it calls "integrated coverage measurement" (ICM)—in essence, a survey of some 750,000 households that will lead to separate estimates of the size and whereabouts of the population and its subgroups. Physical-count field data and nonresponse follow-up estimates that differ from the survey's results will be corrected accordingly before the final totals are released. The bureau estimates that sampling rather than interviewing the last 10% of the population in 2000 will cost $900 million less than the $4.8 billion it would cost to merely repeat the 1990 census.

Among other criticisms of the bureau's plan is the contention by Republican opponents in Congress that selecting the best statistical models for estimation and adjustment is an "inherently subjective" process that opens the door to political tampering. And academic allies of the committee have put forth their own critiques. As demographer Steven Murdock, director of the Texas State Data Center at Texas A&M University, argues, samples are only as good as the data from which they are drawn. Hard-to-locate rural residents and minorities may still be undercounted during the nonresponse follow-up phase, Murdock says, as they are often underrepresented in the data the bureau uses to compile address lists for follow-up interviewing, typically rosters from previous censuses and U.S. Postal Service records.

Kenneth Wachter, a demographer at the University of California, Berkeley, says that quality-check surveys aren't necessarily reliable either. For instance, he maintains that a postcensus survey in 1990 sampled a larger fraction of minorities in the South and West than in the Northeast and Midwest, thanks to differing patterns of housing, and racial and ethnic self-identification—regional biases that are likely to recur in the 2000 ICM. "If the basic data collection is working unevenly, [quality-check surveys] can amplify" undercounts rather than correct them, he says.

But the larger community of census advisers and users "overwhelmingly supports" the bureau's plan, says demographer James Trussell, director of the Office of Population Research at Princeton University. Congressional critics "are simply not bothering to look at the evidence."

It is a mathematical truism that the smaller the area being sampled, the larger the margin of uncertainty in statistical estimates. But data collected through the bureau's intensive nonrespondent follow-up effort will contain far fewer factual errors than regular field results, more than compensating for sampling errors, says University of Southern California statistician John Rolph, who led an American Statistical Association panel that strongly endorsed the Census Bureau's plans in September. "When taking a sample, you can use a smaller, higher-quality operational staff and have much better quality control than when you are trying to reach every last person," says Rolph.

Further, the bureau's address information is not as skimpy as Murdock implies, says Marx: "As we've done in every previous census, we'll send people out in advance to list every unit they can lay an eyeball on. We make sure they are sent a mail-in form and that they are included in the candidates for nonresponse follow-up if we don't get it back." And as for Wachter's concern about the accuracy of the planned ICM, Census Bureau statisticians can find no evidence of the regional biases in the 1990 survey that Wachter describes, Marx says.

To many statisticians, the committee's report is more than just wrongheaded; it's an affront to their profession. Forbidding the use of statistical methods to determine the population and apportion House seats—as a bill offered this term by Wisconsin Republican Thomas Petri would have done—"really calls into question the scientific validity of the discipline of statistics," says Rolph.

But Pennsylvania Republican William F. Clinger Jr., the retiring chair of the reform and oversight committee, says the experts are overreacting. "Are statisticians offended when our elected officials are elected by physical ballot, rather than by a scientific poll with a measured margin of error?" he asks. "For apportioning the House ... it is essential that we have a census which enables us to draw real lines around real people." As for charges that the committee's recommendations are intended to minimize Republican losses in post-2000 reapportionment, Clinger is dismissive: "There is no question that reapportionment is a politically charged issue ... [but] we have studied the issues of sampling and adjustment on their merits."

Ultimately, cost may prove to be the deciding factor in how the 2000 survey gets done. While Clinger says that Congress should commit to the full $4.8 billion cost of a physical enumeration, other politicians have indicated that the Census Bureau might not get even the $3.9 billion it has requested for its streamlined plans. The bureau is pushing forward with field tests of statistical sampling. But should future legislation or court challenges nullify those plans, "We've done 21 censuses the old way," says Marx. "We're practiced at that."

–Wade Roush

THE NETHERLANDS

Agencies Protest Funding Reforms

The Dutch research community is reacting angrily to a plan to overhaul the way basic research is funded in the Netherlands. The proposal, the brainchild of Jo Ritzen, the Netherlands' Minister of Education, Culture, and Science, would strip the Dutch Research Council, or NWO, of its responsibility for running labs and turn it into a granting agency, much like the U.S. National Science Foundation. The plan is expected to be debated by the Dutch Parliament next month, but the universities and NWO officials are hoping to head it off by hammering out an alternative in the next few weeks.

P DIJKSTRA

Reformer. Science minister Jo Ritzen.

The main elements of the plan came from an international committee that Ritzen appointed in January to review the functioning of NWO and that included Wolfgang Frühwald, president of the German funding agency DFG, and European Science Foundation vice-president Dervilla Donnelly. The committee came up with a dozen recommendations in June, and Ritzen incorporated them into his plan, unveiled in September as part of the annual research and development budget.

Ritzen's proposal is an attempt to bring more coordination to the multilevel organization of Dutch science. At present, the government spends about $2.9 billion a year on R&D, of which $1.3 billion goes directly to the country's 13 universities. The NWO gets just $340 million and distributes it to the research community via 25 foundations that disburse grants. Mostly this money goes to university researchers but some NWO foundations, such as the Foundation for Fundamental Research on Matter (FOM), run their own institutes.

The review committee argued that the structure should be simpler and there should be a clear distinction between the funding and conduct of research, to avoid possible accusations of conflict of interest. Ritzen's response was to propose that NWO be transformed into a purely granting agency. All 16 institutes run by its offshoot foundations would be placed under the control of a new independent organization, along with institutes now run by the Netherlands Academy of Arts and Sciences (KNAW), which plays a similar role to NWO. The foundations would lose their research institutes to this new organization, but may survive as granting agencies.

While NWO would lose responsibility for running labs, it would gain authority over the direction of basic research. Not only would it

continue to fund research in universities and institutes through competitive grants, but it would control the funding of the 100 or so "research schools" responsible for a large part of postgraduate training in Dutch universities. NWO will also get some extra funding, reaching $58 million annually by 2000, to build up 10 of these schools into centers of excellence.

NWO's president Reinder van Duinen argues that Ritzen's plan would contribute far too little to competitive funding. Moreover, he says, with only 12% of the research budget, NWO would be in a weak position to influence the direction of Dutch science. "In relation to the direct funding of research at the universities, which is not based on a selection process, this figure is far too low. It is much lower than the corresponding figures in neighboring countries," he says. "If there is no direct increase in NWO's budget, NWO could end up in a difficult position, that of simply being an advisory body. We are not keen on this," says van Duinen.

And he is even more concerned about the proposal to split off NWO and KNAW institutes into a new organization. He argues that the close connection between scientists and funding administrators is the "success formula of Dutch physics research." Ger van Middelkoop, director of FOM's National Institute for Nuclear and High-Energy Physics (NIKHEF), argues that it is not clear how the new organization would work better than the current one. "FOM is functioning very well and we have no reason to believe we made big mistakes."

According to Daan Frenkel of the FOM Institute of Atomic and Molecular Physics, "We always work with a system of external referees, referees from other countries, for all projects that are funded by FOM." Frank van Eyckeren, director of the Association of Dutch Universities, agrees that moving NWO and KNAW institutes from their present homes may cause damaging disruption in some centers, which are strongly integrated with the research departments of universities. "It is too big a step for certain institutes, such as the FOM institutes," he says.

NWO, KNAW, and the universities are hoping to come up jointly with a compromise through discussions with Ritzen. On the agenda will be the possibility of an organization to run the research institutes that would be controlled jointly by KNAW and NWO. Parliament will begin debating Ritzen's proposals next month, says KNAW director Chris Moen, "and we will wait and see what the politicians think of all this."

–Alexander Hellemans

Alexander Hellemans is a writer based in Paris.

INTERNATIONAL COLLABORATION

Both Sides Point Finger In Tiff Over China Dig

Last August, Spencer Lucas, a paleontologist at the New Mexico Museum of Natural History, and a team of Western scientists arrived in a remote region of northwestern China for a long-planned field expedition. Their goal: to explore one of the best nonmarine sites in the world for studying the Permian-Triassic boundary (PTB), a time of mass extinctions some 250 million years ago. But Lucas and his colleagues—two other Americans, one Hungarian, and two Chinese scientists—never got to complete their work. After demanding immediate payment to cover unforeseen expenses, their Chinese hosts informed the team that no samples could leave China. Following a tense exchange, the trip was cut short and Lucas and his colleagues returned home empty-handed. "We were snookered pretty good," says Lucas.

Chinese officials say the entire incident is a misunderstanding among scientists and that it should have no bearing on future collaborations. But they also feel wronged. "What Prof. Spencer Lucas is spreading is far from the truth and full of personal prejudice," Zhao Xun, vice president of the Chinese Academy of Geological Sciences (CAGS), told *Science*. But whether the events were a calculated attempt to manipulate foreigners or a series of innocent blunders by both parties, several non-Chinese scientists and research administrators say what happened illustrates the seamy side of research partnerships with China. Lucas and his colleagues are even asking international geology organizations to withdraw support for some activities in China. The U.S. embassy in Beijing is also taking notice: "We have had many reports of scientists being charged exorbitant fees for work already agreed upon," says Marco Dicapua, science and technology counselor at the embassy. He says that stamping out such practices and providing better working conditions for U.S. scientists have become a "priority."

When the field trip was being planned, there was not even a hint that it would end on such a sour note. In 1995, the National Geographic Society awarded a $16,500 grant to paleomagnetist Roberto Molina-Garza of the University of New Mexico for work on the Guodikeng Formation near Jimusar in the autonomous region of Xinjiang. Cheng Zheng-wu of the Institute of Geology, Beijing, was a co-investigator, along with Lucas and Heinz Kozur of the Hungarian Geological Survey. The proposal calls the site "the most complete section of the Permian-Triassic boundary on Earth ... a boundary characterized by terminal extinctions and profound environmental changes." The idea was to learn enough about the region to decide whether to propose that the International Union of Geological Sciences (IUGS) designate it as a model site, open to any qualified researcher who wanted to learn more about this important geological period.

JOHN GEISSMAN

Mountain or molehill? A dispute terminated fieldwork on the Guodikeng formation in northwest China.

The Western scientists arrived in Urumqi, capital of Xinjiang, on 23 August. According to Lucas and paleomagnetist John Geissman of the University of New Mexico, another member of the team, Cheng immediately told them that inflation and additional days in the field had nearly doubled the price of the expedition. Using their credit cards, the Western scientists quickly raised $2900 in cash. "We had no choice," says Geissman. "The alternative was to pack up and go home." But that wasn't the final demand for more money. Five days later, Cheng requested an additional $400 for unexpected field expenses.

That request was part of a rapid deterioration in relations between the western scientists and their Chinese hosts. On 29 August, paleontologist Li Yongan of the Xinjiang Bureau of Geology arrived and claimed half of one group of samples. In addition, according to Lucas and Geissman, he announced that he would analyze them in China unless he received a round-trip plane ticket to the United States. Then Cheng lowered the boom: He informed his collaborators that