Don’t blame the mothers

Careless discussion of epigenetic research on how early life affects health across generations could harm women, warn Sarah S. Richardson and colleagues.
causes birth defects. Many moderate drinkers stopped consuming alcohol during pregnancy, but rates of FAS did not fall\(^1\). Although those who drink heavily during pregnancy can endanger their children, the risks of moderate drinking were overstated by policy-makers — a point recently reaffirmed by the Danish National Birth Cohort study, which did not find adverse effects in children whose mothers drank moderately during pregnancy\(^4\). Nonetheless, warnings about alcohol during pregnancy made in inappropriate contexts still cause pregnant women to suffer social condemnation and to agonize over an occasional sip.

In the 1980s and 1990s, surging use of crack cocaine (a smokable form of the drug) in the United States led to media hysteria around ‘crack babies’ — those who had been exposed to cocaine in the womb. Pregnant women who took drugs lost social benefits, had their children taken away and were even sent to prison. More than 400 pregnant women, mostly African American, have been prosecuted for endangering their fetuses in this way. Exposed infants were stigmatized as a biologically doomed underclass. Today, fetal exposure to crack or cocaine is considered no more harmful than exposure to tobacco or alcohol\(^5\), but criminal prosecution of pregnant women who take such drugs continues.

Previous generations found other ways to blame women. As late as the 1970s, ‘refrigerator mothers’ (a disparaging term for a parent lacking emotional warmth) were faulted for their children’s autism. Until the nineteenth century, medical texts attributed birth deformities, mental defects and criminal tendencies to the mother’s diet and nerves, and to the company she kept during pregnancy.

Although it does not yet go to the same extremes, public reaction to DOHaD research today resembles that of the past in disturbing ways. A mother’s individual influence over a vulnerable fetus is emphasized; the role of societal factors is not. And studies now extend beyond substance use, to include all aspects of daily life.

**CONTEXT IS KEY**

A 2013 story on the health-information website WebMD demonstrates the sort of responsible reporting that we would like to see more of (see go.nature.com/p2krhs). The story reported findings of a four-fold increased risk of bipolar disorder in adult offspring if a mother had influenza during pregnancy\(^6\), but it emphasized that the overall risk observed was small and that bipolar disorder is treatable. It stated that the study considered only one of many possible risk factors and did not establish cause and effect. Furthermore, the headline did not lead with the scary number.

Much less context was given in coverage of a 2012 paper\(^7\) showing that second-generation offspring of rats eating a high-fat diet during pregnancy had an 80% chance of cancer, compared with 50% of control rats. ‘Why you should worry about grandma’s eating habits’, read one headline. “Think twice about that bag of potato chips because you are eating for more than two,” warned another story. These articles did not state that the rats were bred for high cancer rates. Nor did they include inconsistent results: third-generation offspring of male rats on high-fat diets actually had lower incidences of tumours than their control peers.

“We urge scientists, educators and reporters to anticipate how this work is likely to be interpreted in popular discussions.” Inadequately supported and poorly contextualized statements are also found in well-intentioned educational materials. The website beginbeforebirth.org, put together by researchers at Imperial College London, advocates ways to ‘support and look after pregnant women’. A video on the website portrays a 19-year-old released from prison after a stint for looting (see go.nature.com/wynfzw). “Perhaps his problems stretch right back to the womb,” the narrator says. “Could better care of pregnant women be a new way of preventing crime?” At best, such suggestions overstate conclusions of current research.

**BEYOND THE MATERNAL IMPRINT**

Today, an increasing segment of DOHaD research recognizes that fathers and grandparents also affect descendants’ health. Studies suggest that diet and stress modify sperm epigenetically and increase an offspring’s risk of heart disease, autism and schizophrenia. In humans, the influence of fathers over their children’s autism. Until the nineteenth century, medical texts attributed birth deformities, mental defects and criminal tendencies to the mother’s diet and nerves, and to the company she kept during pregnancy.

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