

First Candle/SIDS Alliance has carefully followed and reviewed all studies that have been done to try and substantiate the toxic gas hypothesis but, in short, there has been no real evidence to support the claims. Attached you will also find additional documentation and information relative to the toxic gas hypothesis. As you will see, organizations and researchers from around the world share our position. Even experts in New Zealand, where this theory originated, do not support the claims.

Following are some of the main points of the follow-up studies done abroad to support our position here in the United States:

- There is no difference in antimony in babies that die of cot death/SIDS and other babies;
- Antimony is found in most babies, even before birth (before they could have had any exposure to mattresses. It could come from maternal diet, but antimony is everywhere, including common household dust.
- No antimony was added to mattresses before 1988, and yet SIDS deaths were occurring pre-1988 at the rate of about 2,000 per year (now less than 500 per year.)
- The year after antimony was first added to mattresses, 1989, was the year that cot deaths began to decrease – at first a small decrease and then, after 1991 following campaigns to sleep babies on the back, a rapid decrease – cot deaths dropped in all by over 70% between 1988 and 1995.
- The theory claims that the decrease was due to publicizing advice to wrap mattresses is unfounded: as of 1993-1995, only 2% of babies were sleeping on wrapped mattresses; babies have also been found to die on wrapped mattresses.
- Cot death occurs in countries where no antimony has been added to mattresses.
- When comparing babies who die and babies who live, proportionately more of the babies who live sleep on PVC mattresses.
- According to the theory, death occurs because the toxic gas reduces acetylcholinesterase, leading to heart failure, but post mortem examinations of babies who die shows no reduction in acetylcholinesterase.
- The fungus, *Scopulariopsis brevicaulis*, that was said to be present on all cot mattresses and which was essential for the release of toxic gases, is actually hardly ever present on cot mattresses.

In summary, to date, there is insufficient scientific evidence to support the claim that toxic fumes resulting from a chemical reaction between bed-wetting and a flame retardant chemical used in infant mattresses (antimony) are a cause of SIDS. According to experts both in the U.S. and abroad, the mattress wrapping process proposed by proponents of this theory will not aid in preventing a SIDS death. We encourage parents to avoid old and worn mattresses, especially those that may have foam or padding exposed (increasing the potential for bacteria) or those that where indentations are made when your hand is placed firmly on the surface.

The majority of mattresses that have been sold in the United States for many years provide a vinyl or other protective covering for the mattress. By purchasing/using this type of mattress (as firm as possible) covering it with only a sheet, and placing your baby to sleep on its back, you will be providing the greatest protection for your sleeping baby.

Source: *First Candle/SIDS Alliance, 2004*

STATEMENT OF THE SIDS ALLIANCE IN RESPONSE TO BRITISH REPORTS RE: FLAME RETARDANT CHEMICALS AND SIDS

December 15, 1994

To date, there is insufficient scientific evidence to support the claim by British television that toxic fumes resulting from a chemical reaction between bed-wetting and a flame retardant chemical used in infant mattresses (antimony) are a cause of SIDS. A panel of U.S. medical experts convened by the SIDS Alliance called the independent laboratory study commissioned by the television show, *The Cook Report*, “ill-defined, unsubstantiated, and wildly speculative.”

According to Roger Highfield, Science Editor for the Daily Telegraph in London, “The kind of foot-in-the-door approach of *The Cook Report* may help to catch crooked plumbers and dodgy salesmen, but it is a crude way to tease out the complexities of scientific issues. (This kind of) unsophisticated reporting can cast more heat than light on scientific issues. “

The televised report generated a public scare in Great Britain among new parents made afraid to put their babies on mattresses for sleep. With British parents scrambling to improvise sleeping arrangements for their babies on adult pillows, couch cushions and other sleep environments known to be hazardous for infant use, the risks attached to the highly questionable new finding far outweigh any perceived benefits.

This “bad science” is now seeping into the U.S. market via wire services, despite efforts by Britain’s Chief Medical Officer, Dr. Kenneth Calman, to discredit it through public briefing. In fact, an official British Government Study on SIDS deaths in 1991, *The Turner Report*, examined and found no correlation between chemicals used as flame retardants in infant mattresses and SIDS. A separate study funded by the Foundation for the Study of Infant Deaths in 1990 was also unable to come up with a link.

The SIDS Alliance has a responsibility to the public to separate the myths from the facts when it comes to SIDS. Therefore, we wish to advise American media of a number of flaws in premise made by this laboratory study. And we ask that media assist us in issuing a warning to American parents about the dangers of improvised sleeping arrangements for their babies.

“Media reporting-and worse, commissioning-of bad science can do irreparable harm,” according to Julien Hoffman, MD, Chairman of the Medical and Scientific Advisory Council of the SIDS Alliance and a Pediatric Cardiologist at the University of California, San Francisco. “Just think of all the new parents now afraid to put their babies to bed in what we know to be the safest possible sleep environment — a firm, flat mattress in a crib. It is frightening to think of all the dangerous alternatives not designed for infant sleep.”

Background: In 1989 it was claimed by a scientist that he had discovered that fire retardant used in mattresses were releasing toxic gases as a result of fungal activity. It was feared this may have been one of the main causes of SIDS. The Government looked into it and appointed a committee of experts to report. The Turner report was published in 1991. They relied on attempts by the Government Chemist to

recreate the work of Barry Richardson but to no avail. Their methods have been criticized by Richardson. They reported that there was no independent proof. The Government responded by rebutting the theory and promoting a “back to sleep” campaign, i.e. put baby to sleep on the back. This appears to have been successful in reducing the numbers by half. Some claimed that it is not inconsistent with the gas theory since, as the gases are heavy and lay close to the surface of the mattress thus not causing much risk to babies whose noses are up and away from the mattress, it is akin to saying that you can avoid poisoning by carbon monoxide leaks by opening the windows. An independent television company specializing in medical tragedies completed two years of research that formed the basis of a major program “*The Cook Report*”. That program revealed that tests they had carried out on tissue samples of SIDS babies, and which some members of the Turner Committee had asked to carry out in 1989, which requests had been refused by Government, had shown significant traces of one of the chemicals, antimony, whereas there were no significant levels in the samples from non-SIDS babies. Graham Ross was shown that evidence before the program and was interviewed to comment on the legal implications. Graham Ross took the view that if the theory is correct that new strict product liability laws would make it difficult for the manufacturers to avoid liability and, further, that the Government could be liable in negligence if the criticisms of their actions following the first publication of the theory in 1989 were well founded. Since that program was broadcast shops have ceased stocking mattresses containing antimony and the Government has set up another expert panel under Lady Limerick to re-address the issue.

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News

Mattress link to cot death ruled out

Caroline White, London

There is no evidence to suggest that an interaction between mould and fire retardants used in PVC and other materials used to manufacture cot mattresses causes the sudden infant death syndrome (SIDS).

This is the conclusion reached by an expert group set up to investigate cot death theories in its final report, published this week. The group was set up in December 1994 after the transmission of *The Cook Report* programme on ITV. Worried parents made thousands of calls to the television network after the broadcast.

The programme investigated the hypothesis, originally suggested by an independent consultant, that lethal toxic gases are formed by the degradation of chemicals in cot mattresses and their covers by the fungus *Scopulariopsis brevicaulis*. The consultant Mr. Richardson recommended that parents should buy a new mattress for every new child or that old mattresses should be covered with a polythene sheet to prevent contamination. The Cook Report also claimed to substantiate his hypothesis with new data on potentially fatal antimony concentrations in infants.

A report commissioned by the Department of Health and published in 1991 had already refuted Mr. Richardson’s hypothesis, but unlike this latest report, the working party had not been able to reproduce Mr. Richardson’s experiments, examine tissue samples from SIDS babies, or analyse the circumstances in which antimony can be biomethylated.

Contamination of cot mattresses with *S brevicaulis* is rare, concludes the report, and is no more common among those used by SIDS babies. There are no in vivo conditions in which phosphorus, arsenic, and antimony from PVC mattresses can interact with the fungus. The amount of antimony found in tissue samples from fetal lungs, livers, and umbilical cords indicates that infants acquire the substance

prenatally, says the report; antimony can be transferred from childcare articles to the baby, there are several environmental sources other than mattress fire retardants, and its concentrations are not excessive in SIDS babies, it concludes.

“It has taken so long to disprove this hypothesis because it is biologically plausible and supported by the epidemiology and physiology,” comments Peter Fleming, a professor of infant health and developmental physiology at the University of Bristol. “But closer scrutiny of the data shows that they distort realities.”

Mr. Richardson had also asserted that the changing rates of SIDS corresponded to the introduction and removal of fire retardants in cot mattresses that contained antimony and phosphorus. However, this was not found to be true. The sharpest decline in the rate of SIDS occurred in 1992 when concentrations of the retardant in cot mattress materials were still high, which coincided with the Department of Health’s “Back to Sleep” campaign in the autumn of 1991.

Toxic Gas Hypothesis

Response from FSID to final report of the government appointed Expert Group to Investigate Cot Death Theories: Toxic Gas Hypothesis

FSID welcomes the report of the Expert Group chaired by Lady Limerick. After an exhaustive investigation of the toxic gas hypothesis lasting three and a half years, methodically examining every aspect of the claim both by reviewing existing research, as well as by commissioning new research, the Expert Group has concluded that there is no evidence to support the claim that fire retardants in PVC cot mattresses cause cot death.

Joyce Epstein, Secretary-General of the FSID, said: “The toxic gas theory has now received the most thorough possible attention, and has been rejected as unfounded. It brings to a close a ghastly episode in public health scare-mongering prompted by *The Cook Report* in 1994, which broadcast its programme without responsibly substantiating the evidence.

“Thousands of parents were distressed and misled by the story, convinced that mattresses kill babies. Even now a survey shows that more parents think mattresses cause cot death than are aware, for example, that smoking in pregnancy is dangerous for babies.

“10 babies still die every week in this country from cot death. We know some of the risk factors, but we need serious research - not the TV kind - to find out the causes and prevention of cot death.”

Overall conclusions of report: The overall conclusion was that there was no evidence to substantiate the toxic gas hypothesis that antimony- and phosphorus-containing compounds used as fire retardants in PVC and other cot mattress materials are a cause of SIDS. Neither was there any evidence to believe that these chemicals could pose any other health risk to infants.

Background to investigation: In 1989 Mr. Barry Richardson said he had done research that showed antimony in mattresses released toxic gas which, he said, caused cot death. In 1990 the UK Department of Health and the FSID commissioned studies to investigate the toxic gas claim but neither found any evidence to support it. In 1994 the television programme, *The Cook Report*, broadcast unpublished research that said cot death babies had higher antimony levels in their blood and liver than babies who died of other causes, and asserted that the antimony came from cot mattresses.