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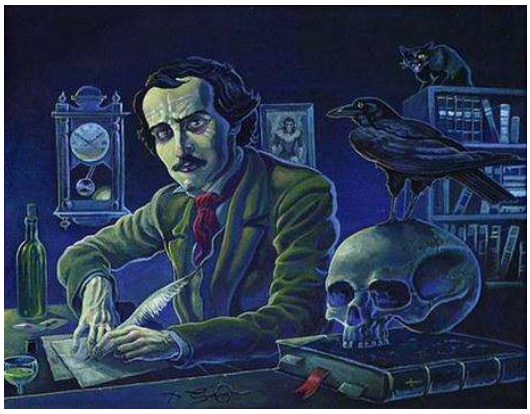
POST-NORMAL PANDEMICS:

WHY COVID-19 REQUIRES A NEW APPROACH TO SCIENCE

This article was first posted on the ESRC STEPS Centre blog. The present version[1] is slightly updated, with some additional topical links, from the original STEPS version.



In addressing the local pandemics science has never seemed more needed and useful, while at the same time limited and powerless. The existing contract between science and society is falling apart. A new covenant is urgently needed to navigate the days ahead.

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On 19 May 1986, *The Guardian* published an essay entitled "Disasters bring the technological wizards to heel: Chernobyl, Challenger, and the Ch-Ch Syndrome". At that time the essay's authors, two of whom are co-authors of this article, wrote that it was "no longer feasible for ruling elites to employ experts for persuading the public that their policies are beneficial, correct, inevitable, and safe. The Ch/Ch Syndrome amounts to a mortal blow at the scientistic foundation for the legitimacy of the modern mega-technological State. A new social contract of expertise is now taking shape."

Not long after this, in 1993, Silvio Funtowicz and Jerry Ravetz published a landmark paper on what came to be called *Post-Normal Science* (PNS), a new understanding of science for situations "when facts are uncertain, stakes high, values in dispute and decisions urgent". The perspective of PNS – neither value-free nor ethically neutral – is epistemological as well as practical and methodological.

But after BSE, foot-and-mouth disease, SARS, H1N1, and a string of other, similar disasters that would have seemed to be exactly the sorts of situations PNS was designed to address, after energetic debates at scholarly conferences and reputable journals – where is that mortal blow? In the middle of a COVID-19 pandemic, where is that new social contract?

1 https://discoversociety.org/2020/03/27/post-normal-pandemics-why-covid-19-requires-a-new-approach-to-science/

The “mortal blow” seems to have been followed by a slow agony, but not yet death. Despite the truly historic mobilization of science, our knowledge in crucial areas is still swamped by ignorance, especially on the sources of the virus but also on its progress and future outcomes. The expertise employed in COVID-19 policy advice builds, at best, on speculative assumptions on the virus itself, and how far it’s possible to control and predict how people behave. Unresolved divergences of perspective expressed by recognised experts as regards the usefulness, limits and dangers of such speculations (e.g. Ioannidis, Crane, Taleb), fuel the public’s experience of improvisation and cacophony.

Known unknowns include, at the time of writing, key elements of epidemiology such as the real prevalence of the virus in the population; the role of asymptomatic cases in the rapid spread of the virus; the degree to which humans develop immunity; the dominant exposure pathways; the disease’s seasonal behaviour; and also key societal factors such the time to deliver global availability of an effective vaccine or cure; and, above all, the nonlinear (potentially chaotic) responses of individuals and collectives, at all scales, to the stresses and confusions associated with: the social distancing interventions; the overload of hospital and public health service capacities; the reduction, closure or disappearance of businesses and jobs…. Formally, we could speak of instabilities in the complex system of communities interconnected across multiple scales, with many tipping points, and hysteresis loops, implying that societies may not be able to rebound to anything like the state that they were in before the coronavirus interventions took place. These deep uncertainties make quantitative predictions speculative and unreliable. Correspondingly, reflective commentators signal deeply contrasting scenarios of plausible futures for humanity.

‘There is no number-answer’

We see here a pattern well known to PNS practitioners. Predictions which purportedly “jarred the U.S. and the U.K. to action” are obtained by mathematical models that produce crisp numbers, even though these numbers have been obtained only at the cost of artificially compressing the associated uncertainties. "There is no number-answer to your question," explodes an angry medical expert to the politician trying to force a number out of him.

And yet the example of Taiwan shows that the post-normal model of deployment of science in society, one where trust, participation and transparency are carefully nurtured in the face of deep indeterminacies, can indeed deliver upon its promises.

The possibility of economic collapse, with associated social breakdown, is quite real, and is now (late March 2020) a matter of daily, if not hourly, commentary in every daily news outlet. And in fact, we seem to be far away, in our technology and governance prowess, from societies that would be capable to guarantee an absolute prediction and control over whatever types of perturbations we may experience in the future. Given this, it would likely be much more effective to run our societies on the basis of a quest for resiliency and not under the assumption that our resources should be allocated according to a strategy of prediction and control.

Everywhere, we are seeing a breakdown of the epistemic consensus required to make normal science ‘work’. This is happening not only in the fields you might expect – behavioural psychology, sociology, and ethics – but also in virology, genetics, and epidemiology. In other words, when ‘applied scientists’ and ‘professional consultants’ are no longer in their comfort zones but find themselves in a ‘post-normal’ context, fitness for purpose changes meaning. Today, even in established fields, disagreements can’t be hidden (or consensus enforced) from broad audiences: so dissent and controversy abounds around the question: are the present draconian measures justified or not?

More data (even ‘reliable data’) and better predictive models cannot resolve the ‘distribution of sacrifice’ which involves, among other things, the arbitration of conflicts and dilemmas that appear

at every scale. Hiding behind some general notion of science, or behind the 'lack of data' – as if data had the power to resolve these dilemmas – is feckless, feeble and confused.

How do different perspectives help?

Normal Science has demonstrated great power in identifying viral structures, attachment sites, and pathogenic mechanisms. All these are essential for medical diagnostic and treatment regimes. However, to answer questions related to *managing* these technologies, including setting priorities when, for instance, respirators and hospital beds reach their limit, and for identifying how to reorganize institutional structures, Normal Science offers no guidance at all.

The design of the campaign, with the balancing of imponderable costs and benefits, will engage a variety of legitimate perspectives and valuations; political leadership is required for choosing among the resultant policies. The ripple effects through the levels of policy and consciousness, may well become much more severe than the initial dangers. How will existing social tensions, as between elites and anti-elites, be refracted through this crisis?

The new, still-emerging social contract calls on us to pause in our vocal desperation to make the square peg of normal science fit a round hole for which it was never intended, and to re-shape our activities to fit the new reality. What if we experience, this time, more so than previously, that we are not in control? Are we condemned to do "more of the same" forever until we're forced to do something else by the events (because of a collapse)?

In response to this conundrum, PNS suggests considering a new objectivity, one obtained (we daresay constructed) by listening to different stories and viewpoints. The PNS diagnosis asks for more, not less, deliberative democracy. It asks for mobilizing and engaging everyone affected in a situation of crisis into an 'extended peer community', fostering individual and collective agency for social learning, instead of technocratic optimization of disempowered people into the virtual reality of assumption-laden model projections under deep ignorance and based on a very limited set of institutionally-privileged forms of expertise.

Under post-normal conditions, the knowledge base should be pluralized and diversified to include the widest possible range of high-quality potentially usable knowledges and sources of relevant wisdom, without enforcing the demand for science to speak with one voice. "Robustness is sought here primarily in policy strategy and not in the knowledge base: which policies are useful regardless of which of the diverging scientific interpretations of the knowledge is correct." An illustration of this approach in the context of the present discussion came when the Council of Europe usefully contested the evidence and the policy of the World Health Organization in relation to the H1N1 influenza, and – according to some researchers – did so using a post-normal-informed analysis. WHO polices were later considered as ill-advised, and possibly biased, by industrial stakeholders.

What does a post-normal approach look like?

The inevitability of accidents and epidemics is 'uncomfortable knowledge'. Confronting it is a moral act as much as a policy decision. Through PNS, we imagine strategies based on a wise monitoring and anticipation obtained by a combination of non-equivalent perceptions of our interaction with nature.

This cannot be delivered by artificial intelligence, algorithms and models alone, nor can the dystopian aspects of these latter be redeemed by the results of the Chinese response to COVID-19. We need to pursue an adaptability based on attention to "weak signals", preserving diversity and flexible management.

Until now, science has been used to improve the quality of life for some social groups, give people an edge on their competitors (for some social groups and countries) and to replace religion as the source of legitimization of power (ditto). It has now become apparent that specific social groups

that have enjoyed the ride so far are now fighting with every political and economic weapon possible to regain control and direct the narrative.

Nonetheless, this pandemic offers society an occasion to open a fresh discussion on whether we now need to learn how to do science in a different way. Conscientious scientists and engaged citizens cannot allow this opportunity to pass.

In PNS, the whole world becomes an extended peer community, as the appropriate behaviour and attitudes of individuals and masses become crucial for a successful response to the virus. This extended peer community is the opposite of a technocratic, number and model-based decision strategy. It's a community where all those with an interest have a say, from the experts of various scientific disciplines, to stakeholders, whistle-blowers, investigative journalists, and the community at large.

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