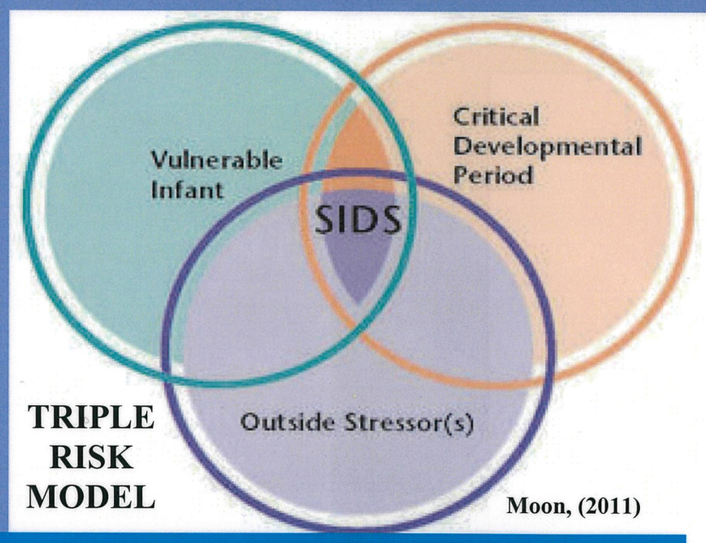
Sudden Unexpected Death in Infancy - What creates a vulnerable, high-risk baby?

Sudden unexpected death in infancy (SUDI) is a term described by the Child, Youth and Mortality review Committee (2009) as a phrase which encompasses all post-neonatal infant deaths (>28 days to 1 year old) which were not anticipated and are unable to be explained. The term SUDI was adopted to include both sudden infant death syndrome (SIDS) and other unintentional deaths. In New Zealand, the incidence of SUDI has decreased significantly to 36 in the year 2013; compared to the 1980's when over 200 babies each year were dying suddenly and unexpectedly.

TRIPLE RISK MODEL - Filiano and Kinney (1994) discuss the concept of SIDS victims not being entirely 'normal' prior to death; they possess an underlying vulnerability which increases their risk for sudden unexpected death. This concept forms an important facet of the triple risk model. The model (as cited in Moon, (2011) - see diagram below) includes three features that must be simultaneously present for SUDI to occur:

- **The critical development period:** From the age of 28 days to 1 year. Significant physical/cognitive development is occurring —add in an underlying vulnerability and exogenous stressor; normal functioning and development is impeded and can result in SUDI. Peak deaths occur during 2-3 months old.
- **The intrinsic vulnerability:** According to Mitchell (2013) this includes underdeveloped and /or poorly functioning respiratory and cardiovascular systems, abnormal arousal systems, pre-term/low birth weight or growth restricted infants, genetic polymorphisms and serotonin receptor abnormalities. Often the issue is that these vulnerabilities are caused by an unfavourable intrauterine environment which stems from exposure cigarettes, alcohol and other drugs. These vulnerabilities are though to be present from birth.
- **The outside stressor:** The modifiable aspect; prone sleeping position, lack of maternal breastfeeding, maternal smoking, soft bedding, too many pillows and blankets, overheating, swaddling and unimmunised infants.



TRIPLE RISK MODEL Moon, (2011)

THE SCENARIO - According to Filiano and Kinney, (1994): An infant exposed to smoke during pregnancy adapts to the hypoxic environment caused by reduced placental bloodflow. The baby is therefore born with a suppressed arousal system which means a lessened ability to detect low oxygen and high carbon dioxide levels—**this is the vulnerability.** At 2 months of age **(critical development period)** the baby's mother places him on his side to sleep as he "won't settle on his back". He rolls onto his front **(external stressor)** and suffocates. On my primary health placement with Plunket the scenario of a baby being placed on its side, as well as infant-parent bed-sharing was unfortunately relatively common and made me realise just how vulnerable babies are.

I identified SUDI as my practice issue and developed the following search question for my literature review:

What factors create a vulnerable and high risk infant which leads to SUDI?

RECOMMENDATIONS FOR PRACTICE: Educating parents/ caregivers on implementing the Ministry of Health's recommendations for safe sleep. SUDI is identified as occurring during sleep therefore preventative measures should target the baby's sleeping environment. These recommendations do so by removing the outside stressor and preventing SUDI even in vulnerable babies who are in a critical development period.

- Make sure your baby is on their back with their face up
- Is in their own bed, in the same room as a parent but NOT bed-sharing
- Baby should have a firm, flat mattress and their face should be clear of pillows, toys and loose bedding to prevent strangulation and suffocation.
- In a smoke free environment
- Baby is breastfed
- Ensure your baby receives immunisations on schedule.

These recommendations elaborate on the 3 principles identified by Change for our Children - **FACE UP, FACE CLEAR, SMOKEFREE. See also the Well Child pamphlet below for keeping your baby safe during sleep.**

SUDI is thought to be more prevalent among Maori and other ethnic populations globally because these populations exhibit higher risk behaviours such as maternal smoking and bed-sharing. In New Zealand the majority (60%) of SUDI cases are made up by Maori infants. See the pamphlet below for the Whakawhetu SUDI prevention message (P.E.P.E) designed specifically for Maori people.

References

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Rationale

I have chosen the poster as the means for distributing the evidence-based literature review I conducted on what factors create a vulnerable baby which leads to sudden unexpected death in infancy (SUDI). The reason for this is that the evidence I reviewed from Moon (2011), Kinney and Thach (2009) and Mitchell (2013), all discuss the triple risk model where three risk factors must be present simultaneously in an infant to SUDI. The most effective way of portraying this model is by using a visual tool such as a poster. Being able to have a visual representation of this concept makes it easier to understand how the combination of three factors leads to SUDI and consequently how the removal of one factor will create a less at risk infant. This is particularly important when recognising which aspects are able to be modified; which leads onto the Ministry of Health's recommendations for safe sleep that target the modifiable part of the model – exposure to an outside stressor. Health professionals have a visual idea of the evidence behind these recommendations and recognise the implications for their practice is that SUDI is associated with vulnerable infants with an underlying susceptibility, while SUDI doesn't occur in normal infants.

References

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Schneider, Z & Whitehead, D. (2013). Identifying research ideas, questions, statements and hypotheses. pp 58-76. In Schneider, Z. & Whitehead, D. (eds.). Nursing and midwifery research: Methods and appraisals. Australia: Elsevier.

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The following PECOT model (Schneider & Whitehead, 2013) articulates my practice issue of SUDI which has to lead to my search question.

PECOT Category	information relating to question	explanation
population	post neonatal infants - >28 days old to 1 year old	This is the age that infants are more likely to die from SUDI, this is also the age that children are identified as "post-neonatal infants".
exposure/intervention	SUDI - infants whose cause of death was determined as SUDI, risk factors and predisposing factors to SUDI, infant mortality in New Zealand, recommendations for prevention of SUDI.	I will look for articles which discuss the causes of SUDI, the rate of infant mortality caused by SUDI in NZ, the risk/predisposing factors to SUDI, and the preventative measures that can be taken when caring for infants.
comparison/control	risk factors that are thought not to contribute to SUDI such as bed sharing.	interested in seeing whether some behaviours that increase the risk of SUDI are not perceived by some as predisposing an infant to SUDI.
outcome	Able to identify what factors create a vulnerable and high risk baby for SUDI.	I want to be able to identify what factors increase an infant's risk for SUDI and understand how and what preventative measures there are that can be implemented.
time	not applicable	not applicable

My search question is: What factors create a vulnerable and high risk infant which leads to sudden unexpected death in infancy (SUDI)?