

TRANSLATING RESEARCH INTO PRACTICE: SOME RECENT LIFE-SAVING EXAMPLES

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FOUR SCIENTIFIC FINDINGS

1. Prenatal **DES** exposure can cause vaginal adenocarcinoma in exposed girls
2. **Aspirin** exposure is a necessary cause of Reye's Syndrome
3. Neural tube defects can be prevented by increasing peri-conceptual **folate** ingestion
4. **Prone sleeping** substantially increases the risk of SIDS

THE POLICIES AND PRACTICES RESULTING FROM THOSE FINDINGS

1. DES

- Use in pregnancy contraindicated

2. Aspirin

- Use in children and adolescents not recommended

3. Folate

- Campaign to increase periconceptional folate intake
- Mandatory folate fortification of flour

4. SIDS

- AAP recommendation on prone sleeping
- “Back to Sleep” Campaign

A STUDY OF 8 CASES LED TO THE REMOVAL OF DIETHYLSTILBESTROL (DES) FROM OBSTETRIC PRACTICE

Pregnancy use of DES	Clear Cell Vaginal Adenocarcinoma	Matched control
YES	7	0
NO	1	32
	8	32

SOURCE: Herbst A, Ulfelder H, Poskanzer D:
NEJM 1971; 285; 16 (April), 878

FDA ruled that DES is contraindicated in pregnancy
in November, 1971

A STUDY OF 7 CASES LED TO THE REMOVAL OF ASPIRIN FOR ROUTINE FEVERS IN PEDIATRIC PRACTICE

Aspirin use while sick	Reye's Syndrome	Matched control
YES	7	8
NO	0	8
	7	16

SOURCE: Starko KM, Ray CG, Dominguez LB et al
Pediatrics 1980 Dec;66(6):859-64.

Surgeon General's advisory advising against use of salicylates in influenza and chickenpox
Issued in June, 1982

SIDS AND SLEEP POSITION

Usual sleep position of infant	All SIDS cases	General population controls	Subset of matched cases	Matched controls
N of subjects	142	320	62	254
% usually put to sleep prone	87%	62%	92%	59%
Odds ratio	4.1*		9.3*	
*p < .001				

9

SOURCE: de Jonge GA, Engelberts AC, Koomen-Liefting AJ et al: Cot death and prone sleeping position in The Netherlands. BMJ 1989; Mar 18;298(6675):722.

In April 1992, the American Academy of Pediatrics (AAP) recommended that healthy newborns be placed on their side or back to sleep, and, in 1994, the "Back to Sleep" campaign was initiated in the United States by a joint statement of the AAP, several government agencies, and SIDS organizations

FOLATE AND NEURAL TUBE DEFECTS

Folic Acid	Other vitamins	N of Pregnancies	NTD cases	NTD Prevalence	Odds Ratio
+	-	298	2	6/593 = 1.0%	OR = 0.28 (0.12- 0.71)
+	+	295	4		
-	+	302	8	21/602 = 3.5%	
-	-	300	13		

Source: Prevention of neural tube defects: results of the Medical Research Council Vitamin Study. MRC Vitamin Study Research Group. Lancet 1991;338:131-7 (July 20).

- In September 1992, CDC recommended that all women of childbearing age capable of becoming pregnant should consume 0.4 mg of folic acid per day to reduce the risk of NTD's.
- Beginning in 1998, the US mandated fortification of enriched cereal grain products with 140 μ g of folic acid per 100 g. Canada, but not the UK, has also adopted mandatory folate fortification of grain.

INTERVALS FROM PAPERS TO POLICIES

	DATE OF FIRST KEY PAPER	DATE OF FIRST POLICY ACTION	RESEARCH TO POLICY INTERVAL
DES and vaginal adenocarcinoma	April, 1971	November, 1971	7 months
ASA and Reye's syndrome	December, 1980	June, 1982	18 months
SIDS and prone sleeping	March, 1989	April, 1992	37 months
Folate and NTD's	July, 1991	September, 1992	14 months

1. The DES/Vaginal cancer study and the folate trial were viewed as convincing evidence by themselves, whereas the other two associations did not become accepted until additional studies were published.
2. None of the studies involved the introduction of an agent with possible side effects, nor the removal of any essential, irreplaceable agent or process.
3. Except for the cost of folate fortification, none of the interventions required any serious resource investment.

DID THE
INTERVENTIONS
WORK?

VAGINAL ADENOCARCINOMA

INCIDENCE OF CLEAR CELL ADENOCARCINOMA OF CERVIX AND VAGINA (CCA) IN POTENTIALLY DES EXPOSED (1957-1971) AND UNEXPOSED (1972-1982/1987/1992) BIRTH COHORTS

Age group	Cohort	CCA incidence*	Percent reduction
15-19	1957-1971	0.63	57%
	1972-1992	0.27	
20-24	1957-1971	1.13	66%
	1972-1987	0.38	
25-29	1957-1971	0.95	83%
	1972-1982	0.16	

*per million population of women

Source: Data from National Program of Cancer Registries, derived from Smith EK et al: Cancer Causes and Control 2012; 23:207-211.

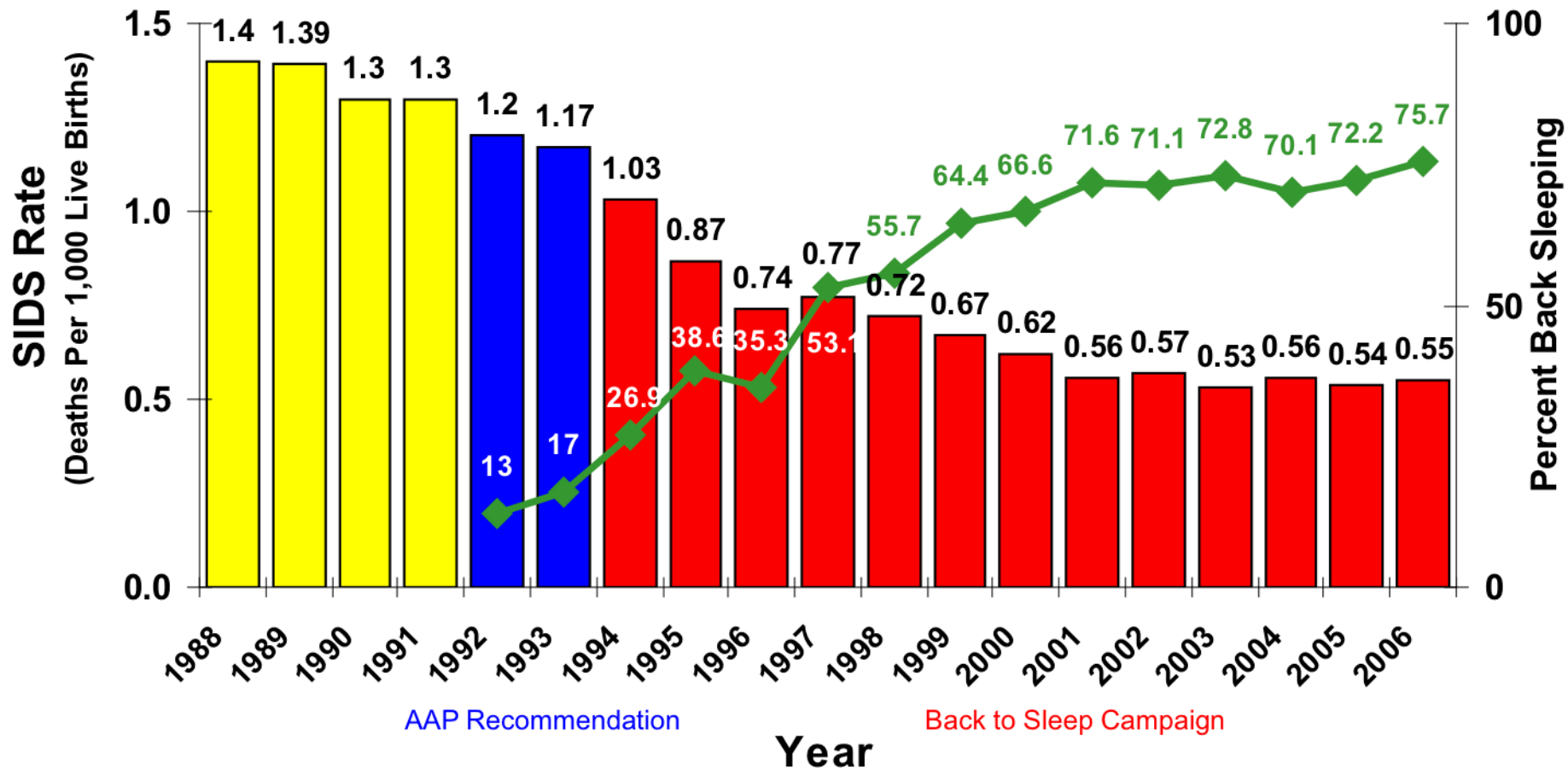
REYES SYNDROME NATIONAL SURVEILLANCE

- N of cases in 1981 = 221
- N of cases in 1989 = 25

“The annual number of cases reported to the NRSSS has decreased sharply since 1980, coinciding with increased public awareness of the association between the ingestion of aspirin during antecedent varicella or influenza-like illness and subsequent development of RS. In addition, the use of aspirin-containing medication to treat children with these viral illnesses has decreased.”

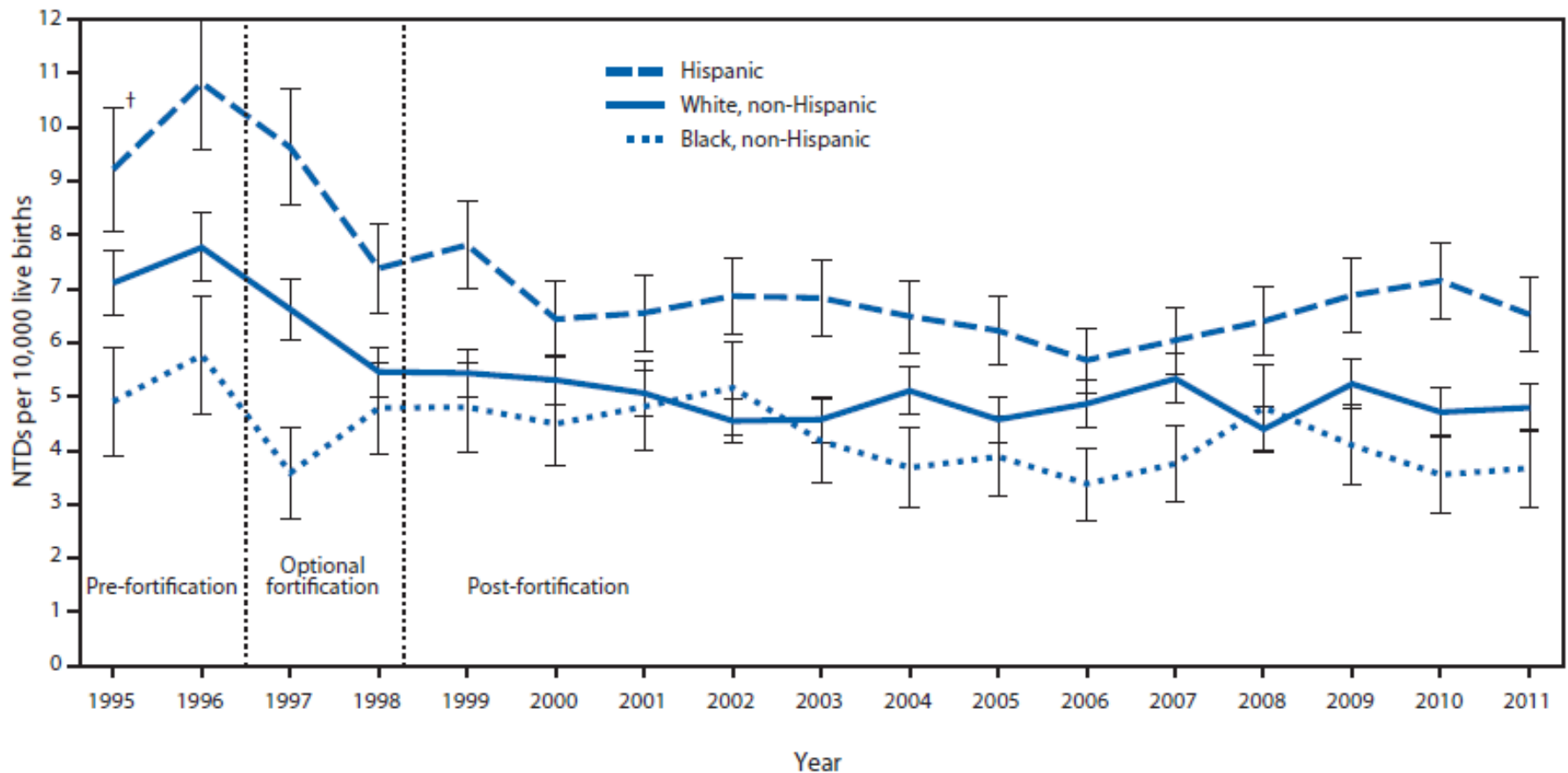
MMWR 1991; 40(5);88-90 (February 08)

SIDS Rate and Back Sleeping (1988 – 2006)



SIDS Rate Source: CDC, National Center for Health Statistics,
Sleep Position Data: NICHD, National Infant Sleep Position Study.

BIRTH PREVALENCE OF NEURAL TUBE DEFECTS IN 19 POPULATION-BASED BIRTH DEFECTS SURVEILLANCE PROGRAMS IN US 1995 - 2011



Source: MMWR: 2015; 64 (01); 1-5, January 16

CONCLUSIONS

- Clinical and epidemiologic research in child health can yield rapid changes in public policy and clinical practice.
- Policy and practice changes can lead to measurable health improvements.
- We in ECHO have a wealth of opportunities to discover relationships between exposures and disease that can be translated into policy and clinical behavior.
- LET'S DO IT!