program evaluation of a cluster randomised controlled trial of a community-based, lay peer led program for people with diabetes | Riddell, M. A.; Dunbar, J. A.; Absetz, P.; Wolfe, R.; Li, H.; Brand, M.; Aziz, Z.; Oldenburg, B.; Oldenburg, B.; Dunbar, J. A.; Reddy, P.; Hagger, V.; Johnson, G.; De Courten, M.; Wolfe, R.; Carter, R.; Absetz, P.; Zaini, A. | 10.1186/s12889-016-3538-3          | 03. Not CVD               |
| Rosbergen 2017| Embedding an enriched environment in an acute stroke unit increases activity in people with stroke: a controlled before-after pilot study | Rosbergen, I. C. M.; Grimley, R. S.; Hayward, K. S.; Walker, K. C.; Rowley, D.; Campbell, A. M.; McGufficke, S.; Robertson, S. T.; Trinder, J.; Janssen, H.; Brauer, S. G. | 10.1177/0269215517705181          | 07. Intervention          |
| Rosbergen 2019| The impact of environmental enrichment in an acute stroke unit on how and when patients undertake activities | Rosbergen, I. C.; Grimley, R. S.; Hayward, K. S.; Brauer, S. G. | 10.1177/0269215518820087          | 07. Intervention          |
| Ryan 2017     | A cross-sectional study of work-related and lifestyle factors associated with the health of Australian long distance commute and residential miners | Ryan, F.; Otto, B.; Khan, A.; Johnston, V.                                                            | 10.1080/21679169.2017.1381324       | 03. Not CVD               |
| Sapuppo 2018  | The unmet needs of young stroke survivors                             | Sapuppo, D.; Thijs, V.; Bernhardt, J.                                                              | 10.1177/1747493018778666          | 04. CVD prevalence        |
| Schulz 2000   | Factors which influence attendance at a rural Australian cardiac rehabilitation program | Schulz, D. L.; McBurney, H.                                                                          | 10.1054/che.2000.0086             | 04. CVD prevalence        |
| Scott 2004    | Achieving better in-hospital and after-hospital care of patients with acute cardiac disease | Scott, I. A.; Denaro, C. P.; Bennett, C. J.; Hickey, A. C.; Mudge, A. M.; Flores, J. L.; Sanders, D. C. J.; Thiele, J. M.; Wenck, B.; Bennett, J. W.; Jones, M. A. |                                          | 07. Intervention          |
| Scott 2015    | Body mass, cardiovascular risk and metabolic characteristics of young persons presenting for mental healthcare in Sydney, Australia | Scott, E. M.; Hermens, D. F.; White, D.; Naismith, S. L.; GeHue, J.; Whitwell, B. G.; Glazier, N.; Hickie, I. B. | 10.1136/bmjopen-2014-007066        | 03. Not CVD               |
| Simons 1998   | Risk factors for ischemic stroke Dubbo study of the elderly           | Simons Leon A. MD; John McCallum, DPhil; Yechiel Friedlander, PhD; Judith Simons, MACS               |                                          | 02. Not social health "Identified through references |
| Simons 2013   | Impact of loneliness and living alone                                 | Simons, L. A.; McCallum, J.; Simons, J.                                                             | 06. Social health not assessed as a predictor of CVD |
| Study    | Title                                                                 | Authors                                                                 | DOI                        | Exclusion reason |
|----------|-----------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------|------------------|
| Sinnett 1978 | Lifestyle, health and disease: a comparison between Papua New Guinea and Australia | Sinnett, P.; Whyte, M. | 10.1111/j.12465 | 03. Not CVD |
| Ski 2007 | Stroke: the increasing complexity of carer needs                    | Ski, C.; O’Connell, B. |                          | 03. Not CVD |
| Son 2016 | Biopsychosocial predictors of coping strategies of patients postmyocardial infarction | Son, H.; Friedmann, E.; Thomas, S. A.; Son, Y. J. | 10.1016/j.joleg.2018.12.004 | 04. CVD Prevalence |
| Son 2019 | How do patients develop self-care behaviors to live well with heart failure?: a focus group interview study | Son, Y. J.; Lee, Y. M.; Kim, E. Y. | 10.1111/j.12465 | 01. Not AUS/NZ |
| Spaderna 2017 | Role of depression and social isolation at time of waitlisting for survival 8 y after heart transplantation | Spaderna, H.; Zittermann, A.; Reichenspurner, H.; Ziegler, C.; Smits, J.; Weidner, G. | 10.1161/HA.117.007016 | 03. Not CVD |
| Spaeth 2018 | Economic evaluation of point-of-care testing in the remote primary health care setting of Australia's Northern Territory | Spaeth, B. A.; Kaambwa, B.; Shephard, M.D S.; Omond, R. | 10.2147/CEOR.S160291 | 02. Not social health |
| Speechly 2010 | Patient and general practitioner attitudes to healthy lifestyle behaviours and medication following coronary heart disease: An exploratory study | Speechly, C.; Bridges-Webb, C.; McKenzie, S.; Zurynski, Y.; Lucas, A. | 10.1071/PY09011 | 04. CVD prevalence |
| Stapelberg 2011 | A topographical map of the causal network of mechanisms underlying the relationship between major depressive disorder and coronary heart disease | Stapelberg, N. J. C.; Neumann, D. L.; Shum, D. H. K.; McConnell, H.; Hamilton-Craig, I. | dx.doi.org/10.3109/00048674.201 | 04. CVD prevalence |
| Stewart 2003 | Depression and cardiovascular morbidity and mortality: cause or consequence? | Stewart, R. A. H.; North, F. M.; West, T. M.; Sharples, K. J.; Simes, R. J.; Colquhoun, D. M.; White, H. D.; Tonkin, A. M. | 10.1016/j.heartj.2003.08.017 | 04. CVD prevalence |
| Strodl 2013 | A history of heart interventions moderates the relationship between psychological variables and the presence of chest pain in older women with self-reported coronary heart disease | Strodl, E.; Kenardy, J. | 10.1111/bjhp.12011 | 04. CVD prevalence |
| Stuart 2014 | A telephone-supported cardiovascular lifestyle programme (CLIP) for lipid reduction and weight loss in general practice patients: a randomised controlled pilot trial | Stuart, K. L.; Wyld, B.; Bastiaans, K.; Stocks, N.; Brinkworth, G.; Mohr, P.; Noakes, M. | dx.doi.org/10.1017/S1368980013000220 | 07. Intervention |
| Tamplin 2013 | 'Stroke a chord': The effect of singing in a community choir on mood and social engagement for people living with aphasia following a stroke | Tamplin, J.; Baker, F. A.; Jones, B.; Way, A.; Lee, S. | dx.doi.org/10.3233/NRE-130916 | 03. Not CVD |
| Tavener 2015 | Acknowledging how older australian women experience life after stroke: how does the WHO 18-Item brief ICF core set for stroke compare? | Tavener, M.; Thijsen, A.; Hubbard, I. J.; Francis, J. L.; Grennall, C.; Levi, C.; Byles, J. | 10.1080/07399332.2015.1055747 | 04. CVD prevalence |
| Taylor 2014 | Implementing the evidence: from presumption to training | Taylor, E.; Chan, J. | 10.1111/jis.12334 | 04. CVD prevalence |
| Thompson 2017 | Gender disparities in cardiovascular disease prevention | Thompson, L. E.; Daugherty, S. L. | 10.1136/heartjnl-2016-310788 | 02. Not social health |
| Thurston 2008 | What happens next? The role of cardiac rehabilitation in total patient care | Thurston, N. | 10.1016/j.hlc.2008.09.005 | 07. Intervention |
| Tibby 2010 | Establishment of an innovative specialist cardiac indigenous outreach service in rural and remote Queensland | Tibby, D.; Corpus, R.; Walters, D. L. | 10.1016/j.hlc.2010.02.023 | 02. Not social health |
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| Tideman 2014 | Impact of a regionalised clinical cardiac support network on mortality among rural patients with myocardial infarction | Tideman, P. A.; Tirimacco, R.; Senior, D. P.; Setchell, J. J.; Huynh, L. T.; Tavella, R.; Aylward, P. E.; Chew, D. P. | 10.2340/16501977-2184        | 02. Not social health |
| Tse 2017    | Reduction in retained activity participation is associated with depressive symptoms 3 mo after mild stroke: an observational cohort study | Tse, T.; Douglas, J.; Lentin, P.; Lindudden, T.; Churilov, L.; Ma, H.; Davis, S.; Donnan, G.; Carey, L. M. | 10.1080/09638288.2018.1471742 | 04. CVD prevalence |
| Tse 2018    | Longitudinal changes in activity participation in the first year post-stroke and association with depressive symptoms | Tse, T.; Linden, T.; Churilov, L.; Davis, S.; Donnan, G.; Carey, L. M.                               | 10.1080/09638288.2018.1471742 | 04. CVD prevalence |
| Tse 2019    | Longitudinal changes in activity participation in the first year post-stroke and association with depressive symptoms | Tse, T.; Linden, T.; Churilov, L.; Davis, S.; Donnan, G.; Carey, L. M.                               | 10.1080/09638288.2018.1471742 | 04. CVD prevalence |
| Tully 2014  | Routine depression screening after cardiac surgery simply misses those that need it most: Impact of missed cases on hospital resource utilization, cardiac outcomes, depression and quality of life | Tully, P.; Baker, R. A.                                                                               | 10.1177/1474515114521363      | 04. CVD prevalence |
| Turner 2010 | Clinical outcomes associated with depression, anxiety and social support among cardiac rehabilitation attendees | Turner, A.; Phillips, L.; Hambridge, J. A.; Baker, A. L.; Bowman, J.; Colyvas, K.                      | 10.3109/00048671003646751      | 04. CVD prevalence |
| Unsworth 1995 | Rehabilitation team decisions on discharge housing for stroke patients | Unsworth, C. A.; Thomas, S. A.; Greenwood, K. M.                                                    | 10.1016/S0003-9993(95)80658-X  | 04. CVD prevalence |
| Unsworth 1996 | Clients' perceptions of discharge housing decisions after stroke rehabilitation | Unsworth, C.                                                                                       | 10.5014/ajot.50.3.207         | 04. CVD prevalence |
| Unsworth 2019 | Preliminary screening recommendations for patients at risk of depression and/or anxiety more than 1 y poststroke | Unsworth, David J.; Mathias, Jane L.; Dorstyn, Diana S.                                            | 10.1016/j.jstrokecerebrovasdis.2019.03.014 | 04. CVD prevalence |
| Vallesi 2018 | "In their own voice"-incorporating underlying social determinants into aboriginal health promotion programs | Vallesi, S.; Wood, L.; Dimer, L.; Zada, M.                                                          | 10.3390/ijerph15071514         | 03. Not CVD       |
| VonDohren 2013 | Taking therapeutic leisure and recreation seriously during stroke recovery | Von Dohren, C.; Chin, G.                                                                            | 10.1111/ijs.12172              | 06. Social health not assessed as a predictor of CVD |
| Wang 2010   | The prevalence and predictors of anxiety and depression in adolescents with heart disease | Wang, Q.; Hay, M.; Clarke, D.; Menahem, S.                                                          | 10.1111/j.1445-5994.2010.02186.x | 04. CVD prevalence |
| Wang 2011   | Psychosocial functioning in adolescents with heart disease               | Wang, Q.; Hay, M.; Clarke, D.; Menahem, S.                                                          | 10.1016/j.hlc.2011.05.599      | 04. CVD prevalence |
| Ward 2011   | With good intentions: complexity in unsolicited informal support for Aboriginal and Torres Strait Islander peoples. A qualitative study | Ward, N. J.; Jowsey, T.; Haora, P. J.; Aspin, C.; Yen, L. E.                                      | 10.1186/1471-2458-11-686       | 03. Not CVD       |
| Wells 2017  | Cohort profile: the PREDICT cardiovascular disease cohort in New Zealand primary care (PREDICT-CVD 19) | Wells, S.; Riddell, T.; Kerr, A.; Pylypchuk, R.; Chelimo, C.; Marshall, R.; Exeter, D. J.; Mehta, S.; Harrison, J.; Kyle, C.; Grey, C.; Metcalfe, P.; Warren, J.; Kenealy, T.; Drury, P. L.; Harwood, M.; Bramley, D.; Gala, G.; Jackson, R. | 10.1093/ije/dyv312 | 02. Not social health |
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| Westbrook 1993 | Attitudes towards disabilities in a multicultural society | Westbrook, M. T.; Legge, V.; Pennay, M. | | 03. Not CVD |
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| White 2007 | Community-dwelling stroke survivors: function is not the whole story with quality of life | White, J. H.; Alston, M. K.; Marquez, J. L.; Sweetapple, A. L.; Pollack, M. R.; Attia, J.; Levi, C. R.; Sturm, J.; Whyte, S. | | 04. CVD prevalence |
| White 2008 | The occupational experience of stroke survivors in a community setting | White, J. H.; MacKenzie, L.; Magin, P.; Pollack, M. R. P. | 10.3928/15394492-20080901-05 | 04. CVD prevalence |
| White 2009 | Exploring poststroke mood changes in community-dwelling stroke survivors: a prospective, longitudinal, mixed methods study | White, J.; Magin, P.; Attia, J.; Sturm, J.; Pollack, M.; McElduff, P. | 10.1111/j.1747-4949.2009.00306.x | 04. CVD prevalence |
| White 2016 | Predictors of health-related quality of life in community-dwelling stroke survivors: a cohort study | White, J.; Magin, P.; Attia, J.; Sturm, J.; McElduff, P.; Carter, G. | 10.1093/fampra/cmw011 | 06. Social health not assessed as a predictor of CVD |
| Wilson 1993 | The good heart, good life survey: self-reported cardiovascular disease risk factors, health knowledge and attitudes among Greek-Australians in Sydney | Wilson, A.; Bekiaris, J.; Gleeson, S.; Papasavva, C.; Wise, M.; Hawe, P. | 10.1111/j.1753-6405.1993.tb00138.x | 03. Not CVD |
| Winefield 1982 | Male social support and recovery after myocardial infarction | Winefield, H. R. | 10.1080/00049538208254716 | 04. CVD prevalence |
| Wong 2010 | Caveat anicula! Beware of quiet little old ladies: demographic features, pharmacotherapy, readmissions and survival in a 10-y cohort of patients with heart failure and preserved systolic function | Wong, D. T.; Clark, R. A.; Dundon, B. K.; Philpott, A.; Molaree, P.; Shakib, S. | | 04. CVD prevalence |
| Worrall-Carter 2005 | The experiences and adjustments of women following their first acute myocardial infarction | Worrall-Carter, L.; Jones, T.; Driscoll, A. | | 04. CVD prevalence |
| Yarmo-Roberts 2010 | The heart of the matter: health status of aged care clients receiving home- and community-based care | Yarmo-Roberts, D.; Freak-Poli, R. L.; Cooper, B.; Noonan, T.; Stolewinder, J.; Reid, C. M. | 10.4061/2010/275303 | 03. Not CVD |
| Zecchin 2016 | Cardiac rehabilitation for patients with spontaneous coronary artery dissection | Zecchin, R.; Thelander, J.; Bainh, J.; Chai, Y.; Haeusler, K.; Hungerford, J.; Lindsay, G.; Pettitt, M.; Vail, T.; Cooper, M.; Ong, A.; Chow, C.; Dennis, R. | 10.1016/j.hlc.2016.06.768 | 04. CVD prevalence |
| Zhang 2017 | Using the 'Think Aloud' technique to explore quality of life issues during standard quality-of-life questionnaires in patients with atrial fibrillation | Zhang, L.; Gallagher, R.; Lowres, N.; Orchard, J.; Freedman, S. B.; Neubeck, L. | 10.1016/j.hlc.2016.05.121 | 07. Intervention |
## Appendix C

### Risk of Bias

| Authors            | Selection | Comparability | Outcome | Overall |
|--------------------|-----------|---------------|---------|---------|
|                    | 1 2 3 4   | 1             | 1 2 3   | (9 scores) |
| Strodl 2003        | a* a* b* a* | b*           | c b b* | 6 |
| Strodl 2008        | a* a* b* a* | b*           | c b b* | 6 |
| Byles 2015         | a* a* b* b | c b a* | 4 |
| Simons 2013        | a* a* b* b | b*           | b* a* a* | 7 |
| Sahle 2020         | a* a* b* a* | b*           | c a* b* | 7 |

Strodl 2008 was provided a point for Comparability “control for any additional factors” as multivariable adjustment would have been undertaken if social health was statistically significant in univariable analyses.

Appraisal Standard of Newcastle/Ottawa Scale (NOS). * indicates 1 point. The NOS includes eight items, categorised into three dimensions (Selection, Comparability, and Outcome) and provides a rating from 0 to 9 stars, with higher scores indicating less susceptibility to bias. To undertake the NOS, components of two items had to be further clarified or specified. To assess “Comparability of cohorts on the basis of the design or analysis” we defined “Study control for most important factors” as age, sex, sociodemographic (eg education or SEIFA), smoking, blood pressure, cholesterol, and diabetes. We defined “Study control for any additional factors” as either ethnicity, remoteness, lifestyle (alcohol, diet, physical activity), partner status, or mental health. To assess “Was follow-up long enough for outcomes to occur” we defined “Yes” as 5 y or more of follow-up.

### Content

#### Selection

1. Representativeness of the exposed cohort
2. Truly representative of the average general population with or without health conditions *
3. Somewhat representative of the average general population with or without health conditions *
4. Selected group of users
5. No description of the derivation of the cohort

#### Selection of the non-exposed group/cohort

1. Drawn from the same community as the exposed cohort *
2. Drawn from a different source
3. No description of the derivation of the non-exposed group

#### Ascertainment of Social Health exposure

1. Secure record * (not possible)
2. Structured interview or questionnaire *
3. Written self-reports
4. No description

#### Demonstration that Cardiovascular disease outcome of interest was not present at the start of study

1. Yes *
2. No

#### Comparability (2 stars possible)

1. Comparability of cohorts on the basis of the design or analysis
2. Study control for most important factors – * defined as age, sex, sociodemographic (eg education or SEIFA), smoking, blood pressure, cholesterol, and diabetes
3. Study control for any additional factors – * either: ethnicity, remoteness, lifestyle (alcohol, diet, physical activity), partner status, or mental health

### Cardiovascular disease outcome

1. Assessment of cardiovascular disease outcome
2. Independent blind assessment * Not possible
3. Record linkage *
4. Self-report
5. No description

#### Was follow-up long enough for outcomes to occur

1. Yes (More than and equal to 5-y follow-up) *
2. No
Content
1. Adequacy of follow-up of cohorts
2. Complete follow up – all subjects accounted for *
3. Subjects lost to follow-up unlikely to introduce bias – small number lost - >80% follow up, or description provided for those lost *
4. Follow-up <80% and no description of those lost
5. No statement

APPENDIX D

FUNNEL PLOT OF SOCIAL HEALTH AS A PREDICTOR OF CARDIOVASCULAR DISEASE, CONVERSION TO RELATIVE RISK

The Egger’s test demonstrated that there was no small-study effects (regress standard normal deviate of intervention effect estimate against its standard error: slope 0.00 + 0.41SE, bias 0.44 + 3.85SE, P = .919).

The Egger’s test demonstrated that there was no small-study effects (regress standard normal deviate of intervention effect estimate against its standard error: slope 0.00 + 0.41SE, bias 0.44 + 3.85SE, P = .919).