vironmental Protection Agency (EPA), which concludes that many Americans may have enough dioxin in their bodies to trigger such subtle harmful effects as developmental delays and hormonal changes in men. But the draft's most explosive finding is that the risk of getting cancer from dioxin is 10 times higher than previously estimated—a conclusion based largely on new data linking dioxin to cancer in workers.

That conclusion has flabbergasted many outside researchers, who first heard about it when the report was leaked to the press last month (*Science*, 26 May, p. 1313). A few told *Science* that they are concerned that EPA scientists may have fumbled again—when this was their chance to finally get it right. Indeed, agency scientists have spent the past 6 years revising the dioxin report, analyzing new data and reassessing earlier data after portions of their last draft were blasted by outside reviewers. "After all this time, if it doesn't fly, it will be an embarrassment to the agency," says environmental scientist Morton Lippmann of New York University, who chaired the earlier review panel and will lead the new one.

Dioxins are chlorinated chemicals produced mainly by incinerators and paper bleaching. They accumulate in the food chain, winding up in body fat when people eat animal products. In the 1980s, EPA concluded there was no safe level of dioxin—even the lowest exposure was hazardous. Then in the late 1980s, molecular biologists suggested that more than one dioxin molecule, perhaps considerably more, have to latch onto the cell receptor for dioxin to trigger toxic effects. Dioxin experts thought EPA may have overestimated the risk, so the agency set out to reassess it again in 1991.

Cutting the fat. EPA's report may boost concerns about fattening livestock with animal products.

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Instead of downgrading the risk, agency scientists came back in 1994 with a draft report that supported EPA's earlier conclusion that there is no exposure threshold below which dioxin is harmless. But EPA's Science Advisory Board (SAB), while praising much of the reassessment, sent two key chapters back for revision, charging that agency scientists mixed science and policy and failed to mention alternate hypotheses and data that contradicted their conclusions (*Science*, 26 May 1995, p. 1124).

As requested, EPA has now rewritten the report's summary based on new dose-response modeling. It also added a new chapter to clarify how agency scientists reached their conclusions about the cumulative risks from dioxin-like chemicals by assigning each a "toxicity equivalency factor" and adding up their effects. The agency has "significantly updated" the report, says William Farland, chief of risk assessment in EPA's Office of Research and Development. "We have quite a bit of new information"—for example, from a study of Dutch infants exposed to polychlorinated biphenyls and dioxins—that even at background levels, dioxin may cause subtle neurobehavioral and immune effects.

As for cancer effects, the report upgrades dioxin from a "probable" to a "known" human carcinogen. For the most exposed people, such as those eating a diet high in animal fat, EPA puts the risk of developing cancer at between 1 in 1000 and 1 in 100. Farland says this controversial number comes from two changes in EPA's analysis. First, when scientists extrapolated results from rats to humans, they used a new metric that factors in dioxin's far longer half-life in human tissue than in rats. Second, EPA drew on new studies of three worker populations exposed to dioxin in the United States, Germany, and Holland. Those studies include information on the levels of dioxin to which workers were exposed, enabling experts to calculate how cancer risk rises with a given dose. That analysis, which "overlaps" with dose-response estimates from animal studies, results in a dioxin cancer potency that is 30 times higher than the 1985 estimate, Farland says. The agency factors in the threefold drop in dioxin exposure since the mid-1980s to conclude that the cancer risk today is 10 times higher.

Farland acknowledges that this number can be confusing to the public, explaining that this is the highest possible risk for the most exposed individuals, but for most people the risk will likely be lower or even zero. Even so, Farland says the report's new findings that dioxin in soil, water, and sediments may be a major source of exposure could warrant new measures to protect the food

ScienceScope

Environmental Science The Environmental Protection Agency (EPA) needs a new science czar to give researchers a greater voice in agency decisions, according to a National Academy of Sciences report released this week. EPA has long been under assault for the questionable quality of the science underlying its regulation of everything from air pollution to dioxin (see p. 1941). The agency "has made significant improvements" to its research program since a critical 1992 study, according to "Strengthening Science at the U.S. EPA," released this week. But "there is a continuing basis for many of the scientific concerns" raised by previous reports, it concludes. In particular, the agency's current science chief—the head of the Office of Research and Development (ORD)—lacks clout in how regulatory offices use research findings, says panel chair Paul Risser, an ecologist and president of Oregon State University in Corvallis.

To elevate science, the report urges Congress to create a new senior position: deputy administrator for science and technology. It also recommends a fixed 6-year term for ORD chiefs and attracting more top-notch academic scientists to EPA labs. Congress's first reaction to the report may come at a Senate environment committee hearing this summer.

Resistance Was Futile National Institutes of Health (NIH) officials have decided to create a Center for Health Disparities Research on their own, instead of waiting for Congress to force it on them. The new center will coordinate research across NIH and make grants to investigate such questions as why the cancer death rate of African Americans is twice that of other groups. Representative Jesse Jackson Jr. (D–IL), who has been pressing legislation to create the center, this week hailed NIH's decision as "a tremendous step forward."

Former NIH director Harold Varmus resisted the idea last year, reasoning that, with 25 separate institutes and centers, NIH is already too Balkanized. He also worried that establishing the center would allow the agency's other arms to ignore health disparities issues. But Acting NIH Director Ruth Kirschstein says that won't happen; there are enough research questions to go around. And "the reality," says Acting Deputy Director Yvonne Maddox, is that if NIH didn't act now, Congress would force "the same discussion" next year.

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