

Strategies for Addressing Society's 'Wicked' Bioethics Problems

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Dilemmas in a General Theory of Planning*

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ABSTRACT

The search for scientific bases for confronting problems of social policy is bound to fail, because of the nature of these problems. They are "wicked" problems, whereas science has developed to deal with "tame" problems. Policy problems cannot be definitively described. Moreover, in a pluralistic society there is nothing like the undisputable public good; there is no objective definition of equity; policies that respond to social problems cannot be meaningfully correct or false; and it makes no sense to talk about "optimal solutions" to social problems unless severe qualifications are imposed first. Even worse, there are no "solutions" in the sense of definitive and objective answers.

George Bernard Shaw diagnosed the case several years ago; in more recent times popular protest may have already become a social movement. Shaw averred that "every profession is a conspiracy against the laity." The contemporary publics are responding as though they have made the same discovery.

Few of the modern professionals seem to be immune from the popular attack—whether they be social workers, educators, housers, public health officials, policemen, city planners, highway engineers or physicians. Our restive clients have been telling us that they don't like the educational programs that schoolmen have been offering, the redevelopment projects urban renewal agencies have been proposing, the law-enforcement styles of the police, the administrative behavior of the welfare agencies, the locations of the highways, and so on. In the courts, the streets, and the political campaigns, we've been hearing ever-louder public protests against the professions' diagnoses of the clients' problems, against professionally designed governmental programs, against professionally certified standards for the public services.

It does seem odd that this attack should be coming just when professionals in

* This is a modification of a paper presented to the Panel on Policy Sciences, American Association for the Advancement of Science, Boston, December 1969.

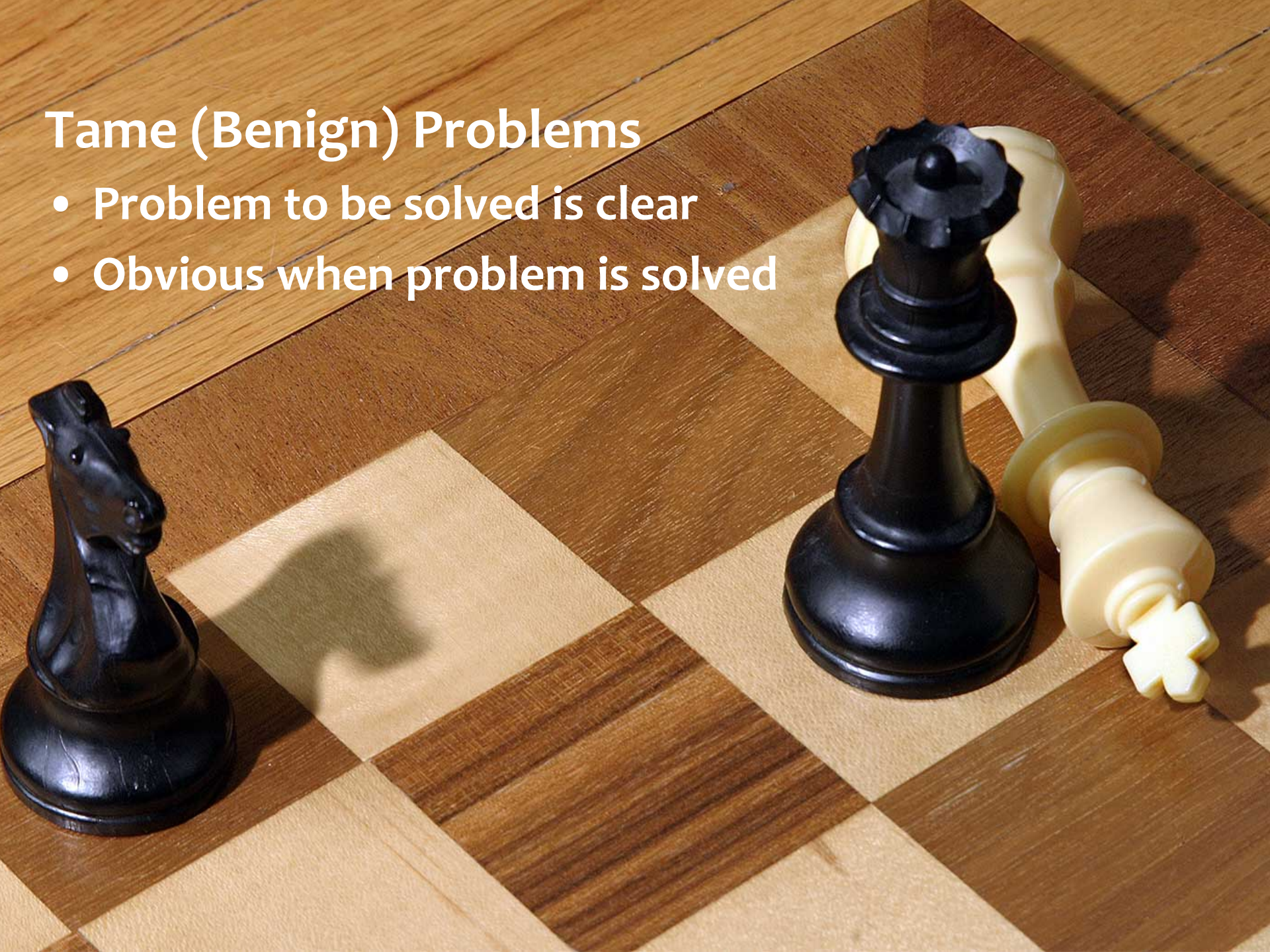
“The kinds of problems that planners deal with—social problems—are inherently different from problems that scientists deal with. Planning problems are inherently **wicked**.”

- Rittel and Webber (1973)



Tame (Benign) Problems

- Problem to be solved is clear
- Obvious when problem is solved





Characteristics of ‘Wicked Problems’

- WP have no definitive formulation.
- There is no immediate test of whether a solution “worked”.
- WP have no stopping rule – you can’t tell when you’ve solved the problem.
- Solutions to WP can be only good or bad, not true or false.
- Every attempt at a solution “counts”; no trial and error.

- WPs do not have an exhaustive list of potential solutions
- Every WP is unique
- Every WP may be a symptom of another WP

- The way one chooses to define the WP determines the nature of the WP
- Planners have responsibilities for their actions to identify and solve these problems

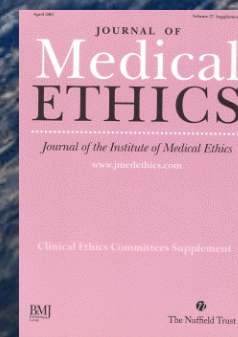
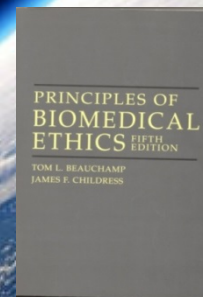
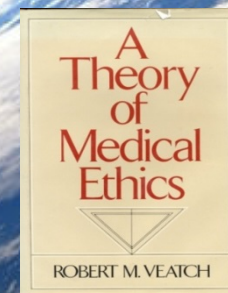


Are Bioethics Problems Tame or Wicked?



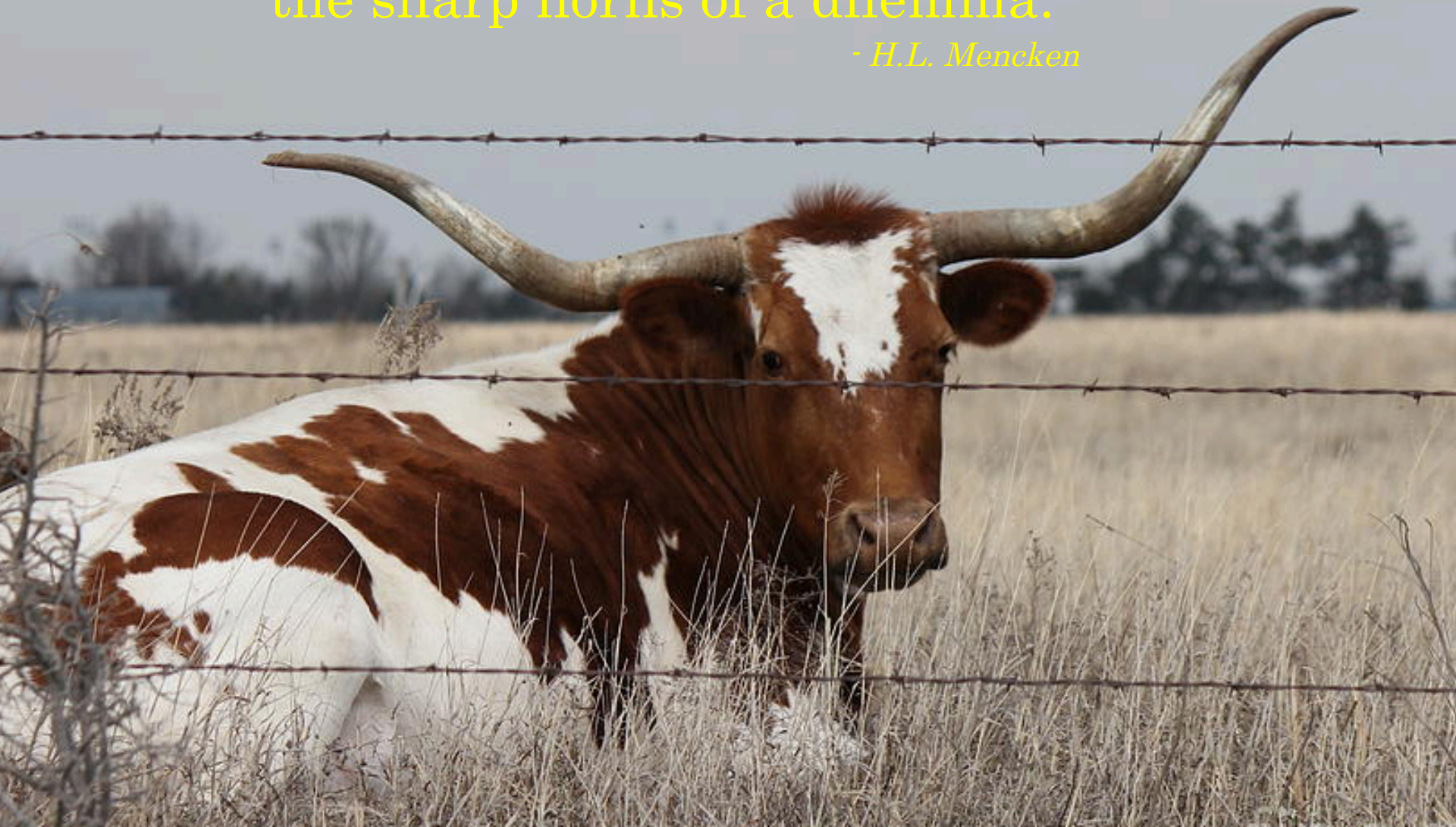
“[Bioethics is] the systematic study of the moral dimensions -- including moral vision, decisions, conduct and policies -- of the life sciences and health care, employing a variety of ethical methodologies in an interdisciplinary setting.”

~ Warren Reich. *Encyl. of Bioethics*



Life is a constant oscillation between
the sharp horns of a dilemma.

- H.L. Mencken



PEDIATRIC ASSENT FOR A STUDY OF ANTIRETROVIRAL THERAPY DOSING FOR CHILDREN IN WESTERN KENYA: A CASE STUDY IN INTERNATIONAL

RESEA

Attitudes About the Use of Newborn Dried Blood Spots

RACHEL C. VREEMAN
Indiana University School of Medicine

Future Uses of Stored Human Biological Materials 15

rents

CANCER PATIENTS' ATTITUDES TOWARD FUTURE RESEARCH
USES OF STORED HUMAN BIOLOGICAL MATERIALS

owns); and Indiana University
(e-mail: kshendri@iu.edu).

Challenging a Well Established Consent Norm?

NOTES

PAUL R. HELFT,
RACHAEL ECKLES

Timothy Caulfield*/Russell Brown**/Eric M. Meslin***

ENCOURAGING TRANSLATIONAL RESEARCH
THROUGH HARMONIZATION OF FDA
AND COMMON RULE INFORMED CONSENT
REQUIREMENTS FOR RESEARCH
WITH BANKED SPECIMENS

Consent Norm?:
Research

the NLM Collections
citations

Barbara J. ...
Eric M. Me

The Ethics of Information: Absolute Risk Reduction and Patient
Understanding of Screening

Peter H. Schwartz, MD, PhD^{1,2,3} and Eric M. Meslin, PhD^{1,2,3}

¹Indiana University Center for Bioethics, Indianapolis, IN, USA; ²Indiana University School of Medicine, Indianapolis, IN, USA; ³Department of Philosophy, IUPUI School of Liberal Arts, Indianapolis, IN, USA.



Allocating Resources — A Wicked Problem

By MARGARET R. MCLEAN, M.DIV., Ph.D.



DAILY COMMENT

JUNE 28, 2012

SOMETHING WICKED THIS WAY COMES

BY ATUL GAWANDE

A few days ago, while awaiting the Supreme Court's ruling on President Obama's health-care law, I called a few doctor friends around the country. I asked them if they could tell me about current patients whose health had been affected by a lack of insurance.



New Biotechnology

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Molecular Diagnostics & Personalised Medicine



Research paper

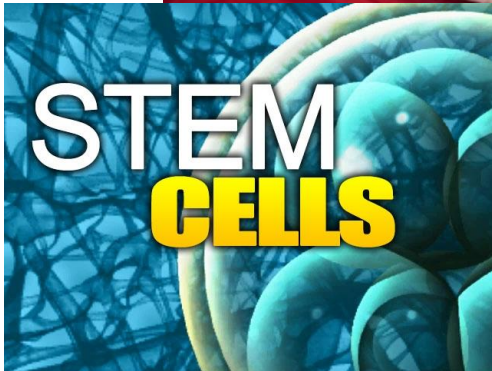
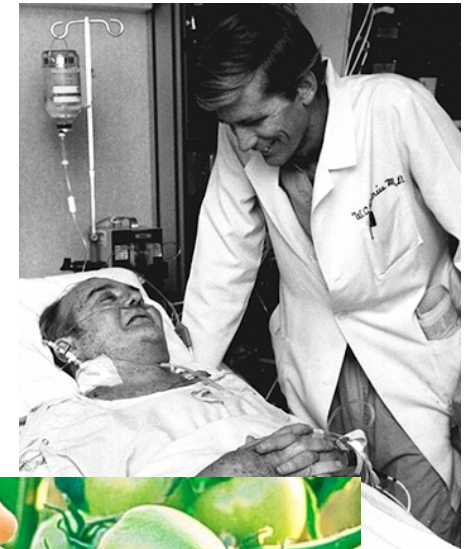
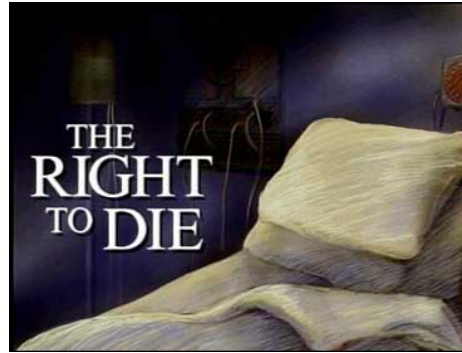
Pharmacogenomics and personalized medicine: wicked problems, ragged edges and ethical precipices

Leonard M. Fleck



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The image features a perspective view of a tunnel formed by multiple rows of binary code (0s and 1s). The code is rendered in a light blue color and appears to be receding into the distance, creating a strong sense of depth. The lines of code curve inward, meeting at a vanishing point in the center. Overlaid on this background is the text "Big Data" in a bold, red, sans-serif font, positioned centrally.

Big Data

The image features a dark silhouette of a person's head and shoulders in profile, facing right. The person is wearing glasses. The background is a dense grid of vertical bars, each containing a sequence of small, multi-colored rectangular segments in shades of red, green, blue, yellow, and purple, resembling a DNA microarray or a genomic data visualization. The text "How to Use Genomics" is overlaid in a reddish-orange color on the person's face.

How to Use Genomics

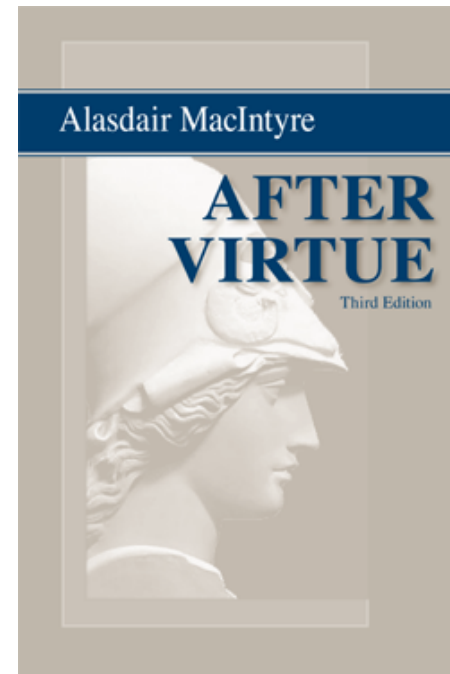
Improve Population and Public Health

INDIANA

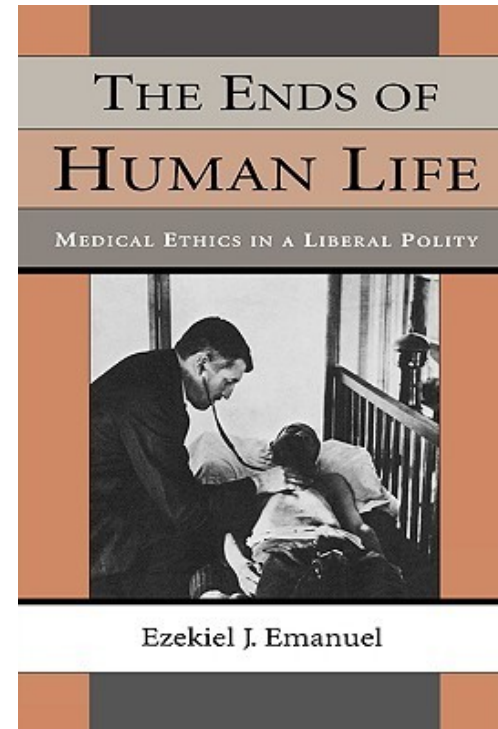
- Overall health rank: **37** (out of 51)
- Immunization rates: **47**
- Obesity rates: **43**
- Infant mortality: **45**
- Deaths from cardiovascular disease per/100,000: **14***

Why Are Bioethics Problems Wicked?

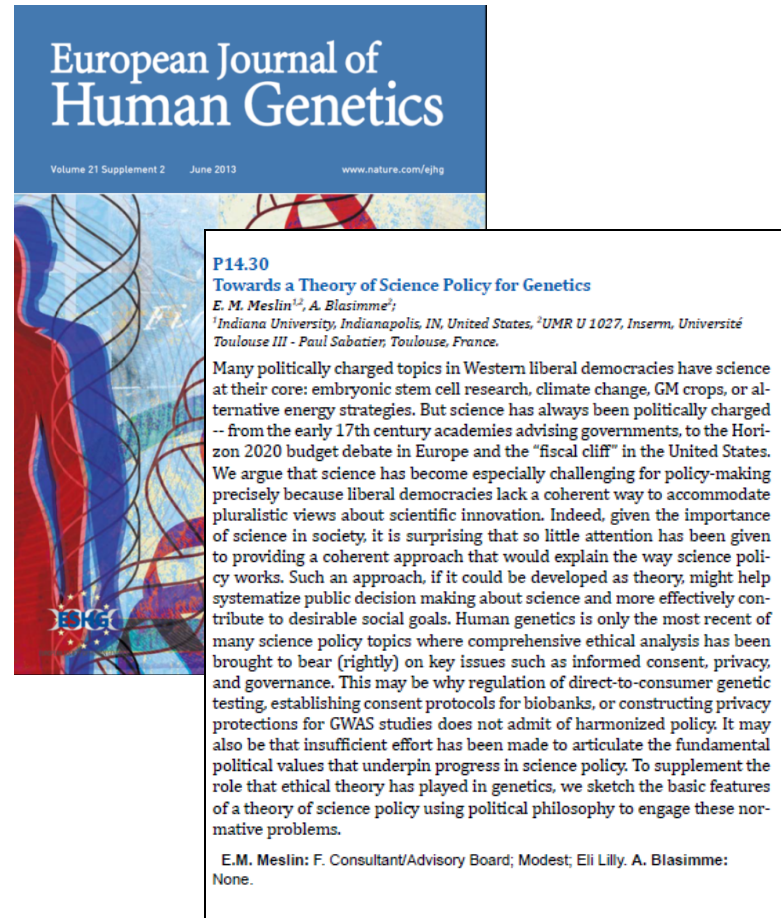
“All evaluative judgments and, more specifically, **all moral judgments are nothing but expressions of preference**, expressions of attitude or feeling”.



"...the reason why medical ethical questions seem irresolvable may well inhere not in some defect of medical practice or the advent of biomedical technology or the inherent complexity of moral life, but in our community's political philosophy. **We lack a common conception of the good.**



“...science has become especially challenging for policy-making precisely because liberal democracies lack a coherent way to accommodate pluralistic views about scientific innovation”.



Towards Solving Them

The Tragedy of the Commons

The population problem has no technical solution; it requires a fundamental extension in morality.

Garrett Hardin

At the end of a thoughtful article on the future of nuclear war, Wiesner and York (1) concluded that: "Both sides in the arms race are . . . confronted by the dilemma of steadily increasing military power and steadily decreasing national security. It is our considered professional judgment that this dilemma has no technical solution. If the great powers continue to look for solutions in the area of science and technology only, the result will be to worsen the situation."

I would like to focus your attention not on the subject of the article (national security in a nuclear world) but on the kind of conclusion they reached, namely that there is no technical solution to the problem. An implicit and almost universal assumption of discussions published in professional and semipopular scientific journals is that the problem under discussion has a technical solution. A technical solution may be defined as one that requires a change only in the techniques of the natural sciences, demanding little or nothing in the way of change in human values or ideas of morality.

In our day (though not in earlier times) technical solutions are always welcome. Because of previous failures in prophecy, it takes courage to assert that a desired technical solution is not possible. Wiesner and York exhibited this courage; publishing in a science journal, they insisted that the solution to the problem was not to be found in the natural sciences. They cautiously qualified their statement with the phrase, "It is our considered profes-

The author is professor of biology, University of California, Santa Barbara. This article is based on a presidential address presented before the meeting of the Pacific Division of the American Association for the Advancement of Science at Utah State University, Logan, 25 June 1968.

13 DECEMBER 1968

What Shall We Maximize?

Population, as Malthus said, naturally tends to grow "geometrically," or, as we would now say, exponentially. In a finite world this means that the per capita share of the world's goods must steadily decrease. Is ours a finite world?

A fair defense can be put forward for the view that the world is infinite; or that we do not know that it is not. But, in terms of the practical problems that we must face in the next few generations with the foreseeable technology, it is clear that we will greatly increase human misery if we do not, during the immediate future, assume that the world available to the terrestrial human population is finite. "Space" is no escape (2).

A finite world can support only a finite population; therefore, population growth must eventually equal zero. (The case of perpetual wide fluctuation above and below zero is a trivial variant that need not be discussed.) When this condition is met, what will be the situation of mankind? Specifically, can Bentham's goal of "the greatest good for the greatest number" be realized?

No—for two reasons, each sufficient by itself. The first is a theoretical one. It is not mathematically possible to maximize for two (or more) variables at the same time. This was clearly stated by von Neumann and Morgenstern (3), but the principle is implicit in the theory of partial differential equations, dating back at least to D'Alembert (1717-1783).

The second reason springs directly from biological facts. To live, any organism must have a source of energy (for example, food). This energy is utilized for two purposes: mere maintenance and work. For man, maintenance of life requires about 1600 kilocalories a day ("maintenance calories"). Anything that he does over and above merely staying alive will be defined as work, and is supported by "work calories" which he takes in. Work calories are used not only for what we call work in common speech; they are also required for all forms of enjoyment, from swimming and automobile racing to playing music and writing poetry. If our goal is to maximize population it is obvious what we must do: We must make the work calories per person approach as close to zero as possible. No gourmet meals, no vacations, no sports, no music, no literature, no art. . . . I think that everyone will grant, without

1245

“The population problem has no technical solution; it requires a fundamental extension of morality”.

- Garret Hardin (1968)

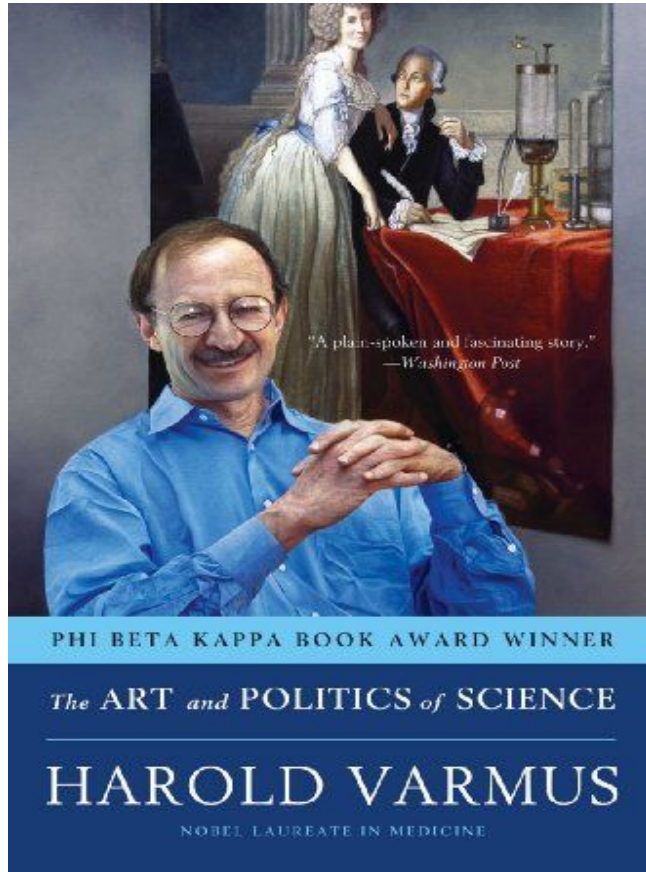




No such conflict should exist because each subject has a legitimate magisterium – and these do not overlap...The net of science covers the empirical realm...The net of religion extends over covers questions of moral meaning and value.

S.J. Gould *Non-Overlapping Magisteria* (1982)





“....There are no easy fixes to these dilemmas. But any solutions are going to require a much broader pursuit and application of science.....”



Australian Government
Australian Public Service Commission

Contemporary
Government

Challenges

Tackling Wicked Problems

A Public Policy Perspective

The Australian Public Service (APS) is increasingly being tasked with solving very complex policy problems. Some of these policy issues are so complex they have been called 'wicked' problems. The term 'wicked' in this context is used, not in the sense of evil, but rather as an issue highly resistant to resolution.

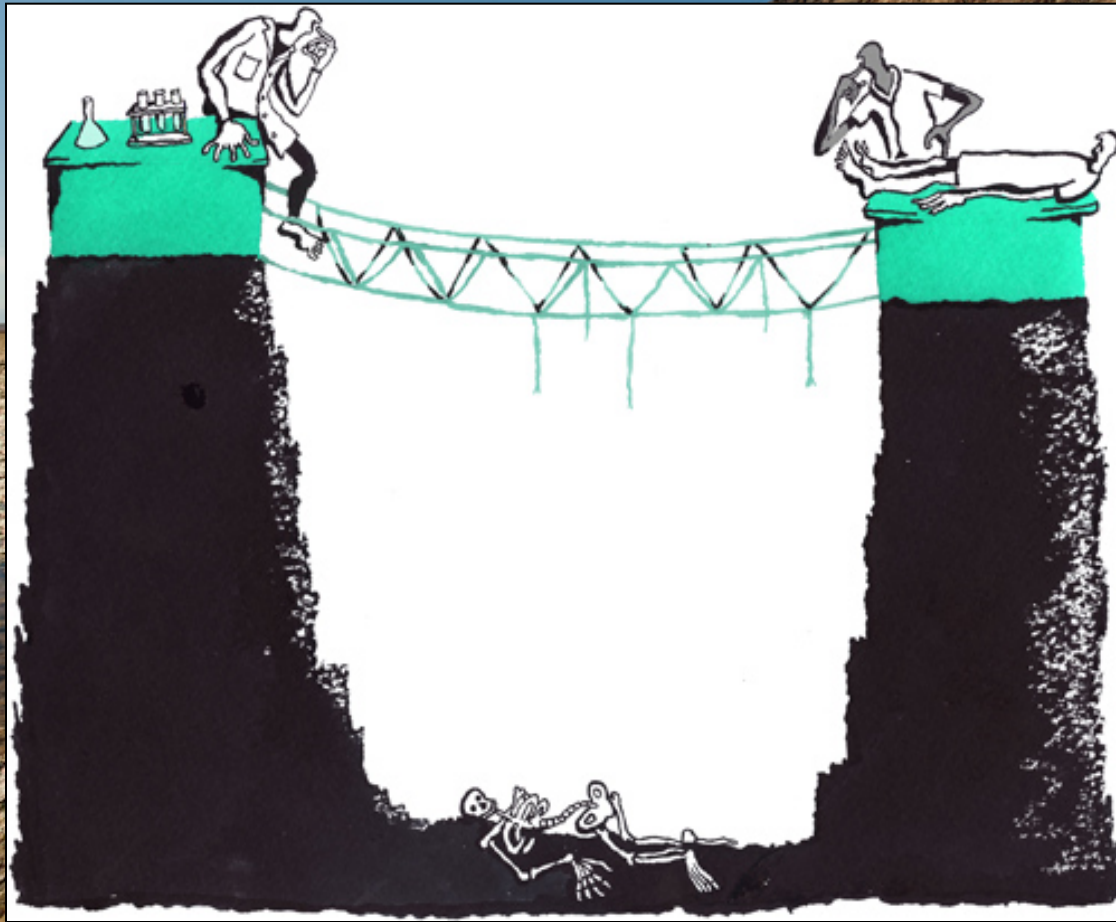
Successfully solving or at least managing these wicked policy problems requires a reassessment of some of the traditional ways of working and solving problems in the APS. They challenge our governance structures, our skills base and our organisational capacity.



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Translational Science and the “Valley of Death”



Meslin et al. *Clinical and Translational Medicine* 2013, **2**:14
<http://www.clintransmed.com/content/2/1/14>

 **Clinical and Translational Medicine**
a SpringerOpen Journal

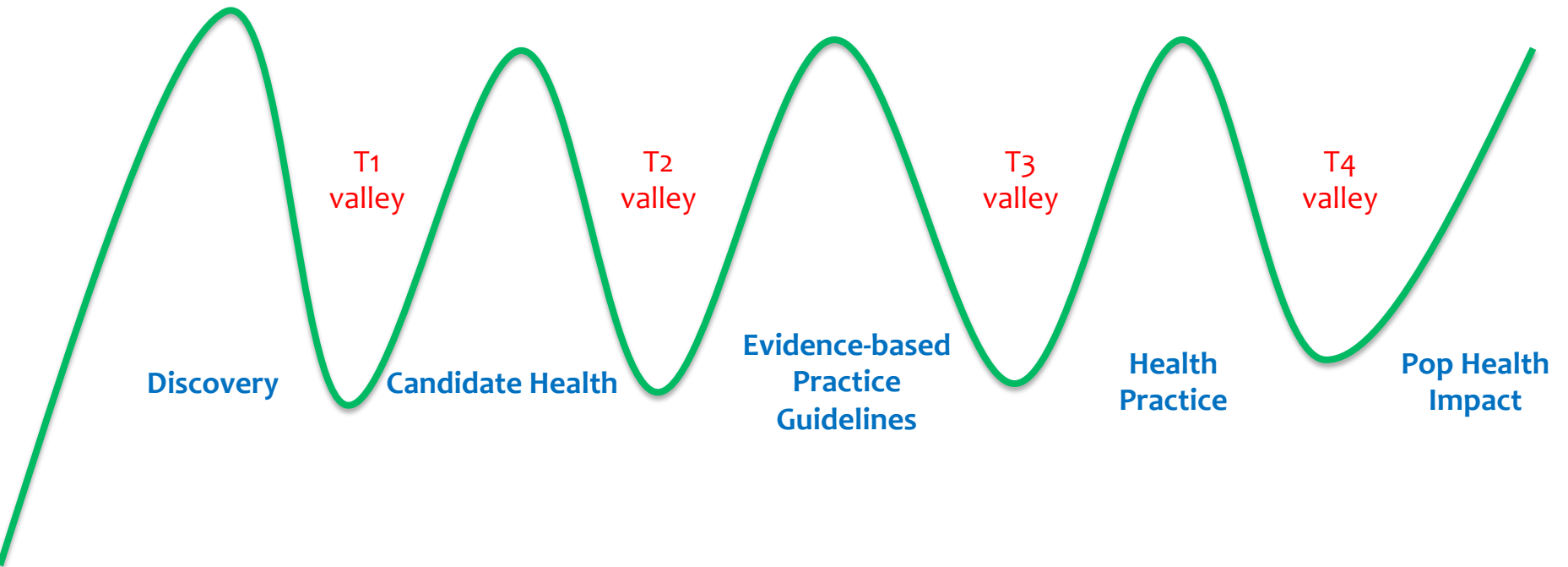
PERSPECTIVE

Open Access

Mapping the translational science policy 'valley of death'

Eric M Meslin^{1,2*}, Alessandro Blasimme² and Anne Cambon-Thomsen²

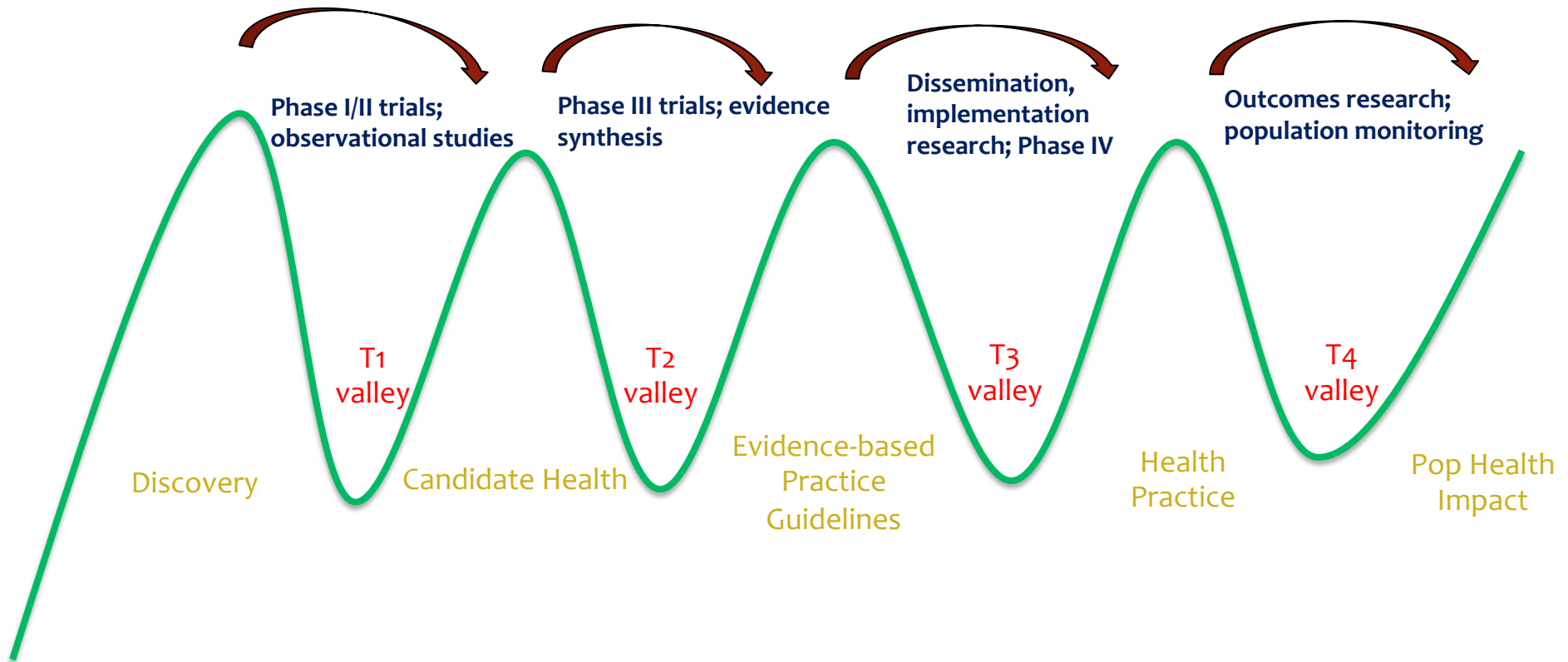
Mapping Translational Science



Adapted from Khoury et al. *Genetics in Med* (2007)



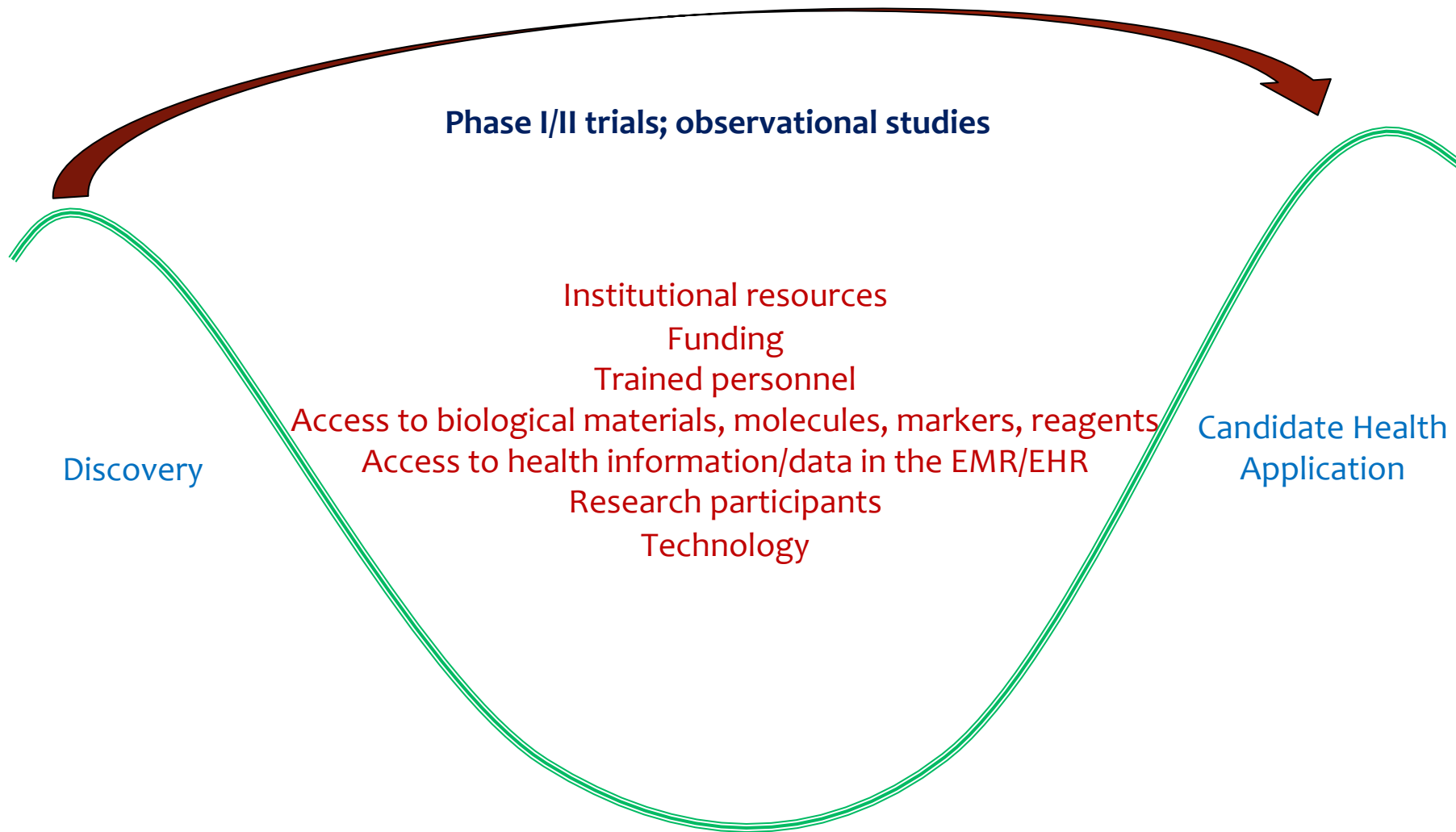
Steps on the Translational Path



Adapted from Khoury et al. *Genetics in Med* (2007)



Impediments to Crossing the T1 Valley



- Rethink the science social contract with society
- Build and maintain public trust
- Creative use of evidence and novel research platforms

Meslin et al. *Clinical and Translational Medicine* 2013, **2**:14
<http://www.clintransmed.com/content/2/1/14>

 Clinical and Translational Medicine
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PERSPECTIVE

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Mapping the translational science policy 'valley of death'

Eric M Meslin^{1,2*}, Alessandro Blasimme² and Anne Cambon-Thomsen²

Rethink The Social Contract

JOURNAL OF CIVIC LITERACY

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Volume 1, Issue 1 <http://journals.iupui.edu/index.php/civilitat/index> July 2014

IS THE SOCIAL CONTRACT INCOMPATIBLE WITH THE SOCIAL SAFETY NET? REVISITING A KEY PHILOSOPHICAL TRADITION

By ERIC M. MESLIN, AARON E. CARROLL, PETER H. SCHWARTZ, SHEILA KENNEDY
INDIANA UNIVERSITY

Author's Note: The authors would like to thank several people for comments on earlier versions of this paper including Eric Wright, Heather McCabe, Halley Rose Meslin, and Kimberly Quaid.

ABSTRACT: *The American political landscape is characterized by ideological posturing and seemingly intractable disagreement. Nowhere is this more obvious than in current efforts to reform health care which has become more about scoring political points than about developing public policy that would benefit millions. Especially worrisome is the odious habit of dismissing proposals – especially those that see an expanded role for government – as somehow inconsistent with American ‘values’. We believe that progress may be possible by re-engaging directly with and expanding on our basic understanding of social contract theory and its influence on American civic discourse.*

Keywords: *Social contract theory, Affordable Care Act, Hobbes, Locke, Rousseau, Health reform, civic discourse, political culture, safety net*

July 2014 Is the Social Contract Incompatible with the Social Safety Net? 1

Public Health Genomics

Special Topic Section: The Age of Personal Genomics
Editor: Timothy Caulfield (Edmonton, Alta.)

Original Paper

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Research Ethics in the Era of Personalized Medicine: Updating Science’s Contract with Society

Eric M. Meslin^a Mildred K. Cho^b

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Build and Maintain Public Trust

- Reduce hype about science progress
- Valuing the role that science should play in public policy generally
- Agree on ways to democratize science, including sustained critical reflection and creative political experimentation.

GENOMICS

Deflating the Genomic Bubble

James P. Evans,^{1*} Eric M. Meslin,² Theresa M. Marteau,³ Timothy Caulfield⁴

“Soccer is the sport of the future in America ... and it always will be.” This oft-quoted epithet poking fun at the promise of the “beautiful game” in the United States can seem uncomfortably apt when applied to genomic medicine. It’s now been 10 years since humans deciphered the digital code that defines us as a species. Although it may be hard to overestimate the significance of that achievement, it is easy to misconstrue its meaning and promise. People argue about whether mapping the human genome was worth the investment (1–3). With global funding for genomics approaching \$3 billion/year (4), some wonder what became of all the genomic medicine we were promised (5). It thus seems an appropriate time to take stock of whence the real benefits from genomic research may come and how best to attain a future in which genomics improves human health.

Recent methodological progress in genomics has been breathtaking. We now regularly assay genomes at millions of loci (6), and routine whole-genome sequencing

Impediments and Hyperbole

Substantial impediments to realizing many of the claims most frequently heard include the following:

The problem of clinical utility and relative risk. The numerous genetic variants that mediate disease risk typically confer woefully low relative risks (i.e., compared with the much more meaningful absolute risk) and are thus meager in their predictive power (10). Their applicability to patient care shows little promise; studies (11–14) demonstrate that even combining dozens of risk markers provides little clinically meaningful information. In the public health realm, the prospect of effectively stratifying populations as high or low risk, thereby guiding screening, is equally dismal. Given the multifactorial nature of common diseases and

Use Innovative Research Platforms

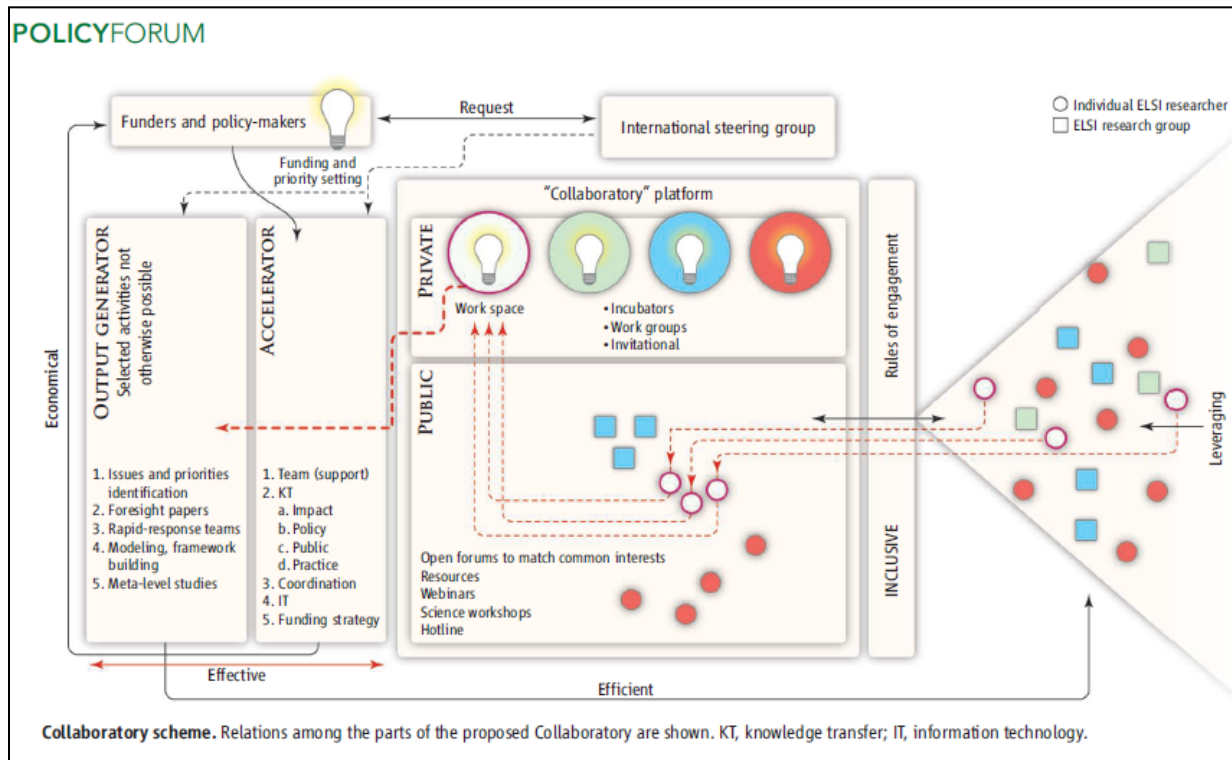
POLICYFORUM

RESEARCH PRIORITIES

ELSI 2.0 for Genomics and Society

We need an international infrastructure for the ethical, legal, and social implications of genomic research.

Jane Kaye,^{1*} Eric M. Meslin,² Bartha M. Knoppers,³ Eric T. Juengst,⁴ Mylène Deschênes,⁵ Anne Cambon-Thomsen,⁶ Donald Chalmers,⁷ Jantina De Vries,⁸ Kelly Edwards,⁹ Nils Hoppe,¹⁰ Alastair Kent,¹¹ Clement Adebamowo,¹² Patricia Marshall,¹³ Kazuto Kato¹⁴



- Internationalize science
- Public engagement strategies that move further “upstream”
- ELSI 2.0 “Collaboratory”
- Identifying key impediments to policy implementation
- Collect data on policy influences



EDITOR

Alarm Bells Should Help Us Refocus

Neal Lane is the Malcolm Gillis University Professor and Senior Fellow of the James A. Baker III Institute for Public Policy at Rice University in Houston, Texas. He is a physicist and works on matters of science and technology policy.

WE'RE HEARING ALARM BELLS THESE DAYS ABOUT SCIENCE IN THE UNITED STATES. ON THE one hand, we've been told that in the global economy of today's "flattened" world, we need to bolster innovation and competitiveness and science and engineering research and education. Earlier this year, when President Bush announced his American Competitiveness Initiative, the future appeared brighter for the physical sciences, math, and engineering (although the National Institutes of Health budget remains flat). But other alarms have sounded that the increases may be at the expense of the disciplines that have historically sought to understand how all this hard work actually helps societies deal with these very issues. Last month, Senator Kay Bailey Hutchinson (R-TX), chair of a Senate panel that oversees the U.S. National Science Foundation (NSF), aggressively argued that the agency should limit its funding for the social sciences and focus on the "hard" sciences. Although the committee stopped short of tying NSF's hands, Congress has yet to make a final decision on whether or not competitiveness is just about technology. Congress should think hard about this.

In the past, investments in science have brought breakthrough technologies, a productive technical workforce and positive trade balance in the high-tech sector, and medical miracles, along with many other tangible benefits. Most Americans believe they are healthier and better off because of the nation's long-standing preeminence in science and technology. Moreover, because other nations are replicating our blueprint for research and higher education with increasing success, competition is growing fierce. So fierce, that our country's present and future position in the world economy is at considerable risk.

All this challenges our political leaders, but it should also challenge the broad scientific community to make sure that our science actually helps provide what most Americans need. Clearly, this requires an aggressive and ambitious program of basic research in the hard sciences, including physics, chemistry, materials science, mathematics and computer science, biology and biomedical science, earth and space sciences, and engineering. But that will not be enough.

Over decades, as our scientific knowledge has become more sophisticated, we have come to recognize how such things as human dynamics and institutional behavior can either enhance or impede the benefits to society of our research achievements. But recognizing that reality is only the first step. We need a much better understanding of how new technical knowledge and tools translate into products, jobs, and wealth; how people learn; how offshoring of jobs, even technical jobs, affects our workforce and quality of life; how increased investment in science and engineering research leads to increased industrial productivity and to better jobs; and how to cope with a host of ever-changing societal problems. These issues are the domain of the social sciences, which also need increased federal support. But that still is not sufficient.

The successful application of new knowledge and breakthrough technologies, which are likely to occur with ever-increasing frequency, will require an entirely new interdisciplinary approach to policy-making: one that operates in an agile problem-solving environment and works effectively at the interface where science and technology meet business and public policy. It must be rooted in a vastly improved understanding of people, organizations, cultures, and nations and be implemented by innovative strategies and new methods of communication. All of this can occur only by engaging the nation's top social scientists, including policy experts, to work in collaboration with scientists and engineers from many fields and diverse institutions on multidisciplinary research efforts that address large but well-defined national and global problems. This will not be easy. It will require qualitative changes in research cultures and in the way federal agencies consider research funding.

Cynics may dismiss these concerns with an alibi, "We've seen all this before." I believe they are wrong and it would be folly to ignore the alarm bells. Rather, let us use these sometimes shrill warnings to help us refocus and regain the high road for the 21st century for science, the nation, and all of humanity. Albert Einstein eloquently framed this issue for scientists in 1931 at the California Institute of Technology: "Concern for man himself and his fate must always constitute the chief objective of all technological endeavors. . . . Never forget this in the midst of your diagrams and equations." Congress, as well as scientists, should remember these words.

— Neal Lane

10.1126/science.1131478

www.sciencemag.org SCIENCE VOL 312 30 JUNE 2006



“The successful application of new knowledge and breakthrough technologies... will require an **entirely new interdisciplinary approach** to policy-making:

- that operates in an **agile problem-solving environment**
- works effectively at the interface where **science and technology meet business and public policy.**
- is rooted in a **vastly improved understanding** of **people, organizations, cultures,** and nations
- implemented by innovative strategies and **new methods of communication**
- engages the nation's top **social scientists,** including policy experts, to work in collaboration with **scientists and engineers from many fields”.**

Neal Lane, Science 312, 30 June, 2006



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