Rise of inequity

Current trends indicate that science is starting to become a preserve of the privileged.

There are a couple of supposed absolute truths that science holds as self-evident. The first is that research is self-correcting: incomplete, irrelevant and incorrect findings are shaved from the scientific record over time, to leave a reproducible and robust foundation for the future. The second is that science operates as a genuine meritocracy. Research and researchers advance on neutral data and objective analysis, so talent emerges alongside the truth.

But articles in this journal and elsewhere have drawn attention to doubts about the self-correcting nature of science and an apparent crisis in reproducibility (see go.nature.com/2ca0ej1). And this week we take a swing at the second of those supposed maxims, with a special series of articles that offers an analysis of science and inequality.

The good news is that science is keeping up with modern trends. The bad news is that trend seems to be towards wider inequality, fewer opportunities for those from more disadvantaged backgrounds and a subsequent smaller pool of people and talent for research to draw on. From the United Kingdom and Japan to the United States and India, the story is alarmingly consistent. In many places, careers in science tend to go to the children of families who belong to the higher socio-economic groups (see page 466).

There are various reasons for this, and many of them are explored in the pages that follow. The problem is complex, but one of its implications is stark. Unlike many other sectors of society and the economy that rightly draw fire for a lack of social mobility, science relies heavily — almost exclusively in some places — on public money. If the research system is soaking up billions of pounds and dollars and yen from taxpayers merely to hand a subsidy to an already privileged subsection of society — cementing their advantage in the process — then in no way can that system be described as positive for human welfare, however noble its goals.

On page 475 in this special issue, Mike Savage calls on researchers to settle their differences over definitions of social class. Those who categorize people according to their occupation are at loggerheads with those who classify according to income, wealth, culture and social ties. Each approach has its uses, he urges, and easing hostilities would allow better analyses of "our unequal, riven societies". In another Comment piece on page 479, Branko Milanovic illustrates the power of the long view: looking at archival data on wages and incomes from as far back as the 1200s, he argues that inequality is cyclical and likely to fall soon.

Access is one thing, but the picture is no more comforting for those who have managed to secure a place on the inside looking out. For in scientific careers, there is a growing gap between the monetary rewards showered on the few at the top and the relatively meagre compensation that trickles down to the rest (see page 471).

Our biennial *Nature* survey on salary and job satisfaction (see page 573), which this year drew close to 6,000 respondents from around the world at all career stages, finds that most scientists — almost two-thirds — are happy with their jobs. But there is a considerable vein of discontent. Many, especially in Europe, are frustrated with the state of scientific research, with their own pay and with the competition for grants. Fewer than half of all European respondents said they're excited about their future job prospects.

Still, worldwide, more than 60% of those asked in our survey said they'd recommend research as a career. This journal agrees with them. So how can we make science more accessible to all those who would like to get into it? There are echoes here of the ongoing struggle for equality for women scientists and for greater representation of ethic minorities in places such as the United States. And some of the same measures used to rectify inequality in those cases can be copied to stem economically based bias. Indeed, some — such as social inclusion schemes in Brazil (see page 469) — may already be bearing fruit. Active intervention to identify and encourage those being excluded, with the support of institutions and funders, seems to be crucial. Equally important is increased awareness, among those who pay for science and those who control who gets to do research, that the system is riddled with inequality and risks getting worse. This is one problem that absolutely, truthfully — and self-evidently — will not self-correct. ■

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Direct report

US clampdown on lax clinical-trial reporting is a necessary and welcome move.

For too long, researchers who don't like the results of a clinical trial have simply failed to publish them. The US government has now taken solid steps to crack down on this problem. On 16 September, the US Department of Health and Human Services (HHS) issued a revision to the 2007 law that requires clinical trials to be registered and published (see go.nature.com/2cleagr).

The law was poorly worded and opaque, so researchers were able to hide behind exceptions and loopholes to avoid publishing results. As a consequence, results were often reported only when the product was approved or pending approval. In one analysis, 30% of a sample of trials on clinicaltrials.gov hadn't reported their results even 4 years after completion (H. Saito and C. J. Gill *PLoS ONE* **9,** e101826; 2014). And the percentage is probably much higher for initial safety studies, for which there is no requirement to publish at all. Pharmaceutical firms are often criticized for failing to publish results from trials if they have no plans to continue with a therapy, but academic researchers seem equally guilty.

The practice is bad for science because it means that the literature is biased towards positive results, and researchers will unknowingly repeat failed experiments. It is bad for medicine because dangerous side effects stay hidden. Most of all, it is bad for the volunteers who take part in trials, risking their health only to see their contribution confined to a desk drawer. Yet the US Food and Drug Administration rarely cracks down on offenders: according to bioethicist Jennifer Miller of New York University's Langone Medical Center, the agency has never enforced the US$10,000-per-day non-compliance fine.

Under the new rule, researchers must register their trials within 21 days of enrolling the first patient, and publish data within a year of completion. In a surprise and welcome move, researchers must now disclose their exact methodology and how they plan to analyse the results. They must also record any changes to the protocol. This attempts to address '*p*-hacking': shopping around for the statistical test that will yield the best results, or leaving out a group — such as women, or people with a disease — that changes the overall results.

The reforms are not as strict as many would like. They still do not require the reporting of safety studies. The US National Institutes of Health has built on the rules to require this of agency-funded researchers, but industry remains exempt. The HHS also opted not to require researchers to publish data for individual patients, which would have allowed independent analysis of results and made it more difficult to hide adverse side effects. But for now, it is a good first step, one that fosters scientific rigour and affords greater respect to patient commitments. ■