

The loss of a baby is an extremely traumatic event and has enduring effects that ripple out from parents to their extended families, friends, and co-workers. Educating parents and other infant caregivers about making infants' sleep settings safer can help prevent these tragedies and the considerable resulting emotional despair and productivity loss.

Guarding all infants in sleep

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A sizable racial disparity in rates of Sudden Infant Death Syndrome (SIDS) also troubles many people from a social justice perspective, spurring interest in understanding why the gap persists and how to reduce it. Although death rates from SIDS for both non-Hispanic white and non-Hispanic black babies fell during the back-to-sleep campaigns of the early 1990s, the gap between the two groups remains large. This is true in Illinois as well as the nation as a whole.

The overall declines before and after the back-to-sleep campaign are dramatic. Nationally, deaths from SIDS fell from nearly 5,500 (rate of 1.3 per 1,000 live births) in 1990 to 2,250 (rate of 0.5) in 2009. The decline was even larger in Illinois – from nearly 300 SIDS deaths (rate of 1.6 per 1,000 children under age 1) in 1990 to fewer than 60 (rate of 0.3) in 2009.

¹ <http://www.sidscenter.org/Statistics/table1.html>

² Statistics supplied by the Illinois Department of Public Health, SIDS/Infant Mortality Program.



Yet the SIDS death rate remains almost double for black babies in contrast to whites nationally (1.8 times larger in 2009, down from 2.3 in 1995).³ In contrast, national SIDS death rates are lower for babies of Asian and Hispanic descent than whites. In Illinois, the SIDS rate for black babies was nearly 1.19 out of 1,000 children under age 1, in contrast to a rate of 0.31 for white babies during the 2000s, a near four-fold difference.⁴

It is also the case that across racial-ethnic groups, national SIDS rates leveled off during the 2000s (see Figure 1). Medical experts' definitions of SIDS changed over time, somewhat complicating the interpretation of time trends.^{5,6,7} Importantly, as forensic investigations have collected more information about the circumstances of sleep-related deaths, cases that were once considered SIDS are now being classified as due to other causes. An increase in one of the categories – Accidental Suffocation and Strangulation in Bed – has received particular attention.⁸ Nationally, the rates for this classification quadrupled between 1984 and 2004.⁹ In Illinois, rates in this category have been trending upward throughout the last decade (see Figure 2). The black-white gap is even larger for this classification than SIDS,

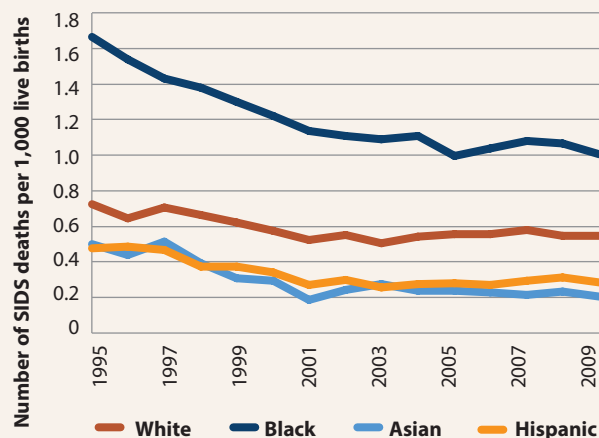
Sleep positioning campaigns that followed in the United States and around the world were widely seen as producing sizable declines in SIDS deaths.

with black infants being categorized as dying of accidental suffocation or strangulation at more than five times the rate of white infants in Illinois throughout the 2000s (a rate of 0.51 versus 0.09 per 1,000 children under age 1).¹⁰

Understanding of SIDS has changed markedly from the times of heightened concern during the 1980s and early 1990s, when healthy babies mysteriously died in their cribs. Putting babies on their backs to sleep was a tangible protective factor with a clear and easy-to-implement behavioral change. Positioning offered a simple target for reducing SIDS risk; and, in its initial recommendation of 1992, the American Academy of Pediatrics (AAP) Task Force focused principally on this issue of positioning.¹¹ Sleep positioning campaigns that followed in the United States and around the world were widely seen as producing sizable declines in SIDS deaths.

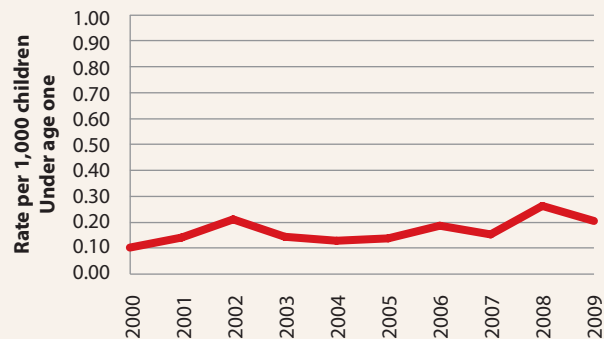
Strategies to further reduce SIDS are less clear-cut and more controversial. The latest AAP policy statement makes 18 recommendations, each with several subparts.¹² One of the most controversial is AAP's recommendation that adults not sleep in the same bed with an infant. Part of the controversy stems

Figure 1
National SIDS Death Rate by Race and Ethnicity, 1995-2009



Source: <http://www.sidscenter.org/Statistics/table2.html>

Figure 2
Rate of Infant Deaths Due to Accidental Suffocation and Strangulation in Bed: Illinois Residents Under Age 1, 2000-2009



Source: Statistics supplied by the Illinois Department of Public Health, SIDS/Infant Mortality Program. The conclusions, opinions, and recommendations expressed in this article are not necessarily the conclusions, opinions, or recommendations of the Department, nor are they promoted, endorsed, or supported by the Department.

from perceived conflicts between this recommendation and breastfeeding. The AAP does recommend “room sharing without bed sharing” (e.g., in a bassinet by the adult bed) and bringing a baby into bed to nurse but returning the baby to a separate space for sleep. Other stakeholders perceive these recommendations as inhibiting breastfeeding, which they view as easiest when mothers spend the entire night on the same sleep surface as the infant. Some controversy also stems from subcultures that value and practice bed sharing, sometimes with very low SIDS rates. Yet other controversy stems from different reading of the evidence cited by the AAP, which some interpret as indicating that bed sharing should be recommended against only when other risks are present (e.g., soft bedding, maternal smoking, parental inebriation or exhaustion).

The AAP recommendations

The AAP recommendations are not government policy, but practitioners, legislators, and agencies rely upon them heavily. For example, an online fact sheet from the Illinois Department of Public Health includes a subsection on “SIDS and Bed-Sharing” that notes, “according to the American Academy of Pediatrics, bed sharing is not recommended.”¹³ The DCFS report on rising deaths due to suffocation in bed stated, “most deaths occurred when parents, ignoring the advice of the American Academy of Pediatrics and safety experts, slept with a newborn or infant in their bed.”¹⁴ Since 2010, the Illinois General Assembly also amended the licensing requirements of hospitals and childcare providers to require instruction related to the AAP recommendations. For hospitals, the law stated that prior to discharge new parents receive materials about SIDS and that a nurse would “discuss best practices to reduce the incidence of SIDS as recommended by the American Academy of Pediatrics.”¹⁵ The Illinois childcare licensing standards were amended to require training every three years in sudden unexpected infant death “and the safe sleep recommendations of the American Academy of Pediatrics.”¹⁶

Unfortunately, the evidence available to the AAP has scientific limitations that reduce its ability to pinpoint definitive causes of SIDS. The AAP recognizes these limitations in their lengthier policy statements and reports, but the limits are easily obscured

as messages are simplified and translated for policy and practice. We highlight three key limitations of the AAP’s evidence here – the limitations of the type of studies, the complication of subgroup variation, and the few U.S. studies.

One important limitation is that the gold standard of scientific evidence – a randomized experiment – has not been conducted for SIDS due to ethical and

- ³ <http://www.sidscenter.org/Statistics/table2.html>
- ⁴ Statistics supplied by the Illinois Department of Public Health, SIDS/Infant Mortality Program.
- ⁵ Shapiro-Mendoza CK, Tomashek KM, Anderson RN, Wingo J. (2006). Recent national trends in sudden, unexpected infant deaths: More evidence supporting a change in classification or reporting. *American Journal of Epidemiology*, 163(8), 762–769.
- ⁶ Task Force on Sudden Infant Death Syndrome. (2005). The changing concept of sudden infant death syndrome: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116(5), 1245–1255.
- ⁷ CDC’s Sudden Unexpected Infant Death Initiative Available at: <http://www.cdc.gov/sids/suidabout.htm>
- ⁸ The latest classification categories are based on the World Health Organization’s International Classification of Diseases, 10th Edition (ICD-10) available at <http://www.who.int/classifications/icd/en/>.
- ⁹ Shapiro-Mendoza CK, Tomashek KM, Anderson RN, Wingo J. (2006). Recent national trends in sudden, unexpected infant deaths: More evidence supporting a change in classification or reporting. *American Journal of Epidemiology*, 163(8), 762–769.
- ¹⁰ Statistics supplied by the Illinois Department of Public Health, SIDS/Infant Mortality Program.
- ¹¹ American Academy of Pediatrics (AAP) Task Force on Infant Positioning and SIDS (1992). Positioning and SIDS. *Pediatrics*, 89, 1120–1126.
- ¹² AAP Task for on Sudden Infant Death Syndrome. (2011). SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128, 1030–1039. AAP Task for on Sudden Infant Death Syndrome. (2011). Technical report: SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128, e1–e27.
- ¹³ http://www.idph.state.il.us/sids/sids_factsheet.htm
- ¹⁴ Illinois Department of Children and Family Services. (2013). *DCFS: Illinois Child Deaths Skyrocket in 2012: Suffocation by Neglect Top Cause of Death in Indicated Neglect and Abuse Cases*. (Press Release Issued January 10, 2013).
- ¹⁵ 210 ILCS 85/ Hospital Licensing Act.
- ¹⁶ Public Act 0970083



practical constraints (e.g., the rate of SIDS is so low that an extremely large experiment would be needed, and ethical concerns elevate when a design calls for randomly assigning some families to sleep practices that existing evidence suggests may be unsafe). Instead, the AAP relies primarily on case-control studies, which are more feasible than experiments for rare events like SIDS. Case-control studies begin with cases (e.g., families with an infant who died of SIDS) and then identify similar controls (e.g., families with a still-living infant) and look to see what differentiates the two, sometimes by gathering new information (e.g., asking parents “Where did/does the infant usually sleep?”). Although cases and controls are often matched on certain characteristics (e.g., hospital of birth, gender and race-ethnicity) and other information is usually gathered from families and statistically controlled (e.g., parents’ level of education, extent of prenatal care), it is always possible that some factors that differentiate cases and controls are not adequately adjusted and limit a causal interpretation. Furthermore, some cases and some controls may decline to participate in the study. Results will differ more from causal estimates when the families that participate differ in important ways from the families that do not.

Like other research, case-control studies of SIDS are also complicated by the extent to which a

characteristic (like bed sharing) is associated with SIDS across all situations or only in certain circumstances. Although such variation across subgroups is of vital importance to policy and practice, it is more complicated than a simple association that holds across all families. More nuanced conclusions about variation may be difficult to write, and may be simplified as researchers and practitioners search for a simple bottom line. This issue is especially important to the case of bed sharing and SIDS because the crux of the debate between groups such as the AAP Task Force and other stakeholders surrounds the extent to which bed sharing should be recommended against in all situations or only when other co-occurring risks are present. For example, a synthesis of case-control studies that the AAP Task Force cited as evidence considered subgroup analyses of mothers who smoke and mothers who do not smoke. The statistical results showed that the association of bed sharing to SIDS was significant only for smoking mothers and not for non-smoking mothers. However, the authors’ conclusion implied the association was significant for all mothers by stating “...bed sharing strongly increases the risk of SIDS. This risk is greatest when parents smoke...”

Synthesis of case-control studies is also challenged by substantial variation in populations, definitions, and analyses across studies. Importantly, the bulk of the case-control studies used to support AAP recommendations about bed sharing are from outside of the U.S., primarily Europe, Australia, and New Zealand. Just three of 11 studies included in the research synthesis cited by the AAP were from the U.S., two in California and one in Chicago.¹⁷ All three U.S. samples were from two states (California and Illinois) and were primarily urban, lower socioeconomic status, and non-white. Thus, it is difficult to know the extent to which the case-control findings generalize to other subgroups (e.g., white, middle-class families in less urban settings and other states). Although the successful back-to-sleep campaign was also based primarily on case-control studies from outside the U.S., some experts contend that bed sharing and its risks are more culturally dependent than sleep positioning. For instance, Japanese families regularly share a sleep space with infants but have low SIDS rates; many interpret this anomaly as being due to fewer co-occurring risks in Japanese circumstances (e.g., low rates of smoking and drinking;

a flat and firm sleep space). Although some U.S. families may bed share in similarly low risk contexts, the AAP emphasizes others that have potential hazards to sleeping infants (like soft mattresses, numerous pillows, and fluffy blankets).

Perspectives of anthropologists and other stakeholders

It is not surprising that debate persists about the AAP Task Force's recommendation against bed sharing, given the limitations of case-control studies just reviewed. Cross-cultural and sleep lab studies as well as qualitative research and family surveys further demonstrate the ways that bed sharing can be influenced by cultural norms, and the ways in which decisions about where a baby sleeps can be complicated when parents try to weigh conflicting information from multiple sources.

One prominent review of the anthropological literature laid out the ways that the demands of modern times produced new sleep arrangements that we take for granted, although such arrangements are not universal across time and space.¹⁸ The authors of the review argue that placing infants to sleep in a crib in a separate room is a contemporary phenomenon, better suited to meet parental than infant needs. Infant needs – the prematurity of human newborns and the nutritional content of human milk – instead are better met through close physical presence of caregivers to infants. By studying mothers and infants staying overnight in a lab, anthropologists have also identified that the safest sleep position – face up – happens naturally when breastfeeding mothers sleep with infants, and sleep lab studies document other physiological benefits of this close proximity including less

deep sleep, more awakenings and greater interactions (which are all protective given infants still-developing arousal systems).¹⁹

Other sleep-lab studies document how important it is to look at the entire sleep space holistically, rather than to focus on individual risks one at a time. These studies provide examples of shared adult-infant sleep spaces without other risks and crib sleeping with numerous risks. One such study described four mothers who arranged sleep spaces for their infants in a lab that contained a living room with a couch, a bedroom with a bed, and a separate room with a crib.²⁰ Sleep arrangements varied among the mothers, as well as for any given mother-infant pair throughout the night. In some situations, mother and baby shared a space with the infant in a safe position (on her back, on a firm surface, with nothing covering the face). In others, the baby slept alone in a crib with numerous risks present (surrounded by soft blankets and stuffed animals, with instances of the face becoming covered). The overall conclusion of the study was that public health messaging may not sufficiently recognize that risks can be introduced into any sleep environment.

Qualitative studies and focus groups also identify ways in which parents assimilate the AAP recommendations with other information. Some parents perceive the advice to avoid bed sharing as conflicting with advice to breastfeed. In one study, about one-third of bed-sharing mothers said they started this practice in the hospital, and several mothers learned from midwives to breastfeed lying down, especially after a C-section.²¹ Another study found that African-American parents said they chose to share their bed because it made breastfeeding and other infant care more convenient.²² These mothers also

¹⁷ Vennemann, M. M., Hense, H., Bajanowski, T., Blair, P. S., Complojer, C., Moon, R. Y., Kiechl-Kohlendorfer, U. (2012). Bed sharing and the risk of sudden infant death syndrome: Can we resolve the debate? *Journal of Pediatrics*, 160, 44-48. (Quote from p. 47).

¹⁸ McKenna, J. J. & McDade, T. (2005). Why babies should never sleep alone: A review of the co-sleeping controversy in relation to SIDS, bed sharing and breast feeding. *Paediatric Respiratory Reviews*, 6, 134-152.

¹⁹ McKenna, J. J. & McDade, T. (2005). Why babies should never sleep alone: A review of the co-sleeping controversy in relation to SIDS, bed sharing and breast feeding. *Paediatric Respiratory Reviews*, 6, 134-152.

²⁰ Volpe, L. E., Ball, H. L., & McKenna, J. (2013). Nighttime parenting strategies and sleep-related risks to infants. *Social Science & Medicine*, 79, 92-100.

²¹ Ball, H. L. (2002). Reasons to bed-share: Why parents sleep with their infants. *Journal of Reproductive and Infant Psychology*, 20(4), 207-222.

²² Chianese, J., Ploof, D., Trovato, C., & Chang, J. C. (2009). Inner-city caregivers' perspectives on bed sharing with their infants. *Academic Pediatrics*, 9(1), 26-32. doi:10.1016/j.acap.2008.11.005

reported that bed sharing was a tradition in their families, and believed that both bed sharing mothers and infants slept better and that sharing a sleep space helped protect babies from dangers such as fire, vermin, and violence. Yet another study found that parents perceived exceptions to safe sleep guidelines – for instance knowing someone whose baby died while sleeping on her back – and changes to recommendations over time – such as from tummy to back – invalidated the recommendations in general.²³

Of course, none of the evidence offered by anthropologists, or pointed to by parents' experiences, definitely shows that bed sharing is safe. Indeed, the absolute risk of SIDS is so low that it is easy to find anecdotal evidence that shows infants do survive in situations not consistent with the AAP recommendations. Thus, the AAP Task Force focused on the lack of evidence that bed sharing was protective when it concluded that "there is insufficient evidence to recommend any bed sharing situation in the hospital or at home as safe."²⁴ In contrast, the anthropological review cited above concluded: "No single recommendation to bed share ... either as a way to reduce SIDS or to enhance the night-time attachment behaviors shared by parents and their children, is appropriate; but neither is it appropriate to recommend in an unqualified way against any and all bed sharing, or especially to advise that no infants should ever sleep with their parent but should always be placed in cribs to sleep alone."²⁵

Next steps

What next steps can help resolve the debate and advance evidence for policymaking? A collaboration between medical doctors, epidemiologists, anthropologists, and other SIDS researchers – including those prominent on both sides of this issue – would likely move more quickly toward resolving disagreements than would more research done independently by each side. For example, a recent study re-analyzed many of the earlier case-control studies on bed sharing and SIDS, aggregating them together so that there would be more cases for subgroup

It seems such cross-side collaboration could be productive in the debate about bed sharing and SIDS, especially because a careful reading of the writing from both sides of this debate reveals their perspectives are closer together than the differences in their final conclusions suggest.

analyses.²⁶ Doing so was an important step toward understanding the type of nuance discussed above – and particularly to resolve debate about whether bed sharing is risky only in certain circumstances. Unfortunately, they lacked collaborators from the other side of the debate who might offer independent perspective on the data and analyses. Rather than resolving debate, this study spurred new controversy, with numerous criticisms and a response from the authors posted on the journal web site.²⁷ For instance, the larger sample size supported a significant association between bed sharing and SIDS for non-smoking mothers, although the absolute risk remained

low in this group and smoking and alcohol use greatly increased bed sharing risk.

In situations like this, some academics have instead used "adversarial collaboration" in which scholars on either side of an issue come together to define research questions, design a study, analyze the data, and interpret the results. Another scholar sometimes acts as a mediator to help facilitate the collaboration, and each side writes its own interpretation and conclusion at the end of a jointly produced paper. Even given the challenges of this approach, one of its originators reports that the process leads to "new facts accepted by all, narrowed differences of opinion, and considerable mutual respect."²⁸ It seems such cross-side collaboration could be productive in the debate about bed sharing and SIDS, especially because a careful reading of the writing from both sides of this debate reveals their perspectives are closer together than the differences in their final conclusions suggest. A thorough examination of the AAP Task Force reports reveals that they acknowledge the limitations of case-control studies and also recognize cross-cultural variation and the complexities of parents' decisions about sleep practices; and, a careful look at anthropological writing also reveals that they recognize that bed sharing can be risky in certain circumstances.

Such collaborative research might produce more case-control studies in the United States in order to

balance the weight of the evidence which is currently primarily from outside of the U.S. (and sometimes decades old). New studies could take advantage of technological innovations in collection and analysis of large-scale sensitive data and the integration of various administrative data sources in the U.S.²⁹ Research-policy partnerships would be ideal, since state legislators and state agencies could support such studies by enabling access to data, while scholars could help design rigorous studies through peer review and raise funds from federal agencies and foundations. Also, new insight might be gained by drawing from a broader range of methodologies for analyzing observational data. For example, econometricians leverage natural experiments whose exogenous changes in key predictors can account for many difficult-to-measure confounds.

Two recent studies use this kind of approach to increase evidence of the association of SIDS with parental smoking and drinking. One found that higher cigarette prices and taxes were associated with reductions in SIDS.³⁰ Another demonstrated that both alcohol-related motor vehicle deaths and SIDS deaths spiked on New Years Eve.³¹

Creative thinking about natural experiments that alter bed-sharing behaviors might also produce new evidence on the topic. For example, the Christchurch earthquakes of 2011 in New Zealand displaced many families from their homes. With rapid mobilization, health agents distributed nearly 1,000 portable sleep spaces to families as emergency baby beds.³² The concept spread rapidly and during 2012 health agencies in five regions of the



²³ Moon, R. Y., Oden, R. P., Joyner, B. L., & Ajao, T. I. (2010). Qualitative analysis of beliefs and perceptions about sudden infant death syndrome in African-American mothers: Implications for safe sleep recommendations. *Journal of Pediatrics*, 157(1), 92–97.e2.

²⁴ AAP Task for on Sudden Infant Death Syndrome. (2011). Technical report: SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128, e1–e27. (Quote from p. e10).

²⁵ McKenna, J. J. & McDade, T. (2005). Why babies should never sleep alone: A review of the co-sleeping controversy in relation to SIDS, bed sharing and breast feeding. *Paediatric Respiratory Reviews*, 6, 134–152. (Quote from p. 141).

²⁶ Carpenter, R., McGarvey, C., Mitchell, E. A., Tappin, D. M., Venne-mann, M. M., Smuk, M., & Carpenter, J. R. (2013). 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, e002299. doi:10.1136/bmjopen-2012-002299

²⁷ Published letters and author reply. <http://bmjopen.bmj.com/content/3/5/e002299/reply>

²⁸ Kahneman, D. (2003). Experiences of collaborative research. *American Psychologist*, 58, 723–730. (Quote from p. 729).

²⁹ Card, D., Chetty, R., Feldstein, M. & Saez, E. (2010). Expanding access to administrative data for research in the United States. NSF white papers on Future Research in the Social, Behavioral & Economic Sciences. Full paper available at <http://elsa.berkeley.edu/~saez/card-chetty-feldstein-saezNSF10dataaccess.pdf>

³⁰ Markowitz, S. (2008). The effectiveness of cigarette regulations in reducing cases of Sudden Infant Death Syndrome. *Journal of Health Economics*, 27, 106–133.

³¹ Phillips, D. P., Brewer, K. M. & Wadensweiler, P. (2010). Alcohol as a risk factor for sudden infant death syndrome (SIDS). *Addiction*, 106, 516–525.

³² Cowan, S., Bennett, S., Clarke, J. and Pease, A. (2013). An evaluation of portable sleeping spaces for babies following the Christchurch earthquake of February 2011. *Journal of Pediatrics and Child Health*, 49: 364–368. doi: 10.1111/jpc.12196

country provided a collective 3,000 such devices to their more vulnerable infant populations.³³ A gap in SIDS rates between the New Zealand Maori population and the total New Zealand population had persisted from the mid-1990s, with rates being about 7 per 1,000 in the former group and 5 per 1,000 in the latter throughout the 2000s. During 2012, rates dropped sharply for the Maori, falling to 4.7 per 1,000 in 2012, much closer to the rate of 4.2

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per 1,000 in the total population that year.³⁴ Importantly, the 2012 decline in infant mortality was in the five regions providing full or partial sleep space programs compared to the 15 regions that were not. A randomized trial of the program delivered to a vulnerable population of Maori and Pacific families is near completion. Half of 240 families with newborns enrolled in the study were chosen at random to receive the program, and their use of the sleep spaces was assessed. Another study is using infrared video and measures of infant heart rate, blood oxygen levels, and body temperature to assess the safety of similar sleep spaces. Replication of such studies in the U.S., and observation of parents' use of similar devices in sleep labs, would likely help inform the bed sharing debate in the U.S.

Also informative would be new collaborations examining why parents share their bed. A recent report from the annual National Infant Sleep Position Study documents continued trends upward in bed sharing in the U.S., with the percentage of parents reporting that they usually share a bed with their infant doubling from 6.5 to 13.5 between 1993 and 2010.³⁵ Racial differences widened over this period, with 10 percent of white parents saying that they usually share a bed with their infant, in contrast to 20 percent of Hispanic and nearly 40 percent of black parents. Strikingly, although this level of reported usual bed sharing is twice as high for Hispanics as whites, SIDS rates do not differ between these two groups, although the SIDS rates for blacks exceeds both of these groups.³⁶ Similar patterns (higher bed sharing rates, but less SIDS) are also suggested for Asians.³⁷ More research is needed into the circumstances of bed sharing, and

especially co-occurring risks, across racial-ethnic groups. Another national study – the Infant Feeding Practices Study II – also recently documented that bed sharing is associated with a longer duration of breastfeeding. Nearly 80 percent of mothers who frequently shared their bed were still breastfeeding at 6 months versus less than 60 percent of mothers who did not bed share.³⁸ The authors, including a member of the AAP Task Force on SIDS, con-

cluded that: “Parents need to know that bed sharing may make breastfeeding easier to maintain and therefore it is tempting for them to do it. On the other hand, they deserve to know that it comes with a risk to their infant’s safety. Health professionals need to address these two sides when educating parents, so that informed decisions can be made. Future guidelines on safe sleep for infants also should identify these associations as potential barriers to following the advice of public health policy and offer ways to overcome them.”³⁹

Continued research into the broader risks for infant mortality and the challenges of the transition to parenthood could also inform new interventions. Beyond SIDS, racial disparities are evident for all of the leading causes of death in both the neonatal (first month after birth) and post-neonatal (end of first month to first birthday) period.⁴⁰ SIDS is the leading post-neonatal cause of death, accounting for about one-fifth of deaths in that period.⁴¹ Complication from low birth weight or prematurity is the number one cause of death in the neonatal period, accounting for about one-fourth of deaths.⁴² Stepping back from our focus on the AAP recommendations and bed sharing, the broader research literature suggests that in most situations a biological vulnerability – such as an immature arousal system – interacts with an environmental stressor – such as stomach sleeping (which promotes deeper sleep that is harder for the infant to arouse from and can obstruct the airway). Some biological and environmental risk factors for SIDS are also risk factors for other causes of infant mortality as well as many other negative individual and family outcomes. For instance, maternal smoking is directly associated with prematurity and low birth weight as well as

SIDS, and appears to interact with bed sharing in association with SIDS. Smoking has other direct health and economic costs to parents, and reduced social acceptance in contemporary times. Thus, smoking is a less controversial target for reducing infant mortality, including SIDS, than is bed sharing; and policies that aim to reduce smoking for other reasons can also reduce infant deaths.

Families also face broader challenges in the transition to parenthood and in balancing work and family, beyond safe infant sleep practices. Policies aimed generally at reducing the stress of new parenthood may reduce SIDS, given for instance some evidence that parental exhaustion increases SIDS' risk.⁴³ Policies that promote parental leave would allow both parents time to support one another during the first few months of a baby's life, when SIDS rates are highest. Policies aimed at reducing poverty may also help families implement safe sleep practices, given low-income families have little money to spend on buying a separate sleep space for a newborn. Some organizations also distribute portable cribs to low-income parents to directly meet this need.

Despite inroads into reducing infant mortality and SIDS, it is still the case that too many parents lose a child before their first birthday, including to accidental

or unknown causes. Innovative research-policy partnerships in Illinois have the potential to further reduce the number of parents who experience such a traumatic event. Not only will doing so avert distress for these families and those who know them, but reducing certain risks for infant deaths will have multiple benefits, promoting health and well-being in other arenas of children and families' lives and supporting their productive contributions to the state.

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³³ Cowan, S. (2013). The Pepi-pod Safe Sleep Programme: Report on the 2012 distribution and use of portable spaces for promoting safe sleep for more vulnerable babies. Christchurch, New Zealand: Change for Our Children. Available at http://www.changeforourchildren.co.nz/files/docs/pepi-pod%20programme%20report_2012.pdf

³⁴ Cowan, S. (2013). Our first 500 sleeps: Pursuing protection sleep by sleep. Presentation at the 2013 Illinois Family Impact Seminar on "Guarding All Children in Sleep: New Ideas for Reducing Disparities in Safe Sleep Practices." Available at <http://igpa.uillinois.edu/system/files/Cowan.pdf>

³⁵ Colson, E. R., Willinger, M., Ryben, D., Heeren, T., Smith, L. A., Lister, G., & Corwin, M. J. (2013). Trends and factors associated with infant bed sharing, 1993-2010. The National Infant Sleep Position Study. *JAMA Pediatrics*, 167(11), 1032-1037.

³⁶ <http://www.sidscenter.org/Statistics/table2.html>

³⁷ Colson and colleagues do not report statistics specifically for Asians, although their "other" category has bed sharing rates between Hispanics and blacks.

³⁸ Huang, Y., Hauck, F. R., Signore, C., Yu, A., Raju, T. N. K., Huang, T. T., & Fein, S. B. (2013). Influence of bed sharing activity on breastfeeding duration among U.S. mothers. *JAMA Pediatrics*, 167(11), Figure, 1040.

³⁹ *Ibid*, p. 1043.

⁴⁰ Hauck, F. R., Tanabe, K. O., & Moon, R. Y. (2011). Racial and ethnic disparities in infant mortality. *Seminars in Perinatology*, 35, 209-220.

⁴¹ *ibid*, page 212.

⁴² *ibid*, page 210.

⁴³ Blair, P. S., Fleming, P. J., Smith, I. J., Platt, M. W., Young, J., Nadin, P., Berry, P. J., Golding, J., and CESDI SUID Research Group. (1999). Babies sleeping with parents: Case-control study of factors influencing the risk of the Sudden Infant Death Syndrome. *BMJ: British Medical Journal*, 319, 1457-1461.