National Institute for Health and Care Excellence

Final

Postnatal care

[N] Co-sleeping risk factors

NICE guideline NG194

Evidence review underpinning recommendations 1.3.13 to 1.3.14

April 2021

Final

These evidence reviews were developed by the National Guideline Alliance, part of the Royal College of Obstetricians and Gynaecologists

Disclaimer

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Local commissioners and/or providers have a responsibility to enable the guideline to be applied when individual health professionals and their patients or service users wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with compliance with those duties.

NICE guidelines cover health and care in England. Decisions on how they apply in other UK countries are made by ministers in the Welsh Government, Scottish Government, and Northern Ireland Executive. All NICE guidance is subject to regular review and may be updated or withdrawn.

Copyright

ISBN: 978-1-4731-4078-3

Contents

Co-sleeping risk factors

Review question

What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

Introduction

There have been conflicting statements about the safety of co-sleeping and the possible risk of associated sudden unexpected death in infancy, resulting in some confusion among healthcare professionals uncertain about the advice they should be offering. It is important to examine the evidence to clarify the nature of risk, if any, and enable healthcare professionals to advise parents on safe sleeping practices. The aim of this evidence review is to identify factors that may impact the risk of sudden unexpected death in infancy (SUDI) when co-sleeping.

Summary of the protocol

Please see Table 1 for a summary of the population, risk factors, confounding factors and outcome characteristics of this review.

Table 1: Summary of the protocol

Population	Parents or carers who have a healthy baby who co-sleep
Risk factors (relating to co-sleeping)	By co-sleeping we mean those who start sharing any type of sleep surface within the first 8 weeks after birth. • Type of sleep surface (for example parents' bed, a side-car cot or crib, a pepi-pod, a sofa or arm-chair) • Planned and unplanned co-sleeping • Individuals who have been drinking alcohol, taking medication, taking recreational drugs or drugs that have drowsiness as a side-effect, smoking, using e-cigarettes or vape sharing the bed with a baby • Type of bedding used (loose) or baby is covered by blanket or quilt, especially pillows, soft toys, soft versus firm mattress. • Temperature of the room • More than one bed sharer (including other siblings) • Position of baby in bed sharing
Confounding factors	Important confounding factors, such as: • sex • age • gestational age at birth.
Outcomes	Critical outcomes All unexplained/unexpected infant deaths: • within the first 6 months • within the first year.

For further details see the review protocol in appendix A.

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual 2014. Methods specific to this review question are described in the review protocol in appendix A.

Declarations of interest were recorded according to NICE's 2014 conflicts of interest policy until March 2018. From April 2018 until June 2019, declarations of interest were recorded according to NICE's 2018 conflicts of interest policy. From July 2019 onwards, the declarations of interest were recorded according to NICE's 2019 conflicts of interest policy. Those interests declared before July 2019 were reclassified according to NICE's 2019 conflicts of interest policy (see Register of Interests).

Protocol deviation

Following the sign-off of the review protocol, the committee agreed that in order to locate the most robust data for the purposes of drafting recommendations, only studies reporting multivariate analysis should be included. Therefore, any study that reported only unadjusted data was excluded.

Clinical evidence

Included studies

Nine case-control studies reported in 13 publications were identified for this review (Fu 2010, Hauck 2003, McGarvey 2003, McGarvey 2006, Mitchell 1998, Mitchell 1997, Mitchell 2017, Rechtman 2014, Scragg 1993, Scragg 1995, Scragg 1996, Tappin 2005 and Vennemann 2005) and one pooled analysis of two case-control studies (Blair 2014). The Blair 2014 study combines individual data from two case-control studies that used the same study design, similar protocols and many of the same questions and categorical responses. Fu 2010 and Hauck 2003 reported on the same population as did Scragg 1993, Scragg 1995, Scragg 1996 and Mitchell 1998. All but three of the studies (Mitchell 2017, Rechtman 2014 and one of the two studies within Blair 2014) collected data pre 2001. The included studies are summarised in Table 2.

From the risk factors of interest that were set out in the protocol the included studies reported on the following:

- type of sleep surface
- individuals who have been drinking alcohol, taking medication, taking recreational drugs or drugs that have drowsiness as a side-effect, smoking, using e-cigarettes or vape sharing the bed with a baby
- type of bedding used (loose) or baby is covered by blanket or quilt, especially pillows, soft toys, soft versus firm mattress
- more than one bed sharer (including other siblings)
- position of baby in bed sharing.

None of the included studies reported on the following risk factors:

- planned and unplanned co-sleeping
- temperature of the room.

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Two of the publications (Mitchell 1998 and Rechtman 2014) reported the exposures of interest (co-sleeping with a risk factor) against the reference of interest for this review (co-sleeping without a risk factor). All of the other papers reported the exposures of interest (co-

sleeping with a risk factor) against the reference standard of not co-sleeping. These papers also report the risk of co-sleeping against not co-sleeping. Therefore, the NGA technical team were able to calculate the risk of SUDI of co-sleeping with a risk factor against this review's desired reference standard of co-sleeping without a risk factor using an equation by Franchini (2012). The data extracted in Appendix D is the risks of SUDI as reported in the publications, the data reported in Appendix M is the risk of SUDI from co-sleeping with an additional risk factor versus co-sleeping without an additional risk factor as calculated by the NGA technical team. The data in Appendix M is also the same data reported in the GRADE tables in Appendix F.

Excluded studies

Studies not included in this review with reasons for their exclusions are provided in appendix K.

Summary of clinical studies included in the evidence review

A summary of the studies that were included in this review are presented in Table 2.

Table 2: Summary of included studies

Study	Population	Risk factors	Adjustments
Blair 2014 Case-control study England	Cases: N=400 Controls: N=1386	• Bed share versus co-slept on a sofa or chair • Bed share versus co-slept on a sofa or chair (child <98 days old) • Bed share versus co-slept on a sofa or chair (child ≥98 days old) • Bed share versus Bed share next to adult > 2 units of alcohol • Bed share versus Bed share next to adult > 2 units of alcohol (child <98 days old) • Bed share versus Bed share next to adult > 2 units of alcohol (child ≥98 days old) • Bed share versus bed share next to an adult who smoked • Bed share versus bed share next to an adult who smoked (child <98 days old) • Bed share versus bed share next to an adult who smoked (child ≥98 days old) • Bed share next to adult > 2 units of alcohol versus co-slept on a sofa or chair • Bed share next to adult > 2 units of alcohol versus co-slept on a sofa or chair (child <98 days old) • Bed share next to adult > 2 units of alcohol versus co-slept on a sofa or chair (child ≥98 days old) • Bed share next to adult > 2 units of alcohol versus bed share next to an adult who smoked	Adjusted for infant age and whether a day or night sleep as well as infant characteristics: birthweight, <2500 g, pre-term, male gender and currently breastfeeding, maternal characteristics: larger families (≥3 children), younger mothers (≤21 years) and poor maternal education (<GCSE or no qualification) factors at the time of the last sleep: infant unwell (scoring 8 or more on Baby Check), infant placed prone or side, infant swaddled, use of a duvet, use of a dummy and infant found with head covered.

Study	Population	Risk factors	Adjustments
		• Bed share next to adult > 2 units of alcohol versus bed share next to an adult who smoked (child <98 days old) • Bed share next to adult > 2 units of alcohol versus bed share next to an adult who smoked (child ≥98 days old) • Bed share next to an adult who smoked versus co-slept on a sofa or chair • Bed share next to an adult who smoked versus co-slept on a sofa or chair (child <98 days old) • Bed share next to an adult who smoked versus co-slept on a sofa or chair (child ≥98 days old)	
Fu 2010 Case-control study USA	Cases: N=195 Controls: N=194 (Same population as Hauck 2003)	• Bed share + firm mattress versus Bed share + soft mattress • Bed share + no maternal smoking versus Bed share + maternal smoking • Bed share + no pillow versus bed share + pillow • Bed share + 0-1 covers versus Bed share + >2 covers • Bed share + supine versus Bed share + prone/side	Adjusted for maternal marital status, education, and index of prenatal care
Hauck 2003 Case-control study USA	Cases: N=260 Controls: N=260 (Same population as Fu 2010)	• Share bed with mother or mother and father versus share bed with others	Adjusted for maternal age, marital status, education, and index of prenatal care

Study	Population	Risk factors	Adjustments
McGarvey 2003 Case-control study Ireland	Cases: N=203 Controls: N=622	• Bed share + put back in cot versus bed share entire sleep • Bed share + put back in cot versus co-sleep in sofa/ armchair • Bed share entire sleep versus co-sleep in sofa/ armchair	Adjusted for maternal age, education, smoking and drinking during pregnancy, social disadvantage, z scores for weight by gestation, whether breastfeeding was initiated at birth, baby being ill, crying/colic problems, symptoms in 48 h prior to last/reference sleep, tog of bed covering >10, use of pillows, duvets, prone position, and absence of routine soother use during the last/reference sleep period.
McGarvey 2006 Case-control study Ireland	Cases: N=287 Controls: N=831	• Bed share versus co-sleep in sofa/armchair • Bed share next to one adult versus between two adults	Adjusted for maternal age, education, smoking, drinking, and occurrence of urinary tract infection >3 previous live births, z scores for weight by gestation, resuscitation required at birth, male sex, whether breastfeeding was initiated at birth, any history of illness during infant's lifetime, baby prone to sweating, symptoms in 48 h prior to last/reference sleep, tog of clothing/bedding >10, use of duvets, prone position, and absence of routine soother use during the last/reference sleep period.
Mitchell 1997 Case-control study New Zealand	Cases: N=127 Controls: N=922	• Bed share + no maternal smoking versus bed share + maternal smoking (assessed at initial contact) • Bed share + no maternal smoking versus bed share + maternal smoking (assessed at 2 months contact)	Adjusting for maternal age, marital status, age mother left school, previous number of pregnancies, infant's sex, ethnicity of infant, birthweight, sleep position, breastfeeding and bed sharing/maternal smoking combinations.
Mitchell 1998 Case-control study New Zealand	Cases: N=393 Controls: N=1592 (Same population as Scragg 1993,	• Bed sharing versus bed sharing + sleeping on sheep skin • Bed share usually in last 2 weeks versus bed share usually in last 2 weeks + sleeping on sheep skin	Adjusted for age of infant, region, season, and time; sociodemographic background: marital status, occupation, age mother left school, and age of mother; pregnancy variables: parity, age of mother at first pregnancy, and attendance at antenatal clinics and education classes; infant factors: sex, ethnicity, birth weight, and gestational age; and postnatal factors: admission to neonatal unit, breast-feeding, maternal smoking, sleep position, infant sharing a bed with another person, pacifier use, excess thermal insulation, and illness.

Study	Population	Risk factors	Adjustments
	Scragg 1995, Scragg 1996)		
Mitchell 2017 Case-control study New Zealand	Cases: N=133 Controls: N=258	• Bed share + no smoking versus Bed share + smoking	Adjusted for ethnicity, marital status, number of previous live births, maternal age, maternal smoking in pregnancy, multiple birth, sex, birthweight, age of infant, position placed to sleep, breastfeeding and sharing parental bedroom.
Rechtman 2014 Case-control study USA	Cases (deaths on a sofa): N=1024 Controls (deaths occurred elsewhere): N=6910	• Sharing a sofa versus sharing a surface that is not a sofa	Adjusted for infant characteristics (age, gender, race or ethnicity, complex chronic condition, or technology dependence, eg, ventilator dependence, gastrostomy tube feeds), place of incident, whether an autopsy was performed, cause of death, sleep environment factors (sur- face sharing, object found in sleep environment, sleep position, and sleep position change), and pregnancy characteristics (maternal medical problems, intimate partner violence, and sub- stance use or abuse).
Scragg 1993 Case-control study New Zealand	Cases: N=393 Controls: N=1592 (Same population as Mitchell 1998, Scragg 1995, Scragg 1996)	• Bed share + no smoking versus bed share + smoking (assessed as the last sleep) • Bed share + no smoking versus bed share + smoking (assessed as typically over the last 2 weeks)	Adjusted for age of mother at birth, age she left school, age of first pregnancy, number of previous pregnancies, attendance at antenatal clinics and classes, the sex, gestational age, weight at birth of infant, admission to a neonatal unit, mother's marital status, occupational status, usual region of residence of the household, dummy use, breastfeeding, sleep position of the infant, age of the infant, season and time of day at death (or nominated time for controls) room the infant usually slept in at night during the last two weeks or during the last sleep, as appropriate for the bed sharing variable.
Scragg 1995 Case-control study New Zealand	Cases: N=393 Controls: N=1592	• Bed share versus bed share and maternal smoking (Maori; assessed as the last sleep) • Bed share versus bed share and maternal smoking (Maori; assessed as typically over the last 2 weeks)	Adjusted for age of infant, region, season and nominated time, marital status, occupation, age mother left school and age of mother, number of previous pregnancies attendance at antenatal clinics and education classes, infant sex, infant ethnicity, birthweight, gestation, admission to neonatal unit, breastfeeding, infant sleeping position and room infant slept in

Study	Population	Risk factors	Adjustments
	(Same population as Mitchell 1998, Scragg 1993, Scragg 1996) Paper focuses on comparing Maori to Non-Maori populations	• Bed share versus bed share and maternal smoking (Non-Maori; assessed as the last sleep) • Bed share versus bed share and maternal smoking (Non-Maori; assessed as typically over the last 2 weeks)	
Scragg 1996 Case-control study New Zealand	Cases: N=393 Controls: N=1592 (Same population as Mitchell 1998, Scragg 1993, Scragg 1995)	• Bed share + no room share + mother not smoking versus bed share + no room share + mother smoking (last 2 weeks at night) • Bed share + room share + mother not smoking versus bed share + room share + mother smoking (last 2 weeks at night) • Bed share + no room share + mother not smoking versus Bed share + no room share + mother smoking (last sleep) • Bed share + room share + mother not smoking versus Bed share + room share + mother smoking (last sleep)	Adjusted for ethnic origin, for infant subgroups classified by sharing room with an adult, bed sharing, and maternal smoking
Tappin 2005 Case-control study Scotland	Cases: N=123 Controls: N=263	• Room with parent(s) some beds sharing versus share couch • Bed sharing versus bed sharing either parent smoked • Bed sharing versus bed sharing mother smoked • Bed sharing versus bed sharing found in past with head covered • Bed sharing versus bed sharing found after last sleep head covered	Adjusted for maternal age; quadratic function of maternal age; birth weight; infant age; parity; either parent smoked; laid prone to sleep; laid on side to sleep; found with head covered in the past; found with head covered after last sleep; infant routinely slept on a used infant mattress.

Study	Population	Risk factors	Adjustments
		• Close not touching bed share versus snuggled up bed share • Outside edge 1 parent bed share versus outside edge 2/3 people bed share • Outside edge 1 parent bed share versus between 2/3 people bed share • Outside edge 2/3 people bed share versus between 2/3 people bed share • Bed sharing versus Bed sharing placed prone last sleep • Bed sharing versus Bed sharing placed on side last sleep	
Vennemann 2005 Case-control study Germany	Cases: N=333 Controls: N=998	• Bed share + no maternal smoking versus bed share + maternal smoking	Adjusted for all variables which were found significant at the 5% level in the univariate analysis, except gestational age, as this was closely related to birth-weight.

See the full evidence tables in appendix D. No meta-analysis was conducted (and so there are no forest plots in appendix E).

Quality assessment of clinical outcomes included in the evidence review

See the evidence profiles in appendix F.

Economic evidence

Included studies

A single economic search was undertaken for all topics included in the scope of this guideline but no economic studies were identified which were applicable to this review question. See the literature search strategy in appendix B and economic study selection flow chart in appendix G.

Excluded studies

No economic studies were reviewed at full text and excluded from this review.

Economic model

No economic modelling was conducted for this review question because the committee agreed that other topics were higher priorities for economic evaluation.

Evidence statements

Clinical evidence statements

Type of sleep surface

Co-sleeping on a sofa versus co-sleeping in bed

High quality evidence from pooled analysis of two case-control studies (cases: n=400, controls: n=1386) showed a clinically important increase in the risk of SUDI among those co-sleeping on a sofa compared to those who co-slept in a bed for the whole cohort and also when stratified by age, for children <98 days old and for children ≥98 days old.

Sharing sofa versus sharing surface that is not a sofa

High quality evidence from one case-control study (cases: NR, controls: NR) showed a clinically important increase in the risk of SUDI among those sharing a sofa surface compared to sharing a surface that is not a sofa.

Sharing a sofa versus sleeping in a room with the parents with some bed sharing

Moderate quality evidence from one case-control study (cases: n=123, controls: n=263) showed no clinically important differences in the risk of SUDI between those sharing a sofa compared to those sleeping in a room with the parents with some bed sharing.

Bed sharing entire night versus bed sharing and placing infant back in the cot

Moderate quality evidence from one case-control study (cases: n=203, controls: n=622) showed no clinically important differences in the risk of SUDI between those bed sharing the entire night compared to those bed sharing and placing the infant back in the cot.

Planned or unplanned co-sleeping

No evidence was identified for this risk factor.

Substance use

Co-sleeping next to an adult who has consumed >2 units of alcohol versus co-sleeping next to an adult who has not consumed alcohol

High quality evidence from pooled analysis of two case-control studies (cases: n=400, controls: n=1386) showed a clinically important increase in the risk of SUDI among those co-sleeping next to an adult who has consumed >2 units of alcohol compared to those co-sleeping next to an adult who had not consumed alcohol for the whole cohort, also when stratified by age, for children <98 days old and for children ≥98 days old.

Co-sleeping next to an adult who smoked versus co-sleeping next to an adult who did not smoke

High to low quality evidence from a pooled analysis of two case-control studies (cases: n=400, controls: n=1386) and seven case-control studies (cases: n=133 to 393, controls: n=258 to 1592) reported on various scenarios of co-sleeping next to an adult who smoked. Three studies showed a clinically important increase in the risk of SUDI among those co-sleeping next to an adult who smoked compared to those co-sleeping next to an adult who did not smoke. One study showed a clinically important increase in the risk of SUDI among those co-sleeping next to an adult who smoked compared to those co-sleeping next to an adult who did not smoke for children <98 days, also for children ≥98 days old (n=1 study), if co-sleeping was recorded at the initial contact (n=1 study), for those who did not share the room in the last sleep (n=1 study), for those who did share a room in the last sleep (n=1 study) and if the mother smoked (n=1 study).

Co-sleeping on a sofa versus co-sleeping next to an adult who smoked

High quality evidence from pooled analysis of two case-control studies (cases: n=400, controls: n=1386) showed a clinically important increase in the risk of SUDI among those co-sleeping on a sofa compared to those who co-slept next to an adult who smoked for the whole cohort and also when stratified by age, for children ≥98 days old. However, there were no clinically important differences in the risk of SUDI for children <98 days old (low quality evidence), likely because of low statistical power due to low numbers.

Bed sharing next to an adult who smoked versus bed sharing next to an adult who had consumed >2 units of alcohol

High quality evidence from pooled analysis of two case-control studies (cases: n=400, controls: n=1386) showed a clinically important decrease in the risk of SUDI among those co-sleeping next to an adult who smoked compared to those who co-slept next to an adult who had consumed >2 units of alcohol for the whole cohort and also when stratified by age, for children ≥98 days old. However, there were no clinically important differences in the risk of SUDI for children <98 days old (low quality evidence), likely because of low statistical power due to low numbers.

Co-sleeping with an adult who had consumed >2 units of alcohol versus co-sleeping on a sofa

Low quality evidence from pooled analysis of two case-control studies (cases: n=400, controls: n=1386) showed no clinically important difference in the risk of SUDI between co-sleeping next to an adult who had consumed >2 units of alcohol compared to co-sleeping on

a sofa for the whole cohort and also when stratified by age, for children <98 days and for children ≥98 days old.

Type of bedding used

Bed sharing with a pillow versus bed sharing with no pillow

Low quality evidence from one case-control study (cases: n=195, controls: n=194) showed no clinically important difference in the risk of SUDI between bed sharing with a pillow and bed sharing without a pillow.

Bed sharing with a soft mattress versus bed sharing with a firm mattress

High quality evidence from one case-control study (cases: n=195, controls: n=194) showed a clinically important increase in the risk of SUDI among those bed sharing with a soft mattress compared with bed sharing with a firm mattress.

Bed sharing with >2 covers versus bed sharing with 0-1 covers

Low quality evidence from one case-control study (cases: n=195, controls: n=194) showed no clinically important difference in the risk of SUDI between bed sharing with 0-1 covers and bed sharing with >2 covers.

Bed sharing usually in the last 2 weeks and sleeping on sheep skin versus bed sharing usually in the last 2 weeks and not sleeping on a sheep skin

High quality evidence from one case-control study (cases: n=393, controls: n=1592) showed a clinically important decrease in the risk of SUDI among those bed sharing whilst sleeping on a sheep skin compared with bed sharing without a sheep skin.

Temperature of the room

No evidence was identified for this risk factor.

More than one bed sharer

Bed sharing with others versus bed sharing with mother or mother and father

High quality evidence from one case-control study (cases: n=260, controls: n=260) showed a clinically important increase in the risk of SUDI among those bed sharing with others compared to bed sharing with a mother or mother and father.

Bed sharing next to two adults versus bed sharing next to one adult

Low quality evidence from one case-control study (cases: n=287, controls: n=831) showed no clinically important difference in the risk of SUDI among those bed sharing between two adults compared to bed sharing next to one.

Sleeping on the outside edge with 2-3 people in bed versus sleeping on the outside edge with 1 parent in bed

Low quality evidence from one case-control study (cases: n=123, controls: n=263) showed no clinically important difference in the risk of SUDI among those sleeping on the outside edge with 2-3 people in the bed compared to sleeping on the outside edge with 1 parent in bed.

Sleeping between 2-3 people in bed share versus sleeping on the outside edge with 1 parent in bed

Low quality evidence from one case-control study (cases: n=123, controls: n=263) showed no clinically important difference in the risk of SUDI among those sleeping between 2-3 people in the bed compared to sleeping on the outside edge with 1 parent in bed.

Sleeping between 2-3 people in bed versus sleeping on the outside edge with 2-3 people in bed

Low quality evidence from one case-control study (cases: n=123, controls: n=263) showed no clinically important difference in the risk of SUDI among those sleeping between 2-3 people in the bed compared to sleeping on the outside edge of a bed with 2-3 people.

Position of baby in bed sharing

Bed sharing with infant sleeping in prone position versus bed sharing with infant sleeping in supine position

Low quality evidence from one case-control study (cases: n=195, controls: n=194) showed no clinically important difference in the risk of SUDI between bed sharing with the infant sleeping prone or side position compared to supine position.

Snuggled up bed sharing versus bed sharing close but not touching

Low quality evidence from one case-control study (cases: n=123, controls: n=263) showed no clinically important difference in the risk of SUDI between those snuggled up in bed compared to sleeping close to the infant but not touching.

Economic evidence statements

No economic evidence was identified which was applicable to this review question.

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

This review focused on the outcome of sudden unexplained or unexpected death in infancy within the first 6 months or one year following the initiation of co-sleeping within the first 8 weeks. Included studies generally collected data on any sudden unexpected deaths of an infant that was less than one year old.

The quality of the evidence

The quality of the evidence varied from high to low using GRADE and following assessment. The individual studies had a low risk of bias as assessed by the QUIPS quality assessment tool. The committee noted that although case-control studies are not generally seen as high quality evidence, given the rare events associated with sudden unexpected death in infancy, this was the most appropriate study design. For some results, the quality of the evidence was downgraded on the GRADE assessment for imprecision of the effect estimate.

No evidence was identified for the following subgroups of interest; young women (19 years or under), women with physical and cognitive disabilities, women with severe mental health illness and women who have difficulty accessing postnatal care services. For the subgroup of populations using specific cultural practices versus the general population, one study

reported on the risk factors for co-sleeping Maori women and co-sleeping non-Maori women. The committee did not feel that this evidence was particularly relevant for the UK context and given its inconclusive nature, did not use it to inform their recommendations.

Benefits and harms

Two recommendations were made about bed sharing, both were based on data from this review about the risk factors of bed sharing in relation to sudden unexpected death in infancy and were also informed by the evidence review M on the benefits and harms of bed sharing. The committee used these data, combined with their own expert knowledge using informal consensus, to recommend advice on safer practices for bed sharing that practitioners should provide to parents. The advice included:

Baby should sleep on its back on a firm and flat mattress. Evidence from one case-control study showed that bed sharing on a soft mattress carried a greater risk of sudden unexpected death in infancy than bed sharing on a firm mattress. The committee discussed that when the baby's head sinks deeper on a soft mattress it can increase the thermal environment, which in turn may increase the risk of sudden unexpected death of an infant. Despite the evidence in this review that there was no difference in sleeping on the front or the back when co-sleeping, the committee used their expert knowledge and agreed that the baby sleeping on their back has been established as a safer sleeping position than the baby sleeping on their front or on their side in studies not specifically looking at co-sleeping and therefore a recommendation for the baby to sleep on their back was made.

Not sleeping on a sofa or chair with a baby. Evidence from three case-control studies showed that co-sleeping on a sofa carried a greater risk of sudden unexpected death in infancy than co-sleeping in a bed or alternative surface that was not a sofa. The committee discussed that when the baby's head sinks deeper on a sofa cushion or becomes trapped between the adult and the sofa cushion, this can increase the thermal environment or cause suffocation, which in turn may increase the risk of sudden unexpected death of an infant.

Not using pillows or duvets for the baby. Evidence from one case-control study showed that bed sharing with a pillow carried no greater risk of sudden unexpected death in infancy than bed sharing without a pillow. The committee nevertheless agreed it was important to advise parents against using a pillow or a duvet near the baby based on their knowledge of other evidence on infant sleeping not specifically in relation to co-sleeping which show that using pillows or duvets for the baby may increase the risk of SUDI. They discussed that the baby's body sinks into the pillow or duvets which can increase the thermal environment, which could increase the risk of sudden unexpected death of an infant. Recommending not to use a pillow is in line with advice given in current practice.

There should be no other children or pets in bed when sharing a bed with a baby. Evidence from one case-control study showed that bed sharing with others (for example other children or pets) carried a greater risk of sudden unexpected death in infancy than bed sharing with a mother or mother and partner. In addition, evidence from one case-control study showed that bed sharing with two adults carried no greater risk of sudden unexpected death in infancy than bed sharing with one adult.

Based on the evidence and their expertise, the committee also agreed about circumstances in which bed sharing might not be safe and should be strongly advised against. The advice included:

Baby should not share a bed with someone who has consumed more than 2 units of alcohol that day. Evidence from two case-control studies showed that bed sharing with someone who had consumed more than 2 units of alcohol carried a greater risk of sudden unexpected death in infancy than bed sharing with someone who had not consumed alcohol. The committee discussed how this association could be explained by an impaired arousal of the

bed sharer, affecting for example the ability to wake up or respond to cues from the baby or the sleeping position of the baby and the bed sharer.

Baby should not share a bed with someone who smokes. Evidence from nine case-control studies showed that bed sharing with someone who smokes carried a greater risk of sudden unexpected death in infancy than bed sharing with someone who did not smoke. Through discussions of the evidence, the committee recognised that the effects of smoking are almost certainly underestimated by research due to the unreliability of self-reporting in this sensitive area. Consensus about including this advice was unanimous, with the committee explaining that the key issue is that smoking reduces parents' arousal.

Baby should not share a bed with someone who has taken prescribed medication that may cause drowsiness or someone who has used recreational drugs. This advice was added following committee discussions about their knowledge in the area. Although there were no relevant evidence identified in this review, committee members were aware of wider evidence about drugs as a risk factor in this context, although interpretation is difficult because use of drugs and alcohol are usually inextricably linked.

The committee agreed based on their knowledge of other evidence that low birth weight (meaning birth weight of less than 2500 g regardless of gestation) and preterm birth are additional risk factors for SUDI. Preterm babies are outside the remit of the guideline, however, some term babies are born low birth weight so the committee thought it is important to mention in the recommendation that bed sharing with a low birth weight infant should be advised against.

The committee also acknowledged the importance of providing information about safer sleeping practices in general (not just in relation to bed sharing), although this was not reviewed for this guideline. The committee were aware of established guidance on safer sleeping practices published by, for example, UNICEF, Baby Sleep Information Source (Basis), and the Lullaby Trust.

For the discussion about benefits and harms of bed sharing in general, see evidence report M on benefits and harms of bed sharing.

Cost effectiveness and resource use

No economic evidence is available for this review question. The committee agreed that identifying risk factors in relation to co-sleeping for sudden unexpected death in infancy and offering relevant advice to parents is likely to reduce the risk of sudden unexpected death in infancy at a very small cost associated with the healthcare professionals' time spent on offering advice. Given that some time is already spent offering relevant advice to parents in current practice, the resource implications of the recommendations were considered to be negligible.

Other factors the committee took into account

The committee noted during protocol development that certain subgroups of women and health care professionals may require special consideration:

- young women (19 years or under)
- women with physical and cognitive disabilities
- women with severe mental health illness
- women who had difficulty accessing postnatal care services
- the type of the teams exchanging information (for example, hospital to social services, hospital to community midwife or midwife to community health visitor).
- population using specific cultural practices versus the general population.

A stratified analysis was therefore predefined in the protocol based on these subgroups. However, considering the lack of evidence for these sub-groups, the committee agreed not to make separate recommendations and that the recommendations they did make should apply universally.

References

Blair 2014

Blair, P. S., Sidebotham, P., Pease, A., Fleming, P. J., Bed sharing in the absence of hazardous circumstances: Is there a risk of sudden infant death syndrome? An analysis from two case-control studies conducted in the UK, PLoS ONE, 9, 2014

Franchini 2012

Franchini, A. J., S. Dias, A. E. Ades, J. P. Jansen, N. J. Welton. Accounting for correlation in network meta-analysis with multi-arm trials. Research Synthesis Methods 3, 142-160, 2012

Fu 2010

Fu, L. Y., Moon, R. Y., Hauck, F. R., Bed sharing among black infants and sudden infant death syndrome: Interactions with other known risk factors, Academic Pediatrics, 10, 376-382, 2010

Hauck 2003

Hauck, F. R., Herman, S. M., Donovan, M., Iyasu, S., Moore, C. M., Donoghue, E., Kirschner, R. H., Willinger, M., Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago infant mortality study, Pediatrics, 111, 1207-1214, 2003

McGarvey 2003

McGarvey, C., McDonnell, M., Chong, A., O'Regan, M., Matthews, T., Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland, Archives of Disease in Childhood, 88, 1058-1064, 2003

McGarvey 2006

McGarvey, C., McDonnell, M., Hamilton, K., O'Regan, M., Matthews, T., An 8 year study of risk factors for SIDS: Bed sharing versus non-bed sharing, Archives of Disease in Childhood, 91, 318-323, 2006

Mitchell 1997

Mitchell, E. A., Tuohy, P. G., Brunt, J. M., Thompson, J. M. D., Clements, M. S., Stewart, A. W., Ford, R. P. K., Taylor, B. J., Risk factors for sudden infant death syndrome following the prevention campaign in New Zealand: A prospective study, Pediatrics, 100, 835-840, 1997

Mitchell 1998

Mitchell, E. A., Thompson, J. M. D., Ford, R. P. K., Taylor, B. J., Becroft, D. M. O., Allen, E., Barry, D., Scragg, R., Roberts, A., Hassall, I. B., Stewart, A., Williams, S., Sheepskin bedding and the sudden infant death syndrome, Journal of Pediatrics, 133, 701-704, 1998

Mitchell 2017

Mitchell, E. A., Thompson, J. M. D., Zuccollo, J., Macfarlane, M., Taylor, B., Elder, D., Stewart, A. W., Percival, T., Baker, N., McDonald, G., Lawton, B., Schlaud, M., Fleming, P., The combination of bed sharing and maternal smoking leads to a greatly increased risk of sudden unexpected death in infancy: The New Zealand sudi nationwide case control study, New Zealand Medical Journal, 130, 52-64, 2017

Rechtman 2014

Rechtman, L. R., Colvin, J. D., Blair, P. S., Moon, R. Y., Sofas and infant mortality, Pediatrics, 134, e1293-e1300, 2014

Scragg 1993

Scragg, R., Mitchell, E. A., Taylor, B. J., Stewart, A. W., Ford, R. P. K., Thompson, J. M. D., Allen, E. M., Becroft, D. M. O., Bed sharing, smoking, and alcohol in the sudden infant death syndrome, British Medical Journal, 307, 1312-1318, 1993

Scragg 1995

Scragg, R., Stewart, A. W., Mitchell, E. A., Ford, R. P., Thompson, J. M., Public health policy on bed sharing and smoking in the sudden infant death syndrome, The New Zealand medical journal, 108, 218-222, 1995

Scragg 1996

Scragg, R. K. R., Mitchell, E. A., Stewart, A. W., Ford, R. P. K., Taylor, B. J., Hassall, I. B., Williams, S. M., Thompson, J. M. D., Infant room-sharing and prone sleep position in sudden infant death syndrome, Lancet, 347, 7-12, 1996

Tappin 2005

Tappin, D., Ecob, R., Brooke, H., Bedsharing, roomsharing, and sudden infant death syndrome in Scotland: A case-control study, Journal of Pediatrics, 147, 32-37, 2005

Vennemann 2005

Vennemann, M. M. T., Findeisen, M., Butterfass-Bahloul, T., Jorch, G., Brinkmann, B., Kopcke, W., Bajanowski, T., Mitchell, E. A., Modifiable risk factors for SIDS in Germany: Results of GeSID, Acta Paediatrica, International Journal of Paediatrics, 94, 655-660, 2005

Appendices

Appendix A – Review protocols

Review protocol for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

Table 3: Review protocol

Field (based on PRISMA-P)	Content
Review question	What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?
Type of review question	Prognostic review
Objective of the review	To determine the risk factors in relation to co-sleeping for sudden unexpected death in infancy (or 'sudden infant death syndrome', a term also used in practice and research).
Eligibility criteria – population/disease/condition/issue/domain	Parents or carers who have a healthy baby Exclude studies with a specific population of babies who were born pre-term. This means babies born before 37 weeks since 'term' is considered to be between 37 and 42 weeks of pregnancy. For studies with a mixed population, they will be included if at least 66% of babies are born at term.
Eligibility criteria – intervention(s)/exposure(s)/prognostic factor(s)	Risk factors relating to co-sleeping (by co-sleeping we mean sharing any type of sleep surface) within the first 8 weeks after birth. • type of sleep surface (for example parents' bed, a side-car cot or crib, a pepi-pod, a sofa or arm-chair) • planned and unplanned co-sleeping • individuals who have been drinking alcohol, taking medication, taking recreational drugs or drugs that have drowsiness as a side-effect, smoking, using e-cigarettes or vape sharing the bed with a baby • type of bedding used (loose) or baby is covered by blanket or quilt, especially pillows, soft toys, soft versus firm mattress. • temperature of the room • more than one bed sharer (including other siblings) • position of baby in bed sharing

Field (based on PRISMA-P)	Content
Confounding factors	Important confounding factors, such as: • sex • age • gestational age at birth
Outcomes and prioritisation	Critical outcomes All unexplained/unexpected infant deaths: • within the first 6 months • within the first year
Eligibility criteria – study design	Include published full text papers: • systematic reviews • prospective or retrospective comparative cohort studies if at least 500 infants in each arm • only if cohort studies unavailable to inform decision-making: case-control studies of at least 50 infants in each arm (if no studies are located then studies with smaller study arms will be included). • prospective study designs will be prioritised over retrospective study designs • population-based studies and multicentre studies will be prioritised Data must be adjusted for potential confounding factors. Exclude: • conference abstracts • follow-up of RCTs
Other inclusion exclusion criteria	• English-language studies from low- and middle-income countries, as defined by the World Bank, will be excluded, as the configuration of antenatal and postnatal services in these countries might not be representative of that in the UK. • only studies conducted post 1990 will be included, as there was a big change in 1991 with the 'back to sleep campaign', after which 'fashions' in co-sleeping changed markedly.

Field (based on PRISMA-P)	Content
Proposed sensitivity/sub-group analysis, or meta-regression	Groups that will be reviewed and analysed separately: • young women (19 years or under) • women with physical and cognitive disabilities • women with severe mental health illness • women who have difficulty accessing postnatal care services • population using specific cultural practices versus the general population • different sleep surfaces, for example shared bed, side-car cot or crib, pepi-pod, or sofa/armchair.
Selection process – duplicate screening/selection/analysis	Sifting, data extraction and appraisal of methodological quality will be performed by the systematic reviewer. Any disputes will be resolved in discussion with the senior systematic reviewer and the Topic Advisor. Quality control will be performed by the senior systematic reviewer. This review question was not prioritised for health economic analysis and so no formal dual weeding, study selection (inclusion/exclusion) or data extraction into evidence tables will be undertaken. (However, internal (NGA) quality assurance processes will include consideration of the outcomes of weeding, study selection and data extraction and the committee will review the results of study selection and data extraction).
Data management (software)	NGA STAR software will be used for study sifting, data extraction, recording quality assessment using checklists and generating bibliographies/citations.
Information sources – databases and dates	Sources searched: CDSR, DARE, Embase, Emcare, HTA, Medline, Medline in process Limits: Standard animal/non-English language exclusion Dates: Published from 1990 onwards
Identify if an update	Not an update, but linked to the review question from the 2014 addendum 'What is the risk of co-sleeping in relation to sudden infant death syndrome (SIDS)?' This was an intervention review (as opposed to prognostic) looking at the risk of co-sleeping versus not co-sleeping as opposed to the risk factors associated with co-sleeping (as with this question).

Field (based on PRISMA-P)	Content
Author contacts	National Guideline Alliance https://www.nice.org.uk/guidance/indevelopment/gid-ng10070
Highlight if amendment to previous protocol	For details please see section 4.5 of Developing NICE guidelines: the manual 2014
Search strategy – for one database	For details please see appendix B.
Data collection process – forms/duplicate	A standardised evidence table format will be used, and published as appendix D (clinical evidence tables) or H (economic evidence tables).
Data items – define all variables to be collected	For details please see evidence tables in appendix D (clinical evidence tables) or H (economic evidence tables).
Methods for assessing bias at outcome/study level	Standard study checklists were used to critically appraise individual studies. For details please see section 6.2 of Developing NICE guidelines: the manual 2014. Appraisal of methodological quality: The methodological quality of each study will be assessed using an appropriate checklist: • ROBIS for systematic reviews • Quality in prognostic studies (QUIPS) tool
Criteria for quantitative synthesis	Meta-analyses will be conducted for this prognostic review only if the same confounders are accounted for in the analyses, the same analytical methods are adapted, and the populations assessed are suitably similar for example similar gestational age. In all other cases, the results will reported separately.
Methods for quantitative analysis – combining studies and exploring (in)consistency	The adjusted Risk Ratio or Odds Ratio and 95% confidence intervals will be plotted in RevMan, however pooled results will usually not be calculated due to the heterogeneity between studies (for example different confounders accounted for in analyses, different populations). If a meta-analysis is conducted the forest plots will be used to visually see the studies alongside each other and to explore similarities and differences between studies.
Meta-bias assessment – publication bias, selective reporting bias	For details please see section 6.2 of Developing NICE guidelines: the manual 2014.
Confidence in cumulative evidence	For details please see sections 6.4 and 9.1 of Developing NICE guidelines: the manual 2014
Rationale/context – what is known	For details please see the introduction to the evidence review.
Describe contributions of authors and guarantor	A multidisciplinary committee developed the guideline. The committee was convened by The National Guideline Alliance and chaired by Dr David Jewell in line with section 3 of Developing NICE guidelines: the manual.

Field (based on PRISMA-P)	Content
Sources of funding/support	Staff from The National Guideline Alliance undertook systematic literature searches, appraised the evidence, conducted meta-analysis and cost-effectiveness analysis where appropriate, and drafted the guideline in collaboration with the committee. For a full description of the methods see Supplement 1.
Name of sponsor	The National Guideline Alliance is funded by NICE and hosted by the Royal College of Obstetricians and Gynaecologists
Roles of sponsor	NICE funds The National Guideline Alliance to develop guidelines for those working in the NHS, public health, and social care in England
PROSPERO registration number	Not registered

NGA: National Guideline Alliance; NICE: National Institute for Health and Care Excellence; QUIPS: Quality in Prognostic Studies; RCT: randomised controlled trial; SIDS: sudden infant death syndrome

Appendix B – Literature search strategies

Literature search strategies for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

Clinical search

The search for this topic was last run on 10th May 2019.

Database: Emcare, Embase, Medline, Medline Ahead of Print and In-Process & Other Non-Indexed Citations (global) – OVID [Multifile]

#	Search
1	exp infant/ use emczd, ppez
2	(babies or baby or infant* or newborn* or new born*).ti,ab.
3	1 or 2
4	sudden infant death syndrome/ use emczd or sudden infant death/ use ppez
5	(cot* death* or sids or sudden infant death or ((unexpected or sudden) adj death)).ti,ab.
6	4 or 5
7	accident prevention/ use emczd, ppez or primary prevention/ use emczd, ppez or risk factor/ use emczd or risk factors/ use ppez
8	(risk* or ((avoid* or prevent* or reduc*) adj2 (accident* or death* or harm* or injur* or mortalit*))).ti,ab.
9	7 or 8
10	(((shar* or sleep*) adj3 (armchair* or arm chair* or basket* or bed or beds or chair* or cot*1 or crib* or peripod* or peri pod* or sidecar* or side car* or sofa* or (sleep adj2 surface*))) or bedshar* or cosleep* or co sleep* or (sleep* adj2 with adj (baby or infant* or newborn*))).ti,ab.
11	(((baby or infant* or newborn* or new born*) adj2 (cold or hot or temperature)) or ((cold or heating or hot or temperature or warm or warmth) adj2 (nurser* or room*))).ti,ab.
12	(bedding or blanket* or mattress* or pillow* or quilt* or toy*).ti,ab.
13	(cover* adj2 (baby or infant* or newborn* or new born*)).ti,ab.
14	sleep*.sh,ti,ab.
15	(9 and 14) or (or/10-13)
16	3 and 6 and 15
17	limit 16 to english language
18	limit 17 to yr=”1990-current”
19	((animal/ not human/) or nonhuman/ or exp animal experiment/ or exp experimental animal/ or animal model/ or exp rodent/) use emczd or ((animals/ not humans/) or exp animals, laboratory/ or exp animal experimentation/ or exp models, animal/ or exp rodentia/) use ppez or (rat or rats or mouse or mice).ti.
20	18 not 19

Database: CDSR [Wiley]

#	Search
#1	mesh descriptor: [infant] explode all trees

#	Search
#2	((babies or baby or infant* or newborn* or “new born*”)):ti,ab,kw
#3	#1 or #2
#4	mesh descriptor: [sudden infant death] explode all trees
#5	((cot* death* or sids or “sudden infant death” or ((unexpected or sudden) near/1 death))):ti,ab,kw
#6	#4 or #5
#7	#3 and #6 with cochrane library publication date from jan 1990 to may 2019, in cochrane reviews

Database: DARE, HTA (global) [CRD Web]

#	Search
1	mesh descriptor postpartum period in dare,hta
2	mesh descriptor peripartum period in dare,hta
3	mesh descriptor postnatal care in dare,hta
4	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) near2 birth*)) in dare, hta
5	#1 or #2 or #3 or #4
6	mesh descriptor breast feeding explode all trees in dare,hta
7	mesh descriptor lactation in dare,hta
8	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing next (baby or infant* or mother* or neonate* or newborn*))) in dare, hta
9	#6 or #7 or #8
10	mesh descriptor bottle feeding in dare,hta
11	mesh descriptor infant formula in dare,hta
12	(((bottle or formula or synthetic) near2 (artificial or fed or feed* or infant* or milk*)) or (artificial next (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk near2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) next supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) next (formula* or milk)) or formulafeed or formulated or (milk near2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) next bottle*) or infant feeding or bottle nipple* or milk pump*)) in dare, hta
13	#10 or #11 or #12
14	#5 or #9 or #13

Health economic search

The search for this topic was last run on 5th December 2019.

Database: Emcare, Embase, Medline, Medline Ahead of Print and In-Process & Other Non-Indexed Citations (global) – OVID [Multifile]

#	Search
1	puerperium/ or perinatal period/ or postnatal care/
2	1 use emczd, emcr
3	postpartum period/ or peripartum period/ or postnatal care/
4	3 use ppez
5	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) adj2 birth*)).ti,ab.
6	or/2,4-5
7	breast feeding/ or breast feeding education/ or lactation/
8	7 use emczd, emcr
9	exp breast feeding/ or lactation/
10	9 use ppez
11	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab.
12	or/8,10-11
13	artificial food/ or bottle feeding/ or infant feeding/
14	13 use emczd, emcr
15	bottle feeding/ or infant formula/
16	15 use ppez
17	(((bottle or formula or synthetic) adj2 (artificial or fed or feed* or infant* or milk*)) or (artificial adj (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk adj2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) adj supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) adj (formula* or milk)) or formulafeed or formulated or (milk adj2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) adj bottle*) or infant feeding or bottle nipple* or milk pump*)).ti,ab.
18	or/14,16-17
19	or/6,12,18
20	budget/ or exp economic evaluation/ or exp fee/ or funding/ or exp health care cost/ or health economics/
21	20 use emczd, emcr
22	exp budgets/ or exp "costs and cost analysis"/ or economics/ or exp economics, hospital/ or exp economics, medical/ or economics, nursing/ or economics, pharmaceutical/ or exp "fees and charges"/ or value of life/
23	22 use ppez
24	budget*.ti,ab. or cost*.ti. or (economic* or pharmaco?economic*).ti. or (price* or pricing*).ti,ab. or (cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab. or (financ* or fee or fees).ti,ab. or (value adj2 (money or monetary)).ti,ab.
25	or/21,23-24
26	economic model/ or quality adjusted life year/ or "quality of life index"/
27	(cost-benefit analysis.sh. and (cost-effectiveness ratio* and (perspective* or life expectanc*)).tw.)
28	((quality of life or qol).tw. and cost benefit analysis.sh.)
29	or/26-28 use emczd, emcr
30	models, economic/ or quality-adjusted life years/

#	Search
31	(cost-benefit analysis.sh. and (cost-effectiveness ratio* and (perspective* or life expectanc*)).tw.)
32	((quality of life or qol).tw. and cost-benefit analysis.sh.)
33	or/30-32 use ppez
34	(eq-5d* or eq5d* or eq-5* or eq5* or euroqual* or euro qual* or euroqual 5d* or euro qual 5d* or euro qol* or euroqol*or euro quol* or euroquol* or euro quol5d* or euroquol5d* or eur qol* or eurqol* or eur qol5d* or eurqol5d* or eur?qul* or eur?qul5d* or euro* quality of life or european qol).tw.
35	(euro* adj3 (5 d* or 5d* or 5 dimension* or 5dimension* or 5 domain* or 5domain*)).tw.
36	(hui or hui2 or hui3).tw.
37	(illness state* or health state*).tw.
38	(multiattibute* or multi attribute*).tw.
39	(qaly* or qal or qald* or qale* or qtime* or qwb* or daly).tw.
40	(quality adjusted or quality adjusted life year*).tw.
41	(sf36 or sf 36 or sf thirty six or sf thirtysix).tw.
42	sickness impact profile.sh.
43	(time trade off*1 or time tradeoff*1 or tto or timetradeoff*1).tw.
44	(utilit* adj3 (score*1 or valu* or health* or cost* or measur* or disease* or mean or gain or gains or index*)).tw.
45	utilities.tw.
46	((qol or hrqol or quality of life).tw. or *quality of life/) and ((qol or hrqol* or quality of life) adj2 (change*1 or declin* or decreas* or deteriorat* or effect or effects or high* or impact*1 or impacted or improve* or increas* or low* or reduc* or score or scores or worse)).ab.
47	quality of life.sh. and ((health-related quality of life or (health adj3 status) or ((quality of life or qol) adj3 (chang* or improv*)) or ((quality of life or qol) adj (measure*1 or score*1))).tw. or (quality of life or qol).ti. or ec.fs.)
48	or/29,33-47
49	or/25,48
50	19 and 50
51	limit 50 to english language
52	(animals/ not humans/) or exp animals, laboratory/ or exp animal experimentation/ or exp models, animal/ or exp rodentia/
53	52 use ppez
54	(animal/ not human/) or nonhuman/ or exp animal experiment/ or exp experimental animal/ or animal model/ or exp rodent/
55	54 use emczd, emcr
56	(rat or rats or mouse or mice).ti.
57	or/53,55-56
58	51 not 57

Database: HTA, NHS EED (global) [CRD Web]

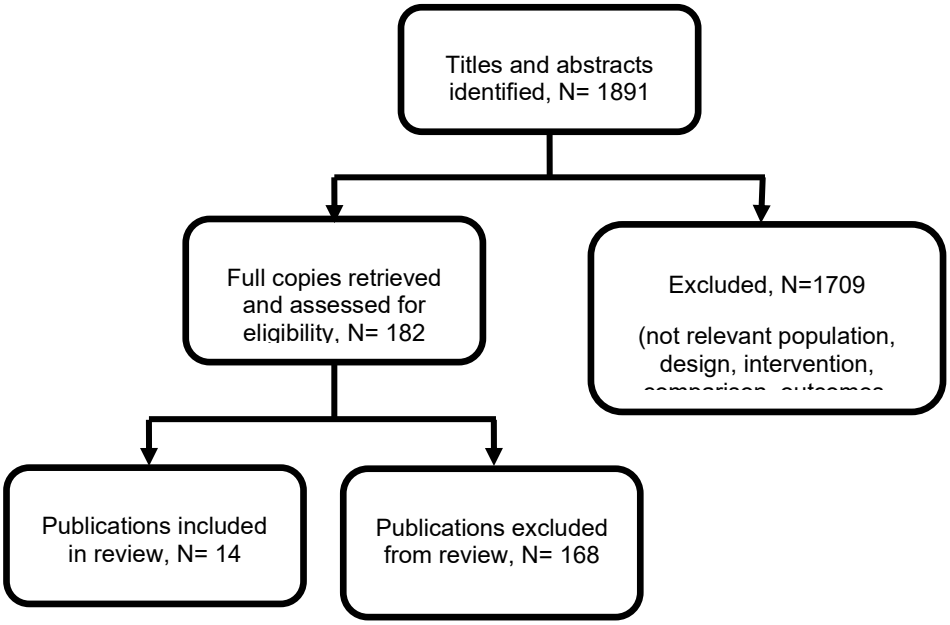
#	Search
1	mesh descriptor postpartum period in hta, nhs eed
2	mesh descriptor peripartum period in hta, nhs eed
3	mesh descriptor postnatal care in hta, nhs eed

#	Search
4	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) near2 birth*)) in hta, nhs eed
5	#1 or #2 or #3 or #4
6	mesh descriptor breast feeding explode all trees in hta, nhs eed
7	mesh descriptor lactation in hta, nhs eed
8	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing next (baby or infant* or mother* or neonate* or newborn*))) in hta, nhs eed
9	#6 or #7 or #8
10	mesh descriptor bottle feeding in hta, nhs eed
11	mesh descriptor infant formula in hta, nhs eed
12	(((bottle or formula or synthetic) near2 (artificial or fed or feed* or infant* or milk*)) or (artificial next (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk near2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) next supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) next (formula* or milk)) or formula feed or formulated or (milk near2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) next bottle*) or infant feeding or bottle nipple* or milk pump*)) in hta, nhs eed
13	#10 or #11 or #12
14	#5 or #9 or #13

Appendix C – Clinical evidence study selection

Clinical study selection for: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

Figure 1: Study selection flow chart



Appendix D – Clinical evidence tables

Clinical evidence tables for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

Two of the publications (Mitchell 1998 and Rechtman 2014) reported the exposures of interest (co-sleeping with a risk factor) against the reference of interest for this review (co-sleeping without a risk factor). All of the other papers reported the exposures of interest (co-sleeping with a risk factor) against the reference standard of not co-sleeping. These papers also report the risk of co-sleeping against not co-sleeping. Therefore, the NGA technical team were able to calculate the risk of SUDI of co-sleeping with a risk factor against this review's desired reference standard of co-sleeping without a risk factor using an equation by Franchini (2012). The data extracted in Appendix D is the risks of SUDI as reported in the publications compared to the references standard as defined in the primary study (which was commonly non co-sleeping). The data reported in Appendix F (GRADE tables) and Appendix M are the re-calculated values.

Table 4: Clinical evidence table

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
Full citation Blair, P. S., Sidebotham, P., Pease, A., Fleming, P. J., Bed sharing in the absence of hazardous circumstances: Is there a risk of sudden infant death syndrome? An analysis from two case-control studies conducted in the UK, PLoS ONE, 9, 2014 **Ref Id** 412334 **Country/ies where the study was carried out** England **Study type**	**Recruited** N=1786 n= 400 Cases n=1386 Controls **Characteristics** None reported **Case Recruitment** Both studies: All deaths classified according to the Avon clinico-pathological system by a multidisciplinary committee after a full paediatric necropsy to a standard protocol as an explained or unexplained SIDS death.	**Adjustments** For all infants: Adjusted for infant age and whether a day or night sleep as well as infant characteristics: birthweight <2500 g, pre-term, male gender and currently breastfeeding, maternal characteristics: larger families (≥3 children), younger mothers (≤21 years) and poor maternal education (<GCSE or no qualification) factors at the time of the last sleep: infant unwell (scoring more 8 or more on the Baby Check), infant placed prone or side, infant swaddled, use of a duvet, use of a dummy and infant found with head covered.	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed shared (all infants): OR 1.08 (0.58 to 2.01) Co-slept on a sofa or chair (all infants): OR 18.34 (7.10 to 47.35) Bed shared next to adult >2 units of alcohol (all infants): OR 18.39 (7.68 to 43.54)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias (although no participant characteristics were reported) Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
Pooled analysis of two case-control studies (Fleming 1993 and Blair 2009) **Study dates** 1993 to 1996 and 2003 to 2006	**Control Recruitment** 1993 study: The health visitor for the infant who died was asked to identify two babies on their case list born in the two weeks before the index baby and two babies born in the two weeks after the index baby. 2009 study: The control infants were weighted to be comparable with the maternal social class distribution of mothers with dependent children in Avon from the 1991 census. The age of the infants at interview and the time of day of the reference sleep were weighted to reflect approximately the ages and times of day at which infants had died.	For infants <92 days or ≥92 days old: Adjusted for infant age and whether a day or night sleep **Follow-up** Cases: 1-2 days after the death of an infant and again 2 weeks later to complete the questionnaire Controls: Visited within a week of the case death to collect the same information	Bed shared next to an adult who smoked (all infants): OR 4.04 (2.41 to 6.75) Bed shared (infant <98 days old): OR 1.62 (0.96 to 2.73) Co-slept on a sofa or chair (infant <98 days old): OR 21.44 (7.93 to 58.04) Bed shared next to adult >2 units of alcohol (infant <98 days old): OR 19.35 (7.05 to 53.11) Bed shared next to an adult who smoked (infant <98 days old): OR 8.93 (5.27 to 15.14) Bed shared (infant ≥98 days old): OR 0.08 (0.01 to 0.52) Co-slept on a sofa or chair (infant ≥98 days old): OR 23.86 (5.22 to 109.2) Bed shared next to adult >2 units of alcohol (infant ≥98	**Source of funding** The two studies were funded by the cot death charities, The Foundation for the Study of Infant Deaths, now the Lullaby Trust and Babes in Arms. There was also funding received from the Department of Health (England) and the Charitable Trusts of University Hospitals Bristol. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
			days old): OR 6.38 (2.38 to 17.12) Bed shared next to an adult who smoked (infant ≥98 days old): OR 1.42 (0.72 to 2.79)	
Full citation Fu, L. Y., Moon, R. Y., Hauck, F. R., Bed sharing among black infants and sudden infant death syndrome: Interactions with other known risk factors, Academic Pediatrics, 10, 376-382, 2010 **Ref Id** 936730 **Country/ies where the study was carried out** USA **Study type** Case-control **Study dates** November 1993 to April 1996	**Recruited** N=389 n=195 Cases n=194 Controls **Characteristics** None reported - characteristics given for bed sharing versus not bed sharing and not cases versus controls **Case Recruitment** All Chicago resident infants from birth to 1 year of age who died of SIDS (cases) as determined by the Office of the Medical Examiner of Cook County, Illinois. Total of 195 cases interviewed and complete results available. **Control Recruitment** One living control infant was matched to each case infant on the following (in order of priority): maternal race/ ethnicity, age at	**Adjustments** Adjusted for maternal marital status, education, and index of prenatal care **Follow-up** Cases: Two weeks after the death Controls: Timed to occur within 2 to 4 weeks of the age at death for the case infant	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed share + firm mattress: OR 2.0 (1.1 to 4.0) Bed share + soft mattress: OR 8.8 (3.5 to 21.7) Bed share + no maternal smoking: OR 1.9 (0.9 to 3.8) Bed share + maternal smoking: OR 6.0 (2.7 to 13.4) Bed share + no pillow: OR 2.9 (1.5 to 5.3) Bed share + pillow: OR 4.1 (1.4 to 11.5) Bed share + 0-1 covers: OR 2.8 (1.5 to 5.2)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias (although no participant characteristics were reported) Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	death/interview, and birth weight (<2500 g, 2500 g to <4000 g, and ≥4000 g; ±250 g if in the middle category). Potential control infants who met the matching criteria were identified through ongoing review of birth certificates at the Chicago Department of Public Health and were invited to participate via mailed correspondence. Total of 194 cases interviewed and complete results available.		Bed share + >2 covers: OR 1.8 (0.8 to 4.1) Bed share + supine: OR 4.9 (1.6 to 14.7) Bed share + prone/side: OR 4.1 (1.7 to 9.7)	**Source of funding** This study was supported by Health Resources and Services Administration grant 1R40MC08963-01 to Rachel Moon, principal investigator.
Full citation Hauck, F. R., Herman, S. M., Donovan, M., Iyasu, S., Moore, C. M., Donoghue, E., Kirschner, R. H., Willinger, M., Sleep environment and the risk of sudden infant death syndrome in an urban population: The Chicago infant mortality study, Pediatrics, 111, 1207-1214, 2003 **Ref Id** 938497 **Country/ies where the study was carried out** USA **Study type** Case-control **Study dates**	**Recruited** N=520 n=260 Cases n=260 Controls **Characteristics** Maternal Age: Cases 23.2 (5.4) versus Controls 24.8 (6.4) years Cases had significantly lower educational attainment, had significantly less adequate pre-natal care, significantly more likely to be single and had significantly higher parity. **Case Recruitment** See Fu 2010 **Control Recruitment**	**Adjustments** Adjusted for maternal age, marital status, education, and index of prenatal care **Follow-up** See Fu 2010	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Shared bed + with mother alone or with mother and father: OR 1.3 (0.7 to 2.3) Shared bed + with others: OR 4.1 (2.0 to 8.4)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias **Source of funding** This work was supported by the National Institute of Child Health and Human Development and

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
November 1993 to April 1996	See Fu 2010			the National Institute on Deafness and Other Communication Disorders under contract number NO1-HD-3-3188 and the Centers for Disease Control and Prevention and the Association of Teachers of Preventive Medicine under cooperative agreement number U50/CCU300860-06.
Full citation McGarvey, C., McDonnell, M., Chong, A., O'Regan, M., Matthews, T., Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland, Archives of Disease in Childhood, 88, 1058-1064, 2003 **Ref Id** 937234 **Country/ies where the study was carried out** Republic of Ireland **Study type** Case-control **Study dates** 1 January 1994 to 31 December 1998	**Recruited** N=825 n=203 Cases n=622 Controls **Characteristics** None reported **Case Recruitment** All sudden unexpected infant deaths in the Republic of Ireland. Deaths are reported to the Irish Sudden Infant Death Association's National SIDS Register within 48 hours of the infant's death. Ascertainment of cases was when SIDS was the diagnosis used on the death certificate after a post-mortem examination. Death certificates were made available by the central statistics office, facilitated by the Department of Health and Children, and post-mortem reports were also	**Adjustments** Adjusted for maternal age, education, smoking and drinking during pregnancy, social disadvantage, z scores for weight by gestation, whether breastfeeding was initiated at birth, baby being ill, crying/colic problems, symptoms in 48 h prior to last/reference sleep, tog of bed covering >10, use of pillows, duvets, prone position, and absence of routine soother use during the last/reference sleep period. **Follow-up** Parents were interviewed within six weeks of their baby's death. The average time interval between notification and interview was 5.7 weeks for cases and 5.9 weeks for controls.	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed share + put back in cot: OR 1.29 (0.41 to 3.95) Bed share entire sleep: OR 9.28 (1.69 to 50.90) Co-sleep in sofa/armchair: No control infants who co-slept on sofa/armchair therefore OR not available	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias (although no participant characteristics were reported) Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias **Source of funding** None reported

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	forwarded to the SIDS Register by the coroners, allowing complete ascertainment of cases. A total of 203 cases were interviewed. **Control Recruitment** Four control infants were selected randomly from the birth register for each case matched for date of birth and geographical location. A total of 622 controls were interviewed.			
Full citation McGarvey, C., McDonnell, M., Hamilton, K., O'Regan, M., Matthews, T., An 8-year study of risk factors for SIDS: Bed sharing versus non-bed sharing, Archives of Disease in Childhood, 91, 318-323, 2006 **Ref Id** 412984 **Country/ies where the study was carried out** Republic of Ireland **Study type** Case-control	**Recruited** N=1118 n=287 Cases n=831 Controls **Characteristics** Cases age at time of death: 16.4 weeks; Control age at interview 21.8 weeks. **Case Recruitment** All sudden unexpected deaths in infancy (SUDI) in Ireland and all cases with ‘‘SIDS’’ as the certified cause of death were included in the study.	**Adjustments** Adjusted for maternal age, education, smoking, drinking, and occurrence of urinary tract infection >3 previous live births, z scores for weight by gestation, resuscitation required at birth, male sex, whether breastfeeding was initiated at birth, any history of illness during infant’s lifetime, baby prone to sweating, symptoms in 48 h prior to last/reference sleep, tog of clothing/bedding >10, use of duvets, prone position, and absence of routine soother use during the last/reference sleep period. **Follow-up** Both case and control families were invited by letter to participate in a	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Next to one adult in bed: OR 3.29 (1.05 to 10.26) Between two adults in bed: OR 4.68 (1.09 to 19.99)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias **Source of funding**

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
Study dates 1st January 1994 and 31st December 2001	Total cases interviewed: n=287 **Control Recruitment** Controls were selected randomly for each case from the birth register and matched for date of birth and the same community care area as the index case. Total controls interviewed: n=831	home interview which was conducted within 6 weeks of the index case's death.		None reported
Full citation Mitchell, E. A., Tuohy, P. G., Brunt, J. M., Thompson, J. M. D., Clements, M. S., Stewart, A. W., Ford, R. P. K., Taylor, B. J., Risk factors for sudden infant death syndrome following the prevention campaign in New Zealand: A prospective study, Pediatrics, 100, 835-840, 1997 **Ref Id** 413023 **Country/ies where the study was carried out** New Zealand **Study type** Case-control **Study dates**	**Recruited** N=1049 n=127 Cases n=922 Controls **Characteristics** **Marital status** Married: Cases n=31 (26.7%), Controls n=627 (70.1%) De facto: Cases n=50 (43.1%), Controls n=163 (18.2%) Single: Cases n=35 (30.2%), Controls n=104 (11.7%) **Age mother left school** <16: Cases n=38 (36.9%), Controls n=156 (20.0%)	**Adjustments** Adjusting for: maternal age, marital status, age mother left school, previous number of pregnancies, infant's sex, ethnicity of infant, birthweight, sleep position, breastfeeding and bed sharing/maternal smoking combinations. **Follow-up** Data were recorded routinely by a community child health nurse at two time points: at the first contact (initial) and at approximately 2 months of age.	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed sharing + no maternal smoking (Initial): OR 0.55 (0.17 to 1.78) Bed sharing + maternal smoking (Initial): OR 5.01 (2.01 to 12.46) Bed sharing + no maternal smoking (2 months): OR 1.03 (0.21 to 5.06) Bed sharing + maternal smoking (2 months): OR 5.02 (1.05 to 24.05)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias (although only 55% of all cases took part) Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias **Source of funding**

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
October 1 1991 to September 30 1993	16: Cases n=25 (24.3%), Controls n=218 (27.9%) >17: Cases n=40 (38.8%), Controls n=407 (52.1%) **Age of mother** <20: Cases n=15 (13.3%), Controls n=62 (7.1%) 20-24: Cases n=44 (38.9%), Controls n=169 (19.4%) 25-29: Cases n=37 (32.7%), Controls n=303 (34.9%) 30+: Cases n=17 (15.1%), Controls n=335 (38.5%) **Previous number of pregnancies** 0: Cases n=17 (14.2%), Controls n=277 (31.3%) 1: Cases n=25 (20.8%), Controls n=242 (27.3%) 2: Cases n=29 (24.2%), Controls n=181 (20.4%) 3+: Cases n=49 (40.8%), Controls n=186 (21.0%) **Infants sex**			Funded by the Cot Death Association and the Public Health Commission

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	Male: Cases n=138 (59.5%), Controls n=476 (51.7%) Female: Cases n=94 (40.5%), Controls n=445 (48.3%) **Ethnicity of Infant** Maori: Cases n=69 (55.6%), Controls n=196 (21.7%) Pacific Islander: Cases n=8 (6.5%), Controls n=71 (7.9%) Other: Cases n=47 (37.9%), Controls n=635 (70.4%) **Birthweight** <2500g: Cases n=15 (12.1%), Controls n=47 (5.2%) 2500-2999g: Cases n=30 (24.2%), Controls n=139 (15.3%) 3000-3499g: Cases n=46 (37.1%), Controls n=302 (33.2%) 3500+g: Cases n=33 (26.6%), Controls n=421 (46.3%) **Case Recruitment** All deaths registered by the New Zealand Health Information Service as attributable to SIDS in the postneonatal age group (dying after			

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	28 completed days and within the first year of life) form the cases of this study. A total of 127 cases completed the data sheets **Control Recruitment** A sample of infants was obtained that was representative of all births within New Zealand. The method for sampling was: (a) a date of birth was randomly selected from all the days in the study period; (b) an obstetric hospital was randomly chosen in proportion to the number of births; (c) in the obstetric hospital with multiple births on nominated date of birth random numbers were used to select a particular infant from among those born on that day; and (d) a direction variable, which indicates to either go forward or back in looking for a birth in the situation where the hospital did not have one on the nominated day, was also randomly chosen. A total of 922 controls completed the data sheets			
Full citation Mitchell, E. A., Thompson, J. M. D., Ford, R. P. K., Taylor, B. J., Becroft, D. M. O., Allen, E., Barry, D., Scragg, R., Roberts, A., Hassall, I. B., Stewart, A., Williams, S., Sheepskin bedding and the	**Recruited** N=1985 n= 393 Cases n=1592 Controls	**Adjustments** Adjusted for age of infant, region, season, and time; sociodemographic background: marital status, occupation, age mother left school, and age of mother; pregnancy variables: parity, age of mother at first pregnancy, and attendance at	**Outcome: sudden unexpected death in infancy** Bed sharing last sleep versus bed sharing + sleeping on sheep skin last sleep: Logistic	**Limitations** See Scragg 1995 **Source of funding**

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
sudden infant death syndrome, Journal of Pediatrics, 133, 701-704, 1998 **Ref Id** 1011859 **Country/ies where the study was carried out** New Zealand **Study type** Case-control **Study dates** See Scragg 1995	**Characteristics** None reported **Case Recruitment** See Scragg 1995 **Control Recruitment** See Scragg 1995	antenatal clinics and education classes; infant factors: sex, ethnicity, birth weight, and gestational age; and postnatal factors: admission to neonatal unit, breast-feeding, maternal smoking, sleep position, infant sharing a bed with another person, pacifier use, excess thermal insulation, and illness. **Follow-up** See Scragg 1995	regression did not converge Bed sharing usually in last 2 weeks versus Bed sharing + sleeping on sheep skin in last 2 weeks: OR 0.61 (0.38 to 0.99)	Supported by the Health Research Council of New Zealand and the Hawke's Bay Medical Research Foundation.
Full citation Mitchell, E. A., Thompson, J. M. D., Zuccollo, J., Macfarlane, M., Taylor, B., Elder, D., Stewart, A. W., Percival, T., Baker, N., McDonald, G., Lawton, B., Schlaud, M., Fleming, P., The combination of bed sharing and maternal smoking leads to a greatly increased risk of sudden unexpected death in infancy: The New Zealand sudi nationwide case control study, New Zealand Medical Journal, 130, 52-64, 2017 **Ref Id**	**Recruited** N=391 n=133 Cases n=258 Controls **Characteristics** **Ethnicity (missing n=6)** European: Cases n=28 (22%), Controls n=73 (28.3%) Maori: Cases n=63 (49.6%), Controls n=135 (52.3%)	**Adjustments** Adjusted for ethnicity, marital status, number of previous live births, maternal age, maternal smoking in pregnancy, multiple birth, sex, birthweight, age of infant, position placed to sleep, breastfeeding and sharing parental bedroom. **Follow-up** The parents of control infants were sent a patient information sheet, and were phoned one to two weeks later to arrange an interview close to the nominated date.	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed sharing + no smoking: OR 1.59 (0.52 to 4.87) Bed sharing + smoking: OR 32.8 (11.2 to 95.8)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
936872 **Country/ies where the study was carried out** New Zealand **Study type** Case-control **Study dates** 1 March 2012 to 28 February 2015	Pacific: Cases n=19 (15%), Controls n=34 (13.2%) Other: Cases n=17 (13.4%), Controls n=16 (6.2%) **Marital status (missing n=23)** Married: Cases n=19 (17%), Controls n=89 (34.8%) Cohabiting: Cases n=53 (34.6%), Controls n=100 (39.1%) Single: Cases n=40 (35.7%), Controls n=67 (26.2%) **Number of previous live births (missing n=13)** 0: Cases n=63 (52.5%), Controls n=59 (22.9%) 1: Cases n=14 (11.7%), Controls n=62 (24.0%) 2: Cases n=16 (13.3%), Controls n=41 (15.9%) 3+: Cases n=27 (22.5%), Controls n=96 (37.2%) **Maternal age at birth (missing n=11)** Cases 25.3 yrs (SD 6.5), Controls 28.7 yrs (SD 6.6)			Statistical analysis and reporting - Low risk of bias **Source of funding** Health Research Council of New Zealand

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	Smoking during pregnancy (missing n=9) No: Cases n=32 (25.8%), Controls n=167 (64.7%) Yes: Cases n=92 (74.2%), Controls n=91 (35.3%) **Multiple births (missing n=5)** No: Cases n=8 (6.3%), Controls n=4 (1.6%) Yes: Cases n=120 (93.8%), Controls n=254 (98.4%) **Baby sex (missing n=0)** Female: Cases n=56 (42.1%), Controls n=95 (36.8%) Male: Cases n=77 (57.9%), Controls n=163 (63.2%) **Birthweight (mean g, SD) (missing n=14)** Cases 3158 g (SD 619), Controls 3466 g (SD 581) **Age of infant (mean weeks, SD) (missing n=0)**			

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	Cases 14.3 weeks (SD 18.1), Controls 15.3 weeks (SD 10.4) **Position placed to sleep (missing n=7)** Back: Cases n=83 (65.9%), Controls n=89 (83.3%) Side: Cases n=31 (24.6%), Controls n=100 (12.0%) Front: Cases n=12 (9.5%), Controls n=67 (4.7%) **Breastfed (missing n=5)** Yes: Cases n=115 (89.8%), Controls n=248 (96.1%) No: Cases n=13 (10.2%), Controls n=10 (3.9%) **Sharing parental bedroom (missing n=6)** Yes: Cases n=69 (54.3%), Controls n=177 (68.6%) No: Cases n=58 (45.7%), Controls n=81 (31.4%) **Bed sharing (missing n=6)**			

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	No: Cases n=54 (42.5%), Controls n=212 (82.2%) Yes: Cases n=73 (57.5%), Controls n=46 (17.8%) **Case Recruitment** The death of an infant that was referred to the coroner was potentially eligible for inclusion. The cases had to be born and domiciled in New Zealand, and be between seven days of age and the first birthday (post-perinatal age group). A total of 133 cases were interviewed. **Control Recruitment** The following method was used to select controls: 1. A date of interview (nominated date) was randomly selected from all days in the three-year study (1 March 2012 to 28 February 2015). 2. The control was then randomly allocated an age at which to be inter-viewed to ensure that the control group had a similar			

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	age distribution to that previously described for cases. 3. The date of birth was calculated from the age and nominated date at interview. 4. An obstetric hospital was randomly chosen in proportion to the obstetric hospital of birth of SUDI cases over the previous four years. 5. Ethnicity was randomly allocated to each control in proportion to the ethnicities of the cases over the previous four years. 6. Random numbers were used to select a particular ethnic specific infant from among those born on the nominated date at that obstetric hospital. For obstetric hospitals where there were no deliveries of ethnic-specific babies on the nominated date, a randomly allocated direction indicator was used to indicate whether to go forwards or backwards in time to select an infant.			

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	A total of 258 controls were interviewed.			
Full citation Rechtman, L. R., Colvin, J. D., Blair, P. S., Moon, R. Y., Sofas and infant mortality, Pediatrics, 134, e1293-e1300, 2014 **Ref Id** 1013189 **Country/ies where the study was carried out** USA **Study type** Case-control **Study dates** 2004 to 2012	**Recruited** N=7934 n=1024 Cases n=6910 Controls **Characteristics** Deaths on sofa = cases; Other sleep related infant deaths = controls **Age** <1 month: Cases 137/1024; Controls 738/6910 1 month: Cases 241/1024; Controls 1386/6910 2 months: Cases 224/1024; Controls 1481/6910 3 months: Cases 136/1024; Controls 1142/6910 4 months: Cases 104/1024; Controls 778/6910 5 months: Cases 61/1024; Controls 507/6910 6 months: Cases 37/1024; Controls 331/6910	**Adjustments** Adjusted for infant characteristics (age, gender, race or ethnicity, complex chronic condition, or technology dependence, eg, ventilator dependence, gastrostomy tube feeds), place of incident, whether an autopsy was performed, cause of death, sleep environment factors (surface sharing, object found in sleep environment, sleep position, and sleep position change), and pregnancy characteristics (maternal medical problems, intimate partner violence, and sub- stance use or abuse). **Follow-up** Not reported	**Outcome: sudden unexpected death in infancy** Sofa sharing versus sharing a surface that is not a sofa: OR 2.4 (1.9 to 3.0)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias **Source of funding** The data set was provided by the National Center for the Review and Prevention of Child Deaths, which is funded in part by grant U49MC00225 from the US Department of Health and Human Services, Health Resources and Services Administration, and in part by the US Centers for Disease Control and Prevention Division of Re-productive Health.

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	7 months: Cases 34/1024; Controls 221/6910 8 months: Cases 20/1024; Controls 127/6910 9 months: Cases 13/1024; Controls 79/6910 10 months: Cases 9/1024; Controls 68/6910 11 months: Cases 7/1024; Controls 53/6910 **Gender** Male: Cases 609/1024; Controls 4013/6910 Female: Cases 412/1024; Controls 2883/6910 Unknown: Cases 2/1024; Controls 15/6910 **Race** Hispanic: Cases 141/1024; Controls 1394/6910 non-Hispanic White: Cases 502/1024; Controls 30056/6910 non-Hispanic Black: Cases 335/1024; Controls 2067/6910 Other race: Cases 46/1024; Controls 393/6910			

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	Case Recruitment All infants (≤365 days of age) whose death was recorded in the Child Deaths Child Death Review and Case Reporting System (CDR-CRS) as a sleep-related death (ie, occurring during sleep or in a sleep environment, such as a crib, bassinet, or bed). Cases = those specifically who died on a sofa Controls = those who died in other sleep-related locations that were not a sofa **Control Recruitment** See Case Recruitment for more information			
Full citation Scragg, R., Mitchell, E. A., Taylor, B. J., Stewart, A. W., Ford, R. P. K., Thompson, J. M. D., Allen, E. M., Becroft, D. M. O., Bed sharing, smoking, and alcohol in the sudden infant death syndrome, British Medical Journal, 307, 1312-1318, 1993 **Ref Id** 1012110	**Recruited** N=1985 n= 393 Cases n=1592 Controls **Characteristics** Not reported for cases and controls.	**Adjustments** Adjusted for age of mother at birth, age she left school, age of first pregnancy, number of previous pregnancies, attendance at antenatal clinics and classes, the sex, gestational age, weight at birth of infant, admission to a neonatal unit, mother's marital status, occupational status, usual region of residence of the household, dummy use, breastfeeding, sleep position of the infant, age of the infant, season and time of day at death (or nominated	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed sharing + no smoking (bed share in last 2 weeks): OR 1.73 (1.11 to 2.70)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias (although no participant characteristics were reported) Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
Country/ies where the study was carried out New Zealand **Study type** Case-control **Study dates** 1 November 1987 to 30 October 1990	**Case Recruitment** Infants who died between the 28th day of life and the completion of their first year with a diagnosis of SIDS with or without other abnormalities. A total of 393 cases completed the interviews. **Control Recruitment** Randomly selected from all births, except home births in the study regions. Controls were randomly allocated a nominated date (to ensure group matching with cases for infant age) and a nominated time of day so that the distribution of this time for controls was similar to the expected distribution of the time of death in cases. A total of 1592 controls completed the interviews.	time for controls) room the infant usually slept in at night during the last two weeks or during the last sleep, as appropriate for the bed sharing variable. **Follow-up** 81% of case interviews were completed within seven weeks of the infant's death, and 70% of controls within four days of the nominated date.	Bed sharing + mother smoked in last 2 weeks (bed share in last 2 weeks): OR 3.94 (2.47 to 6.27) Bed sharing + no smoking (bed share in last sleep): OR 0.98 (0.44 to 2.18) Bed sharing + mother smoked in last 2 weeks (bed share in last sleep): OR 4.55 (2.63 to 7.88)	Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias **Source of funding** Health Research Council of New Zealand and the Hawkes Bay Medical Research Foundation.
Full citation Scragg, R., Stewart, A. W., Mitchell, E. A., Ford, R. P., Thompson, J. M., Public health policy on bed sharing and smoking in the sudden infant death syndrome, The New Zealand medical journal, 108, 218-222, 1995 **Ref Id**	**Recruited** N=1985 n= 393 Cases n=1592 Controls **Characteristics** Not reported	**Adjustments** Adjusted for age of infant, region, season and nominated time, martial status, occupation, age mother left school and age of mother, number of previous pregnancies attendance at antenatal clinics and education classes, infant sex, infant ethnicity, birthweight, gestation, admission to neonatal unit, breastfeeding, infant sleeping position and room infant slept in.	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed share last 2 weeks (Maori): OR 1.70 (0.53 to 5.43)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias (although no participant characteristics were reported) Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
1012111 **Country/ies where the study was carried out** New Zealand **Study type** Case-control **Study dates** 1 November 1987 to 31 October 1990	**Case Recruitment** Cases were all infants dying between the 28th day of life and the completion of their first year with a diagnosis of SIDS with or without other abnormalities from the following districts: Takapuna, Auckland, South Auckland, Hamilton, Rotorua, Napier, Hutt, Wellington, Christchurch, Dunedin and Invercargill. Total cases n=393 **Control Recruitment** Controls were randomly selected from all births in the study region except home births. Controls has to be born and domiciled in the study region. Methods for selecting controls were as follows: 1) a date for interview was randomly selected from all 365 days. 2) the control was then randomly allocated an age at which to be interviewed to ensure that the control group had a similar age distribution to that previously described for cases. 3) The data of birth was calculated from age and data at interview. 4) Births by day of the eek vary considerably, probably because of induction of labour. The day of birth as adjusted to fit this distribution. 5) An obstetric hospital was randomly chosen in proportion to the number of births over the previous financial year. 6) l hospitals with more than	**Follow-up** 81% of the cases were interviewed within 7 weeks of the infants death. 70% of the controls were interviewed within 4 days of the nominated date.	Bed share last 2 weeks and maternal smoking last 2 weeks (Maori): OR 4.06 (1.38 to 11.97) Bed share last sleep (Maori): OR 1.02 (0.25 to 4.13) Bed share last sleep and maternal smoking last 2 weeks (Maori): OR 4.99 (2.10 to 11.88) Bed share last 2 weeks (non-Maori): OR 1.66 (1.00 to 2.76) Bed share last 2 weeks and maternal smoking last 2 weeks (non-Maori): OR 0.74 (0.25 to 2.18) Bed share last sleep (non-Maori): OR 4.25 (2.37 to 7.64) Bed share last sleep and maternal smoking last 2 weeks (non-Maori): OR 3.04 (1.14 to 8.14)	Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias **Source of funding** The Health Research Council of New Zealand and the Hawkes Bay Medical Research Foundation.

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
	one birth on the selected day random numbers were used to select a particular infant from among those born on the nominated data. For obstetric hospitals where there were no deliveries on the nominated day, a randomly allocated direction indicator was used to indicate whether to go forwards or backwards in time to select the infant. (Data on recruitment taken from Mitchell 1991) Total controls n=1592			
Full citation Scragg, R. K. R., Mitchell, E. A., Stewart, A. W., Ford, R. P. K., Taylor, B. J., Hassall, I. B., Williams, S. M., Thompson, J. M. D., Infant room-sharing and prone sleep position in sudden infant death syndrome, Lancet, 347, 7-12, 1996 **Ref Id** 1013272 **Country/ies where the study was carried out** New Zealand **Study type** Case-control **Study dates**	**Recruited** N=1985 n= 393 Cases n=1592 Controls **Characteristics** None reported **Case Recruitment** See Scragg 1995 **Control Recruitment** See Scragg 1995	**Adjustments** Adjusted for ethnic origin, for infant subgroups classified by sharing room with an adult, bed sharing, and maternal smoking **Follow-up** See Scragg 1995	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed share + no room share + mother not smoking (last 2 weeks at night): OR 0.88 (0.50 to 1.53) Bed share + no room share + mother smoking (last 2 weeks at night): OR 4.45 (2.60 to 7.65) Bed share + room share + mother not smoking (last 2 weeks at night): OR 0.64 (0.39 to 1.05) Bed share + room share + mother smoking (last 2 weeks	**Limitations** See Scragg 1995 **Source of funding** The study was supported by the Health Research Council of New Zealand and the Hawkes Bay Medical Research Foundation.

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
See Scragg 1995			at night): OR 2.32 (1.47 to 3.66) Bed share + no room share + mother not smoking (last sleep): OR 1.17 (0.24 to 5.79) Bed share + no room share + mother smoking (last sleep): OR 2.26 (0.69 to 7.39) Bed share + room share + mother not smoking (last sleep): OR 0.30 (0.11 to 0.78) Bed share + room share + mother smoking (last sleep): OR 2.95 (1.66 to 5.27)	
Full citation Tappin, D., Ecob, R., Brooke, H., Bedsharing, roomsharing, and sudden infant death syndrome in Scotland: A case-control study, Journal of Pediatrics, 147, 32-37, 2005 **Ref Id** 1012188 **Country/ies where the study was carried out** Scotland **Study type**	**Recruited** N=376 n= 123 Cases n=263 Controls **Characteristics** None reported **Case Recruitment** Pathologists notified researchers of all sudden unexpected infant deaths.	**Adjustments** Adjusted for maternal age; quadratic function of maternal age; birth weight; infant age; parity; either parent smoked; laid prone to sleep; laid on side to sleep; found with head covered in the past; found with head covered after last sleep; infant routinely slept on a used infant mattress. **Follow-up** Cases interviewed within 28 days of the child's death.	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Room with parent(s) some bed sharing: OR 3.49 (1.54 to 7.92) Share couch: OR 66.95 (2.81 to 1596) Outside edge 1 parent + bed share: OR 7.63 (1.27 to 46)	**Limitations** Assessed using the QUIPS Quality Appraisal tool Study participation - Low risk of bias (although no participant characteristics were reported) Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
Case-control **Study dates** January 1996 to May 2000	Total number of cases with completed interviews n=123 **Control Recruitment** Two controls were identified for each case: the births immediately before and after in the same maternity unit. Total number of controls with completed interviews n=263		Outside edge 2/3 people + bed share: OR 7.06 (1.16 to 43) Between 2/3 people + bed share: OR 28.64 (4.17 to 197) Close not touching + bed sharing: OR 12.11 (2.11 to 69) Snuggled up + bed sharing: OR 9.45 (2.17 to 41)	Statistical analysis and reporting - Low risk of bias **Source of funding** The Scottish Cot Death Trust provided funding for this project.
Full citation Vennemann, M. M. T., Findeisen, M., Butterfass-Bahloul, T., Jorch, G., Brinkmann, B., Kopcke, W., Bajanowski, T., Mitchell, E. A., Modifiable risk factors for SIDS in Germany: Results of GeSID, Acta Paediatrica, International Journal of Paediatrics, 94, 655-660, 2005 **Ref Id**812789 **Country/ies where the study was carried out** Germany **Study type** Case-control	**Recruited** N=1331 n=333 Cases n=998 Controls **Characteristics** **Sex** Male: Cases 201/333, Controls 602/998 Female: 132/333, Controls 396/998 **Age of infant (weeks, SD)** Mean: Cases 19.1 (12.1), Controls 20.5 (11.8)	**Adjustments** Adjusted for all variables which were found significant at the 5% level in the univariate analysis, except gestational age, as this was closely related to birth-weight: Maternal age, Family status, Ethnicity, Smoking in pregnancy, previous live births, socio-economic status, gestational age, birthweight, breastfeeding>2weeks, position placed to sleep, pacifier used during sleep, co-sleeping with an adult, pillow in infants bed, extra warming during sleep. **Follow-up** Cases: Interviews were carried out by a mean of 39 days after death	**Outcome: sudden unexpected death in infancy** **Reference standard: not bed sharing** Bed share + no maternal smoking: OR 2.20 (0.99 to 4.91) Bed share + maternal smoking: OR 6.44 (2.62 to 15.81)	**Limitations** QUIPS Quality Appraisal Study participation - Low risk of bias Study attrition - Low risk of bias Prognostic factor measurement - Low risk of bias Outcome measurement - Low risk of bias Study confounding - Low risk of bias Statistical analysis and reporting - Low risk of bias **Source of funding** The German Federal Ministry for Science and Education

Study details	Participants	Adjustments and Follow-up	Outcomes and Results	Critical Appraisal
Study dates November 1998 to October 2001	**Case Recruitment** All cases of sudden and unexpected deaths in the first year of life after the first 7 days were to be reported to the study centre in Muenster. The study centre then asked the parents for participation. A total of 333 cases took part. **Control Recruitment** For each case, three control infants were matched for region, age (±2 weeks), gender and reference sleep. The control infants were recruited through the same or a neighbouring local birth registration office where the case was registered. Control infants were born 4–6 weeks after the case infant, so that by the time the interviews were done, they had the same age as the index case (±2 weeks). If one control family refused to participate, another family was recruited. If more than three controls agreed to participate, the three controls with the best age matching were chosen by the study centre. A total of 998 controls took part.	Controls: Interviews were carried out at a time to match the cases age ±2 weeks		supported this study on sudden infant death syndrome from 1998–2003.

OR: Odds ratio; SD: standard deviation; SIDS: sudden infant death syndrome; SUDI: sudden unexpected death of an infant

Appendix E – Forest plots

Forest plots for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

No meta-analysis was undertaken for this review and so there are no forest plots.

Appendix F – GRADE tables

GRADE tables for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

Recalculated where necessary from the original publication (where necessary) to compare co-sleeping plus an additional risk factor versus co-sleeping without additional risk factors.

Table 5: Clinical evidence profile for the risk of sudden unexpected death of an infant when bed sharing on different types of sleep surfaces

Quality assessment							No of patients recruited		Effect	Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Cases	Control	Relative (95% CI)[1]		
Co-sleeping on a sofa versus co-sleeping in bed											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	400	1386	aOR 16.98 (5.92 to 48.7)	HIGH	CRITICAL
Co-sleeping on a sofa versus co-sleeping in bed (child <98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	221	672	aOR 13.23 (4.46 to 39.25)	HIGH	CRITICAL
Co-sleeping on a sofa versus co-sleeping in bed (child ≥98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	179	714	aOR 298.24 (24.97 to 3562.56)	HIGH	CRITICAL
Sharing sofa versus sharing surface that is not a sofa											

1 (Rechtman 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	NR	NR	aOR 2.4 (1.9 to 3.03)	HIGH	CRITICAL
Sharing a sofa versus sleeping in a room with the parents with some bed sharing											
1 (Tappin 2005)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[2]	none	123	263	aOR 19.18 (0.75 to 490.53)	MODERATE	CRITICAL
Bed sharing entire night versus bed sharing and placing infant back in the cot											
1 (McGarvey 2003)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[2]	none	203	622	aOR 7.19 (0.96 to 53.85)	MODERATE	CRITICAL

aOR: adjusted odds ratio; NR: not reported
1 The confidence intervals in GRADE tables do not match exactly the confidence intervals in Appendix M due to entering the data first into RevMan to export into GRADE. Discrepancies are most likely due to rounding differences. The difference between the two was negligible.
2 Evidence downgraded by 1 level due to risk of serious imprecision, confidence intervals cross the line of no effect

Table 6: Clinical evidence profile for the risk of sudden unexpected death of an infant when bed sharing and substance use

Quality assessment							No of patients recruited		Effect	Quality	Importance
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Cases**	**Control**	**Relative (95% CI)[1]**		
Co-sleeping next to an adult who has consumed >2 units of alcohol versus co-sleeping next to an adult who has not consumed alcohol											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	400	1386	aOR 16.98 (5.92 to 48.7)	HIGH	CRITICAL
Co-sleeping next to an adult who has consumed >2 units of alcohol versus co-sleeping next to an adult who has not consumed alcohol (child <98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	221	672	aOR 11.94 (3.97 to 35.91)	HIGH	CRITICAL
Co-sleeping next to an adult who has consumed >2 units of alcohol versus co-sleeping next to an adult who has not consumed alcohol (child ≥98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	179	714	aOR 79.75 (8.89 to 715.43)	HIGH	CRITICAL

Co-sleeping next to an adult who smoked versus co-sleeping next to an adult who did not smoke											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	400	1386	aOR 3.74 (1.71 to 8.18)	HIGH	CRITICAL
Co-sleeping next to an adult who smoked versus co-sleeping next to an adult who did not smoke (child <98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	221	672	aOR 5.51 (2.78 to 10.92)	HIGH	CRITICAL
Co-sleeping next to an adult who smoked versus co-sleeping next to an adult who did not smoke (child ≥98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	179	714	aOR 17.75 (2.23 to 141.29)	HIGH	CRITICAL
Bed share + maternal smoking versus bed share + no maternal smoking											
1 (Vennemann 2005)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[2]	none	333	998	aOR 2.93 (0.91 to 9.43)	MODERATE	CRITICAL
Bed share + smoking versus bed share + no smoking											
1 (Mitchell 2017)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	133	258	aOR 20.63 (5.04 to 84.45)	HIGH	CRITICAL
Bed share + smoking versus bed share + no smoking (at initial contact)											
1 (Mitchell 1997)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	127	922	aOR 9.11 (2.25 to 36.89)	HIGH	CRITICAL
Bed share + smoking versus bed share + no smoking (at 2 months contact)											
1 (Mitchell 1997)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	127	922	aOR 4.87 (0.58 to 40.89)	LOW	CRITICAL
Bed share + smoking versus bed share + no smoking (last sleep)											
1 (Scragg 1993)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	393	1592	aOR 4.64 (1.83 to 11.76)	HIGH	CRITICAL

Bed share + smoking versus Bed share + no smoking (bed share in last 2 weeks)											
1 (Scragg 1993)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	393	1592	aOR 2.28 (1.33 to 3.91)	HIGH	CRITICAL
Bed share and maternal smoking versus bed share (Maori; last sleep)											
1 (Scragg 1995)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	393	1592	aOR 4.89 (1.38 to 17.33)	HIGH	CRITICAL
Bed share and maternal smoking versus bed share (Maori; last 2 weeks)											
1 (Scragg 1995)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	393	1592	aOR 2.39 (0.73 to 7.82)	LOW	CRITICAL
Bed share and maternal smoking versus bed share (non-Maori; last sleep)											
1 (Scragg 1995)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[2]	none	393	1592	aOR 4.11 (1.00 to 16.89)	MODERATE	CRITICAL
Bed share and maternal smoking versus bed share (non-Maori; last 2 weeks)											
1 (Scragg 1995)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	393	1592	aOR 2.57 (0.74 to 8.93)	LOW	CRITICAL
Bed share + smoking versus Bed share + no smoking											
1 (Fu 2010)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	195	194	aOR 3.16 (1.21 to 8.25)	HIGH	CRITICAL
Bed share + no room share + mother smoking versus bed share + no room share + mother not smoking (last 2 weeks at night)											
1 (Scragg 1996)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	393	1592	aOR 2.57 (0.74 to 8.93)	LOW	CRITICAL
Bed share + room share + mother smoking versus bed share + room share + mother not smoking (last 2 weeks at night)											
1 (Scragg 1996)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	393	1592	aOR 3.53 (1.04 to 11.98)	HIGH	CRITICAL

Bed share + no room share + mother smoking versus bed share + no room share + mother not smoking (last sleep)											
1 (Scragg 1996)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	393	1592	aOR 1.93 (0.27 to 13.8)	LOW	CRITICAL
Bed share + room share + mother smoking versus bed share + room share + mother not smoking (last sleep)											
1 (Scragg 1996)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	393	1592	aOR 9.83 (3.28 to 29.46)	HIGH	CRITICAL
Co-sleeping on a sofa versus co-sleeping next to an adult who smoked											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	400	1386	aOR 4.54 (1.57 to 13.13)	HIGH	CRITICAL
Co-sleeping on a sofa versus co-sleeping next to an adult who smoked (child <98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	221	672	aOR 2.4 (0.81 to 7.11)	LOW	CRITICAL
Co-sleeping on a sofa versus co-sleeping next to an adult who smoked (child ≥98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	179	714	aOR 16.8 (3.24 to 87.11)	HIGH	CRITICAL
Bed sharing next to an adult who smoked versus bed sharing next to an adult who had consumed >2 units of alcohol											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	400	1386	aOR 0.22 (0.08 to 0.6)	HIGH	CRITICAL
Bed sharing next to an adult who smoked versus bed sharing next to an adult who had consumed >2 units of alcohol (child <98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	221	672	aOR 0.46 (0.15 to 1.41)	LOW	CRITICAL
Bed sharing next to an adult who smoked versus bed sharing next to an adult who had consumed >2 units of alcohol (child ≥98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	179	714	aOR 0.22 (0.07 to 0.69)	HIGH	CRITICAL

Co-sleeping with an adult who had consumed >2 units of alcohol versus co-sleeping on a sofa											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	400	1386	aOR 1.00 (0.28 to 3.57)	LOW	CRITICAL
Co-sleeping with an adult who had consumed >2 units of alcohol versus co-sleeping on a sofa (child <98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	221	672	aOR 1.11 (0.31 to 3.96)	LOW	CRITICAL
Co-sleeping with an adult who had consumed >2 units of alcohol versus co-sleeping on a sofa (child ≥98 days)											
1 (Blair 2014)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[3]	none	179	714	aOR 3.74 (0.62 to 22.56)	LOW	CRITICAL

aOR: adjusted odds ratio
1 The confidence intervals in GRADE tables do not match exactly the confidence intervals in Appendix M due to entering the data first into RevMan to export into GRADE. Discrepancies are most likely due to rounding differences. The difference between the two was negligible.
2 Evidence downgraded by 1 level due to risk of serious imprecision, confidence intervals cross the line of no effect
3 Evidence downgraded by 2 levels due to risk of very serious imprecision because of breadth of confidence intervals, including crossing the line of no effect

Table 7: Clinical evidence profile for the risk of sudden unexpected death of an infant when bed sharing with different types of bedding

Quality assessment							No of patients recruited		Effect	Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Cases	Control	Relative (95% CI)[1]		
Bed sharing with a pillow versus bed sharing with no pillow											
1 (Fu 2010)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	195	194	aOR 1.41 (0.45 to 4.42)	LOW	CRITICAL
Bed sharing with a soft mattress versus bed sharing with a firm mattress											
1 (Fu 2010)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	195	194	aOR 4.4 (1.61 to 12.03)	HIGH	CRITICAL
Bed sharing with >2 covers versus bed sharing with 0-1 covers											
1 (Fu 2010)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	195	194	aOR 0.64 (0.25 to 1.64)	LOW	CRITICAL
Bed share usually in last 2 weeks + sleeping on sheep skin versus Bed share usually in last 2 weeks											
1 (Mitchell 1998)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	393	1592	aOR 0.61 (0.38 to 0.98)	HIGH	CRITICAL

aOR: adjusted odds ratio
1 The confidence intervals in GRADE tables do not match exactly the confidence intervals in Appendix M due to entering the data first into RevMan to export into GRADE. Discrepancies are most likely due to rounding differences. The difference between the two was negligible.
2 Evidence downgraded by 2 levels due to risk of very serious imprecision because of breadth of confidence intervals, including crossing the line of no effect

Table 8: Clinical evidence profile for the risk of sudden unexpected death of an infant when bed sharing with more than one bed sharer

Quality assessment							No of patients recruited		Effect	Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Cases	Control	Relative (95% CI)[1]		
Bed sharing with others versus bed sharing with mother or mother and father											
1 (Hauck 2003)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	260	260	aOR 3.15 (1.30 to 7.63)	HIGH	CRITICAL
Bed sharing next to two adults versus bed sharing next to one adult											
1 (McGarvey 2006)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	287	831	aOR 1.42 (0.23 to 8.77)	LOW	CRITICAL
Sleeping on the outside edge with 2-3 people in bed versus sleeping on the outside edge with 1 parent in bed											
1 (Tappin 2005)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	123	263	aOR 0.93 (0.08 to 10.81)	LOW	CRITICAL
Sleeping between 2-3 people in bed share versus sleeping on the outside edge with 1 parent in bed											
1 (Tappin 2005)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	123	263	aOR 3.73 (0.3 to 46.37)	LOW	CRITICAL
Sleeping between 2-3 people in bed versus sleeping on the outside edge with 2-3 people in bed											
1 (Tappin 2005)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	123	263	aOR 4.06 (0.32 to 51.52)	LOW	CRITICAL

aOR: adjusted odds ratio
1 The confidence intervals in GRADE tables do not match exactly the confidence intervals in Appendix M due to entering the data first into RevMan to export into GRADE. Discrepancies are most likely due to rounding differences. The difference between the two was negligible.
2 Evidence downgraded by 2 levels due to risk of very serious imprecision because of breadth of confidence intervals, including crossing the line of no effect

Table 9: Clinical evidence profile for the risk of sudden unexpected death of an infant when bed sharing with the baby in different positions in the bed

Quality assessment							No of patients recruited		Effect	Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Cases	Control	Relative (95% CI)[1]		
Bed sharing with infant sleeping in prone position versus bed sharing with infant sleeping in supine position											
1 (Fu 2010)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	195	194	aOR 0.84 (0.28 to 2.52)	LOW	CRITICAL
Snuggled up bed sharing versus bed sharing close but not touching											
1 (Tappin 2005)	case-control	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	123	263	aOR 0.78 (0.09 to 6.76)	LOW	CRITICAL

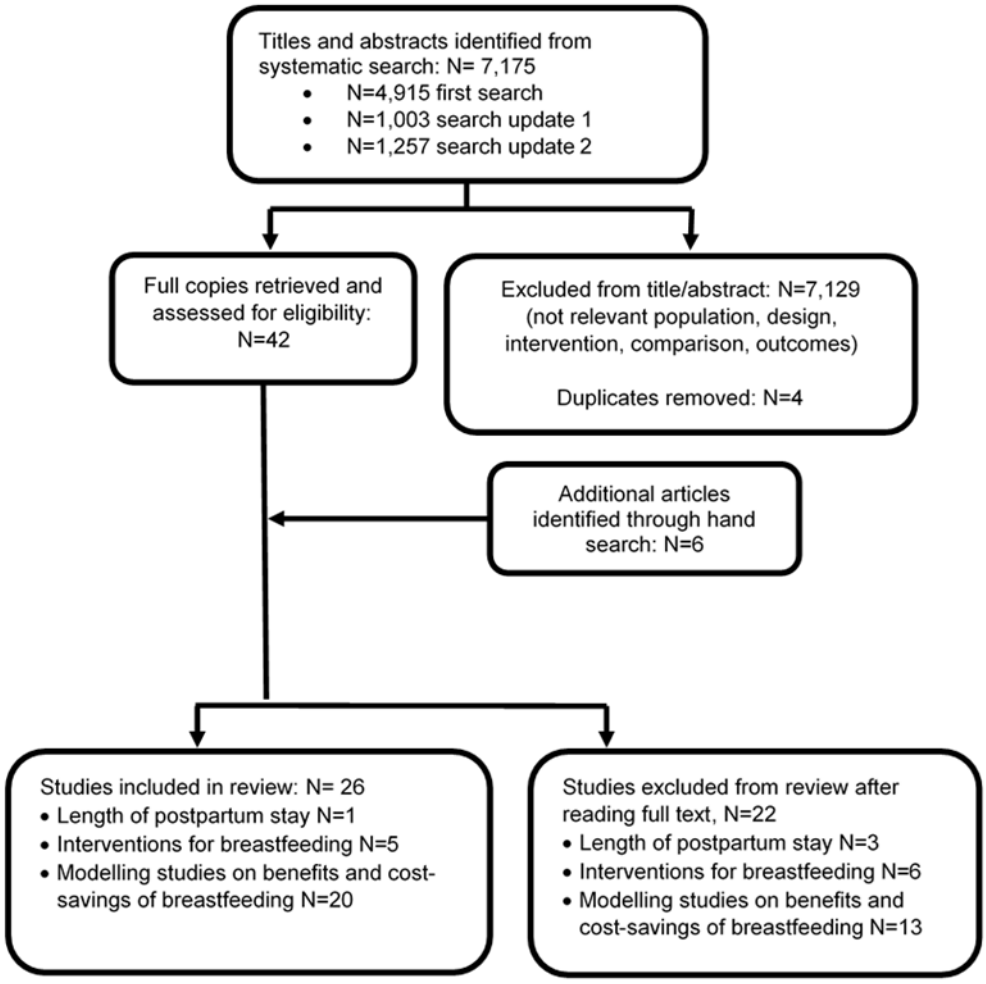
aOR: adjusted odds ratio
1 The confidence intervals in GRADE tables do not match exactly the confidence intervals in Appendix M due to entering the data first into RevMan to export into GRADE. Discrepancies are most likely due to rounding differences. The difference between the two was negligible.
2 Evidence downgraded by 2 levels due to risk of very serious imprecision because of breadth of confidence intervals, including crossing the line of no effect

Appendix G – Economic evidence study selection

Economic evidence study selection for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

A global health economics search was undertaken for all areas covered in the guideline. **Figure 2** shows the flow diagram of the selection process for economic evaluations of postnatal care interventions, including modelling studies on the benefits and cost-savings of breastfeeding.

Figure 2. Flow diagram of selection process for economic evaluations of postnatal care interventions and modelling studies on the benefits and cost-savings of breastfeeding



Appendix H – Economic evidence tables

Economic evidence tables for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

No economic evidence was identified which was applicable to this review question.

Appendix I – Economic evidence profiles

Economic evidence profiles for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

No economic evidence was identified which was applicable to this review question.

Appendix J – Economic analysis

Economic analysis for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

No economic analysis was conducted for this review question

Appendix K – Excluded studies

Excluded clinical and economic studies for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

Clinical studies

Table 10: Excluded studies and reasons for their exclusion

Study	Reason for exclusion
Alexander, R. T., Radisch, D., Sudden infant death syndrome risk factors with regards to sleep position, sleep surface, and co-sleeping, Journal of Forensic Sciences, 50, 147-151, 2005	Study design - not comparative
Alm, B., Mollborg, P., Erdes, L., Pettersson, R., Aberg, N., Norvenius, G., Wennergren, G., SIDS risk factors and factors associated with prone sleeping in Sweden, Archives of Disease in Childhood, 91, 915-917, 2006	No relevant outcome data
Anderson, M. E., Johnson, D. C., Batal, H. A., Sudden Infant Death Syndrome and prenatal maternal smoking: rising attributed risk in the Back to Sleep era, BMC Medicine, 3 (no pagination), 2005	No relevant outcome data
Anonymous,, Sleeping position and cot deaths, Lancet, 338, 192, 1991	Abstract
Anonymous,, Roughly 14% of Infants Share Bed With Adult or Child, Home healthcare nurse, 32, 8-9, 2014	Study design - commentary
Anonymous,, Erratum: Bedding and sleeping position in the sudden infant death syndrome (British Medical Journal (8 September 1990) (p 493)), British Medical Journal, 301, 875, 1990	Study design - letter
Anonymous,, Bedding and sleeping position in the sudden infant death syndrome, BMJ (Clinical research ed.), 301, 492-494, 1990	Study design - letter
Ball, H. L., Blair, P. S., Ward-Platt, M. P., "New" practice of bedsharing and risk of SIDS, Lancet, 363, 1558, 2004	Study design - letter
Bartick, M., Bed sharing with unimpaired parents is not an important risk for sudden infant death syndrome [13], Pediatrics, 117, 992-993, 2006	Study design - letter
Beal, S., Sudden infant death syndrome related to sleeping position and bedding, Medical Journal of Australia, 155, 507-508, 1991	Study design - editorial
Beal, S. M., Sudden infant death syndrome (SIDS) in South Australia related to sleeping conditions, Medical Journal of Australia, 158, 723, 1993	Study design - letter
Beal, S. M., Sudden infant death syndrome in South Australia 1968-97. Part I: changes over time, Journal of Paediatrics & Child Health, 36, 540-7, 2000	No relevant outcome data
Beal, S. M., Baghurst, P., Antoniou, G., Sudden infant death syndrome (SIDS) in South Australia 1968-97. Part 2: the epidemiology of non-prone and non-covered SIDS infants, Journal of Paediatrics & Child HealthJ Paediatr Child Health, 36, 548-51, 2000	No relevant outcome data
Beal, S. M., Byard, R. W., Accidental death or sudden infant death syndrome?, Journal of Paediatrics and Child Health, 31, 269-271, 1995	Study design - review

Beal, S. M., Byard, R. W., Sudden infant death syndrome in South Australia 1968-97. Part 3: Is bed sharing safe for infants?, Journal of Paediatrics and Child Health, 36, 552-554, 2000	Study design - not comparative
Bell, S. A., Cole, M., Cot mattresses and sudden infant death syndrome, Lancet, 345, 1046, 1995	Study design - letter
Blair, P. S., Fleming, P. J., Smith, I. J., Platt, M. W., Young, J., Nadin, P., Berry, P. J., Golding, J., Babies sleeping with parents: Case-control study of factors influencing the risk of the sudden infant death syndrome, British Medical Journal, 319, 1457-1461, 1999	Included as part of Blair 2014 (which is included), therefore paper is a duplicate of data
Blair, P. S., Mitchell, E. A., Heckstall-Smith, E. M. A., Fleming, P. J., Head covering - A major modifiable risk factor for sudden infant death syndrome: A systematic review, Archives of Disease in Childhood, 93, 778-783, 2008	Three studies reported on bed sharing and head covering. All three included in this review (Blair 199, Blair 2006 and Tappin 2005)
Blair, P. S., Platt, M. W., Smith, I. J., Fleming, P. J., Sudden infant death syndrome and sleeping position in pre-term and low birth weight infants: An opportunity for targeted intervention, Archives of Disease in Childhood, 91, 101-106, 2006	Included as part of Blair 2014 (which is included), therefore paper is a duplicate of data
Blair, P. S., Platt, M. W., Smith, I. J., Fleming, P. J., Sudden Infant Death Syndrome and the time of death: Factors associated with night-time and day-time deaths, International Journal of Epidemiology, 35, 1563-1569, 2006	No relevant outcome data
Blair, P. S., Sidebotham, P., Berry, P. J., Evans, M., Fleming, P. J., Major epidemiological changes in sudden infant death syndrome: A 20-year population-based study in the UK, Lancet, 367, 314-319, 2006	Study design - not comparative
Blair, P. S., Sidebotham, P., Evason-Coombe, C., Edmonds, M., Heckstall-Smith, E. M., Fleming, P., Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England, BMJ (clinical research ed.), 339, b3666, 2009	No relevant outcomes
Blair, P., Fleming, P., Bensley, D., Smith, I., Bacon, C., Taylor, E., Plastic mattresses and sudden infant death syndrome [1], Lancet, 345, 720, 1995	Study design - letter
Brixey, S. N., Kopp, B. C., Schlotthauer, A. E., Collier, A., Corden, T. E., Use of child death review to inform sudden unexplained infant deaths occurring in a large urban setting, Injury Prevention, 17, i23-i27, 2011	Study design - not comparative
Buzzetti, R., D'Amico, R., Liberati, A., Sudden infant death syndrome and sleeping position [2], Pediatrics, 108, 211-212, 2001	Study design - letter
Byard, R. W., Bed sharing and sudden infant death syndrome, Journal of Pediatrics, 160, 1063, 2012	Study design - letter
Byard, R. W., Beal, S., Blackbourne, B., Nadeau, J. M., Krous, H. F., Specific dangers associated with infants sleeping on sofas, Journal of Paediatrics and Child Health, 37, 476-478, 2001	Study design - not comparative
Byard, R. W., Winskog, C., Floor mattresses: another potentially dangerous infant sleeping environment, Journal of Paediatrics & Child Health, 47, 554-6, 2011	Study design - not comparative
Carpenter, R. G., Irgens, L. M., Blair, P. S., England, P. D., Fleming, P., Huber, J., Jorch, G., Schreuder, P., Sudden unexplained infant death in 20 regions in Europe: Case control study, Lancet, 363, 185-191, 2004	Pooled analysis - included studies checked for relevance

Carpenter, R., McGarvey, C., Mitchell, E. A., Tappin, D. M., Vennemann, M. M., Smuk, M., Carpenter, J. R., Bed sharing when parents do not smoke: Is there a risk of SIDS? An individual level analysis of five major case-control studies, BMJ Open, 3 (5) (no pagination), 2013	Pooled analysis - included studies checked for relevance
Carroll-Pankhurst, C., Mortimer, E. A., Jr., Case-control study of sudden infant death syndrome in Scotland. Risk of bed sharing was not sufficiently examined, BMJ, 315, 813, 1997	Study design – letter
Carter, N., Rutty, G. N., Babies sleeping with parents and sudden infant death syndrome. Invoking sudden infant death syndrome in cosleeping may be misleading, BMJ (Clinical research ed.), 321, 1019; author reply 1020, 2000	Study design – letter
Chong, D. S. Y., Yip, P. S. F., Karlberg, J., Maternal smoking: An increasing unique risk factor for sudden infant death syndrome in Sweden, Acta Paediatrica, International Journal of Paediatrics, 93, 471-478, 2004	No relevant outcomes
Cohen, M. C., Morley, S. R., Coombs, R. C., Maternal use of methadone and risk of sudden neonatal death, Acta Paediatrica, International Journal of Paediatrics, 104, 883-887, 2015	Study design - not comparative
Colvin, J. D., Collie-Akers, V., Schunn, C., Moon, R. Y., Sleep environment risks for younger and older infants, Pediatrics, 134, e406-e412, 2014	Study design - not comparative
Cooper, R., Potter, A., Watson, L., Yelland, J., Co-sleeping in infancy, Journal of Paediatrics & Child Health, 31, 60-1, 1995	Study design – letter
Cowan, S., Bed sharing and cot death, The New Zealand medical journal, 108, 278, 1995	Study design – letter
Coyne, I., Sudden infant death syndrome and baby care practices, Paediatric nursing, 8, 16-18, 1996	Study design – review
Dallas, R. J., Cot death and cot mattresses, The New Zealand medical journal, 108, 492, 1995	Study design – letter
Davies, L., Babies co-sleeping with parents, Midwives : official journal of the Royal College of Midwives, 108, 384-386, 1995	Study design – editorial
Eidelman, A. I., Gartner, L. M., Bed sharing with unimpaired parents is not an important risk for sudden infant death syndrome [12], Pediatrics, 117, 991-992, 2006	Study design – letter
Elliott, R. B., Bed sharing and cot death, The New Zealand medical journal, 108, 370, 1995	Study design – letter
Engleberts, A., De Jonge, G. A., Bedding and sleeping position in the sudden infant death syndrome (IV), British Medical Journal, 301, 493, 1990	Study design – letter
Ezeonyeji, A., Jewitt, S., Poyser, L., Stadward, T., Babies sleeping with parents and sudden infant death syndrome. Smoking may be residual confounder in bed sharing, BMJ (Clinical research ed.), 321, 1019-1020, 2000	Study design – letter
Farooqi, I. S., Lip, G. Y. H., Beevers, D. G., Bed sharing and smoking in the sudden infant death syndrome [25], British Medical Journal, 308, 204-205, 1994	Study design – letter
Field, J., Bedding and sleeping position in the sudden infant death syndrome (II), British Medical Journal, 301, 871-872, 1990	Study design – letter
Fleming, P. J., Blair, P. S., Making informed choices on co-sleeping with your baby, BMJ, 350, h563, 2015	Study design – editorial
Fleming, P. J., Blair, P. S., Bacon, C., Bensley, D., Smith, I., Taylor, E., Berry, J., Golding, J., Tripp, J., Environment of infants during sleep and risk of the sudden infant death syndrome: results of 1993-5 case-control study for confidential inquiry into	No relevant outcomes

stillbirths and deaths in infancy. Confidential Enquiry into Stillbirths and Deaths Regional Coordinators and Researchers, Bmj, 313, 191-5, 1996	
Fleming, P. J., Blair, P. S., Mitchell, E. A., Mattresses, microenvironments, and multivariate analyses: No reason to change current practices for reducing risk of sudden infant death, British Medical Journal, 325, 981-982, 2002	Study design – editorial
Fleming, P. J., Blair, P. S., Platt, M. W., Tripp, J., Smith, I. J., Sudden infant death syndrome and social deprivation: Assessing epidemiological factors after post-matching for deprivation, Paediatric and Perinatal Epidemiology, 17, 272-280, 2003	No relevant outcomes
Fleming, P., Berry, J., Gilbert, R., Rudd, P., Bedding and sleeping position in the sudden infant death syndrome, BMJ (Clinical research ed.), 301, 871-872, 1990	Study design – letter
Franco, P., Raoux, A., Kugener, B., Dijoud, F., Scaillet, S., Groswasser, J., Kato, I., Montemitro, E., Lin, J. S., Kahn, A., Sudden death in infants during sleep, Handbook of Clinical Neurology, 98, 501-17, 2011	Study design – review
Garstang, J., Ellis, C., Griffiths, F., Sidebotham, P., Unintentional asphyxia, SIDS, and medically explained deaths: a descriptive study of outcomes of child death review (CDR) investigations following sudden unexpected death in infancy, Forensic science, medicine, and pathology, 12, 407-415, 2016	Study design - not comparative
Gaw, C. E., Chounthirath, T., Midgett, J., Quinlan, K., Smith, G. A., Types of Objects in the Sleep Environment Associated With Infant Suffocation and Strangulation, Academic Pediatrics, 17, 893-901, 2017	Study design - not comparative
Gessner, B. D., Ives, G. C., Perham-Hester, K. A., Association between sudden infant death syndrome and prone sleep position, bed sharing, and sleeping outside an infant crib in alaska, Pediatrics, 108, 923-927, 2001	Not comparative
Gessner, B. D., Porter, T. J., Bed sharing with unimpaired parents is not an important risk for sudden infant death syndrome [11], Pediatrics, 117, 990-991, 2006	Study design – letter
Gilbert, R. E., Wigfield, R. E., Fleming, P. J., Berry, P. J., Rudd, P. T., Bottle feeding and the sudden infant death syndrome, BMJ, 310, 88-90, 1995	Outcomes not relevant
Glasgow, J. F. T., Thompson, A. J., Ingram, P. J., Sudden unexpected death in infancy: Place and time of death, Ulster Medical Journal, 75, 65-71, 2006	No relevant outcomes
Gordon, R. R., Bedding and sleeping position in the sudden infant death syndrome (III), British Medical Journal, 301, 493, 1990	Study design – letter
Gormally, S. M., Matthews, T. G., Contemporary risk factors for sudden infant death in an Irish population--a case control study, Irish Journal of Medical Science, 161, 131-134, 1992	No relevant outcomes
Gunn, T. R., Davis, S., Tonkin, S., Bed sharing as a risk factor for sudden infant death (cot death), The New Zealand medical journal, 105, 155-156, 1992	Study design – letter
Guntheroth, W., Spiers, P. S., Bedding and sleeping position in the sudden infant death syndrome (VI), British Medical Journal, 301, 494, 1990	Study design – letter
Hawkes, N., Sharing a bed with your baby increases the risk of sudden infant death syndrome, UK study shows, BMJ (Clinical research ed.), 346 (no pagination), 2013	Study design – letter

Hayman, R. M., McDonald, G., De, C. Baker N. J., Mitchell, E. A., Dalziel, S. R., Infant suffocation in place of sleep: New Zealand national data 2002-2009, Archives of Disease in Childhood, 100, 610-614, 2015	Study design - not comparative
Helweg-Larsen, K., Lundemose, J. B., Oyen, N., Skjaerven, R., Alm, B., Wennergren, G., Markestad, T., Irgens, L. M., Interactions of infectious symptoms and modifiable risk factors in sudden infant death syndrome. The nordic epidemiological SIDS study, Acta Paediatrica, International Journal of Paediatrics, 88, 521-527, 1999	No relevant outcomes
Hiley, C. M. H., Morley, C. J., Risk factors for sudden infant death syndrome: Further change in 1992-3, British Medical Journal, 312, 1397-1398, 1996	Study design – not case control
Hirabayashi, M., Yoshinaga, M., Nomura, Y., Ushinohama, H., Sato, S., Tauchi, N., Horigome, H., Takahashi, H., Sumitomo, N., Shiraishi, H., Nagashima, M., Environmental risk factors for sudden infant death syndrome in Japan, European Journal of Pediatrics, 175, 1921-1926, 2016	Study design – not case control
Hoffend, C., Sperhake, J. P., Sudden unexpected death in infancy (SUDI) in the early neonatal period: the role of bed sharing, Forensic Science, Medicine, and Pathology, 10, 157-162, 2014	Study design - not comparative
Holborow, P. L., Bed sharing or lung fluid as a cause of cot death?, The New Zealand medical journal, 105, 297, 1992	Study design – letter
Hutchison, B. L., Rea, C., Stewart, A. W., Koelmeyer, T. D., Tipene-Leach, D. C., Mitchell, E. A., Sudden unexpected infant death in Auckland: a retrospective case review, Acta Paediatrica, 100, 1108-12, 2011	Study design - not comparative
James, C., Klenka, H., Manning, D., Sudden infant death syndrome: Bed sharing with mothers who smoke, Archives of Disease in Childhood, 88, 112-113, 2003	Study design - not comparative
Jonville-Bera, A. P., Autret-Leca, E., Barbeillon, F., Paris-Llado, J., Sudden unexpected death in infants under 3 months of age and vaccination status - A case-control study, British Journal of Clinical Pharmacology, 51, 271-276, 2001	No relevant outcomes
Kahn, A., Wachholder, A., Winkler, M., Rebuffat, E., Prospective study on the prevalence of sudden infant death and possible risk factors in Brussels: Preliminary results (1987-1988), European Journal of Pediatrics, 149, 284-286, 1990	No relevant outcomes
Kassa, H., Moon, R. Y., Colvin, J. D., Risk factors for sleep-related infant deaths in in-home and out-of-home settings, Pediatrics, 138 (5) (no pagination), 2016	No relevant outcomes
Kerbl, R., Zotter, H., Einspieler, C., Roll, P., Ratschek, M., Kostl, G., Strenger, V., Hoffmann, E., Perrogon, A., Zotsch, W., Schober, P., Granz, A., Sauseng, W., Bachler, I., Kenner, T., Ipsiroglu, O., Kurz, R., Classification of sudden infant death (SID) cases in a multidisciplinary setting. Ten years experience in Styria (Austria), Wiener Klinische Wochenschrift, 115, 887-893, 2003	Study design - not comparative
Kleemann, W. J., Schlaud, M., Fieguth, A., Hiller, A. S., Rothamel, T., Troger, H. D., Body and head position, covering of the head by bedding and risk of sudden infant death (SID), International journal of legal medicine, 112, 22-6, 1998	No relevant outcomes
Klonoff-Cohen, H., Edelstein, S. L., Bed sharing and the sudden infant death syndrome, BMJ, 311, 1269-72, 1995	No relevant outcomes

Klonoff-Cohen,H.S., Edelstein,S.L., A case-control study of routine and death scene sleep position and sudden infant death syndrome in Southern California, JAMA, 273, 790-794, 1995	No relevant outcomes
Knight, L. D., Hunsaker, D. M., Corey, T. S., Cosleeping and sudden unexpected infant deaths in Kentucky: A 10-year retrospective case review, American Journal of Forensic Medicine and Pathology, 26, 28-32, 2005	Confounders not adjusted for
Lagon, E., Moon, R. Y., Colvin, J. D., Characteristics of Infant Deaths during Sleep While Under Nonparental Supervision, Journal of Pediatrics, 197, 57-62.e36, 2018	No relevant outcomes
Leach, C. E., Blair, P. S., Fleming, P. J., Smith, I. J., Platt, M. W., Berry, P. J., Golding, J., Epidemiology of SIDS and explained sudden infant deaths. CESDI SUDI Research Group, Pediatrics, 104, e43, 1999	No relevant outcomes
L'Hoir, M. P., Engelberts, A. C., Van Well, G. Th J., Westers, P., Mellenbergh, G. J., Wolters, W. H. G., Huber, J., Case-control study of current validity of previously described risk factors for SIDS in the Netherlands, Archives of Disease in Childhood, 79, 386-393, 1998	Confounders not adjusted for
Li, L., Fowler, D., Liu, L., Ripple, M. G., Lambros, Z., Smialek, J. E., Investigation of sudden infant deaths in the State of Maryland (1990-2000), Forensic Science International, 148, 85-92, 2005	Study design - not comparative
Li, L., Zhang, Y., Zielke, R. H., Ping, Y., Fowler, D. R., Observations on increased accidental asphyxia deaths in infancy while cosleeping in the state of Maryland, The American journal of forensic medicine and pathology : official publication of the National Association of Medical Examiners, 30, 318-321, 2009	Study design - not comparative
Liebrechts-Akkerman, G., Lao, O., Liu, F., Van Sleuwen, B. E., Engelberts, A. C., L'Hoir, M. P., Tiemeier, H. W., Kayser, M., Postnatal parental smoking: An important risk factor for SIDS, European Journal of Pediatrics, 170, 1281-1291, 2011	No relevant outcomes
Lutz, T. L., Elliott, E. J., Jeffery, H. E., Sudden unexplained early neonatal death or collapse: A national surveillance study, Pediatric Research, 80, 493-498, 2016	Study design - not comparative
MacFarlane, M., Thompson, J. M. D., Zuccollo, J., McDonald, G., Elder, D., Stewart, A. W., Lawton, B., Percival, T., Baker, N., Schlaud, M., Fleming, P., Taylor, B., Mitchell, E. A., Smoking in pregnancy is a key factor for sudden infant death among Maori, Acta Paediatrica, International Journal of Paediatrics, 107, 1924-1931, 2018	No relevant outcomes
Matthews,T., McDonnell,M., McGarvey,C., Loftus,G., O'Regan,M., A multivariate "time based" analysis of SIDS risk factors, Archives of Disease in Childhood, 89, 267-271, 2004	No relevant outcomes
Mehanni, M., Cullen, A., Kiberd, B., McDonnell, M., O'Regan, M., Matthews, T., The current epidemiology of SIDS in Ireland, Irish Medical Journal, 93, 264-268, 2000	Study design - not comparative
Mileva-Seitz, V. R., Bakermans-Kranenburg, M. J., Battaini, C., Luijk, M. P. C. M., Parent-child bed sharing: The good, the bad, and the burden of evidence, Sleep Medicine Reviews, 32, 4-27, 2017	No relevant outcomes
Mitchell, E. A., Co-sleeping and sudden infant death syndrome, Lancet, 348, 1466, 1996	Study design – commentary
Mitchell, E. A., Sudden infant death syndrome: Should bed sharing be discouraged?, Archives of Pediatrics and Adolescent Medicine, 161, 305-306, 2007	Study design – editorial

Mitchell, E. A., Sleeping position of infants and the sudden infant death syndrome, Acta Paediatrica Supplement, 82 Suppl 389, 26-30, 1993	No relevant outcomes
Mitchell, E. A., Bajanowski, T., Brinkmann, B., Jorch, G., Stewart, A. W., Vennemann, M. M. T., Prone sleeping position increases the risk of SIDS in the day more than at night, Acta Paediatrica, International Journal of Paediatrics, 97, 584-589, 2008	No relevant outcomes
Mitchell, E. A., Esmail, A., Jones, D. R., Clements, M., Do differences in the prevalence of risk factors explain the higher mortality from sudden infant death syndrome in New Zealand compared with the UK?, The New Zealand medical journal, 109, 352-355, 1996	Not relevant comparator
Mitchell, E. A., Scragg, R., Are infants sharing a bed with another person at increased risk of sudden infant death syndrome?, Sleep, 16, 387-389, 1993	Study design – review
Mitchell, E. A., Scragg, R., Stewart, A. W., Becroft, D. M., Taylor, B. J., Ford, R. P., Hassall, I. B., Barry, D. M., Allen, E. M., Roberts, A. P., Results from the first year of the New Zealand cot death study, The New Zealand medical journal, 104, 71-76, 1991	No relevant outcomes
Mitchell, E. A., Stewart, A. W., Scragg, R., Ford, R. P. K., Taylor, B. J., Becroft, D. M. O., Thompson, J. M. D., Hassall, I. B., Barry, D. M. J., Allen, E. M., Roberts, A. P., Ethnic differences in mortality from sudden infant death syndrome in New Zealand, British Medical Journal, 306, 13-16, 1993	No relevant outcomes
Mitchell, E. A., Taylor, B. J., Ford, R. P. K., Stewart, A. W., Becroft, D. M. O., Thompson, J. M. D., Scragg, R., Hassall, I. B., Barry, D. M. J., Allen, E. M., Roberts, A. P., Four modifiable and other major risk factors for cot death: The New Zealand study, Journal of Paediatrics and Child Health, 28, S 3-S 8, 1992	No relevant outcomes
Mitchell, E. A., Thach, B. T., Thompson, J. M. D., Williams, S., Changing infants' sleep position increases risk of sudden infant death syndrome, Archives of Pediatrics and Adolescent Medicine, 153, 1136-1141, 1999	No relevant outcomes
Mollborg, P., Wennergren, G., Almqvist, P., Alm, B., Bed sharing is more common in sudden infant death syndrome than in explained sudden unexpected deaths in infancy, Acta Paediatrica, International Journal of Paediatrics, 104, 777-783, 2015	No relevant outcomes
Moon, R. Y., Sprague, B. M., Patel, K. M., Stable prevalence but changing risk factors for sudden infant death syndrome in child care settings in 2001, Pediatrics, 116, 972-977, 2005	No relevant outcomes
Nelson, E. A. S., To, K. F., Wong, Y. Y., Dickinson, J. A., Choi, K. C., Yu, L. M., Ou, Y., Chow, C. B., Wong, E., Tang, N. L. S., Hjelm, M., Chen, L., Hong Kong case-control study of sudden unexpected infant death, New Zealand Medical Journal, 118, 1227	Number of cases less than 50
O'Hara, M., Harruff, R., Smialek, J. E., Fowler, D. R., Sleep location and suffocation: how good is the evidence?, Pediatrics, 105, 915-7, 2000	Study design – letter
Ostfeld, B. M., Esposito, L., Perl, H., Hegyi, T., Concurrent risks in sudden infant death syndrome, Pediatrics, 125, 447-453, 2010	Study design - not comparative
Ostfeld, B. M., Perl, H., Esposito, L., Hempstead, K., Hinnen, R., Sandler, A., Pearson, P. G., Hegyi, T., Sleep environment, positional, lifestyle, and demographic characteristics associated	No relevant outcomes

with bed sharing in sudden Infant Death Syndrome cases: A population-based study, Pediatrics, 118, 2051-2059, 2006	
Oyen, N., Markestad, T., Skjaerven, R., Irgens, L. M., Helweg-Larsen, K., Alm, B., Norvenius, G., Wennergren, G., Combined effects of sleeping position and prenatal risk factors in sudden infant death syndrome: The nordic epidemiological SIDS study, Pediatrics, 100, 613-621, 1997	No relevant outcomes
Panaretto, K. S., Whitehall, J. F., McBride, G., Patole, S., Whitehall, J. S., Sudden infant death syndrome in Indigenous and non-Indigenous infants in north Queensland, 1990-1998, Journal of Paediatrics and Child Health, 38, 135-139, 2002	Study design - not comparative
Paris, C. A., Remler, R., Daling, J. R., Risk factors for sudden infant death syndrome: changes associated with sleep position recommendations, Journal of Pediatrics, 139, 771-7, 2001	No relevant outcomes
Pasquale-Styles, M. A., Tackitt, P. L., Schmidt, C. J., Infant death scene investigation and the assessment of potential risk factors for asphyxia: A review of 209 sudden unexpected infant deaths, Journal of Forensic Sciences, 52, 924-929, 2007	Study design - not comparative
Pharoah, P., Bed sharing and sudden infant death, Lancet, 347, 2, 1996	Study design – commentary
Piumelli, R., Nassi, N., Head covering, sweating, and the risk of sudden infant death syndrome, Pediatrics, 122, 909, 2008	Study design – letter
Ponsonby, A. I., Dwyer, T., Cochrane, J., Couper, D., Waterproof mattress linings and SIDS, The New Zealand medical journal, 110, 343-344, 1997	Study design - letter
Ponsonby, A. L., Dwyer, T., Cochrane, J. A., Gibbons, L. E., Jones, M. E., Characteristics of the infant thermal environment in the control population of a case-control study of SIDS, Journal of Paediatrics & Child Health, 28 Suppl 1, S36-40, 1992	Study design - not comparative
Ponsonby, A. L., Dwyer, T., Couper, D., Cochrane, J., Association between use of a quilt and sudden infant death syndrome: Case-control study, British Medical Journal, 316, 195-196, 1998	No relevant outcomes
Ponsonby, A. L., Dwyer, T., Gibbons, L. E., Cochrane, J. A., Wang, Y. G., Factors potentiating the risk of sudden infant death syndrome associated with the prone position, New England Journal of Medicine, 329, 377-382, 1993	No relevant outcomes
Ponsonby, A. L., Dwyer, T., Kasl, S. V., Cochrane, J. A., The Tasmanian SIDS case-control study: Univariable and multivariable risk factor analysis, Paediatric and Perinatal Epidemiology, 9, 256-272, 1995	No relevant outcomes
Ponsonby,A.L., Dwyer,T., Gibbons,L.E., Cochrane,J.A., Jones,M.E., McCall,M.J., Thermal environment and sudden infant death syndrome: case-control study, BMJ, 304, 277-282, 1992	No relevant outcomes
Pybus, M., Fleming, V., Bed sharing and cot death, The New Zealand medical journal, 108, 112, 1995	Study design - letter
Rosenberg, K. D., Sudden infant death syndrome and Co-sleeping, Archives of Pediatrics and Adolescent Medicine, 154, 529-530, 2000	Study design - letter
Ruys, J. H., De Jonge, G. A., Brand, R., Engelberts, A. C., Semmekrot, B. A., Bed sharing in the first four months of life: A risk factor for sudden infant death, Acta Paediatrica, International Journal of Paediatrics, 96, 1399-1403, 2007	Confounders not adjusted for
Sauber-Schatz, E. K., Sappenfield, W. M., Shapiro-Mendoza, C. K., Comprehensive review of sleep-related sudden unexpected	No relevant outcomes

infant deaths and their investigations: Florida 2008, Maternal and Child Health Journal, 19, 381-390, 2015	
Scheers, N. J., Dayton, C. M., Kemp, J. S., Sudden infant death with external airways covered: case-comparison study of 206 deaths in the United States, Archives of Pediatrics & Adolescent Medicine, 152, 540-7, 1998	Study design - not comparative
Schellscheidt, J., Ott, A., Jorch, G., Epidemiological features of sudden infant death after a German intervention campaign in 1992, European Journal of Pediatrics, 156, 655-60, 1997	No relevant outcomes
Schlaud, M., Dreier, M., Debertin, A. S., Jachau, K., Heide, S., Giebe, B., Sperhake, J. P., Poets, C. F., Kleemann, W. J., The German case-control scene investigation study on SIDS: epidemiological approach and main results, International Journal of Legal Medicine, 124, 19-26, 2010	No relevant outcomes
Schlaud, M., Eberhard, C., Trumann, B., Kleemann, W. J., Poets, C. F., Tietze, K. W., Schwartz, F. W., Prevalence and determinants of prone sleeping position in infants: Results from two cross-sectional studies on risk factors for SIDS in Germany, American Journal of Epidemiology, 150, 51-57, 1999	Study design - not comparative
Schluter, P. J., Ford, R. P. K., Mitchell, E. A., Taylor, B. J., Residential mobility and sudden infant death syndrome, Journal of Paediatrics and Child Health, 34, 432-437, 1998	No relevant outcomes
Schnitzer, P. G., Covington, T. M., Dykstra, H. K., Sudden unexpected infant deaths: sleep environment and circumstances, American journal of public health, 102, 1204-1212, 2012	Not relevant comparator
Scott, S., Bedding and sleeping position in the sudden infant death syndrome (V), British Medical Journal, 301, 493-494, 1990	Study design – letter
Scragg, R., Bed sharing and cot death, The New Zealand medical journal, 108, 277-278, 1995	Study design – letter
Scragg, R. K. R., Mitchell, E. A., Side sleeping position and bed sharing in the sudden infant death syndrome, Annals of Medicine, 30, 345-349, 1998	No relevant outcomes
Southall, D., Stebbens, V., Samuels, M., Bedding and sleeping position in the sudden infant death syndrome (I), British Medical Journal, 301, 492, 1990	Study design – letter
Spencer, N., Logan, S., Sudden unexpected death in infancy and socioeconomic status: A systematic review, Journal of Epidemiology and Community Health, 58, 366-373, 2004	No relevant data
Stewart, A. J., Williams, S. M., Mitchell, E. A., Taylor, B. J., Ford, R. P. K., Allen, E. M., Antenatal and intrapartum factors associated with sudden infant death syndrome in the New Zealand Cot Death Study, Journal of Paediatrics and Child Health, 31, 473-478, 1995	No relevant data
Sugrue, T., Bedsharing and cot death, The New Zealand medical journal, 108, 324, 1995	Study design – letter
Tanaka, T., Kato, N., Evaluation of child care practice factors that affect the occurrence of sudden infant death syndrome: Interview conducted by public health nurses, Environmental Health and Preventive Medicine, 6, 117-120, 2001	Study design - not comparative
Tappin, D., Brooke, H., Ecob, R., Bedsharing and sudden infant death syndrome (SIDS) in Scotland, UK [3], Lancet, 363, 994, 2004	Study design – letter
Taylor, J. A., Krieger, J. W., Reay, D. T., Davis, R. L., Harruff, R., Cheney, L. K., Prone sleep position and the sudden infant	No relevant outcomes

death syndrome in King County, Washington: A case-control study, Journal of Pediatrics, 128, 626-630, 1996	
Thogmartin, J. R., Siebert Jr, C. F., Pellan, W. A., Sleep position and bed sharing in sudden infant deaths: An examination of autopsy findings, Journal of Pediatrics, 138, 212-217, 2001	No relevant comparative data
Thomas, L., Silverman, W., Hunt, C. E., Shannon, D. C., Sudden infant death syndrome and sleeping position, Pediatrics, 90, 115-118, 1992	Review
Thompson, E. L., Moon, R. Y., Hazard Patterns Associated with Co-sleepers, Clinical Pediatrics, 55, 645-649, 2016	Study design - not comparative
Thompson, J. M. D., Thach, B. T., Becroft, D. M. O., Mitchell, E. A., Sudden infant death syndrome: Risk factors for infants found face down differ from other SIDS cases, Journal of Pediatrics, 149, 630-633.e1, 2006	No relevant outcomes
Tipene-Leach, D. C., Bedsharing and smoking, The New Zealand medical journal, 108, 300-301, 1995	Study design – letter
Tonkin, S. L., Bed sharing and cot death, The New Zealand medical journal, 108, 257, 1995	Study design – letter
Trachtenberg, F. L., Haas, E. A., Kinney, H. C., Stanley, C., Krous, H. F., Risk factor changes for sudden infant death syndrome after initiation of back-to-sleep campaign, Pediatrics, 129, 630-638, 2012	Confounders not adjusted for
Tully, K. P., Holditch-Davis, D., Brandon, D., The Relationship Between Planned and Reported Home Infant Sleep Locations Among Mothers of Late Preterm and Term Infants, Maternal and Child Health Journal, 19, 1616-1623, 2015	No relevant data
Unger, B., Kemp, J. S., Wilkins, D., Psara, R., Ledbetter, T., Graham, M., Case, M., Thach, B. T., Racial disparity and modifiable risk factors among infants dying suddenly and unexpectedly, Pediatrics, 111, E127-131, 2003	Not relevant comparator
Vege, A., Rognum, T. O., Opdal, S. H., SIDS - Changes in the epidemiological pattern in Eastern Norway 1984-1996, Forensic Science International, 93, 155-166, 1998	Study design - not comparative
Vennemann, M. M. T., Findeisen, M., Butterfass-Bahloul, T., Jorch, G., Brinkmann, B., Kopcke, W., Bajanowski, T., Richter, A., Mitchell, E. A., Infection, health problems, and health care utilisation, and the risk of sudden infant death syndrome, Archives of Disease in Childhood, 90, 520-522, 2005	No relevant outcomes
Vennemann, M. M., Bajanowski, T., Brinkmann, B., Jorch, G., Sauerland, C., Mitchell, E. A., Sleep environment risk factors for sudden infant death syndrome: The German sudden infant death syndrome study, Pediatrics, 123, 1162-1170, 2009	No relevant data
Vennemann, M. M., Hense, H. W., Bajanowski, T., Blair, P. S., Complojer, C., Moon, R. Y., Kiechl-Kohlendorfer, U., Bed sharing and the risk of sudden infant death syndrome: Can we resolve the debate?, Journal of Pediatrics, 160, 44-48.e2, 2012	Includes of the systematic review checked for relevance – none found
Vennemann,M., Bajanowski,T., Butterfass-Bahloul,T., Sauerland,C., Jorch,G., Brinkmann,B., Mitchell,E.A., Do risk factors differ between explained sudden unexpected death in infancy and sudden infant death syndrome?, Archives of Disease in Childhood, 92, 133-136, 2007	No relevant data
Wailoo, M. P., Petersen, S. A., Bedding and sleeping position in the sudden infant death syndrome (II), British Medical Journal, 301, 492-493, 1990	Study design - letter

Wailoo, M., Ball, H., Fleming, P., Ward Platt, M. P., Infants bed sharing with mothers, Archives of Disease in Childhood, 89, 1082-3, 2004	Study design - letter
Waite, A. J., Coombs, R. C., McKenzie, A., Daman-Willems, C., Cohen, M. C., Campbell, M. J., Carpenter, R. G., Mortality of babies enrolled in a community-based support programme: CONI PLUS (Care of Next Infant Plus), Archives of Disease in Childhood, 100, 637-642, 2015	Study design - not comparative
Weber, M. A., Risdon, R. A., Ashworth, M. T., Malone, M., Sebire, N. J., Autopsy findings of co-sleeping-associated sudden unexpected deaths in infancy: Relationship between pathological features and asphyxial mode of death, Journal of Paediatrics and Child Health, 48, 335-341, 2012	No relevant outcomes
Wennergren, G., No bed sharing or safer bed sharing?, Acta Paediatrica, 105, 1321, 2016	Study design - commentary
Wennergren, G., Why it is important to present all the available facts about bed sharing and breastfeeding, Acta Paediatrica, 105, 22, 2016	Study design - commentary
Wennergren, G., Prevention of Sudden Infant Death Syndrome, Pediatric Pulmonology, 37, 110-111, 2004	Study design - review
Wennergren, G., Alm, B., Oyen, N., Helweg-Larsen, K., Milerad, J., Skjaerven, R., Norvenius, S. G., Lagercrantz, H., Wennborg, M., Daltveit, A. K., Markestad, T., Irgens, L. M., The decline in the incidence of SIDS in Scandinavia and its relation to risk-intervention campaigns. Nordic Epidemiological SIDS Study, Acta Paediatrica, 86, 963-8, 1997	Study design - not comparative
Wigfield, R., Gilbert, R., Fleming, P. J., SIDS: Risk reduction measures, Early Human Development, 38, 161-164, 1994	Study design - review
Williams, F. L. R., Lang, G. A., Mage, D. T., Sudden unexpected infant deaths in dundee, 1882-1891: Overlying or sids?, Scottish Medical Journal, 46, 43-47, 2001	Study design - not comparative
Williams, S. M., Mitchell, E. A., Stewart, A. W., Taylor, B. J., Temperature and the sudden infant death syndrome, Paediatric and Perinatal Epidemiology, 10, 136-149, 1996	Study design - not comparative
Williams, S. M., Mitchell, E. A., Taylor, B. J., Are risk factors for sudden infant death syndrome different at night?, Archives of Disease in Childhood, 87, 274-278, 2002	No relevant outcomes
Williams, S. M., Taylor, B. J., Mitchell, E. A., Scragg, R., Ford, R. P. K., Stewart, A. W., Sudden infant death syndrome in New Zealand: Are risk scores useful?, Journal of Epidemiology and Community Health, 49, 94-101, 1995	No relevant outcomes
Willinger, M., Sleep position and sudden infant death syndrome, JAMA, 273, 818-9, 1995	Study design - editorial
Wilson, C. A., Taylor, B. J., Laing, R. M., Williams, S. M., Mitchell, E. A., Clothing and bedding and its relevance to sudden infant death syndrome: Further results from the New Zealand cot death study, Journal of Paediatrics and Child Health, 30, 506-512, 1994	No relevant outcomes
Yoo, S. H., Kim, A. J., Kang, S. M., Lee, H. Y., Seo, J. S., Kwon, T. J., Yang, K. M., Sudden infant death syndrome in Korea: A retrospective analysis of autopsy-diagnosed cases, Journal of Korean Medical Science, 28, 438-442, 2013	Study design - not comparative

Economic studies

No economic evidence was identified for this review.

.

Appendix L – Research recommendations

Research recommendations for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

No research recommendations were made for this review question.

Appendix M – Further data calculations

Further data calculation for review question: What are the risk factors in relation to co-sleeping for sudden unexpected death in infancy?

Table 11: Results of calculations for data on the risk of sudden unexpected death in infancy from of co-sleeping with a risk factor compared to co-sleeping without a risk factor. Where the comparison is emboldened, no additional calculations were required and data is as reported in the paper, all other comparisons required adjustments using an equation based on Franchini 2012.

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
Blair 2014	24 versus 33 /400	131 versus 7 /1386	Co-slept on a sofa or chair versus Bed share	16.98	5.55 to 51.96	Adjusted for infant age and whether a day or night sleep as well as infant characteristics: birthweight, <2500 g, pre-term, male gender and currently breastfeeding, maternal characteristics: larger families (≥3 children), younger mothers (≤21 years) and poor maternal education (<GCSE or no qualification) factors at the time of the last sleep: infant unwell (scoring more 8 or more on the Baby Check), infant placed prone or side, infant swaddled, use of a duvet, use of a dummy and infant found with head covered.
	24 versus 29 /400	131 versus 12 /1386	Bed share next to adult > 2 units of alcohol versus Bed share	16.98	5.92 to 48.41	
	24 versus 59 /400	131 versus 63 /1386	Bed share next to an adult who smoked versus Bed share	3.74	1.71 to 8.20	
	29 versus 33 /400	12 versus 7 /1386	Co-slept on a sofa or chair versus Bed share next to adult > 2 units of alcohol versus	1.00	0.28 to 3.58	
	29 versus 59 /400	29 versus 63 /1386	Bed share next to an adult who smoked versus Bed	0.22	0.08 to 0.60	

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
			share next to adult > 2 units of alcohol			
	59 versus 33 /400	63 versus 7 /1386	Co-slept on a sofa or chair versus Bed share next to an adult who smoked	4.54	1.57 to 13.14	
	23 versus 22 /400	70 versus 5 /1386	Co-slept on a sofa or chair (child <98 days old) versus Bed share	13.23	4.46 to 39.26	Adjusted for infant age and whether a day or night sleep
	23 versus 19 /400	70 versus 5 /1386	Bed share next to adult >2 units of alcohol versus Bed share (child <98 days old)	11.94	3.97 to 35.90	
	23 versus 47 /400	70 versus 26 /1386	Bed share next to an adult who smoked versus Bed share (child <98 days old)	5.51	2.78 to 10.94	
	19 versus 22 /400	5 versus 5 /1386	Co-slept on a sofa or chair versus Bed share next to adult >2 units of alcohol (child <98 days old)	1.11	0.28 to 4.44	
	19 versus 47 /400	5 versus 26 /1386	Bed share next to an adult who smoked versus Bed share next to adult >2 units of alcohol (child <98 days old)	0.46	0.15 to 1.39	

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
	47 versus 22 /400	26 versus 5 /1386	Co-slept on a sofa or chair versus Bed share next to an adult who smoked (child <98 days old)	2.40	0.81 to 7.14	
	1 versus 11 /400	61 versus 2 /1386	Co-slept on a sofa or chair versus Bed share (child ≥98 days old)	298.25	24.97 to 3562.14	
	1 versus 10 /400	61 versus 7 /1386	Bed share next to adult > 2 units of alcohol versus Bed share (child ≥98 days old)	79.75	8.89 to 715.37	
	1 versus 12 /400	61 versus 37 /1386	Bed share next to an adult who smoked versus Bed share (child ≥98 days old)	17.75	2.23 to 141.13	
	10 versus 11 /400	7 versus 2 /1386	Co-slept on a sofa or chair versus Bed share next to adult > 2 units of alcohol (child ≥98 days old)	3.74	0.62 to 22.51	
	10 versus 12 /400	7 versus 37 /1386	Bed share next to an adult who smoked versus Bed share next to adult > 2 units of alcohol versus (child ≥98 days old)	0.22	0.07 to 0.72	

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
	12 versus 11 /400	37 versus 2 /1386	Co-slept on a sofa or chair versus Bed share next to an adult who smoked (child ≥98 days old)	16.80	3.24 to 87.08	
Fu 2010	91 versus 20 /195	62 versus 10 /194	Bed share + pillow versus Bed share + no pillow	1.41	0.45 to 4.44	Adjusted for maternal marital status, education, and index of prenatal care.
	52 versus 61 /195	55 versus 17 /194	Bed share + soft mattress versus Bed share + firm mattress	4.40	1.61 to 12.02	
	89 versus 24 /195	51 versus 20 /194	Bed share + >2 covers versus Bed share + 0-1 covers	0.64	0.25 to 1.66	
	24 versus 89 /195	15 versus 57 /194	Bed share + prone/side versus Bed share + supine	0.84	0.28 to 2.49	
	49 versus 56 /195	52 versus 20 /194	Bed share + maternal smoking versus Bed share + no maternal smoking	3.16	1.21 to 8.25	
Hauck 2003	70 versus 71 /260	59 versus 20 /260	Share bed with others versus Share bed with mother or mother and father	3.15	1.30 to 7.65	Adjusted for maternal age, marital status, education, and index of prenatal care.

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
McGarvey 2003	23 versus 47 /203	106 versus 31 /622	Bed share entire sleep versus Bed share + put back in cot	7.19	0.96 to 54.05	Adjusted for maternal age, education, smoking and drinking during pregnancy, was initiated at birth, baby being ill, crying/colic problems, symptoms in 48 h prior to last/reference sleep, tog of bed covering >10, use of pillows, duvets, prone position, and absence of routine soother use during the last/reference sleep period.
	23 versus 6 /203	106 versus 0 /622	Co-sleep in sofa/ armchair versus Bed share + put back in cot	Undeterminable due to low numbers of co-sleep sofa/arm chair		
	47 versus 6 /203	31 versus 0 /622	Co-sleep in sofa/ armchair versus Bed share entire sleep	Undeterminable due to low numbers of co-sleep sofa/arm chair		
McGarvey 2006	128 versus 11 /260	101 versus 0 /829	Co-sleep in sofa /armchair versus Bed share	Undeterminable due to low numbers of co-sleep sofa/arm chair		Adjusted for maternal age, education, smoking, drinking, and occurrence of urinary tract infection, >3 previous live births, z scores for weight by gestation, resuscitation required at birth, male sex, whether breastfeeding was initiated at birth, any history of illness during infant's lifetime, baby prone to sweating, symptoms in 48 h prior to last/reference sleep, tog of clothing/bedding >10, use of duvets, prone position, and absence of routine soother use during the last/reference sleep period. Odds ratios for all univariate analysis adjusted for infant age at death/interview. ''Other'' refers to cases found: ''between mother and other child'' (n = 3), ''at top of bed with older sibling, younger siblings at bottom'' (n = 1), ''baby down in middle/bottom of bed'' (n = 2), ''next
	76 versus 44 /260	60 versus 39 /829	Bed share between two adults versus Bed share next to one adult	1.42	0.23 to 8.85	

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
						to one sibling 13 years of age'' (n = 1), or no information on location (n = 1).
Mitchell 1997	5 versus 27 /79	119 versus 43 /679	Bed share + maternal smoking versus bed share + no maternal smoking (at initial contact)	9.11	2.25 to 36.91	Adjusted for maternal age, education, smoking and drinking during pregnancy, was initiated at birth, baby being ill, crying/colic problems, symptoms in 48 h prior to last/reference sleep, tog of bed covering >10, use of pillows, duvets, prone position, and absence of routine soother use during the last/reference sleep period.
	4 versus 10 /38	61 versus 25 /588	Bed share + maternal smoking versus bed share + no maternal smoking (at 2 months contact)	4.87	0.58 to 41.06	
Mitchell 1998	79 versus13 / 393	124 versus 42 / 1592	Bed sharing + sleeping on sheep skin versus Bed share	Data not available as logistic regression did not converge		Adjusted for age of infant, region, season, and time; sociodemographic background: marital status, occupation, age mother left school, and age of mother; pregnancy variables: parity, age of mother at first pregnancy, and attendance at antenatal clinics and education classes; infant factors: sex, ethnicity, birth weight, and gestational age; and postnatal factors: admission to neonatal unit, breast-feeding, maternal smoking, sleep position, infant sharing a bed with another person, pacifier use, excess thermal insulation, and illness.
	167 versus 78/ 393	**417 versus 281 / 1592**	**Bed share usually in last 2 weeks + sleeping on sheep skin versus Bed share usually in last 2 weeks**	**0.61**	**0.38 to 0.99**	
Mitchell 2017	11 versus 49 /133	29 versus 17 /258	Bed share + smoking versus Bed share + no smoking	20.63	5.04 to 84.51	Adjusted for ethnicity, marital status, number of previous live births, maternal age, maternal smoking in pregnancy, multiple birth, sex, birthweight, age of infant, position

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
						placed to sleep, breastfeeding, sharing parental bedroom and bed sharing.
Rechtman 2014	**NR**	**NR**	**Sharing a surface that is not a sofa versus Sharing a sofa**	**2.4**	**1.90 to 3.00**	Adjusted for infant characteristics (age, gender, race or ethnicity, complex chronic condition, or technology dependence, eg, ventilator dependence, gastrostomy tube feeds), place of incident, whether an autopsy was performed, cause of death, sleep environment factors (surface sharing, object found in sleep environment, sleep position, and sleep position change), and pregnancy characteristics (maternal medical problems, intimate partner violence, and sub- stance use or abuse).
Scragg 1993	10 versus 84 /393	99 versus 67 /1592	Bedshare + smoking versus Bedshare + no smoking (last sleep)	4.64	1.83 to 11.80	Adjusted for age of mother at birth, age she left school, age of first pregnancy, number of previous pregnancies, attendance at antenatal clinics and classes, the sex, gestational age, weight at birth of infant, admission to a neonatal unit, mother's marital status, occupational status, usual region of residence of the household, dummy use, breastfeeding, sleep position of the infant, age of the infant, season and time of day at death (or nominated time for controls) room the infant usually slept in at night during the last two weeks or during the
	64 versus 184 /393	452 versus 256 /1592	Bedshare + smoking versus Bedshare + no smoking (bed share in last 2 weeks)	2.28	1.33 to 3.90	

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
						last sleep, as appropriate for the bed sharing variable.
Scragg 1995	23 versus124 / 178	65 versus 132 / 300	Bed share and maternal smoking versus Bed share (Maori; last sleep)	4.89	1.38 to 17.29	Adjusted for age of infant, region, season and nominated time, martial status, occupation, age mother left school and age of mother, number of previous pregnancies attendance at antenatal clinics and education classes, infant sex, infant ethnicity, birthweight, gestation, admission to neonatal unit, breastfeeding, infant sleeping position and room infant slept in
	23 versus124 / 178	65 versus 132 / 300	Bed share and maternal smoking versus Bed share (Maori; last 2 weeks)	2.39	0.73 to 7.79	
	41 versus 59 / 214	387 versus 124 / 1291	Bed share and maternal smoking versus Bed share (Non-Maori; last sleep)	4.11	1.00 to 16.88	
	41 versus 59 / 214	387 versus 124 / 1291	Bed share and maternal smoking versus Bed share (Non-Maori; last 2 weeks)	2.56	1.30 to 5.04	
Scragg 1996	20 versus 32 /393	133 versus 35 / 1592	Bed share + no room share + mother smoking versus Bed share + no room share + mother not smoking (last 2 weeks at night)	2.57	0.74 to 8.96	Adjusted for ethnic origin, for infant subgroups classified by sharing room with an adult, bed sharing, and maternal smoking
	44 versus 150 /393	319 versus 221 / 1592	Bed share + room share + mother smoking versus Bed share + room share +	3.53	1.04 to 11.99	

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
			mother not smoking (last 2 weeks at night)			
	2 versus 7 /393	7 versus 8 / 1592	Bed share + no room share + mother smoking versus Bed share + no room share + mother not smoking (last sleep)	1.93	0.27 to 13.75	
	8 versus 76 /393	92 versus 58 / 1592	Bed share + room share + mother smoking versus Bed share + room share + mother not smoking (last sleep)	9.83	3.28 to 29.50	
Tappin 2005	46 versus 14 /123	44 versus 2 /263	Share couch versus Room with parent(s) some bed sharing	19.18	0.75 to 491.13	Adjusted for maternal age; quadratic function of maternal age; birth weight; infant age; parity; either parent smoked; laid prone to sleep; laid on side to sleep; found with head covered in the past; found with head covered after last sleep; infant routinely slept on a used infant mattress.
	14 versus 16 /123	4 versus 7 /263	Snuggled up bed share versus Close not touching bed share	0.78	0.09 to 6.69	
	6 versus 12 /123	4 versus 4 /263	Outside edge 2/3 people bed share versus Outside edge 1 parent bed share	0.93	0.08 to 10.50	
	6 versus 14 /123	4 versus 3 /263	Between 2/3 people bed share versus Outside edge 1 parent bed share	3.73	0.30 to 46.69	
	12 versus 14 /123	4 versus 3 /263	Between 2/3 people bed share versus Outside	4.06	0.32 to 50.88	

Study	Number of cases with exposure versus number of cases with reference / total number of cases	Number of controls with exposure versus number of controls with reference / total number of controls	Comparison (exposure of interest versus reference)	Odds Ratio	95% Confidence Interval	Adjustments
			edge 2/3 people bed share			
Vennemann 2005	14 versus 34 / 333	19 versus 70 / 998	Bed share + maternal smoking versus bed share + no maternal smoking	2.93	0.91 to 9.42	Adjusted for all variables which were found significant at the 5% level in the univariate analysis, except gestational age, as this was closely related to birth-weight: Maternal age, Family status, Ethnicity, Smoking in pregnancy, previous live births, socio-economic status, birthweight, breastfeeding >2weeks, position placed to sleep, pacifier used during sleep, co-sleeping with an adult, pillow in infants bed, extra warming during sleep.