IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2010 000451

REDACTED FINDING INTO DEATH WITH INQUEST

Form 37 Rule 60(1)
Section 67 of the ***Coroners Act 2008***

Inquest into the Death of: Baby N

Delivered On:	6 July 2012
Delivered At:	Coroner's Court of Victoria Level 11, 222 Exhibition Street Melbourne
Hearing Dates:	29 November 2011
Findings of:	JOHN OLLE, CORONER
Police Coronial Support Unit	Senior Sergeant J Brumby

I, JOHN OLLE, Coroner having investigated the death of Baby N

AND having held an inquest in relation to this death on 29 November 2011

at Melbourne

find that the identity of the deceased was Baby N

born on 6 September 2009

and the death occurred on 31 January 2010

at 15 Southward Street, St Albans, Victoria 3021

from:

1a. SUDDEN INFANT DEATH SYNDROME (CATERGORY 2)

in the following circumstances:

1. Baby N was aged 4 months at the time of his death. He suffered recurring respiratory issues from birth, including wheezing and coughing No concluded diagnosis was made, however doctors suspected he suffered Reactive Airways Disease possibly as a result of recurrent bronchiolitis or asthma.

2. Baby N slept in a crib beside his mother. Once he outgrew the crib, he slept in his mother's bed.

3. On the evening of 30 January 2010, Baby N was put to sleep beside his mother. At approximately 2.00am he awoke, was changed and settled. Baby N was last seen alive at approximately 10.30am on 31 January 2010. An aunty played with him as he slept by his mother. At midday Baby N was found lying on his back next to his mother, not breathing. Emergency services were immediately called, however Baby N was unable to be revived.

4. Dr Duncan MacGregor, Paediatric Forensic Pathologist at the Victorian Institute of Forensic Medicine performed an autopsy. Dr MacGregor noted virology studies revealed Varicella-Zoster virus in left lung tissue. The finding of Varicella-Zoster virus in one specimen, in the absence of any inflammatory reaction in lung or other tissues, is a positive result, but is not considered sufficient to explain death. Dr MacGregor found the medical cause of death as Sudden Infant Death Syndrome (Category 2). I accept Dr MacGregor's cause of death.

5. The most widely accepted definition of SIDS is:

> The sudden unexpected death of an infant < 1 year of age, with onset of the fatal episode apparently occurring during sleep, that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history.[1]

INTRODUCTION

6. The death of an infant is devastating for parents and family. When the death comes suddenly and unexpectedly, without any apparent reason, the parents' distress can be intensified by unanswered questions around how and why the infant died.

7. These findings relate to four Victorian babies who died in 2009 and 2010 where medical examinations found each cause of death to be SIDS – Category 2. This essentially means that the cause of death in each case is unexplained.

PURPOSE

8. From the outset I stressed that the purpose of my investigation was not to apportion blame. In particular, I accept that all the parents in these cases provided appropriate care to their babies prior to death. My purpose is to explore whether lessons can be learnt, which might prevent similar deaths in the future. This is one of the central functions of the modern coronial system. It is hoped that the parents and families of the infants whose deaths were examined can take even a small amount of comfort from the process knowing that the outcome might save other families from the pain of losing an infant.

INVESTIGATION

Shared sleep surfaces with infants

9. The common thread examined was that the infant, either at the time of death or shortly before death, shared a sleep surface with another person, usually an adult caregiver. I am informed that there is a growing body of research which suggests this practice is associated with

[1] Proposed in 2004 by a panel of international experts comprised paediatricians, forensic pathologists and paediatric pathologists with extensive experience with sudden infant death.

increased risk of fatal sleep accidents[2] and may also increase the risk of SIDS. However, many parents are either unaware of this risk or have received incomplete, inconsistent or inaccurate information about how to create a safe sleeping environment for their infants. The investigation has reviewed the messages Victorian parents are being given about infant safe sleeping, sharing a sleep surface with an infant and how these messages are generated and disseminated, together with the underpinning evidentiary basis.

Terminology creates confusion

10. Various terms have been used to define shared sleep environments with infants, including "co-sleeping", "room-sharing" and "bed-sharing". Clear definitions are required to differentiate between the behaviours and situations where a shared sleeping environment with infants presents a risk of or is protective against infant death from fatal sleep accidents or SIDS. In addition, the absence of an agreed definition potentially impacts on the level of uptake of health advice on infant safe sleeping practices by parents and caregivers.

11. The primary source of confusion in terminology centres on the distinction between infants sharing a room with their caregiver(s) and infants sharing a sleep surface (bed, mattress, sofa/armchair, beanbag etc) with their caregiver(s) while one or all parties are engaged in sleep. Given that these semantic inconsistencies may result in the presence of mixed or harmful public health messages, the term "shared sleep surface" is adopted for this finding to describe the behavioural/environmental risk to infants of sleep-related death from a fatal sleep accidents or SIDS.

Coroners Prevention Unit Research

12. At my request, extensive research into sleep-related infant deaths was conducted by the Coroners Prevention Unit[3] (CPU). The results of the research culminated in a report titled "Sleep related infant deaths and the role of co-sleeping: a case series study in Victoria, Australia". The CPU reviewed recently published literature and identified several features associated with sharing a sleep surface that "are said to confer a benefit on infants, including an increased breast feeding frequency and duration, increased maternal checking of and response

[2] A fatal sleep accident is an external cause death resulting from unintentional asphyxia or suffocation from overlaying by a parent, covering of the infant's face with bedding, the infant rolling onto their face and into a mattress, or entrapment between bedding and hard surfaces. The difficulty with this mechanism of death is that in the absence of sufficient evidence from the death scene of one of the above-mentioned scenarios, it is impossible to distinguish a fatal sleep accident from SIDS at autopsy.

[3] CPU - definition

to infants, and more frequent infant awakenings at night compared to solitary sleeping infants." The review also indentified a number of factors that may increase the risk of infant death when co-sleeping compared to sleeping alone , including where: (a) a co-sleeping party is a smoker, affected by alcohol, drugs or medications that lower arousal levels, and/or is over-tired: (b) the infant is co-sleeping with siblings, particularly with older siblings, compared with only adults; (c) the co-sleeping occurs in a bed with thick/and or soft bedding, or on a sofa or couch; (d) the infant is aged under 12 weeks; or the infant is born prematurely.

13. The CPU examined a total of 72 infant deaths occurring in a sleeping context over a three year period 2008-2010. It found that 33 of these deaths occurred whilst the infant was sharing a sleep surface with another person. A statistically significant association was identified for infants less than four months and the presence of a pillow with deaths occurring in a co-sleeping context. Analysis of the circumstances of the 33 co-sleeping deaths showed the practice of co-sleeping was largely intentional, habitual and most often the infant's mother was one of the co-sleeping parties. The CPU case series analysis was unable to identify a causative association between sharing a sleep surface and infant death, and did not demonstrate the expected distribution of risk factors previously reported to be associated with co-sleeping related deaths[4]. However, the results showed that sharing a sleep surface with an infant at the time of the death occurred in combination with the presence of known and identified vulnerabilities, particularly young age.

14. The CPU study noted because it was restricted to a case series of deaths for which no comparison groups were available, it was not possible to provide an estimate of the increased risk of death attributable to co-sleeping.

15. The CPU study recommended that definitive research on the relationship between co-sleeping and risk of infant death is needed and that 'until such time that a prospective analytic study can be conducted .....public health messages must be consistent across the health sector and should be informed by **conservative risk management practices** based on the existing evidence.'

[4] Supported by Dr Baber – Exhibit 1

16. The CPU report was made available to interested parties and stakeholders at the directions hearing held on 3 October 2011. At this time stakeholders and interested parties were invited to make submissions regarding the report. Four submissions were provided by Victoria Police, SIDS and Kids, the Victorian Child Death Review Committee and the Child Safety Commissioner. These bodies and organisations are to be thanked for their efforts in the preparation and provision of these submissions, which assisted the court in this investigation.

Expert evidence

17. Dr Yeliena Baber, forensic pathologist at the VIFM provided an expert report[5] on the role of sharing a sleep surface with an infant in the context of fatal sleep accidents and SIDS. Dr Baber noted that a fatal sleep accident, such as positional asphyxia, was hard to prove at autopsy without positive evidence regarding overlay, and that in the absence of this type of evidence, the cause of death may be recorded as SIDS. This means that a finding of SIDS in a shared sleep surface environment could involve a fatal sleep accident.

18. Dr Baber outlined the recommended safe-sleeping environment for young infants. That is, a cot that meets recommended safety standards with a firm mattress, with no use of soft pillows or bumpers.

19. Dr Baber advised that bedding should comprise a sheet with lightweight blanket(s), which can be tucked in at the sides. The infant's face should not be covered. She recommended the environment be well ventilated and neither too hot nor too cold (at about 16-18 degrees C). The infant should be placed:

    a. at the end of the cot (foot to foot) rather than in the middle[6]

    b. in the 'supine'[7] sleeping position and avoidance of prone[8]

    c. 'side sleeping' is not advised.

[5] Exhibit 1
[6] To avoid burrowing under the covers and over-heating
[7] Placing the infant on their back.
[8] Placing the infant on their stomach.

20. Consistent with the CPU study, Dr Baber noted benefits of sharing a sleep surface with an infant (for example, *to facilitate breastfeeding and maternal bonding)* but also noted the existence of research which highlighted that

> 'bed-sharing with mothers who did not smoke was a **significant risk factor** among infants up to 11 weeks of age.'

Benefits of room sharing

21. Dr Baber advised that it was important to highlight the observed and documented benefits derived from **room sharing**, as distinct from sharing a sleep surface, and was concerned that conflicting messages are being provided to parents. According to Dr Baber the research on this matter is clear,

> "A committed care giver, usually the mother, sleeps in the same room, but not in the same bed with their infant, the chance of the infant dying from Sudden Infant Death Syndrome (SIDS) is reduced by 50%..... it is however, essential that the infant is placed within a bassinet or crib that complies with safety standards."[9]

Significant risk factors associated with shared sleeping surface

22. The single greatest risk factor associated with sharing a sleep surface with an infant is the age of the infant. Other significant risk factors include:

- Maternal smoking
- Infant/babies placed to sleep on pillows or under duvets
- Sleeping with other children
- Sleeping with babies on sofa's, waterbeds or couches
- Sleeping with an adult other than the mother
- Maternal exhaustion
- Alcohol or drug (whether recreational or prescription)
- Leaving infant unattended on an adult bed increases SIDS risks and/or fatal accidents

[9] Inquest statement Dr Baber.

- Body mass index-obesity
- Thermal regulation and ventilatry control
- Too little or too much bedding
- Infection suffered by the baby
- Passive smoking[10]
- The possibility of inherited cardiac rhythm disorders

Key Messages

23. In evidence, Dr Baber explained that, in her experience, infant deaths **do occur in the absence of risk factors** (while you cannot always be sure that the correct evidential material has been given for the purpose of the medical examination). Further, that in a group of children it would be impossible to identify which of those children were more at risk, putting high risk categories aside.

24. Consistent with other research, Dr Baber was unable to say that there was a clear association between sharing a sleep surface and an increase or decrease in the risk of SIDS in the absence of the documented risk factors, but warned that asphyxia can never be completely excluded making it an **inherently dangerous** environment to have a small infant on a shared sleep surface.

Avoid shared sleep surface with an infant in the first 6 months of life

25. Dr Baber's strong recommendation was that sharing a sleep surface should be avoided for the first six months of a child's life and ideally the first 12 months. Whether fed by breast or bottle, Dr Baber urged that a baby should be removed from the sleeping environment for feeding, then returned to cot:

> "That sleeping, feeding and putting back that's fine, but falling asleep no."[11]

[10] Dr Baber stressed that going outside and smoking does not minimise the risk *"It has been shown in studies that maternal particularity, or parental smoking, whether it is done outside or second smoke in the same room, the risk are still there for the infant.*

[11] Transcript evidence Dr Baber P 24.

Consistent messages to parents

26. Dr Baber stressed the need for professional staff to put personal beliefs aside and fully inform parents of the dangers of sharing a sleep surface with an infant. She stressed the importance of re-educating families who have a history of sharing sleep surfaces with infants as it is incumbent on parents to provide a safe sleeping environment for their infants. Professionals should convey the infant safe sleeping message to parents in a consistent and clear manner:

> "I think all through, starting from ante-natal care, when a woman first presents to her GP, all through ante-natal classes, in hospital and also once leaving hospital but going back for outpatient visits, or having help provided as coming into the home, at all stages..... it has to be consistent and personal bias of healthcare providers really shouldn't come into it, they are inexperienced."[12]

Financial constraints must not impede the provision of safe sleeping environment

27. All infants are entitled to sleep in a safe sleeping environment. Dr Baber urged that parents not be prevented from providing a cot which complies with Australian Standards, due to financial constraints.

29. Dr Baber reviewed the CPU report and supported its recommendations.

A controversial issue

30. Highlighting the risks of sharing a sleep surface with an infant often gives rise to fierce debate and controversy in our community. It is also the subject of discussion internationally. The safety of an infant is clearly a matter which affects the whole community. I am aware that by highlighting the existence of any risks associated with sharing a sleep surface with an infant, some hold the view that this may adversely affect breast feeding and any other benefits noted in my finding which arise from close contact between mothers and their infants. The course of the discussion and my recommendations are however far more complex and require careful consideration from community members and health professionals who work across a broad spectrum of diverse families.

[12] Transcript evidence Dr Baber P 19-20.

31. I acknowledge that breastfeeding is a practice that should be promoted and encouraged to lower the risk of post neonatal mortality, particularly from SIDS[13]. I support the advice developed by SIDSandKids which noted that: "There appears to be no increased risk of SIDS whilst sharing a sleep surface with a baby during feeding, cuddling and playing providing that the baby is returned to a cot or a safe sleeping surface before the parent goes to sleep." In this context and where possible, I am of the view that fathers can (and should) perform an important role in safe sleeping practice.

32. I also agree that more research is needed in this area to help refine and inform future health advice to parents and caregivers. They have a right to be informed by health professional of any potential risks and, once fully appraised of this knowledge, can make informed decisions about how to best care for and ensure the safety of their infant.

33. A recent international study has revealed that the rate of infant mortality in co-sleeping environments is growing world wide. Since the CPU study 2008-2010, Dr Baber has performed 90% of the paediatric autopsies at VIFM "sadly many of which have been in co-sleeping environments"[14]

COMMENTS AND RECOMMENDATIONS

Pursuant to sections 67(3) and 72(2) of the **Coroners Act 2008**, I make the following comments and recommendation connected with the death:

1. From the evidence I have examined during this investigation and given the current state of the scientific research, I am satisfied sharing a sleep surface with an infant is an inherently dangerous activity. Ideally, during the first year of life, but certainly, until six months of age, an infant must not sleep in a shared sleeping environment.

2. In my view, a harm minimisation approach should be taken that comprises strengthening of the public health and health promotion messages directed to caregivers of infants that are evidence based, consistently delivered across the health sector and reinforced during the multiple contacts with the health system. Caregivers must be advised of the arrangements and behaviours that provide a safe sleeping environment for infants. Such advice should include:

   - Safe sleep practices should be in place for every sleep.

[13] Hauck FR, Thompson JMD, Kawai O, Moon RY, Vennemann MM. (2011) Breastfeeding and Reduced Risk of Sudden Infant Death Syndrome: A Meta-analysis. Pediatrics. 128:103-112.
[14] T - 15

- That on the current evidence, it is recommended that infants are placed to sleep on their back on a separate sleep surface, preferably a cot that meets recommended safety standards, with their feet at the foot of the cot, in the same room as their caregiver(s), for the first six to twelve months of life.

- Caregiver-infant room sharing (where caregiver(s) sleep in the same room as an infant, but on a separate sleep surface) has been found to be protective against the risk of SIDS.

- Caregiver-infant sharing of a sleep surface (beds, sofas, mattresses and armchairs) increases the risk of infant death from a fatal sleep accident and may increase the risk of infant death from SIDS. It is not clear whether co-sleeping itself confers increased risk of infant death, or whether increased risk only occurs in the presence of particular unsafe practices and circumstances. Specific practices and circumstances associated with increased risk of infant death in co-sleeping, include: when an infant is aged four months or under; when a co-sleeping adult is a smoker; when a co-sleeping adult is affected by substances that lower arousal levels; when co-sleeping takes place on a couch or sofa; and when an infant co-sleeps with older siblings. However, co-sleeping infant deaths can occur in the absence of any of these.

3. This information should be provided at key developmental milestones both pre and post-natally and consistently by all members of the health sector. More specifically, infant safe sleeping advice should be provided to parents as follows:

- first delivered in the antenatal period (by 36 weeks gestation) to allow caregivers sufficient opportunity to establish a safe sleeping environment.

- delivered again in the postnatal period in hospital (in accordance with the Department of Health Victorian Infant Safe Sleeping Policy for Health Services).

- delivered at home, both during the first Maternal and Child Health Service home visit and again during completion of the Safe Sleeping Checklist.

- reinforced at subsequent visits to the Maternal and Child Health nurse.

Recommendation 1

That the Department of Health and Department of Education and Early Childhood Development align public health and health promotion advice on sharing sleep surfaces with infants to those contained in the SIDSandKids Information Statement: Sleeping with a Baby in the form of a revised Infant Safe Sleeping Policy. The revised policy should include advice for caregivers on the current recommended safe sleep practices for infants and the risk of infant death from fatal sleep accidents and sudden infant death syndrome associated with caregivers and infants sharing a sleep surface.

Recommendation 2

That the Department of Health and Department of Education and Early Childhood Development deliver consistent public health and health promotion advice to caregivers on safe sleep practices for infants at the following developmental milestones throughout the pre and post-natal period:

- first delivered in the antenatal period (by 36 weeks gestation) to allow caregivers sufficient opportunity to establish a safe sleeping environment;
- delivered again in the postnatal period in hospital (in accordance with the Department of Health Victorian Infant Safe Sleeping Policy for Health Services);
- delivered at home, both during the first Maternal and Child Health Service home visit and again during completion of the Safe Sleeping Checklist; and
- reinforced at subsequent visits to the Maternal and Child Health nurse.

Consistent with Recommendation 1, the advice should include information about the risk of infant death from fatal sleep accidents and sudden infant death syndrome associated with caregivers and infants sharing a sleep surface.

I direct a copy of the finding to the following parties for their action:

1. Secretary Department of Health
2. Secretary Department of Education and Early Childhood Development

I also direct that this finding be distributed to the following parties for their information only:

1. Parents of Baby N

Signature:

JOHN OLLE
CORONER
Date: 6 July 2012