

## ANALYSIS

## Scientific evidence alone is not sufficient basis for health policy

Keith Humphreys and Peter Piot argue that basing health policy solely on evidence is inherently contrary to the essence of policy development and even potentially dangerous

Keith Humphreys *professor*<sup>1</sup>, Peter Piot *director*<sup>2</sup>

<sup>1</sup>Veterans Affairs and Stanford University Medical Centers, VAPAHCS (152-MPD), 795 Willow Road, Menlo Park, CA 94025, USA; <sup>2</sup>London School of Hygiene and Tropical Medicine, London WC1E 7HT, UK

Articles recently published in *Addiction*<sup>1-6</sup> have reignited debate about David Nutt's 2009 conflict with the then UK home secretary, Alan Johnson. After Professor Nutt publicly accused the government of ignoring science when formulating drug policy (for example, by overestimating the dangers of ecstasy), he was sacked as UK drug policy adviser. As with other contentious issues such as heroin prescribing, needle exchange, and sex education, many scientists think that the lesson of the Nutt controversy is that we must take the politics out of health policy decisions and simply "do what the science says." Based on experience as researchers and as policy makers at the White House and United Nations, we argue that although science should inform health policy, it cannot be the only consideration.

### How science should inform health policy

Science can and must inform health policy decisions in several ways, including by identifying emerging problems. The discovery of new types of influenza virus, for example, or of smoking as a cause of cancer made policy makers aware of grave threats to health. The documentation of the first cases of AIDS and of the emerging epidemic of methamphetamine addiction in the western United States provided similar warnings.

Science can also be useful for telling policy makers which tools are likely to produce a desired effect. For example, when the Obama administration was looking for strategies to reduce substance use disorders, it relied on a large literature establishing the effectiveness of screening and brief intervention services within general healthcare. These services were ultimately included as an essential preventive service in the 2010 healthcare reform and the national drug control strategy.<sup>7-8</sup> Similarly, the evidence that needle exchange can prevent the transmission of HIV was the basis for UNAIDS' support of "harm reduction" programmes<sup>9</sup> and the Obama administration's rationale for lifting the ban on federal funding for this service.<sup>10</sup> Other examples of evidence based interventions with potential policy relevance include vaccines for human papillomavirus,

buprenorphine maintenance therapy for opioid dependence, and male circumcision for the prevention of HIV. Economic research provides further help for policy makers by allowing them to determine the cost and cost effectiveness of interventions.

### Role of factors other than scientific evidence

Science also has limits in health policy decision making. For example, effective policy on smoking required more than the discovery that it is a cause of lung cancer and other diseases. The powerful tobacco industry for years successfully denigrated the research evidence in the public domain and suppressed its own findings on the dangers of cigarettes.<sup>11</sup> Substantial policy action did not occur for several decades and was instigated not by a new scientific breakthrough but by sustained health activism and public interest litigation.

The decision to form policy in response to evidence of effectiveness is made politically, not least by voters who selected particular individuals to lead their countries. For example, the Obama administration could have chosen not to fund screening and brief interventions to prevent substance misuse and instead directed the money at other interventions with evidence of effectiveness. Although it may frustrate scientists when politicians are swayed by the possible electoral consequences of various policy options, few scientists (including us) would want to live in a society in which politicians completely ignored the views of those who have elected them as their representatives. Voting, free speech, debate, and the push and pull of politics must have an important role in what free societies choose to do if the concept of democracy is to be meaningful.

We should remember that progress in public health from its origins in the late 1800s and early 1900s has been as much driven by politics as by scientific and technological innovation. For example, child labour and alcohol control laws were inspired by social justice concerns, with the scientific evidence for their effectiveness coming later. Without constructive politics,

historical progress in public health would have been far more limited, as the example of AIDS illustrates more recently.<sup>12</sup>

More generally, societies have values that don't need to be proved in randomised controlled trials and are appropriate over-riding considerations in policy. A rigorous study showing that people with an infectious disease could be cheaply and efficiently shipped off to colonies of isolation would be ignored in any humane society because respect for human dignity would rule out such a policy. Similarly, current research assessing whether the death penalty is cost effective or has a deterrent effect on crime may someday resolve those empirical questions,<sup>13</sup> but it can never tell us whether the taking of a helpless individual's life by the state is morally acceptable. That judgment falls on all our heads and cannot be evaded by saying that the science made us do it or stopped us from doing it.

None of this is to deny that policy decisions made without scientific advice can be ineffective (such as, restrictions on people with HIV entering a country). They can also lead to a massive waste of public resources (such as the billions of pounds spent worldwide on ineffective youth oriented programmes to prevent drug use<sup>14</sup>) and result in humanitarian catastrophes (such as the over 300 000 deaths resulting from President Mbeki's AIDS policies<sup>15</sup>). This is why the unique system of chief scientific advisers to inform (though not control) policy making in nearly all UK government departments is so important and an example for other countries.

## Scientists as human beings

Science is conducted by scientists, who are—thank goodness—human. Their expertise in science does not necessarily convey any expertise in governance (if you do not believe us, attend a faculty meeting). This principle is implicitly enshrined in democratic societies, where people with technical expertise get one vote at the ballot box just like other citizens. There are at least two reasons why this is wise.

Firstly, scientists, like all people, are wrong at least some of the time. The scientific “fact” that seems a certain basis for policy in one era may be overturned by new discoveries or new research methods. For example, many drugs that seemed to be supported by good scientific evidence have later been found to be ineffective or even dangerous.<sup>16</sup> The use of thalidomide to treat nausea in pregnant women, is one good example.

Secondly, again like all people, scientists can confuse their opinions on policy matters with objective facts.<sup>17</sup> The US eugenics movement, which included many prominent scientists, maintained that particular genes influence risk for mental illness, addiction, and cognitive impairments and that scientists and government officials should therefore attempt to eliminate such genes from the population through selective sterilisation and immigrant exclusion.<sup>18</sup> Supporters of the movement failed to appreciate that the first of these premises is an objective fact and the second is a subjective viewpoint.

Conflating facts and values allows scientists to use their authority inappropriately—that is, to cloak their effort to make society live by their values as a disinterested, objective, and unassailable stance. This may lead the public to defer to scientists on the assumption that they know better, but in a democracy there can be no experts on values. To allow scientists to say that their policy proposals are determined solely by objective science is to promote a lack of accountability. Although scientists have a duty to be a critical voice in society because of the privileged information and position they may have, we do not believe that the fact that someone, for example, received a Nobel prize for groundbreaking medical research

entitles him or her to more credibility in societal or moral matters.

In drugs and AIDS policy, we both often hear advocates say that policy should be based on “evidence rather than morals or politics.” We have a higher opinion of such advocates than this statement would suggest they have of themselves. In particular, we respect them as people, which implies that they have values and politics like all other human beings. Whether we agree with them on policy substance or not, we see their commitment to helping alleviate human suffering as an admirable moral quality. To say that an advocate or policy maker is guided by more than technocratic considerations is a compliment and not an insult.

## Conclusion

Scientific research is an extremely valuable tool for informing health policy decisions because it can identify emerging problems, offer tools to tackle those problems, and forecast the likely effect of various policy choices. This potential to inform does not mean that democratic and human rights considerations can or should be cast aside, hence there is no such thing as evidence based policy, only “evidence informed” policy. Failure to value the influence of forces other than science in forming health policy can have dangerous consequences for the accountability of politicians and scientists, and for the justification of policies that violate fundamental principles in a democratic society. We should refrain from casting so many issues as “science versus politics” because we scientists all have our own political commitments and values, and in that sense we stand on the same level as our fellow citizens rather than above them.

Contributors and sources: This article emerged from conversations between two scientists who recently returned to academia after working in health policy roles. KH served as senior policy adviser at the White House Drug Policy Office from 2009-10 and was a member of President Obama's National AIDS Policy Development Committee. PP was under secretary-general of the United Nations and founding executive director of the Joint United Nations Programme on HIV/AIDS from 1995 to 2008. This article does not necessarily reflect the official position of the White House, the United Nations, the US Veterans Health Administration, or any other governmental organisation. KH is guarantor.

Competing interests: Both authors have completed the ICJME unified declaration form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare: KH had salary support from a US Department of Veterans Affairs career research scientist award while he completed the submitted work; neither author has had financial relationships with any organisations that might have an interest in the submitted work in the past three years; they have no other relations or activities that could appear to have influenced the submitted work.

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