Keeping babies close for sleep
-- an issue of health AND safety

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www.dur.ac.uk/sleep.lab

The questions…

Where does infant sleep safety advice come from?

How are ‘risk factors’ determined?

Why is bed-sharing such a big issue?

How do we explain all this to parents?

How do we keep babies safe AND close?

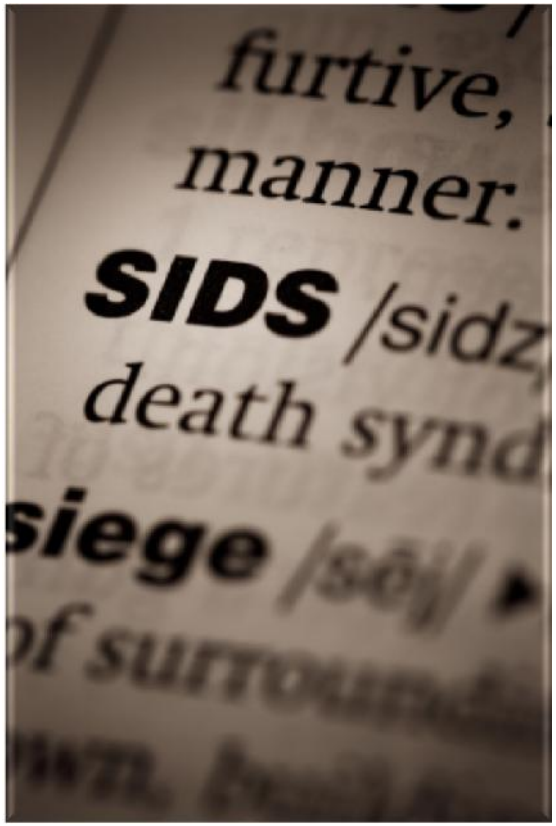
Why have rules about infant sleep safety?

Why does public health policy recommend babies sleep

- **there, but not here?**
- **this way, but not that?**

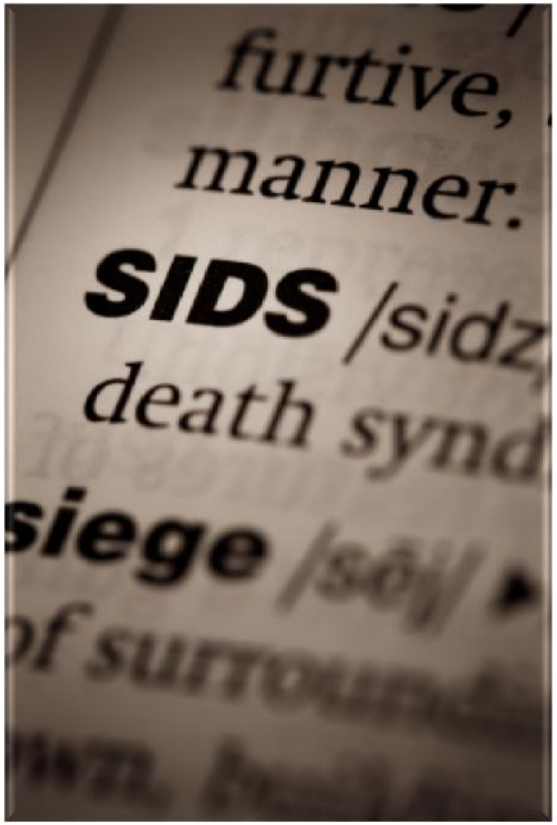
Some babies die during sleep, we STILL don't know why…

Some babies die during sleep



- 1965 ICD-8 code 795 designated for Sudden Infant Death Syndrome
- Category of exclusion: post-mortem fails to determine a specific cause of death
- SIDS is a sudden *unexplainable* infant death
- Grouped with sudden *explainable* mortality under Sudden Unexpected Infant Death (SUID/SUDI).

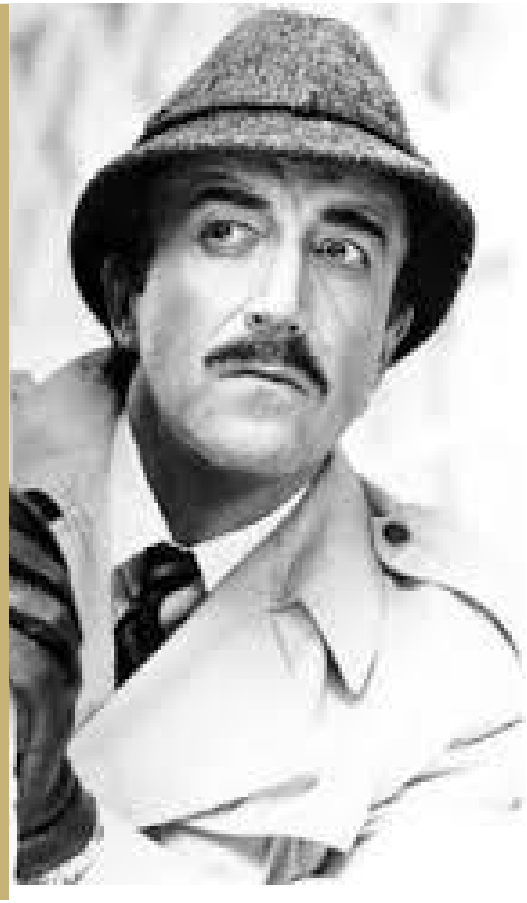
Some babies die during sleep



- Explained SUDI/SUID may include congenital issues, illness, accidents, deliberate harm.
- Differentiating SIDS and explained SUID is difficult -- ambiguity in the pathology of SIDS and suffocation.
- Death scene investigations provide contextual evidence – can be contentious!

The quest for *risk factors*

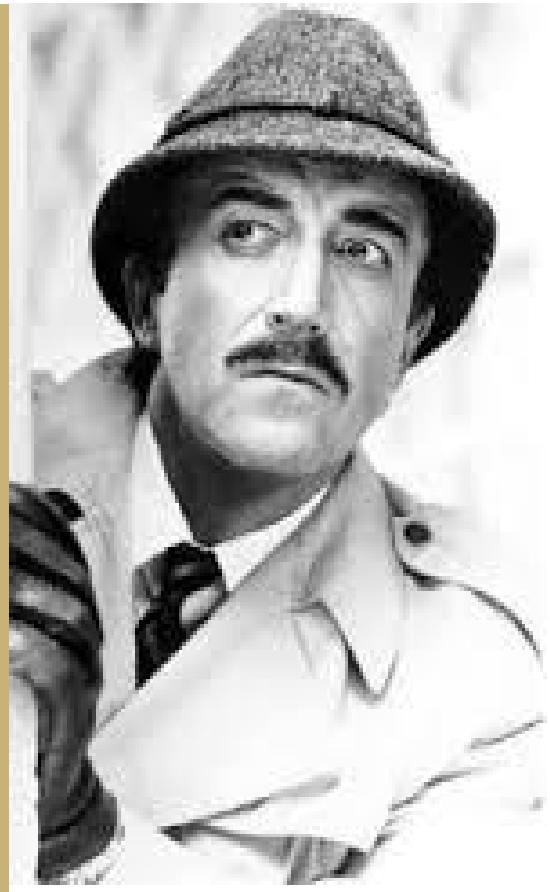
- 'SIDS deaths' have no underlying cause to tackle
- Early SIDS prevention was based upon characteristics of infants who died – but what is a relevant?
- Case series reports tell us nothing about whether or how babies who die differ from those who don't.



Case series studies

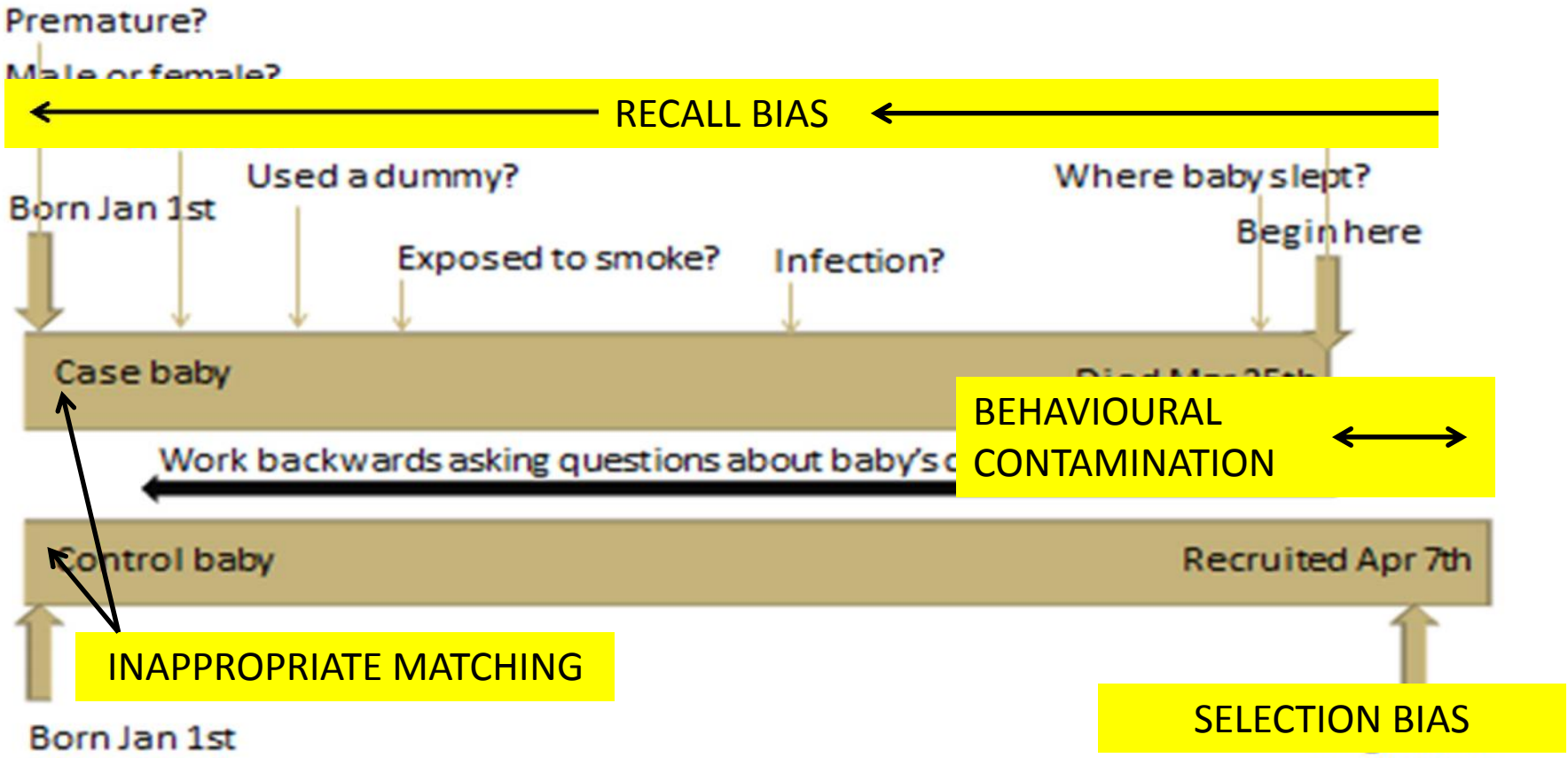
The quest for SIDS '*risk factors*'

- Need comparisons with babies who don't die: **case-control design**
- Compare characteristics of SIDS babies with control babies matched for key criteria
- Identify factors that are **associated** with being in the SIDS but not control group
- Retrospective investigation of exposure to potential factors associated with unexplained infant deaths



How a case-control study works

- Begin with cases (deaths), select controls, work backwards to ascertain differences



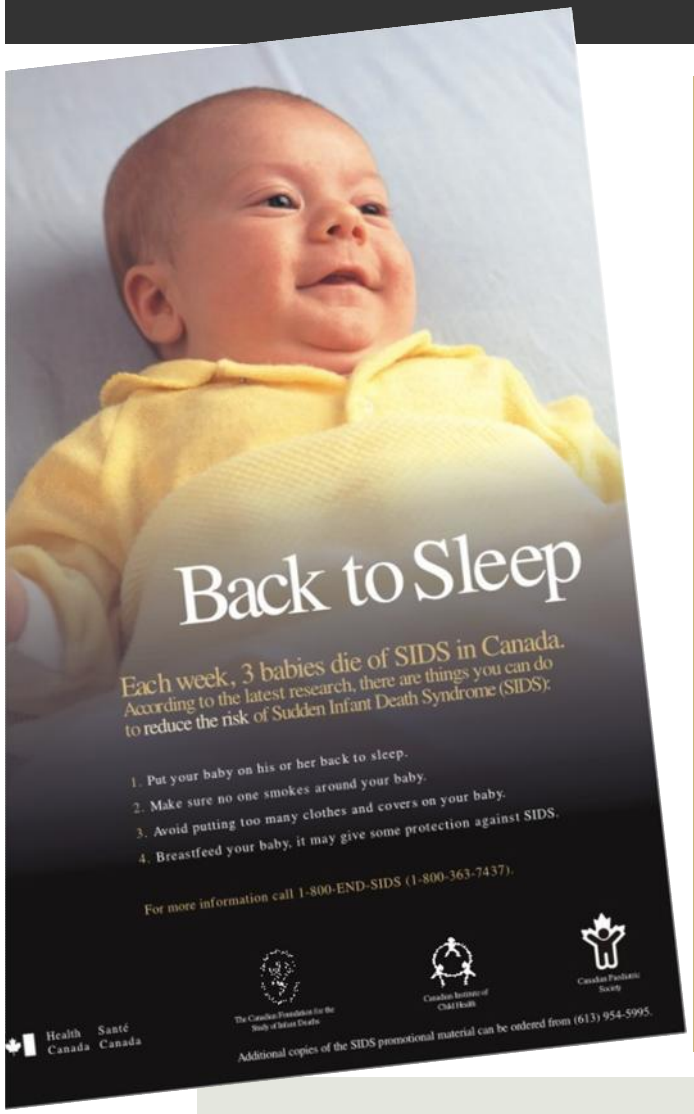
Limitations of case-control studies

- Probability of selection bias = high for controls
- Probability of recall bias = high for cases and controls
- Medium risk of confounding
- Case-control studies are rated as **'Low Quality'** on the scale of medical evidence
- **Normally used for generating hypotheses, not formulating policy**
- Use as evidence for practice **with caution**

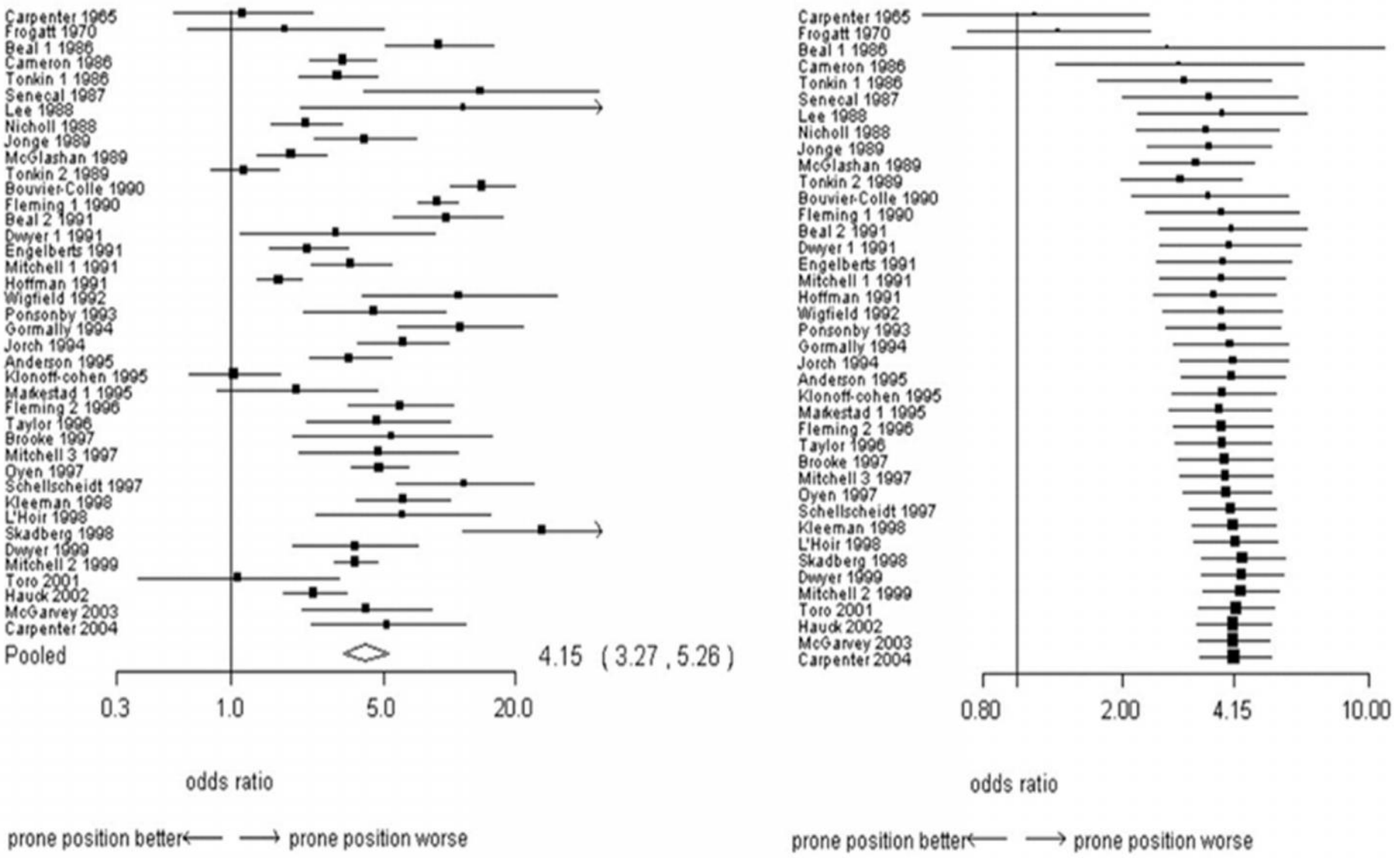
Issues with case-control studies

- Requires categorical data (exposed to potential risk, yes or no) – easy for disease exposure, not so easy for behavioural factors
- Produce odds ratios: provide info on relative, but not absolute risk
- Relative ratios cannot be compared across studies
- **Normally used for generating hypotheses, not formulating policy**
- Use as evidence for practice **with caution**

How are ‘risk factors’ determined?



- Case-control studies conducted in many countries
- All confirmed the association of SIDS and prone sleep (‘risk factor’)
- Back to Sleep campaigns launched around the world
- We still don’t know why supine position is protective!



Gilbert et al (2005) Infant sleeping position and the sudden infant death syndrome: systematic review of observational studies and historical review of recommendations from 1940 to 2002 . *IJE* 34(4)874-888.

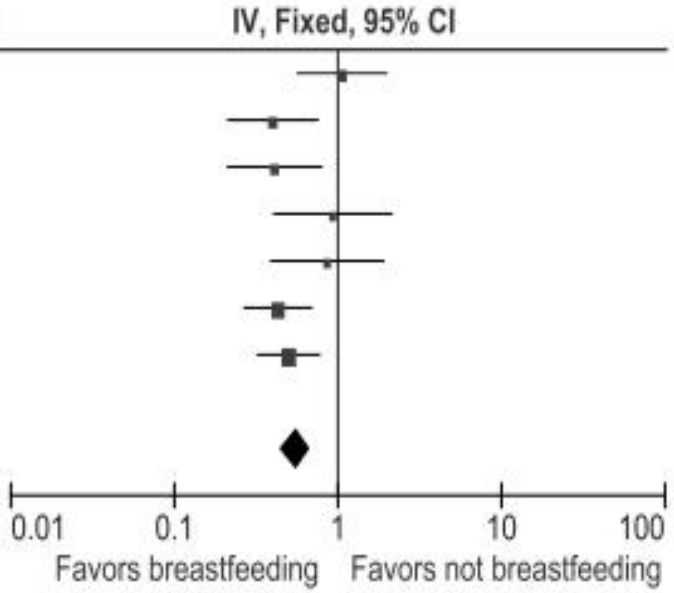
Breastfeeding & SIDS

- Meta-analysis of breastfeeding & SIDS: 'Breastfed' babies had about 'half the risk' of SIDS than those who were not breastfed – effect stronger when breastfeeding was exclusive.

Study or Subgroup	log[]	SE	Weight	IV, Fixed, 95% CI
Fleming et al[17] (1996)	0.058269	0.317657	12.6%	1.06 [0.57–1.98]
Hauck et al[8] (2003)	-0.91629	0.319582	12.4%	0.40 [0.21–0.75]
Klonoff-Cohen and Edelstein[31] (1995)	-0.89159812	0.3346305	11.4%	0.41 [0.21–0.79]
Mitchell et al[5] (1997)	-0.07257	0.420337	7.2%	0.93 [0.41–2.12]
Ponsonby et al[18] (1995)	-0.15082	0.401245	7.9%	0.86 [0.39–1.89]
Vennemann et al[7] (2009)	-0.84397	0.239354	22.2%	0.43 [0.27–0.69]
Wennergren et al[10] (1997)	-0.693147	0.21979	26.3%	0.50 [0.33–0.77]
Total (95% CI)			**100.0%**	**0.55 [0.44–0.69]**

Heterogeneity: $\chi^2 = 10.08$, $df = 6$ ($P = .12$); $I^2 = 40\%$

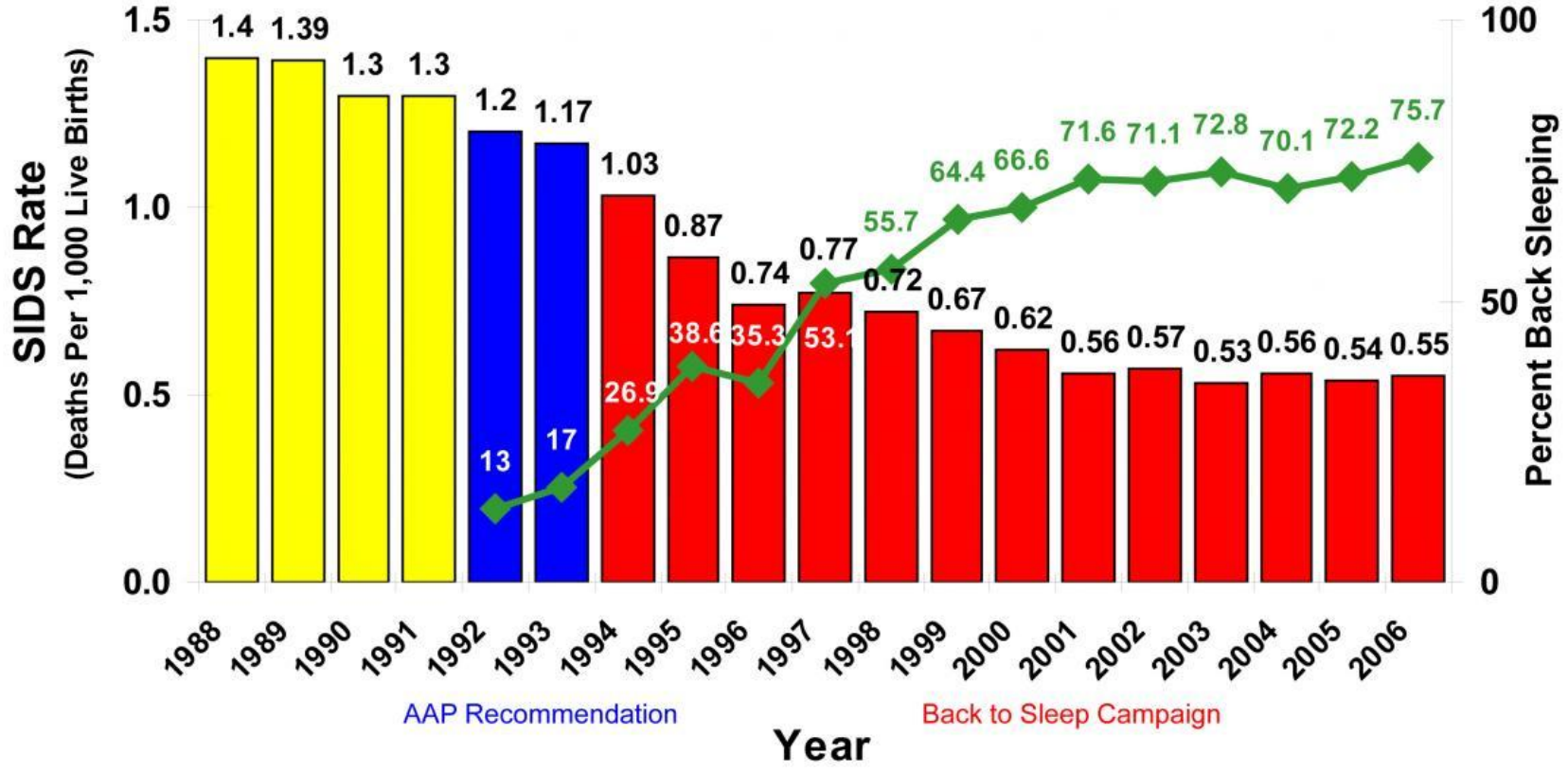
Test for overall effect: $z = 5.28$ ($P < .00001$)



Hauck, F. R., Thompson, J. M. D., Tanabe, K. O., Moon, R. Y., & Vennemann, M. M. (2011). Breastfeeding and Reduced Risk of Sudden Infant Death Syndrome: A Meta-analysis. Pediatrics, 128(1), 103–110. doi:10.1542/peds.2010-3000

SIDS Rate and Back Sleeping

(1988 – 2006)



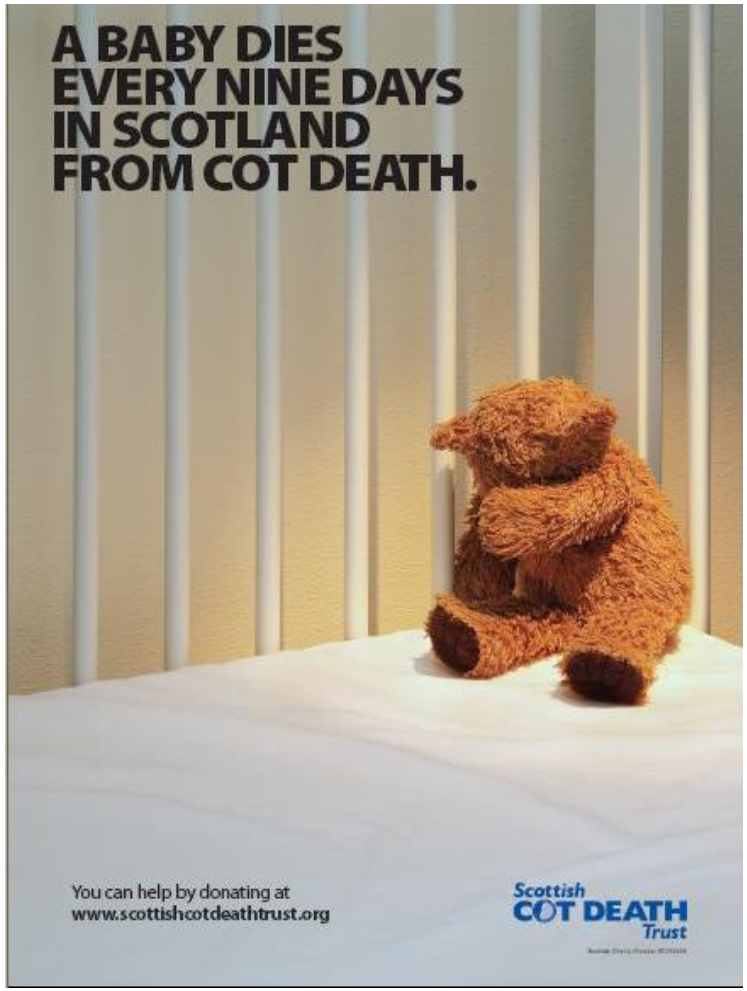
SIDS Rate Source: CDC, National Center for Health Statistics,
Sleep Position Data: NICHD, National Infant Sleep Position Study.

Implementation strategy

- Repeated saturation of ‘back to sleep’ message
- Prevalence of prone sleep fell, SIDS deaths plummeted
- Some cultural/ethnic variation

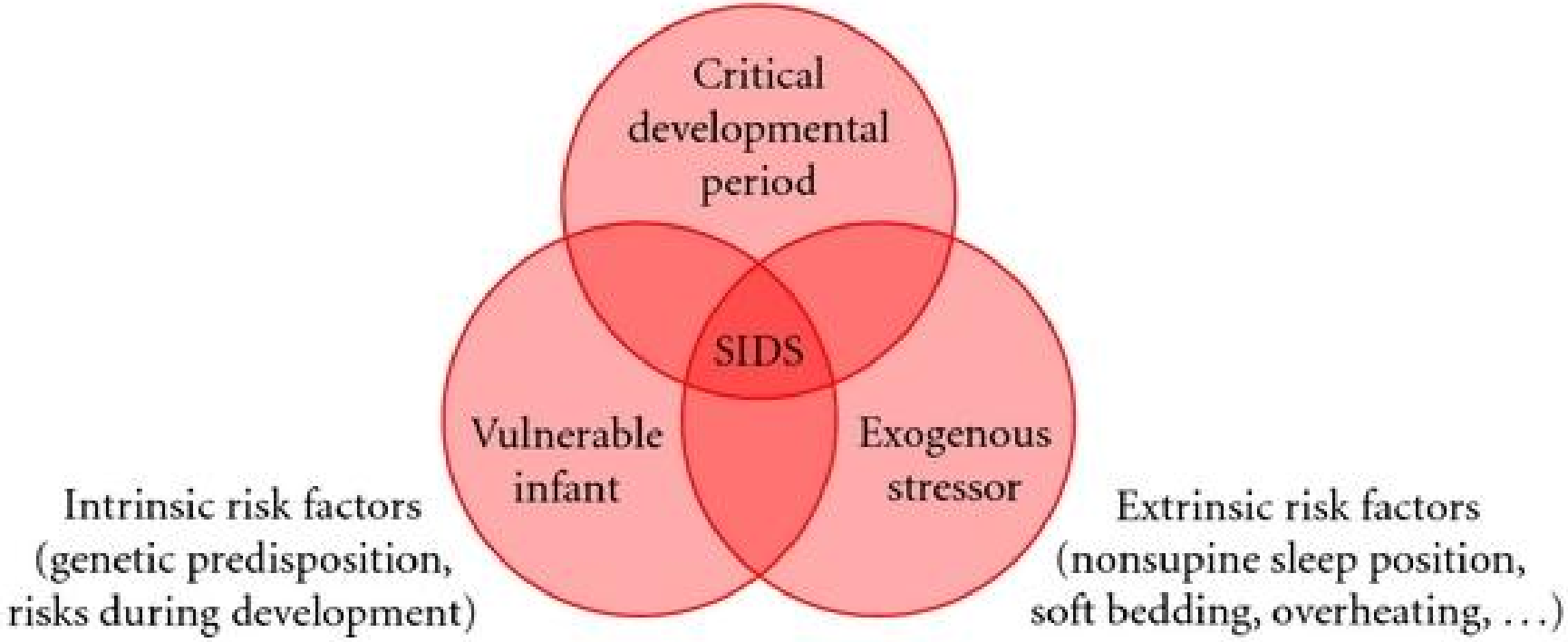
Further associations (risks?) identified

- Smoking
- Head covering
- Overwrapping
- Infant illness
- Soft bedding
- Soft surfaces
- Overheating
- Formula use
- Sleep-contact



The ‘Triple-Risk’ Model / Hypothesis

SIDS occurs at the intersection of three overlapping factors
(Filiano & Kinney, 1994)



Why is bed-sharing an issue?

Photo by: Max Aguillero-Hellwig
Discover Magazine (1992)

- Konner and Super (1987) and McKenna (1986) hypothesized SIDS was a phenomenon of **solitary infant sleep** in Western cultures
- McKenna combined evidence from infant physiology, human evolution, ethnographic reports, and polysomnographic studies to hypothesise **sleep contact** was protective

Epidemiology and bed-sharing/cosleeping

- Prompted epidemiologists to examine infant sleep location more closely in SIDS case-control studies
- Produced array of conflicting evidence,
  - variations in how sleep environments were categorized,
  - how parents were asked about their infant's sleep environment,
  - interaction between sleep location and other variables
- In case-control studies room-sharing, but not bed-sharing is associated with 'protection' from SIDS deaths
- Key interactions between bed-sharing and infant vulnerability (premature, LBW, smoke-exposed), and with hazardous sleep environments (external stressors).

Bed-sharing/co-sleeping & SIDS

Study name	OR	Lower limit	Upper limit	Z-Value	*P* Value
Arnestad	1.66	0.57	4.84	0.93	.35
Blair 1999	9.78	4.02	23.81	5.02	.00
Blair 2009	21.77	3.79	125.02	3.45	.00
Brook	2.90	0.75	11.24	1.54	.12
Hauck	2.00	1.21	3.32	2.69	.01
Klonoff-Cohen	1.21	0.59	2.48	0.52	.60
Li	4.50	1.33	15.22	2.42	.02
McGarvey	3.53	1.40	8.92	2.67	.01
Mitchell	2.02	1.35	3.03	3.40	.00
Tappin	3.36	1.67	6.75	3.41	.00
Vennemann	2.73	1.34	5.56	2.77	.01
Summary OR	2.89	1.99	4.18	5.61	.00

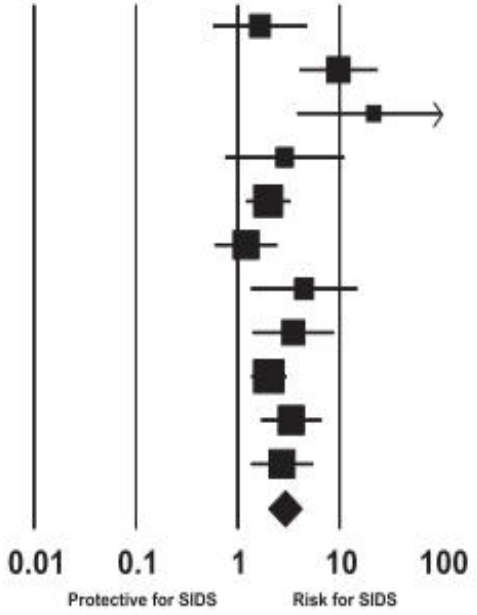


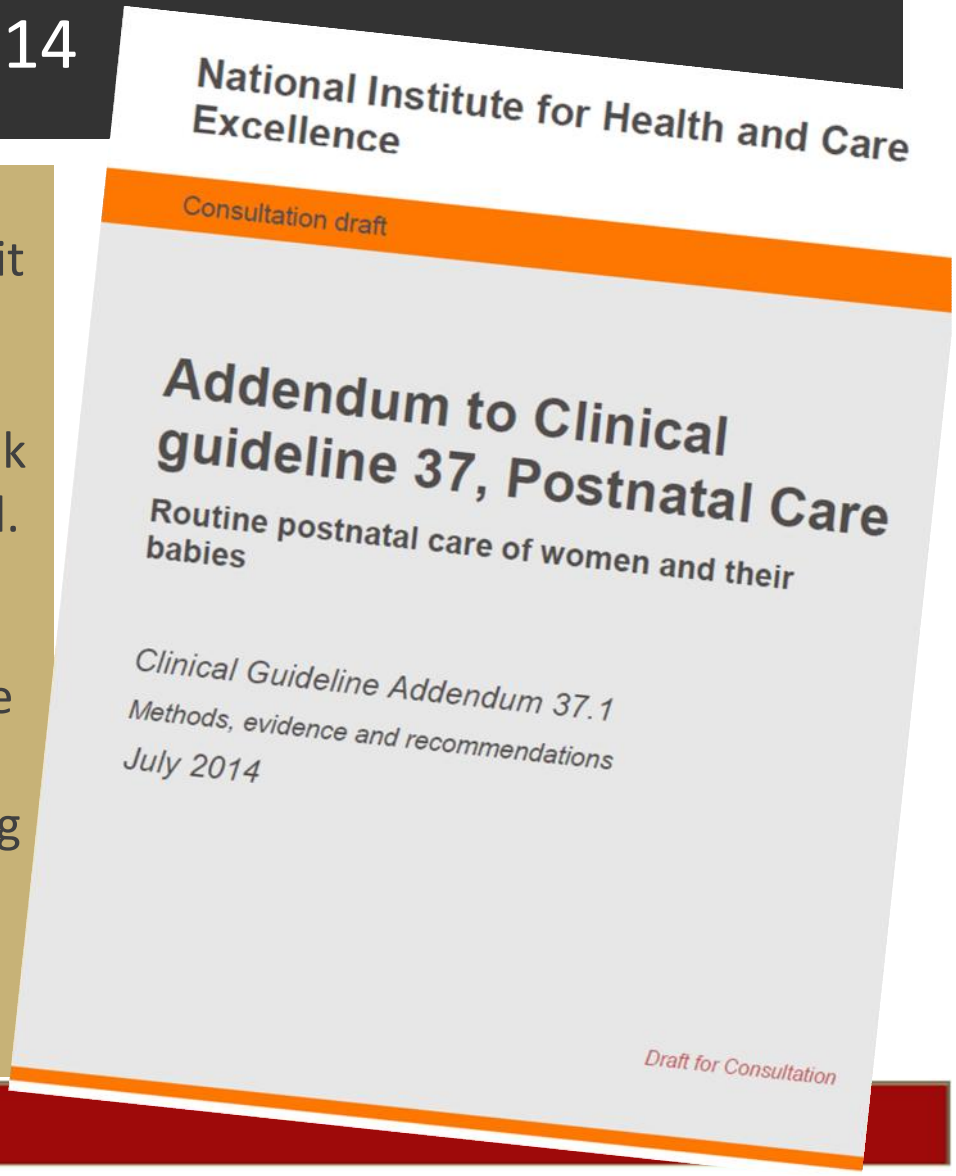
Figure 2. Forest plot and ORs for the association of bed sharing and risk of SIDS, all studies.

Vennemann, M. M et al. (2012). Bed sharing and the risk of sudden infant death syndrome: can we resolve the debate? *Journal of Pediatrics*, 160(1), 44–8.e2. doi:10.1016/j.jpeds.2011.06.052

UK Guidance Update 2014

"When considering SIDS and co-sleeping it would be inappropriate to use the term risk as the causes of SIDS are likely to be multi-factorial and a possible causality link with co-sleeping is not clearly established.

The term association is used throughout this guideline update. This denotes where there is a statistical relationship between SIDS and co-sleeping while acknowledging that it cannot be definitively stated that co-sleeping is a risk for SIDS."



Prompted UK cosleeping research

Who sleeps with their baby?

- 50% of UK babies have slept with their parent(s) by age 3 months
- 70-80% of UK breastfeeding mothers do so
- UK Asian families are 4x more likely to bed-share (sleep) than White UK – yet have 4x lower SIDS rate
- White British families 5x more likely to sofa share (sleep): smokers and breastfeeders
- UK teen mothers, single mothers less likely to bed-share
- Regular bed-sharers at 0-6 months are in lowest risk groups for SIDS (non-smokers, breast-feeders, higher education)

Why do they sleep with baby?

Most new parents don't anticipate sleep contact – but one month after having their child a large proportion sleep together. Parents who regularly bed-share give many reasons:

1. Ni

2. Ca
depr

3. Mi ne
(fathers especially) – enjoy it

4. Reassurance of monitoring the baby when ill or always

5. Familial or cultural beliefs: part of parental identity & nurturing

6. Circumstances (poverty, lack of space) / accidental

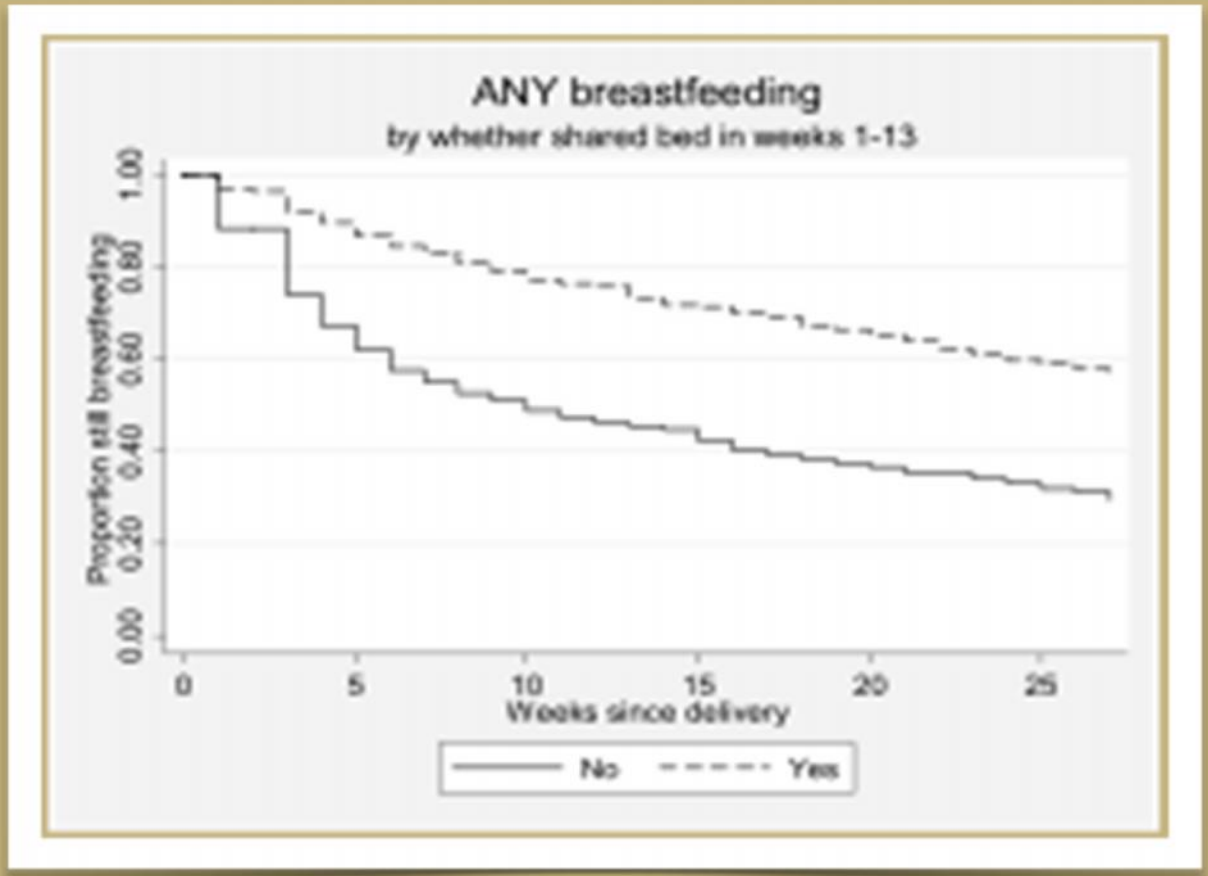
Relational aspects of night-time care: how mothers and babies (and families) align their needs

Newly published: Salm-Ward (2014)

- Systematic narrative synthesis to review a) reasons parents bed-share b) cultural context of bed-sharing c) implications for interventions
- Study inclusion: bedsharing under 12 months, reasons for bedsharing, published 1990-2013. 34 studies included.
- Themes extracted = 1) breastfeeding, 2) comforting, 3) better/more sleep, 4) monitoring, 5) bonding/attachment, 6) environmental, 7) crying, 8) tradition, 9) disagree with danger, 10) maternal instinct.
- Breastfeeding was the most commonly cited reason for bedsharing (26 studies); bedsharing was cited as an easy and convenient way to manage frequent nightttime feedings; mothers reported not having to 'fully waken' to breastfeed and that preservation of maternal sleep was especially important at return to work.

Salm-Ward, T. (2014) Reasons for mother-infant bed-sharing. *Maternal and Child Health J.* DOI 10.1007/s10995-014-1557-1.

Relationship with breastfeeding



Ball HL et al. (2011) Randomised trial of sidecar crib use on breastfeeding duration (NECOT). Arch Dis Child. 96(7):630-634.

Conflicting health agendas

Bed-sharing appears caught between two public health agendas.

- *Safeguarding* views sleep contact (bed-sharing) as dangerous and unnecessary exposing infants to risk of accidental death or SIDS
- *Well-being* views sleep contact (bed-sharing) as a valued parenting behaviour for reinforcing attachment, supporting infant development and facilitating breastfeeding

Sleep contact is associated with SIDS deaths

Sleep contact is associated with more breastfeeding

Sleep contact is associated with less sleep deprivation

Sleep contact is associated with accidental deaths

Sleep contact calms babies, reduces crying

Bed-sharing in the absence of hazardous circumstances (Blair, 2014 PLOS ONE)

- Combined individual-analysis of two population-based case-control studies of SIDS infants and controls comparable for age and time of last sleep (400 SIDS infants and 1386 controls)
- SIDS association with co-sleeping on a sofa (OR=18.3[95%CI:7.1-47.4]) or next to a parent who drank more than two units of alcohol (OR=18.3[95%CI:7.7-43.5]) was very high and significant for infants of all ages.
- SIDS association with co-sleeping next to someone who smoked was significant for infants under 3 months old (OR=8.9[95%CI:5.3-15.1]) but not for older infants (OR=1.4[95%CI:0.7-2.8]).
- Association between SIDS and bed-sharing **in the absence of hazards** was **not significant overall** (OR=1.1[95%CI:0.6-2.0]), **for infants less than 3 months old** (OR=1.6[95%CI:0.96-2.7]), and was **in the direction of protection for older infants** (OR=0.1[95%CI:0.01-0.5]).

Contexts and relationships

- Bed-sharing /cosleeping is associated with positive and negative outcomes
- Context of sleep environment and the **relational aspects** of sleep contact are key.

Practices, behaviors & values

- Intervention campaigns to reduce prone infant sleep were effective
- Parents ignore and reject recommendations to avoid bed-sharing / sleep contact
- Relational aspects of infant sleep are imbued with **cultural and personal values.**

Parental & cultural values/beliefs

Deeply-rooted beliefs are attached to infant sleep location

The ‘nature of infancy’ and the ‘purpose of parenting’ are understood differently in across cultures and communities

Attempts to change such beliefs challenge the cultural identity of the target parents, and their community -- often dismissed by intended recipients as culturally irrelevant.

Explains why efforts to ‘ban bed-sharing’ are rejected.

‘Back to sleep’ – why did it work?

Simple actions with little cultural value are easily modifiable, e.g. prone sleep –was recent, not culturally embedded.

Little parental resistance.

Norway: preference for prone sleep fell from 64% to 8% in a few months following a supine-sleep campaign

Back to Sleep campaigns were a **quick win** for reducing SIDS

‘Modifiable’ risk factors

AAP SIDS Modifiable risk factors	
Prone sleeping	Tobacco-smoke exposure
Overheating or overwrapping	Bed sharing
Soft sleeping surfaces	Absence of breastfeeding
Absence of pacifier use	Sleeping in a room alone

- A heterogeneous collection of ‘factors’ associated with unexplained infant deaths, all assumed to be malleable
- Is it reasonable to use the same approaches to behaviours with vastly different cultural associations, beliefs and values?
- Are simple rules equally effective for all cases?

Inappropriate implementation

- Simple messages misinterpreted
- Blunt prohibitions can be offensive
- Shock tactics = fear-mongering
- Fail to acknowledge reality that most parents WILL fall asleep with baby

Day-time sleep – Baby-wearing

- 75% of daytime SIDS occur when baby is sleeping in room alone
- Slings promote day-time sleep contact – but rare instances of suffocation
- TICKS guidance helps parents use slings safely

Anticipatory guidance vs prohibition

- Help families to assess their baby's sleep environments
- Understand their preferences and reasons
- Provide useful, relevant information
- Consider unplanned/unexpected scenarios
- Offer options and support appropriate solutions
- Shift from authoritative to negotiated guidance

Bed-sharing is not a simple modifiable ‘risk factor’

- There is no right or wrong answer about where babies sleep
- Involves biology, history, cultural values, and motivations
- Can be done more safely or less safely -- context
- Not a simple modifiable ‘risk factor’
- Intentional bed-sharing involves parenting and cultural values and beliefs – vigorously reject anti bed-sharing messages
- Accidental & unplanned bed-sharing might be modifiable with appropriate interventions that give people options in middle of the night

Why Finnish babies sleep in cardboard boxes

COMMENTS (491)

By Helena Lee
BBC News

For 75 years, Finland's expectant mothers have been given a box by the state. It's like a starter kit of clothes, sheets and toys that can even be used as a bed. And some say it helped Finland achieve one of the world's lowest infant mortality rates.

In today's Magazine

Shannon Airport: A

Wahakura Bed-sharing Project

- Targets a Maori 'problem' using Maori traditions
- Raises awareness of the link between prenatal smoking and SIDS
- Provides opportunities for discussions around safe sleep and infant care
- Wahakura produced from free and renewable resources
- Contain no chemicals or artificial ingredients
- Encourage families to bed-share in the Maori tradition
- Doesn't seek to prevent bed-sharing but to educate families on how to make it as safe as possible

More flexible approaches?

- Around the world = different approaches
- Individualized or culturally tailored guidance helps parents to plan ahead
- Specific interventions where infants may be at risk.
- These help parents maximize their infants' safety within the parameters of their own willingness or ability to alter behaviors or beliefs.

Pepi-pods from New Zealand

Multi-stranded information & intervention

- Parents need targeted information on safe bed-sharing
- Those with strong beliefs favourable to bed-sharing need information and culturally relevant interventions if bed-sharing cannot be made safe (e.g. due to prenatal smoking, premature birth etc).
- Sofa-sharing is a recent practice and may be modifiable if bed-sharing is not prohibited
- Educate parents on the likelihood of bed-sharing and hazards of accidental /unplanned bed-sharing
- Consider contingency plans for the middle of the night

Sources of information

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Infant Sleep Information Source

Information for Parents & Carers

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Information sheet 7: Twin infant sleep

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Sources of information

Before bed-sharing ask yourself these questions.

Do either you or your partner EVER smoke?	ANSWER YES	Smoking increases your baby's risk of Sudden Infant Death Syndrome whilst bed-sharing.
Have you or your partner recently drunk any alcohol?	ANSWER YES	Alcohol increases the risk of Sudden Infant Death Syndrome and accidental death whilst bed-sharing.
Did you smoke in pregnancy?	ANSWER YES	Smoking during pregnancy increases your baby's risk of Sudden Infant Death Syndrome whilst bed-sharing
Have you or your partner taken any medication or drugs that might make you sleep heavily?	ANSWER YES	Taking drugs or medication which impair your consciousness increases the risk of accidental death whilst bed-sharing.
Are you excessively tired? (e.g have had less than 4 hours sleep in the last 24 hours?)	ANSWER YES	Excessive tiredness affects the way you sleep and increases the risk of accidental death.
Are you formula feeding your baby?	ANSWER YES	If you formula-feed, you may not naturally adopt the protective 'C' position whilst bed-sharing. See page 11.
Was your baby small at birth? (Born before 37 weeks, or weighing less than 2½ kg or 5½ lb at birth)	ANSWER YES	Some evidence suggests that small at birth babies may have an increased risk of Sudden Infant Death Syndrome when bed-sharing with no-smoking parents. There is a dramatically increased risk of Sudden Infant Death Syndrome for small at birth babies who bed-share with parents who smoke.

If you answer 'Yes' to any of these questions then bed-sharing is NOT advisable.

Remember, people sometimes bed-share accidentally as well as intentionally... circumstances also change...so complete this checklist and assess YOUR risk.

Instead, consider either using a 3-sided cot that attaches to your bed, or having baby in a cot near your bed.'

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ages 8 and 9 to
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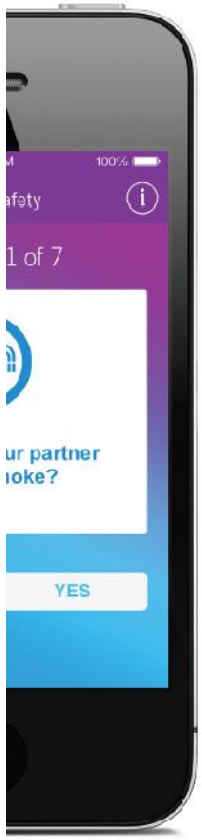

Infant Sleep / Infant Sleeplab

Android version proving temperamental ☹