

SIDS prevention: 3000 lives saved but we can do better

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Abstract

Mortality from sudden infant death syndrome (SIDS) has decreased substantially from the late 1980s. This has been attributed to the change in infant sleep position initially from prone (front) to side and then to predominantly supine (back). We calculate that this has saved over 3000 lives. However, we argue that we could save more infant lives, if more focus was given to the risks observed from parents sleeping in the same bed as their babies.

The prevention of sudden infant death syndrome (SIDS or cot death) has been one of the major success stories in epidemiology. In the 1980s the SIDS mortality rate in New Zealand was extremely high (over 4/1000 live births) that is one in every 250 babies died suddenly, unexpectedly and without explanation.

The New Zealand Cot Death Study was a 3-year case-control study (1987-1990), funded by the Medical Research Council (now Health Research Council). Results from the first year of the study were reported in 1991 in this *Journal*.¹ This identified three modifiable risk factors for SIDS, namely prone sleeping position, maternal smoking and lack of breastfeeding.

A prevention programme was launched with the release of the first year's results.² However, the prevalence of prone sleeping position had started falling before the study was completed, and with it a reduction in SIDS mortality.³ Prone sleeping position changed from 43% in the controls, which were a representative sample of all live births, prior to the prevention programme to less than 3%.

The fall in SIDS mortality was dramatic, with a halving of the SIDS mortality rate, within 2 years and this was accompanied by a reduction in total (all causes) postneonatal mortality (1-11 month mortality) showing that the reduction was real.⁴

Mortality rates have continued to decline, albeit more gradually and this has been attributed to the reduction in the prevalence of side sleeping position,⁵ which doubles the risk of SIDS compared with supine (back) sleeping position. This occurred without understanding of the pathophysiological mechanisms by which prone sleeping position causes death, although since then this has been the focus of considerable research, debate and speculation.

Other countries rapidly followed our lead, initially in Australia and then in the United Kingdom. The number of deaths in the UK fell from 1500 to 600 by the mid 1990s with a concomitant fall in prone sleeping.⁶ Since then the numbers have halved again with clear evidence of a reduction in side sleeping position and head covering.⁷ Indeed as the "Back to Sleep" campaign has been implemented throughout the developed world similar results have been seen.

How many lives has this simple intervention saved in New Zealand? Given that total postneonatal mortality had not changed in the two decades prior to the prevention programme it can be assumed that the SIDS mortality rate would have remained unchanged if the association between infant sleeping position and SIDS had not been identified.

The table shows the number of deaths from SIDS that would be expected to have occurred if the mortality rate had remained unchanged, the number of deaths from SIDS that did occur and thus the number of lives saved each year. Cumulatively more than 3000 lives have been saved.

A similar calculation has been done for England & Wales with over 17,000 lives saved and in the United States more than 40,000 lives saved (Hauck, personal communication, 2011). It is hard to think of any other intervention in the developed world that has had such a dramatic, rapid and clear cut effect.

Table 1. Observed number of SIDS deaths, and the predicted number of deaths if the rate had stayed the same in the 5 years preceding the SIDS prevention campaign

Year	Observed number of SIDS	Livebirths	SIDS rate/1000	Predicted number of SIDS	Total number of lives saved
1985	219	52230	4.19		
1986	213	52824	4.03		
1987	237	55254	4.29		
1988	254	57546	4.41		
1989	237	58091	4.08		
1990	175	60153	2.91	253	78
1991	148	59994	2.47	252	104
1992	137	59266	2.31	249	112
1993	125	58867	2.12	247	122
1994	121	57435	2.11	241	120
1995	121	57791	2.09	243	122
1996	109	57662	1.89	242	133
1997	84	57968	1.45	244	160
1998	67	55674	1.20	234	167
1999	69	57433	1.20	241	172
2000	65	56954	1.14	239	174
2001	48	56124	0.86	236	188
2002	45	54375	0.83	228	183
2003	51	56480	0.90	237	186
2004	45	58556	0.77	246	201
2005	40	58727	0.68	247	207
2006	50	60274	0.83	253	203
2007	56	65121	0.86	274	218
2008	50	65333	0.77	275	225
Total lives saved					3075

mean NZ SIDS rate 1985-1989 = 4.20/1000 live births

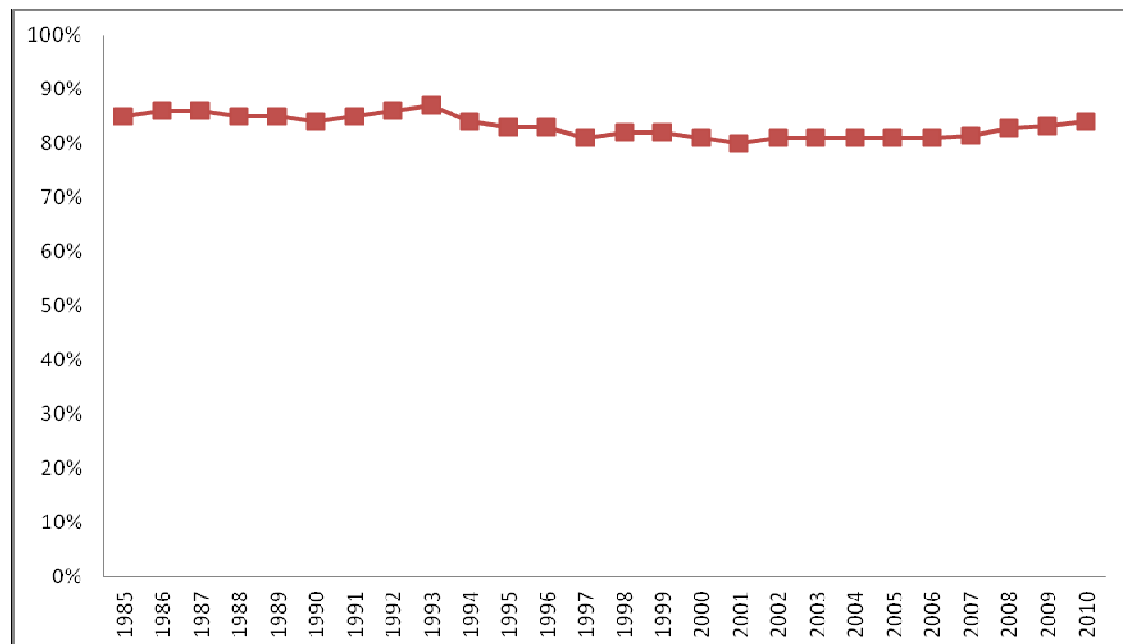
So should we sit on our laurels or could more be done? The SIDS prevention programme also targeted smoking and promoted breastfeeding. There is considerable effort by the Ministry of Health and many other organisations to discourage smoking and promote breastfeeding. Given the many other health benefits there has been somewhat limited focus on their association with SIDS.

The prevalence of smoking in pregnancy has not been consistently collected in New Zealand. In the first year of the New Zealand Cot Death Study (predominantly 1989) the prevalence of smoking in pregnancy in the controls, which were a representative sample of all livebirths, was 34.1%.¹

In Auckland the prevalence of smoking in pregnancy in 2009 was 10.1%.⁸ This is a fantastic achievement, but these total figures hide marked ethnic differences (Maori 41.0% vs. European 6.6%).

New Zealand breastfeeding rates have been good in comparison with many developed countries and thus there has been relatively little room for improvement. The Royal New Zealand Plunket Society (Plunket) has collected breastfeeding data for many years. Figure 1 shows the breastfeeding rates up to 6 weeks of age, 1985 to 2010 (Nikki Hooper, Plunket, personal communication, 2011). New Zealand's high rate of breastfeeding has been maintained.

Figure 1. Percentage of breastfed babies up to 6 weeks of age, 1985–2010



In 1992 we published the association between parents and infants sleeping in the same bed and an increased risk of SIDS.⁹ The following year we reported that the risk was particularly in infants of mothers who smoked.¹⁰ This has been confirmed in many other studies.¹¹

Further studies have shown that the risk of SIDS from bed sharing is especially high in those infants who are under 3 months of age. Two retrospective studies of infant deaths referred to the coroner in Wellington and Auckland show that more than 50% of all sudden unexpected deaths in infancy occur while bed sharing, and this is 90% in the first month of life.^{12,13}

There has been resistance from some quarters about promoting advice not to sleep with baby in the same bed. Some groups have actively encouraged bed sharing to encourage and maintain breastfeeding¹⁴ and there is emerging evidence of a complex interdependent relationship between these two infant care practices.¹⁵

Although the message about safe sleeping includes the risk from bed sharing, it is so dilute that the message has not been heard¹⁶. In particular the specific risks associated with hazardous bed sharing need to be clearly spelt out. Inappropriate sleep surfaces such as soft mattresses and sofas should be avoided and parents need to be reminded to never bring the baby into bed if they have recently consumed alcohol or taken legal or illegal sleep-inducing drugs.⁷ Surveys in Auckland show that less than 50% of mothers of infants identified the risk of SIDS with bed sharing.^{17,18}

So what can be done? Parents need to be given clear evidence based guidance on the risks. The evidence has been summarised by the International Society for the Prevention and Study of Perinatal and Infant Death (ISPID) and the information concerning bed sharing is shown with permission in the box.¹⁹

Box 1. ISPID recommendations for reducing the risk of Sudden Infant Death Syndrome (reproduced with permission from ISPID)¹⁹

Always (day and night) place the baby on his/her back when it's time to sleep

- The most significant proven risk factor is the sleep position. The risk of SIDS is over three times higher for a baby sleeping on the stomach.
- The practice of always placing the baby on his/her back when its time to sleep should begin at birth. The baby will become accustomed to sleeping on the back and will have no problems falling asleep.
- Make sure every caregiver uses the "back to sleep" position. A caregiver placing a baby to sleep on his/her stomach or side when the baby is accustomed to sleeping on the back raises the risk of SIDS 18-fold.
- Place the baby on the stomach only when he/she is awake and under adult supervision.

Always keep the baby's environment smoke-free

- Do not smoke during pregnancy. The more you smoke, the greater the risk for SIDS.
- Second-hand smoke is also a risk factor: stay in a smoke-free environment when pregnant.
- Always maintain a smoke-free environment for the baby.

Make the sleeping environment as safe as possible and avoid overheating

- Place the baby to sleep in its own crib next to the parents' bed for the first 6 months (room sharing).

- Never share a bed with baby if you or your partner smoke. Babies whose parents smoke are at increased risk of SIDS while co-sleeping.
- Never share a bed with baby when you have had alcohol or drugs. (Don't use alcohol or drugs when caring for your baby, especially ANY TIME you may fall asleep.) Babies whose parents have recently used alcohol or drugs are at increased risk of SIDS (and accidental suffocation) while co-sleeping.
- There is a slightly increased risk of SIDS with bed sharing for infants less than 3 months even if they were not exposed to cigarettes, particularly if the baby was small (less than 2.5 kg) at birth or born prematurely.
- In some countries there is a recommendation to avoid all bed sharing, although some disagree and advise avoiding bed sharing only if there are other risk factors present such as smoking or alcohol use.
- Never sleep with baby on a couch or sofa. This increases the risk of SIDS and fatal sleep accidents.
- Keep the crib free of soft objects and anything loose or fluffy (bedding, toys, bumpers, pillows, duvets).
- Do not allow the baby's head to be covered with bedding/blankets.
- Keep the room temperature at 18°C to 22°C and avoid over-dressing (i.e. too many layers of clothes; particularly avoid the use of a hat when indoors) when placing the baby to sleep. Overheating has been cited as a risk factor for SIDS in the past, however, it has been shown that thermal factors are less important if the infant sleeps on the back.
- Use a safe, firm mattress that fits the crib properly.
- Use a mattress that is in new or used and in good condition (no tears).

A word about breast feeding and pacifiers

- Breast feeding is always recommended for its numerous benefits for babies and mothers (as a source of multiple necessary nutrients, disease protection and as a contributor to mother-baby bonding). Several studies show that breastfeeding also offers a risk reduction for SIDS.
- Research suggests that using a pacifier may reduce the risk of SIDS. Start using a pacifier after 1 month of age when breast feeding is usually well established. Give a pacifier when you put the baby to sleep, but do not force it. Some but not all studies have shown that pacifiers may have an adverse effect on breast feeding.

Immunisation

- Infants that are immunised have half the risk of SIDS and are protected against diphtheria, tetanus, whooping cough, etc.

Parental education is needed at antenatal services, in the obstetric unit and in the community by well child health care workers. Grandparents, child care workers, baby sitters all need to understand what keeps babies safe.

Modelling of appropriate infant care practices in obstetric hospitals is crucial. If parents are encouraged to bed share in obstetric units to facilitate breastfeeding, one cannot be surprised if this practice continues when the mother and baby go home.

Families need to be reminded that sleeping the infant in a cot next to the parental bed is the most risk-free environment and if they bed-share, intentionally or unintentionally, need to be aware of the risks involved. The media also has an important role, and was used effectively when the SIDS prevention programme was launched, now 20 years ago.

Some families cannot afford cots, and cots should be provided or rented to these families, rather like the Plunket Society's infant car rental scheme. It is somewhat ironic that more infant deaths occur in the parental bed than in car crashes. The disruption to families following the Christchurch earthquakes resulted in some parents having to share their bed with their baby.

The rapid provision of pepi-pods (Figure 2) was not only a humanitarian response, but probably saved infant lives. Similarly the *wahakura*, a woven flax basket, is able to be taken into the parental bed and provides a safe sleeping space.²⁰ These interventions have face validity, but have not been proven to save lives. However, it is hard to imagine that they have any downside.

Figure 2. Pepi-pod provides a safe sleeping space for baby while co-sleeping



The ideal of course is to identify ways that would enable parent and baby to sleep safely together in the same bed. This is the focus of Nationwide SUDI Case-Control Study which has been just been funded by the HRC.²¹

Unfortunately it will be 3 to 4 years before results are available. In the meantime we need to inform parents about the established risks from bed sharing with their infant.

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