THIS WEEK

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Ground truths

Nature survey shows most scientists are happy at work, but that a significant number still face discrimination — an unacceptable situation.

There is a tendency when drawing conclusions from survey data to look for specific landmarks that instil confidence in the results. Some are defined by cold mathematics: 71% can be presented as "most people" without much controversy. But many others are subject to interpretation. Do 14 of 16 people constitute "almost everybody", or does that take 15?

Perhaps most important is how to handle the lower reaches. Can a single voice from 100 be written off as an outlier? What about two or three? How big does a minority have to become before it gets a bullet point in a report? The data — the numbers that surveys produce — usually tell the full story to those who are willing to look, but most (that word again) of us rely on a more human narrative to make sense of the results. And here, care is needed.

This week, *Nature* publishes the results of our biennial survey of the income and career satisfaction of scientists across the world. And one narrative that emerges is heartening. Most — 68% — said they were satisfied or very satisfied with their careers. And just over half — 51% — had received a pay rise in the past year.

The majority may rule, but it hardly tells the whole story. Nobody should take any comfort, for example, from the fact that most scientists (72%) told the survey they have not witnessed any instances of harassment or discrimination. The corollary of that figure is clear: 28% have. Nobody can be satisfied with that. The problem of harassment has received some much-needed attention in recent years, but, as these figures show, there remains much work to be done, and attitudes and behaviours still need to change.

The survey has limitations. The results are based on the anonymous responses of 4,334 (self-selected) people who have pursued science beyond an undergraduate degree. Three-quarters of them are based in North America or Europe. Still, many of the figures do mirror those of other surveys — high levels of job satisfaction among scientists working across academia and industry, for instance. Researchers are generally a content and motivated bunch. But look in the margins and there remains much room for improvement.

Poor mental health continues to be a huge concern, with more than one-third (36%) of respondents saying they needed or were receiving help for depression or anxiety. Attitudes from colleagues were not always supportive. "I had a mental health crisis and instead of helping I was suspended from work and threatened with potential dismissal," wrote one. Many universities are aware of this issue and are working to improve care and support. But not all are succeeding.

The survey reveals other institutional failings, too. Sadly, only half of university scientists said their institution was doing enough to promote diversity. And 21% said they had personally experienced harassment or discrimination. This was most commonly based on gender, but the list also included discrimination based on race, religion, sexuality and age. One respondent wrote: "Co-workers have scheduled important meetings on religious holidays and when I object or do not attend, I'm viewed as someone who doesn't take their job seriously." Another said: "A liberal faculty will shun and even harass conservative Christians, mocking them openly."

Some 23% of people who replied to the survey reported discrimination based on age. One respondent complained of "Pressure to retire as I approach age 60. Not explicit or stated, but moral pressure and looks." And about the same number (22%) said they had suffered racial bias.

This is unacceptable. Science must do better on these issues, as individuals and institutions. The survey holds up a mirror to the research community, and if the community does not like what it sees — and it should not — then all of us must do more to change the picture.

"The survey holds up a mirror to the research community."

Science should be a rewarding career. Most scientists say they do enjoy their work and — at least according to this survey — most get through the day without being made to feel that they don't belong, or that they have to do more to prove themselves because of their gender or geographical origin. But "most scientists" here is not enough. Individuals and groups who do experience such abhorrent discrimination must know they are not an overlooked interest. It is everybody's responsibility to condemn such behaviour when they see it. And, where they feel comfortable to do so, everybody should speak out when injustice occurs. ■

Capital thinking

Political attention to human capital must be backed up with solid research.

The surprise 2014 global bestseller *Capital in the Twenty-First Century*, written by French economist Thomas Picketty, highlighted the role of wealth — rather than earnings — in the way that money makes the world go around. But Picketty chose to play down an important part of the system: human capital, the economic value derived from the knowledge, skills and abilities that enable people to perform paid work.

How to include human capital in analyses is as much a political as an economic problem: critics argue that the concept creates a false equivalence between having skills and having money, which plays down financial inequality. Supporters insist that it's a genuine measure of the potential of individuals, populations and nations, and so a way to indicate their intrinsic value.

The World Bank has now reignited the debate. Earlier this month, it released its much-anticipated Human Capital Index (see go.nature.

com/2cwyqqd), which ranks 157 nations according to measures of investment in their people. The bank's measure is relatively simple, constructed from data on child survival and growth, years of primary and secondary schooling, and health. A country can achieve a perfect score if all children born today can expect to survive to 60 without impaired growth and development — resulting from poor nutrition, repeated infection or inadequate psychosocial stimulation, and measured by ratios of height and age — and can expect to have received 14 years of good-quality schooling by age 18.

The index is based on the assumption that a country's economic productivity is tied to the knowledge and abilities of its people. It followed the release, two weeks earlier, of the results of a parallel (but separate) academic exercise by the Institute for Health Metrics and Evaluation at the University of Washington in Seattle (S. S. Lim *et al. Lancet* **392**, 1217–1234; 2018).

The World Bank hopes its new index will mimic the success of its national "ease of doing business" ranking, which has focused government efforts around the world to reduce corruption and encourage outside investment as a way to secure a higher placing than their rivals and competitors. The bank wants to demonstrate how measures of education and health are linked to the productivity and prosperity of a country, assuming that investing in human capital through education and health systems can yield rapid development. In short, it wants to push countries to make things better for their people — and their human capital ranking. It has certainly managed to draw attention: Indian officials immediately protested against their country's low ranking, and government officials there say they will ignore what they argue to be a simplistic and misleading measure.

Top scorers on the World Bank list include Singapore, South Korea and Japan, whereas many African countries, including Mali, Nigeria and Liberia, performed poorly and were near the bottom of the index.

The Institute for Health Metrics and Evaluation based its ranking of 195 countries on similar factors, but incorporated more measures of health and education, and used different data sources and methods. Finland, Iceland and Denmark top its charts, which cover the period from 1990 to 2016. During this time, the United States tumbled from 6th to 27th place, largely owing to minimal progress in educational attainment.

Few would argue against the goal of encouraging better health and education. And perhaps by framing these needs in terms of economic returns and tapping into the political desire to climb the leader boards, these measures might succeed in having a greater impact on decision-makers than do simple appeals to the intrinsic good. For example, one way to improve a country's position would be for it to reduce gender inequality in years of schooling.

"These indices are only as good as the data that underlie them."

But any metric — be it a university ranking or standardized mathematics testing — is selective and must be interpreted appropriately. Too often it becomes a convenient proxy, leading to inferences of quality for which it was never intended, and distorting reality. As in most analyses of this type, these indices are only as good as the data that underlie them. There is a huge range in the quality and quantity of data on both health and education across countries. And although deductions about the exact effects of health outcomes and education on economic productivity are based on research, the true relationships are unclear for the range of countries and contexts to which the Human Capital Index is being applied. Critics are right to point out that a national score does not account for regional differences in a country.

Scientists can play a part here, to ensure that indices such as these become the credible motivators that they are intended to be. More and better data on indicators of health and educational outcomes will improve the accuracy of the indices. More research on rigorous ways to capture other determinants of human capital, and on their relationship to health, prosperity and well-being, will enrich our understanding of how to reach global development goals. *Nature* recognizes the need for such work to help inform policymakers and make their efforts more evidence-based. As such, we encourage submissions of high-quality data and analysis addressing knowledge gaps in assessing and improving human health and well-being. ■

ANNOUNCEMENT

Matters Arising: a venue for commentary

There was a time when scientific progress depended on elaborate and often protracted exchanges of correspondence. Charles Darwin wrote thousands of letters, and his correspondence with influential thinkers had an important impact on his theories. This communication was private. Fortunately, much has survived and found its way into archives, where it forms a key part of the scientific record.

Although research findings today are mainly disseminated and recorded in the form of peer-reviewed research manuscripts, scholarly commentary on published research is still crucial: it can provide nuance, refinement and caveats. And these days, it moves fast.

So, from this week, *Nature* will consider such post-publication contributions as Matters Arising — a format designed to peer-review and publish online exceptionally interesting and timely scientific comments and clarifications related to primary research papers published in the journal. Authors of the original papers will be given the chance to reply. If our editors deem that these responses move the discussion forward in a constructive way, they will be published at the same time as the Matters Arising article.

We also recognize the need for timely release of these exchanges to the relevant communities, and the difficulty of doing so through an often-lengthy peer-review process. So, to accommodate both rigorous peer review and the need for timeliness, authors of Matters Arising and the original *Nature* paper are encouraged to release preprints during the formal journal process, as supported by our policies. Comments can also be made on all original *Nature* research papers online, and these can be linked to relevant commentaries, to articles published elsewhere and to relevant preprints.

Decisions to publish Matters Arising will be taken by journal editors. To ensure the integrity of the published record, and to help readers find all relevant information, published Matters Arising articles will be linked to the online version of the original paper and to the original authors' response. This format will replace Brief Communications Arising as an avenue for post-publication commentary on primary research.

Over the coming months, we plan to introduce the Matters Arising format to the other Nature Research journals, where it will replace Correspondence for such discussions. In this way, we aim to offer a standardized formal mechanism and a constructive peer-review process for post-publication commentary. This should allow debate on published papers in the journals' online pages, and provide visibility and credit for authors engaged in these debates.

All current policies on competing interests, authorship standards (including joint authorship) and author contributions, availability of data, materials and code (where relevant), and publication of the reporting summary will apply to Matters Arising and any published reply from the original authors. ■