

# Cot Life 2000

## SIDS Australia and US SIDS Alliance (First Candle) get it wrong

In response to queries about the toxic gas theory for cot death, SIDS Australia issue a highly misleading statement titled "**Speculation concerning toxic gas from mattresses and sudden infant death syndrome (SIDS)**".

The US SIDS Alliance (First Candle) issue a parallel statement titled "**Toxic Gas Theory, Mattresses and SIDS**".

[Here is a list of errors on pages 2 and 3 of SIDS Australia's statement \(under the heading "Summary"\) and on pages 1 to 3 of First Candle's statement:](#)

- SIDS Australia (page 2) and First Candle (pages 2 & 3) say that a 1990 UK Government inquiry (the Turner Inquiry) found no evidence to support the toxic gas theory for cot death.

**Wrong.** *The Turner Committee generated stibine (a highly toxic gas) from cot mattress material: refer the Turner Report (UK Government, May 1991). Furthermore, the Turner Committee recommended that the UK Government should establish a standard for the resistance of cot mattresses to the growth of certain micro-organisms; and that fungi found on the mattresses of cot death babies should be specifically investigated.*

- SIDS Australia say (page 2) that research by D W Warnock failed to replicate UK scientist Barry Richardson's generation of toxic gas from cot mattress materials.

**Wrong.** *Warnock's research team (investigating for the UK Limerick Committee) generated stibine and arsine gas from cot mattress material: this is reported in Lancet 1995; 346: 1516-20.*

- SIDS Australia (page 2) and First Candle (page 1) say that one of the world's largest cot death studies (the UK CESDI Study) found that babies who slept on PVC-covered mattresses were less likely to die from cot death than babies on other mattresses.

**Of course they were.** *Following removal of phosphorus, arsenic and antimony from British PVC-covered mattresses from 1989 onwards, the risk of cot death in Britain is less on PVC-covered mattresses (which are very frequently used in Britain). The finding by the CESDI Study that babies are at less risk on PVC-covered mattresses than other mattresses supports the toxic gas theory for cot death.*

- SIDS Australia (page 2) and First Candle (page 1) say that cot death was occurring long before phosphorus, arsenic and antimony were incorporated into babies' mattresses.

***Of course it was!** Phosphorus, arsenic and antimony are naturally present in numerous historically-used mattress and bedding components (for example, they are present in wool; sheepskin; sheepfleece; kapok; tree bark; flax; coconut fibre; chaff; and horsehair). So all of these natural mattress and bedding components are potentially capable of toxic gas generation - and therefore it stands to reason that cot deaths occurred long before phosphorus, arsenic and antimony were incorporated into mattress manufacturing processes. So again, the statement by SIDS Australia and First Candle supports the toxic gas theory for cot death.*

- First Candle (page 1) say that cot death occurs in countries where no antimony has been added to mattresses.

***Of course it does.** First, as noted above, phosphorus, arsenic and antimony are naturally present in numerous mattress and bedding components - therefore cot death can readily occur regardless of the fact that antimony has not been added to mattresses. Secondly, in those countries where antimony is not usually added to mattresses, phosphorus is nevertheless very prevalent in mattresses. So of course cot death occurs in those countries, because such mattresses are capable of generating toxic phosphine gas. Phosphorus is present in plasticisers, polyester and acrylic - all of which are frequently used in mattress manufacture even where antimony is not used. First Candle's argument is irrelevant.*

- SIDS Australia say (page 2) that cot death babies have died in many sleeping environments, including in carseats and in parents' arms.

***Of course they have.** Carseat padding almost always contains phosphorus, and if it is fire-retarded can also contain antimony. So almost all carseats are potentially capable of toxic gas generation.*

*In respect of cot deaths in parents' arms: If a baby has been lying in a cot or on some surface where he/she has been exposed to a lethal dose of toxic gas, and as a result the mechanism of death is already occurring when the baby is picked up by an adult, the baby will die while being held in the adult's arms. Furthermore, cot death can occur in an adult's arms if a baby is picked up and held in an item of bedding which is generating toxic gas.*

*So once again, the statement by SIDS Australia supports the toxic gas theory for cot death.*

- SIDS Australia (page 2) and First Candle (page 1) say that a report published in 1997 shows that antimony is a common element, found in ordinary house dust.

**Highly misleading.** Antimony is not a common element - it comprises only one part per million (0.0001%) of the earth. Furthermore, antimony is very rare in the domestic environment, the only significant source being mattresses, upholstery materials, etc.

- SIDS Australia say (page 3) that a Scottish SIDS case-control study published in the British Medical Journal in May 1997 concluded that "sleeping on an old mattress may be important [regarding SIDS]". However, SIDS Australia say that recommendations to parents should not address this factor until further research has been carried out - and that the finding does not provide support for the toxic gas theory for cot death.

**SIDS Australia are out-of-date on one score...** *The finding by the Scottish Cot Death Trust that cot death risk rises as mattresses are re-used from one baby to the next (published in BMJ 1997; 314: 1516-20) was replicated in a further separate study published five years later (in BMJ 2002; 325: 1007-1009). The Scottish Cot Death Trust now advise parents to use plastic-covered mattresses for cot death prevention.*

**... and SIDS Australia are wrong on another score:** *These two studies by the Scottish Cot Death Trust clearly confirm the toxic gas theory for cot death: If a mattress contains phosphorus, arsenic or antimony, and if certain fungi have become established in the mattress during use by a baby, any generation of toxic gas commences sooner and in greater volume when the mattress is re-used by another baby. The toxic gas theory explains the rising risk of cot death as mattresses are re-used from one baby to the next.*

**Continuing with the statements by SIDS Australia and First Candle, here is a list of errors on pages 3 and 4 of the SIDS Australia statement under the heading "Expert Group to Investigate Cot Death Theories: Toxic Gas Hypothesis, UK 1998".**

**Parallel errors appear on page 1 of the First Candle statement.**

SIDS Australia and First Candle repeat the following false or misleading claims made by the "Expert Group" (the UK Limerick Committee):

- First claim: Cot mattress contamination with the fungus *S. brevicaulis* is rare, and no more common in SIDS mattresses than in other used mattresses.

**Irrelevant.** *The Limerick Committee found *S. brevicaulis* and many other micro-organisms on cot mattresses - and a number of these are capable of generating toxic gas if phosphorus, arsenic or antimony are present in a mattress. Whether babies had died of cot death on the mattresses tested by the Limerick Committee is immaterial. Household fungi become established in nearly every mattress which is regularly slept on, and in underbedding which is washed infrequently.*

- Second claim: There is no evidence for the generation of gases from phosphorus, arsenic and antimony from cot mattresses by *S. brevicaulis*, when tested using conditions relevant to an infant's cot.

***Again, it's irrelevant.*** Toxic gas generation had already been achieved in cot conditions in the early 1990s, and failure by the Limerick Committee to achieve it did not negate this fact. Various researchers have found it difficult to achieve gas generation consistently using media with a neutral pH. But the pH of a cot mattress is often higher, owing to the conversion of urea to ammonia. Experiments carried out using high pH (say, 10) have achieved more consistent gas generation. In these tests fungus flourished and the amount of gas produced was greater than at a neutral pH.

- Third claim: There is no evidence of poisoning by phosphine, arsine or stibine (or their methylated derivatives) in infants who have died of SIDS, i.e. the babies did not show haemolysis and pulmonary oedema.

***Of course they didn't.*** Babies die so quickly from this type of poisoning that these effects don't have time to develop. Haemolysis, for example, takes many hours to develop; so does pulmonary oedema. But this gaseous poisoning can kill a baby within minutes. The toxicological data in the Limerick Report relates to older children and adults. None of it relates to babies - yet it is well known that babies' blood and physiological responses differ materially from those of older children and adults.

- Fourth claim: Low amounts of antimony can be detected in tissue samples from the majority of live infants, and even newborn infants: the concentrations in the tissues of SIDS infants were not different from those dying from known causes.

***Wrong.*** Research carried out in Britain in 1994 (by the Robens Institute Trace Element Laboratory, Surrey) showed that post-mortem tissue of cot death babies contained many times more antimony than tissue of babies who had died of other causes.

- Fourth claim (continued): There are a number of sources of antimony in the domestic environment other than fire retardant in cot mattress materials (put another way, antimony present in the tissue of cot death babies could have come from many sources other than the babies' mattresses).

***Wrong.*** The same 1994 British research showed that the body tissue of babies who had died of causes other than cot death contained no detectable antimony (or in one case very little). If the above claim were correct, there would have been similar amounts of antimony in the tissue of all the babies tested, whether they had died of cot death or of other causes.

- Fifth claim: No evidence has been found that the changing rates of

sudden infant death in Britain correspond to the introduction and removal of antimony- and phosphorus- containing fire retardant in cot mattresses.

**Wrong.** *These chemicals were first introduced into cot mattresses in the early 1950s, and the British cot death rate increased steadily from that time onwards. (In fact, the term "cot death" was coined in 1952 as a result of the marked increase in the number of such deaths.) The highest cot death rate in Britain (2.3 deaths per 1000 live births in 1986-1988) coincided with the highest concentration of antimony in cot mattresses. The British Government had required fire retardant to be incorporated in cot mattresses by 1988. Manufacturers were given four years' notice, and during this period they moved towards compliance with the new standard.*

*In June 1989 the toxic gas theory was publicised in Britain and the cot death rate immediately began to fall. It had fallen 38% (to about 1.4 deaths per 1000 live births) by the time the British face-up sleeping campaign was launched in December 1991 (i.e. two-and-a-half years later).*

*Certainly the British cot death rate fell while the amount of antimony in mattresses was high - but that was because from mid-1989 onwards parents took preventive measures against toxic gas generation in babies' mattresses. Furthermore, manufacturers began to remove antimony from cot mattresses.*

**SIDS Australia omit to mention the following important points in their statement about the toxic gas theory, all of which are highly relevant for Australian parents:**

- The only mattresses investigated by the Limerick Committee were PVC-covered mattresses... *But only a small number of infant mattresses marketed in Australia are PVC-covered.*
- The Limerick Committee did not investigate natural products used as bedding... *But many Australian babies sleep on natural bedding products, such as sheepskins.*
- The Limerick Committee focused only one of the three gases relevant to the toxic gas theory for cot death: stibine, generated from antimony. They did not test any mattresses or bedding for the generation of phosphine... *But phosphorus is far more prevalent in Australian infant bedding than antimony.*
- The Limerick Committee's research confirmed the gas generation which causes cot death. As reported in *Lancet* in 1995, they achieved the generation of stibine and arsine from cot mattress material. Other researchers had already proved the generation of all three gases: phosphines from phosphorus, arsines from arsenic, and stibines from antimony.

**For their part, First Candle make additional errors on pages 1 and 3 to 5 of their statement:**

- First Candle claim (page 1) that the reduction in the British cot death

rate between 1988 and 1995 cannot be due to mattress-wrapping, because "only 2% of babies were sleeping on wrapped mattresses" .... *But the 2% statistic is irrelevant. As First Candle themselves state (on page 4), the advice publicised in Britain was to either wrap babies' mattresses or buy a new mattress for each new baby. Many British parents took the second option: sales of new cot mattresses increased by 15%. Furthermore, from 1989 onwards British manufacturers started to remove phosphorus, arsenic and antimony from cot mattresses.*

- First Candle claim (page 1) that babies have died on polythene-wrapped mattresses... *This claim (which derives from the UK CESDI Study) is totally unsubstantiated. The CESDI researchers did not carry out any chemical analyses of the plastic used to wrap the three cot mattresses in question, and accordingly there is no evidence that these wraps were made of polythene. Furthermore, the bedding used on top of the mattress wraps was not analysed for the presence of phosphorus, arsenic and antimony. In February 2000 UK Professor Peter Fleming (principal author of the CESDI Study) conceded that the claim that babies have died of cot death on polythene-wrapped mattresses is unsubstantiated.*
- First Candle quote statements published by the British Medical Journal and UK Foundation for the Study of Infant Deaths about the 1998 UK Limerick Report (pages 3 to 5) ... *But the conclusions of the Limerick Report were immediately discredited following its publication (in 1998). For an overview of errors and fallacies in the Limerick Report, click on the sidebar heading **Limerick Report**.*
- First Candle say (page 1) that "even experts in New Zealand, where [the toxic gas theory] originated, do not support it"... *Wrong! As long ago as September 1998 New Zealand environmental scientist M G Fitzpatrick PhD (who has carried out research for the New Zealand Cot Death Association) published the following statement in the New Zealand Medical Journal: "The conclusion that there is no possibility that toxic gases will be produced from cot mattress materials is incorrect. In fact, [UK research] shows the clear potential for microbiological action on cot mattress materials containing arsenic and/or antimony to product trimethylarsine [gas] and perhaps even trimethylstibine [gas]." In February 2000 expatriate New Zealand scientist W R Cullen PhD demonstrated proof of toxic gas generation from infant bedding, which he reported to the SIDS 2000 Conference held in Auckland, New Zealand. That conference was attended by numerous well-known US cot death researchers, such as Dr Henry Krous, Dr Jim McKenna and Dr Carl Hunt.*