

# An Historically Hidden Health Problem: Alcohol and Pregnancy

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# Overview

**For most of the 20<sup>th</sup> Century, alcohol was considered to be safe to drink at anytime and any level during pregnancy.**

**We now know that this view was wrong.**

**By the mid-1970s a birth defects disorder attributable to prenatal alcohol had been recognized in both France and the U.S., and our perspective on the safety of alcohol in pregnancy began to change.**

# **This Birth Defect was named Fetal Alcohol Syndrome**

**FAS was characterized by  
three key features:**

- **A specific pattern of facial features**
- **Growth deficiency**
- **And the presence of brain or neurobehavioral deficits – subsequently noted to fit a characteristic pattern**



**Photo courtesy of Teresa Kellerman**

# Face of Fetal Alcohol Syndrome

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## Cardinal Features

## Associated Features

Short  
palpebral fissure

Elongated &  
Hypoplastic  
philtrum

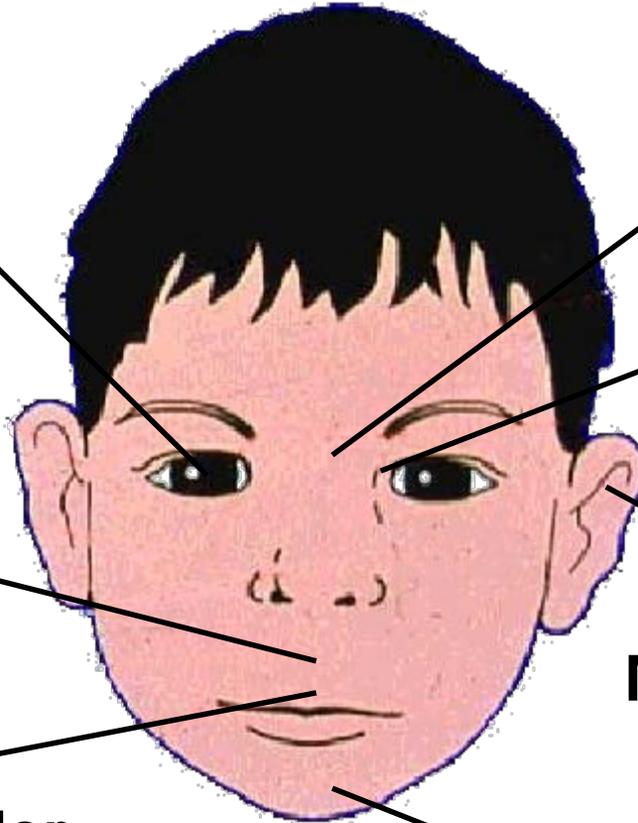
Thin upper  
vermillion lip border  
(hypoplastic “cupid’s bow”)

Low nasal bridge

Epicanthal folds

Minor ear anomalies

Micrognathia



# OTHER PHYSICAL FEATURES OF FAS FEATURES



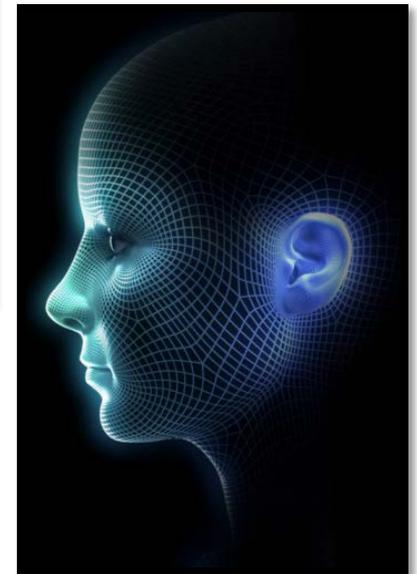
**Renal**

**Cardiac**



**Skeleton**

**Eyes/  
Ears**



**.....and other minor abnormalities**

# CNS Deficits in FAS

## Physical and Neurophysiological:

Sm Head Circumference < 10<sup>th</sup>  
Hearing/Visual abnormalities

Structural Abnormalities  
Fine and Gross Motor  
Deficits

## Cognitive:

Global Intellectual Impairment  
Executive Functioning Deficits  
(Planning; Abstract reasoning)  
Poor Visual Spatial Abilities

Learning Problems  
Math Deficits > Language  
Memory Deficits

## Impaired Behavioral Regulation:

Impulse Control Problems  
Mood or Behavioral Regulation

Attention Problems  
Perseveration

## Deficits in Adaptive Functioning:

Communication Issues  
Problems with Daily Living

Poor Social Skills  
Motor Challenges

# Fetal Alcohol Spectrum Disorders

- It did not take long before researchers began to notice that there were children with a history of prenatal alcohol exposure who showed the **neuro-behavioral deficits** without having the facial features of FAS.
- Several terms were proposed over the next years to refer to these individuals, such as, **Partial FAS (pFAS)** and **Alcohol Related Neurobehavioral Disorder (ARND)**.
- By the early 2000s, the term **Fetal Alcohol Spectrum Disorders (FASD)** was introduced to cover the full range of deficits arising from prenatal alcohol exposure.



# Epidemiology: Current Evidence on the Prevalence of FAS and pFAS in Select Locations (Countries)

Location (Reference Year)	FAS* (FAS+pFAS) Rate per 1000
United States: Mid-Western City (May et al. October 2014)	6 – 9 (17 – 26) FASD (+ ARND) = 21 – 48
United States: Mountain West Medium Size City (May et al. 2009)	6 – 11 (14 – 25)
Italy; Lazio Region (May et al. 2007)	4 – 9 (27 – 55)
Croatia: Urban Region (Petkovic et al. 2010)	6 (41)
Croatia: Rural Region (Petkovic et al. 2013)	17 (67)
Poland (Okulicz, et al. 2015)	4 (12) FAS + pFAS (+ ARND) = 20
South Africa: Western Cape (May et al. 2009)	51 – 67 (68 – 90)
South Africa: Northern Cape (Urban et al. 2008)	67 (75-119)
NW Australia: Fitzroy Valley (Fitzpatrick, et al. 2015)	(120)

All obtained from In School Active Case Ascertainment

\*IOM 1996 prevalence estimated in U.S. for FAS at 0.5 – 2 per 1000

# Misconception on Alcohol Safety in Pregnancy

Given its high prevalence, why were we so unaware of the risk of alcohol in pregnancy for so long in the 20<sup>th</sup> Century?

**There appears to be two primary reasons:**

1. Rejection of knowledge on risks from drinking in pregnancy that had existed before Prohibition;
2. Lack of medical familiarity with the pattern of deficits that would become known as fetal alcohol syndrome so that:
  - The deficits would go undiagnosed,
  - Or, not attributed to the causal agent, alcohol.



# Some Early Observations on Alcohol and Pregnancy

- But there were early historical indications that societies were aware of the dangers of alcohol in pregnancy.
- One of the earliest occurred almost 300 years ago during the London Gin Epidemic in the years 1690 – 1752.
- On 19 January 1725, the London College of Physicians partitioned the House of Commons stating:



*A Ginnery  
(etching)*

19 January 1725

Petition From the London College of Physicians  
To the Honorable House of Commons

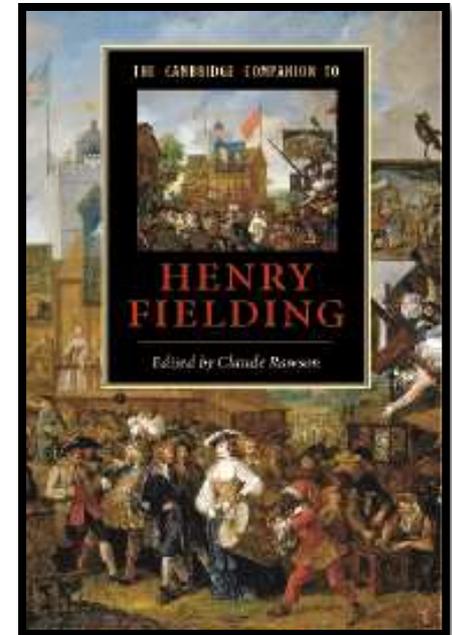


*We... do think it our Duty most humbly to represent that we have with concern observed, for some years past, the fatal effects of the frequent use of several sorts of distilled Spirituous Liquors... and too often the cause of weak, feeble, distempered children, who must be instead of an advantage and strength, a charge to their Country.*

# Henry Fielding, Esq.

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- But the Gin Epidemic continued for 25 more years when several social commentators brought additional attention to the issue.
- Among them was Henry Fielding in *An enquiry into the causes of the late increase of robbers...with some proposals for remedying this growing evil*. London: A. Millar; 1751.
- He wrote: “What must become an infant who is conceived in Gin? With the poisonous distillations of which it is nourished, both in the Womb and at the Breast” -- 1751 quote of Henry Fielding

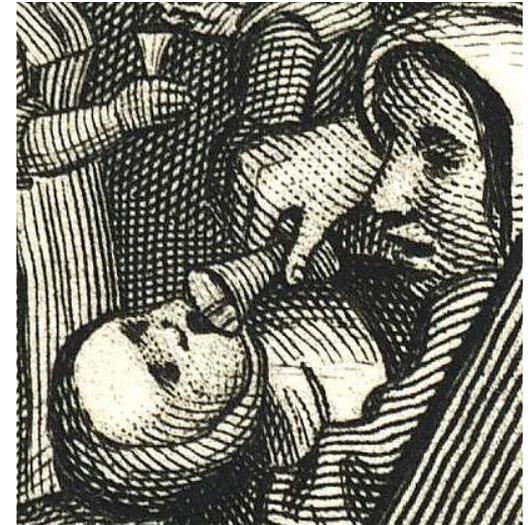




# Pre- 20th Century Understanding Alcohol and Pregnancy

Many of the writings are unclear as to whether alcohol effects on children were being ascribed to:

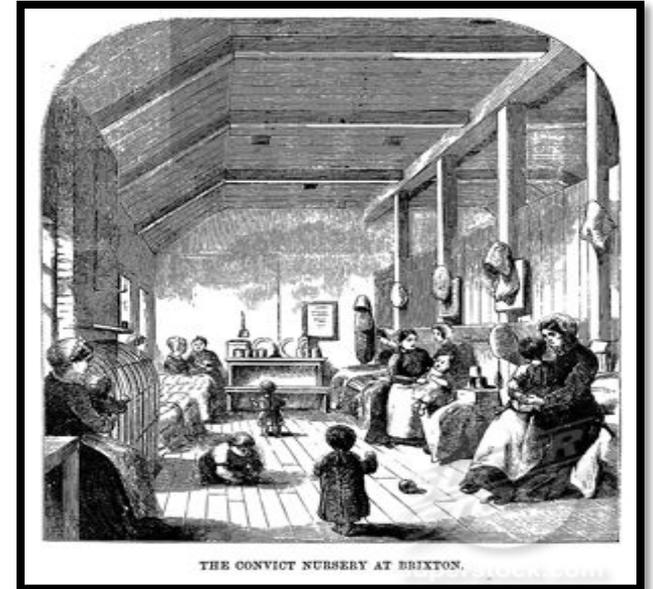
- alcohol consumption in pregnancy;
- male and/or female alcohol use at the time of conception or before conception;
- damage to genetic factors (germ cells);
- toxic damage to the fetus from alcohol-exposure in the womb (teratology);
- alcohol exposure post pregnancy;
- or even the direct **feeding of alcohol**, in place of breast milk, to the infant.



*Lower Right Side  
Corner of  
Gin Lane*

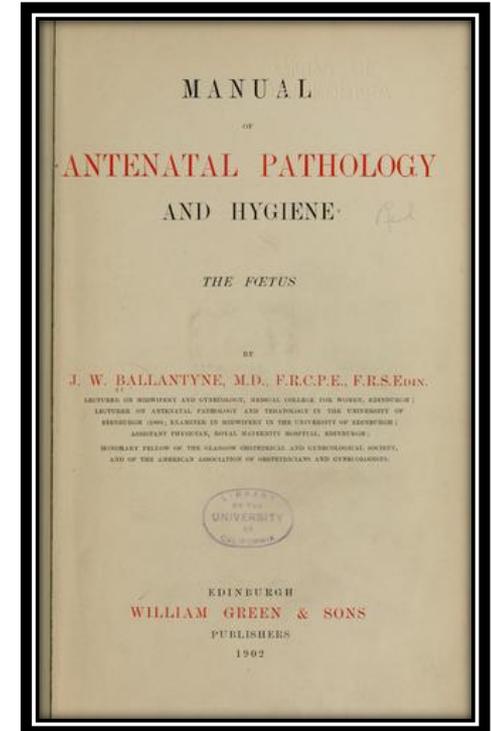
# Sullivan 1899

- First true epidemiological study.
  - Liverpool Jail
    - 600 children of 120 alcoholic women
    - 28 non-drinking relative controls
  - Infant mortality 2-1/2 times higher
  - Healthy children with forced abstinence in prison
- \* *Image: the convict nursery at Brixton*



# 1904 Ballantyne

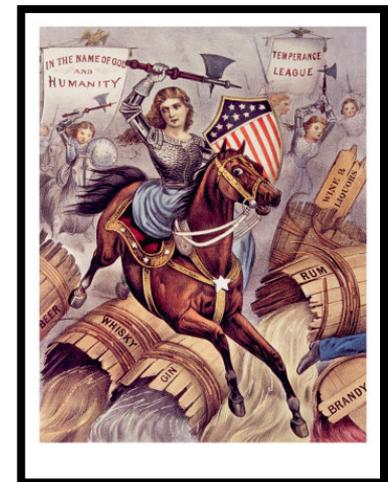
- J.W. Ballantyne, in the 1904 *Manual of Antenatal Pathology and Hygiene*, divided pregnancy into the germinal, embryonic and fetal stages.
- He noted that alcohol can act in all three phases causing:
  - structural abnormalities in the first phases,
  - And, spontaneous abortion, and premature labor in the latter two.



# Pregnancy and the Temperance Movement

- During the Temperance period of the late 19<sup>th</sup> and early 20<sup>th</sup> century, Temperance organizations mounted extensive campaigns citing research findings from early investigations on the adverse effects of alcohol, including those related to adverse fetal outcome, in their effort to legislate Alcohol Prohibition.
- Much literature including journals, brochures and posters were published by these organizations conveying findings from early epidemiologic studies of alcohol on pregnancy

**FOR EXAMPLE.....**



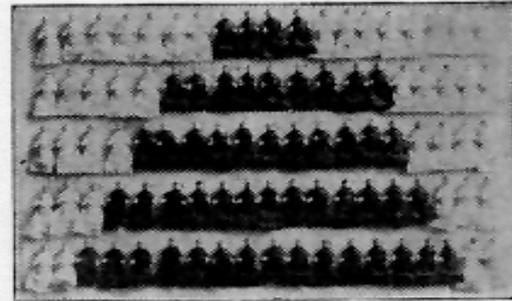
W.C. Sullivan, M.D.  
1906

“Alcoholism”

# Drinking Mothers Lost More than Half their Babies Sober Mothers Less than One-fourth

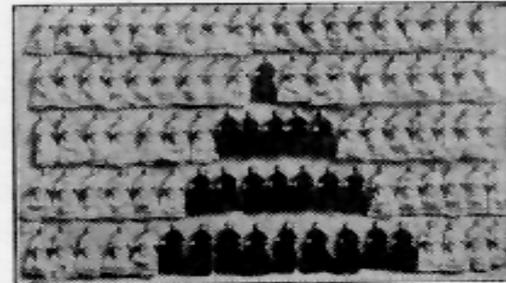
**Mortality of Children of 21 DRINKING Mothers**

Children in Black Died Under Two Years —55 PER CENT.



**Mortality of Children of 28 SOBER Mothers**

Children in Black Died Under Two Years — 23 PER CENT



**The Sober Mothers were relatives of the Drinking Mothers and had Sober Husbands**

W. C. Sullivan, M. D., "Alcoholism," 1906.

COPYRIGHT, 1913  
BY SCIENTIFIC TEMPERANCE FEDERATION  
BOSTON, MASS

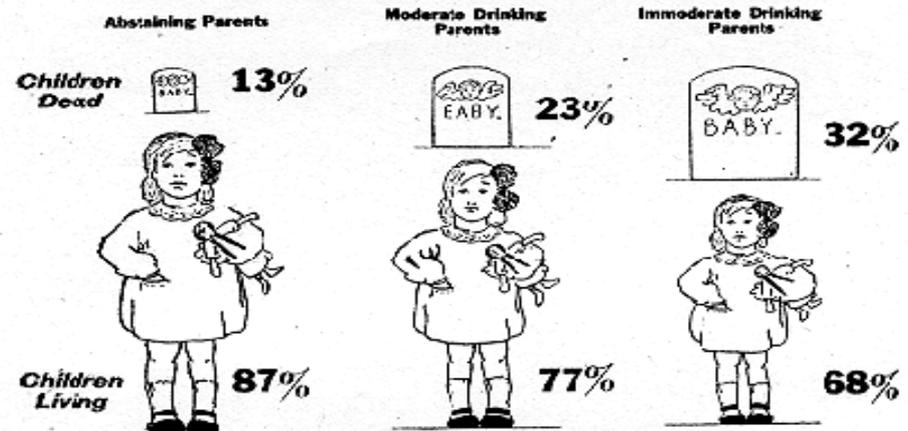
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AMERICAN ISSUE PUBLISHING COMPANY  
WESTERVILLE, OHIO.

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Laitinen XII  
International Congress  
on Alcoholism, 1909

“Statistics of 19,519  
children in 5,735  
families”

# Child Death Rate Higher IN Drinkers' Families



Abstaining parents had never drunk alcoholic liquors, or at least since marriage.  
“Moderates” drank no more daily than corresponded to one glass of 4% beer.  
“Immoderates” drank daily more than the above-named amount.

## Excessive Death-Rate in Drinking Homes Cost 2,407 Children Their Lives

Statistics of 19,519 children in 5,735 families. Laitinen XII, International Congress on Alcoholism, 1909. Abstaining families lost 3 per cent of children by death. At the same rate drinking parents would have lost 2,156 children. They actually lost 4,543, an excess of 2,407.

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BOSTON, MASS.

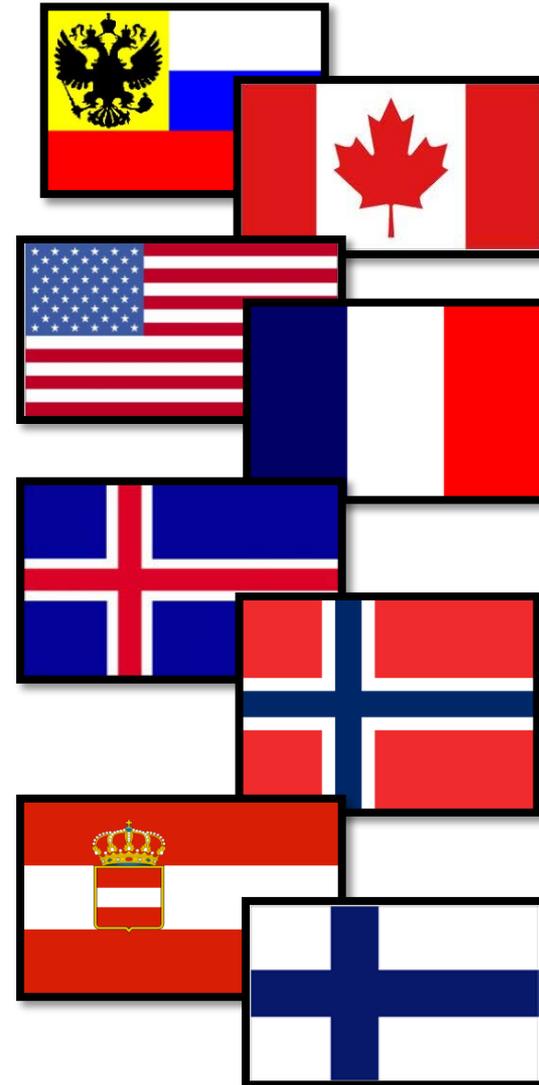
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# Alcohol Prohibition

In many American and European Countries these efforts resulted in the establishment of Prohibition for a period of time:

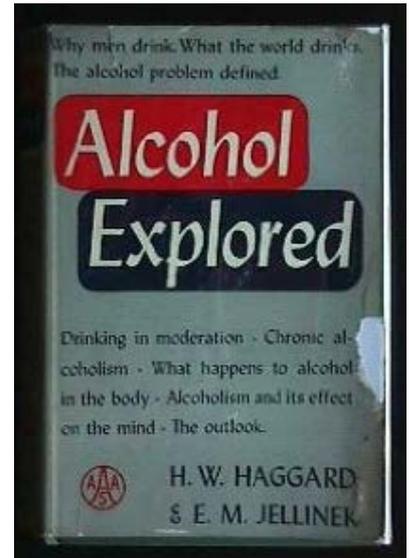
- Russia (1914 – 1927)
- Canada (1917 – 1927)
- **United States (1919 – 1933)**
- France (1916)
- Iceland (1915-1922) – beer was still prohibited until 1989
- Norway (1916–1927)–fortified wine and beer also prohibited from 1917-1923
- Hungary (1919)
- Finland (1919-1932)



# Alcohol and Pregnancy Attitude After Prohibition

In the post-Prohibition period there was a scholarly rejection of any information that had been used earlier to argue for Prohibition:

- “...the idea of germ poisoning by alcohol in humans may be safely dismissed..., Jellinek, E.M., and Jolliffe, N. *Journal of Studies on Alcohol*. Vol. 1, Number 1, pg 110-181 (1940)
- ...mental deficiencies are due to “poor stock” of alcoholic families. *Alcohol Explored*, Haggard and Jellinek, 1942
- Mark Keller (1955) “the old notions about children of drunken parents being born defective can be cast aside...”\*



\* *Popular Pamphlet #3, Rutgers Centers for the Study of Alcohol*

# Alcohol Enters Obstetric Practice

- Given the accepted safety of alcohol with respect to pregnancy, it is not surprising that the danger of using alcohol in a new obstetric procedure would be missed.
- In the mid-1960s the use of very high dose alcohol to treat threatening pre-mature labor – the “alcohol drip” was introduced.

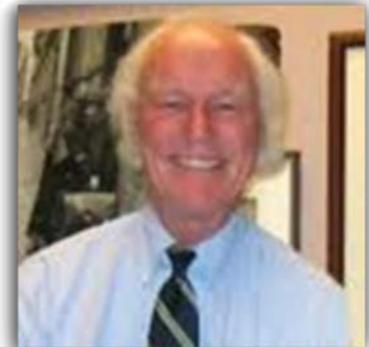
❖ First report — Fuchs, F., et al., *Am. J. Obstet. Gynecol.*, 99:627 (1967)



The medical acceptance of alcohol use in obstetrics likely contributed to the delayed recognition of FAS and FASD.

# Recognition of FAS

- The pattern of deficits that we now recognize as FAS was first reported in the scientific literature in 1968 by a French pediatrician, **Paul Lemoine**, but no attention was paid to his report.
- In 1973, two American pediatricians (**Ken Jones and David Smith**) also observed this pattern in children of women who had consumed alcohol heavily during pregnancy.
- They introduced the term “**fetal alcohol syndrome.**”



# Recognition of FAS

- This name helped to bring more focus to FAS,
- But in addition, research supported by what was then a new federal government institute, NIAAA, was able to support the research to confirm the existence of FAS and what would later be called FASD.
- Following a research conference in early 1977, NIAAA issued the first Health Advisory on alcohol use in pregnancy:



*Rex Morgan, M.D. comic, 1980*

# Health Advisory: Fetal Alcohol Syndrome

**“Recent research reports indicate that heavy use of alcohol... during pregnancy may result in... The Fetal Alcohol Syndrome.”**

**“Given the... evidence available... pregnant women should be particularly conscious of the extent of their drinking. While safe limits are not known... risk is established... above 6 drinks per day....”**

**Recommended not more than 2 drinks per day.**

**June 1, 1977**

# 1981 Surgeon General's Advisory on Alcohol and Pregnancy



In 1980, Congress recommended to the DHHS and Treasury that a new and updated advisory be issued this time by the Surgeon General



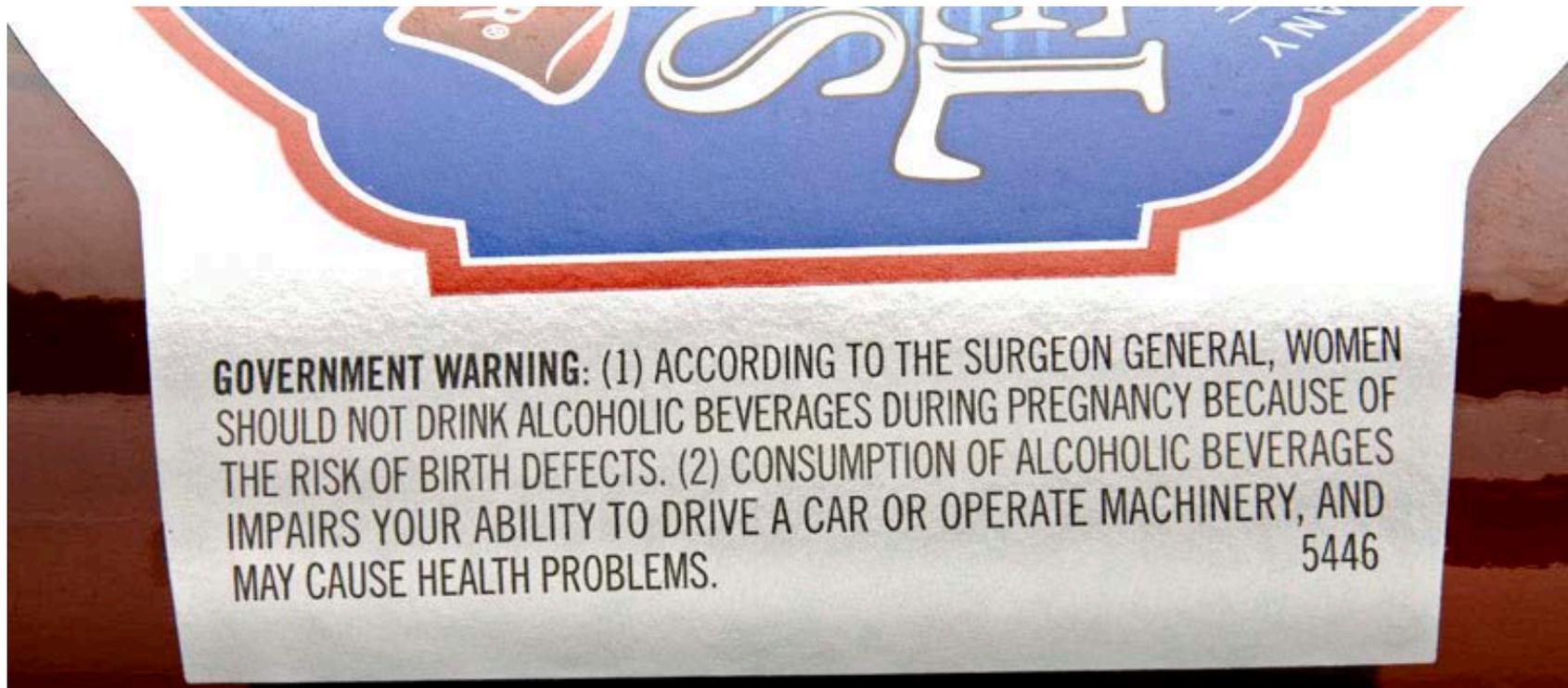
In the 1981 Advisory, now with stronger evidence, the perspective had changed from 'safe until proven dangerous, to advise caution until proven safe':

**“The Surgeon General advises women who are pregnant (or considering pregnancy) not to drink alcoholic beverages and to be aware of the alcoholic contents of food and drugs....” May 1981**

**The Surgeon General's Advisory was reissued in 2005.**

# The Bottle Label Issue

**Bottle Labeling Law – November 1988  
Implemented – November 1989**





**French Bottle Warning Icon - 2007**

# **Remaining Research Challenges**

# Remaining Research Challenges

- Improving detection of FASD cases through enhanced diagnostic capabilities
- Enhanced understanding of the neurobehavioral deficits in FASD to offer improved interventions for those children and adults who are affected
- Improved prevention through education and clinical management
- With 50% of pregnancies unplanned, meaning that many fetuses are exposed to alcohol before pregnancy identification -- working to change the social norms surrounding drinking behavior whenever there is a risk of a pregnancy.



# Thank You!

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*Deputy Director*  
*National Institute on Alcohol*  
*Abuse and Alcoholism*

