The changing need for science advice

Sir Peter Gluckman ONZ FRS

Chief Science Advisor to the Prime Minister of New Zealand
Chair, International Network of Government Science Advice

Buenos Aires, Argentina June 2017

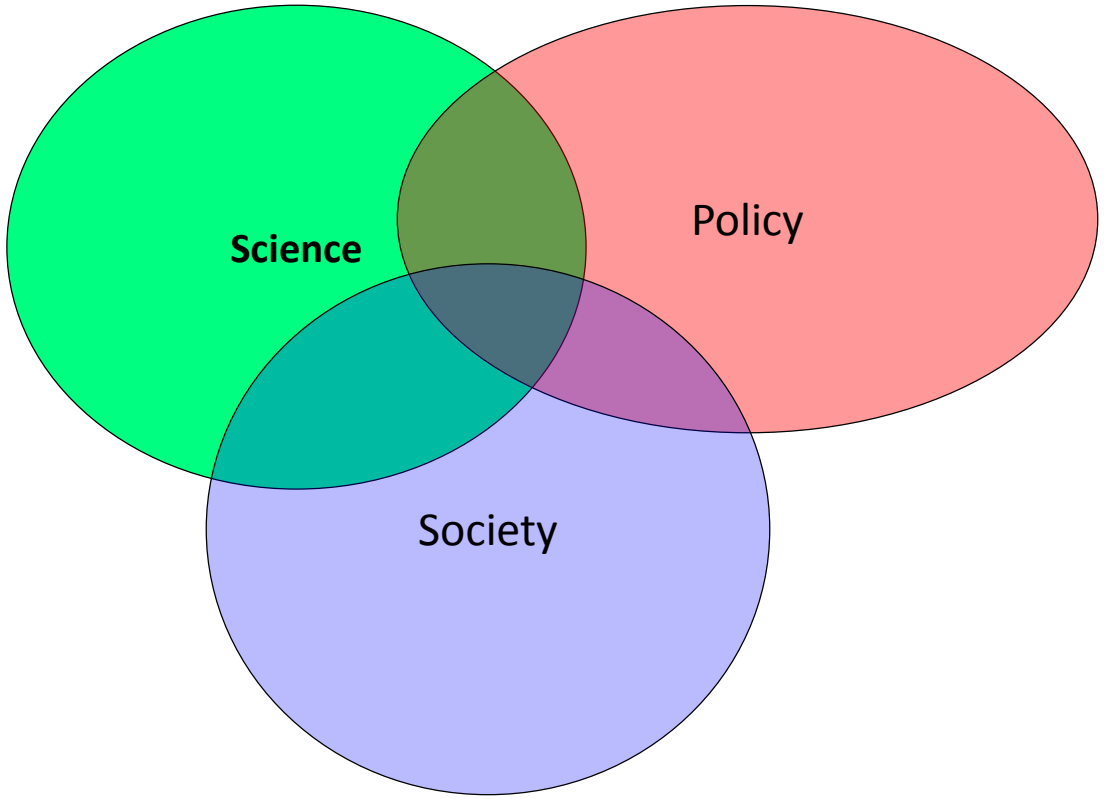
The science – policy nexus

- Presumption: That governments are more likely to make better decisions when they use well-developed evidence wisely

- Virtually every challenge all governments face has a scientific dimension which may or may not be recognised
- But science alone does not make policy; many values and political considerations

- But we also face the challenge of a post-expert, post-elite, post-truth world
- Is robust science available? Will it be used, misused, manipulated or ignored?
- **The need for an effective and trustworthy science advisory ecosystem**

Not is all well in the nexus between science society and policy



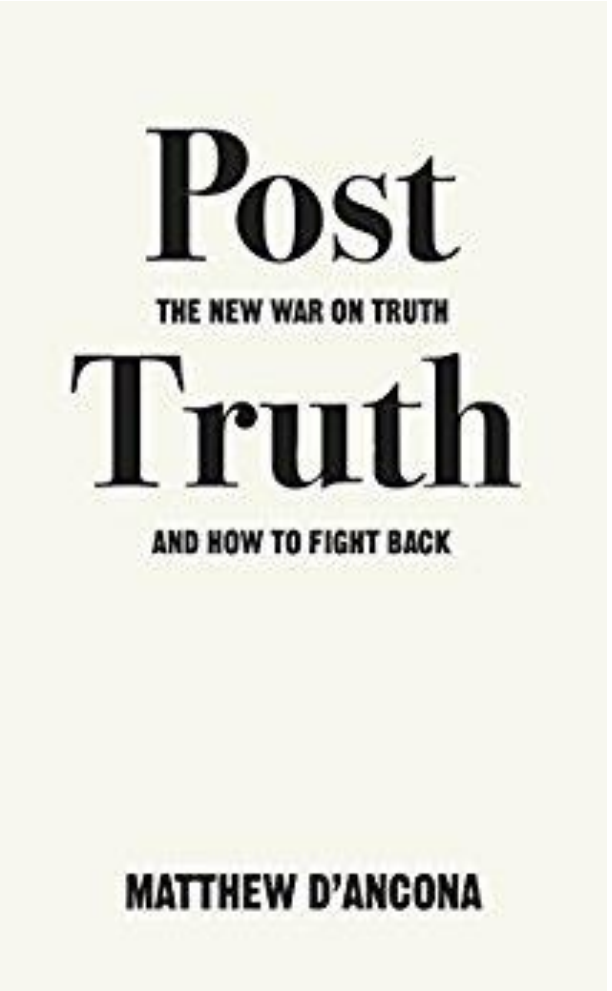
The challenge of information and ideas in a post-truth world

OFFICE OF THE PRIME MINISTER'S CHIEF SCIENCE ADVISOR

Professor Sir Peter Gluckman, ONZ KNZM FRSNZ FMedSci FRS
Chief Science Advisor

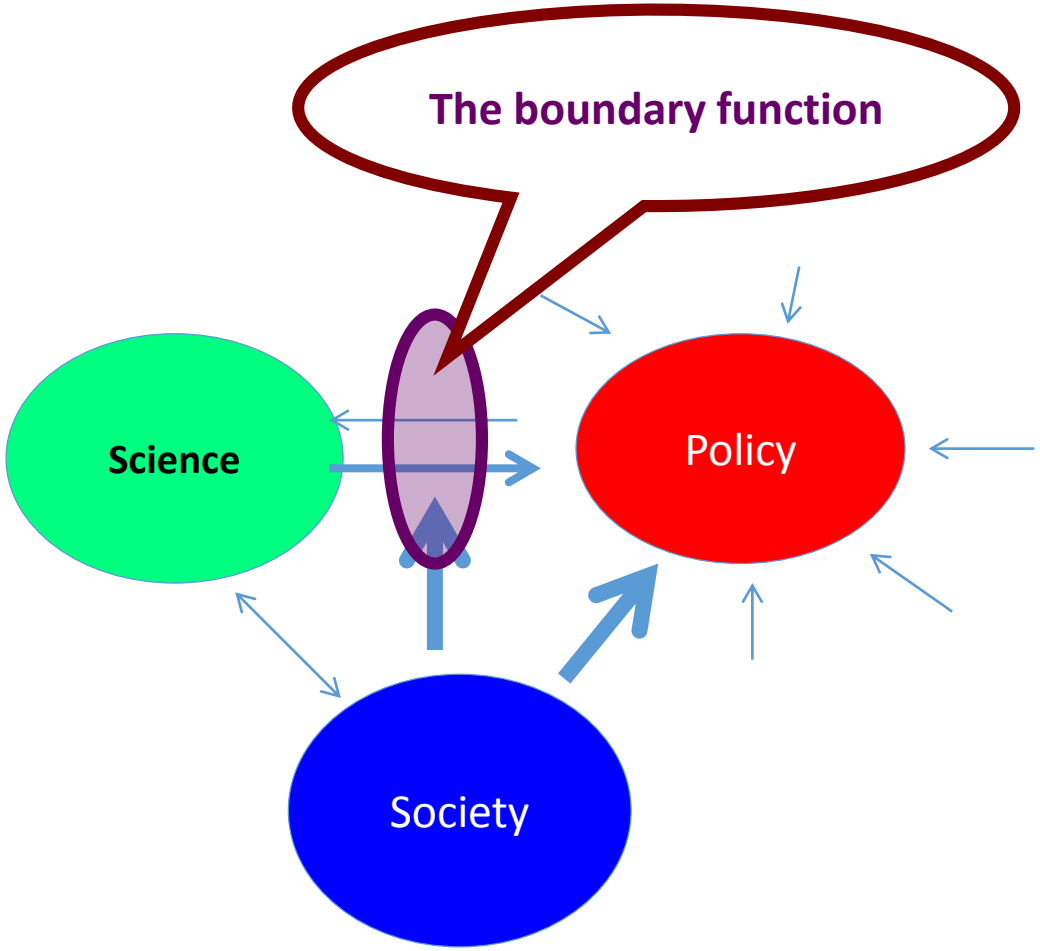
The digital economy and society (DES): A preliminary commentary[1]

www.pmcsa.org.nz



Science and policy making

- Science and policy making are very distinct cultures
- The nature of the interaction is influenced by context, culture and history *and by the relationship between science and society*
- There is increasing recognition of the importance of boundary roles and structures to link these cultures
- The nature of boundary entities is variable and evolving: there will not be a one-size-fits-all model



The evolving science policy nexus

- The nature of science is changing
- The relationship between science and society is changing
- The nature of policy making is evolving
- The relationship between society and the policy elite is changing
- Evidence informed policy making sits at the nexus of science, policy and society
- It is evolving into a distinct set of skills

Science in the 21st century

- Increasingly science is embedded within society rather than standing apart from it
- It is now a tool of national and international development and is placed in a more utilitarian framing by Governments
- The need for science in the policy process is increasingly understood
- The explosion of knowledge and the pace of innovation is both an opportunity and a challenge for society and governments
- The issues of social license for science and technology are growing
- And the nature of science itself has changed and is changing

Changing nature of science

- From linear to non-linear
- From singular to multidisciplinary
- Accepting complexity
- From reductionist to systems based

  From certainty to probabilistic
- From normal to post-normal…

Post-normal science

- Much science applied or needed in the policy space is inevitably ‘post-normal’ (especially with regards the SDGs)
    - The science is complex
    - Facts uncertain
    - There is much which is unknown
    - Stakes are high
    - Decision making is urgent
    - There is a high societal values component and values are in dispute
- It is these characteristics and the frequent failure of science to recognize these that can make the public, policy makers and politicians skeptical about the role and utility of science.
- Science advisory systems must be cognizant of these characteristics to be effective

International Network for Government Science Advice

The core challenges of science advice

- Science and policy making have fundamentally very different cultures and epistemologies
- The processes of science and policy making are very different
- The interaction is not independent of the relationships of each to society
- The place of societal values and understandings of risk is very different in science and policy making
- The meaning of evidence can be very different

Scientists and policy making

- Scientists are
  - Very good at problem definition
  - Less so at finding workable, scalable and meaningful solutions
  - They often approach the policy maker with considerable hubris.
  - They often fail to consider the multiple domains that go into policy formation
- But they have a critical role in the policy process through the science advisory ecosystem

Policy making informed by scientific evidence

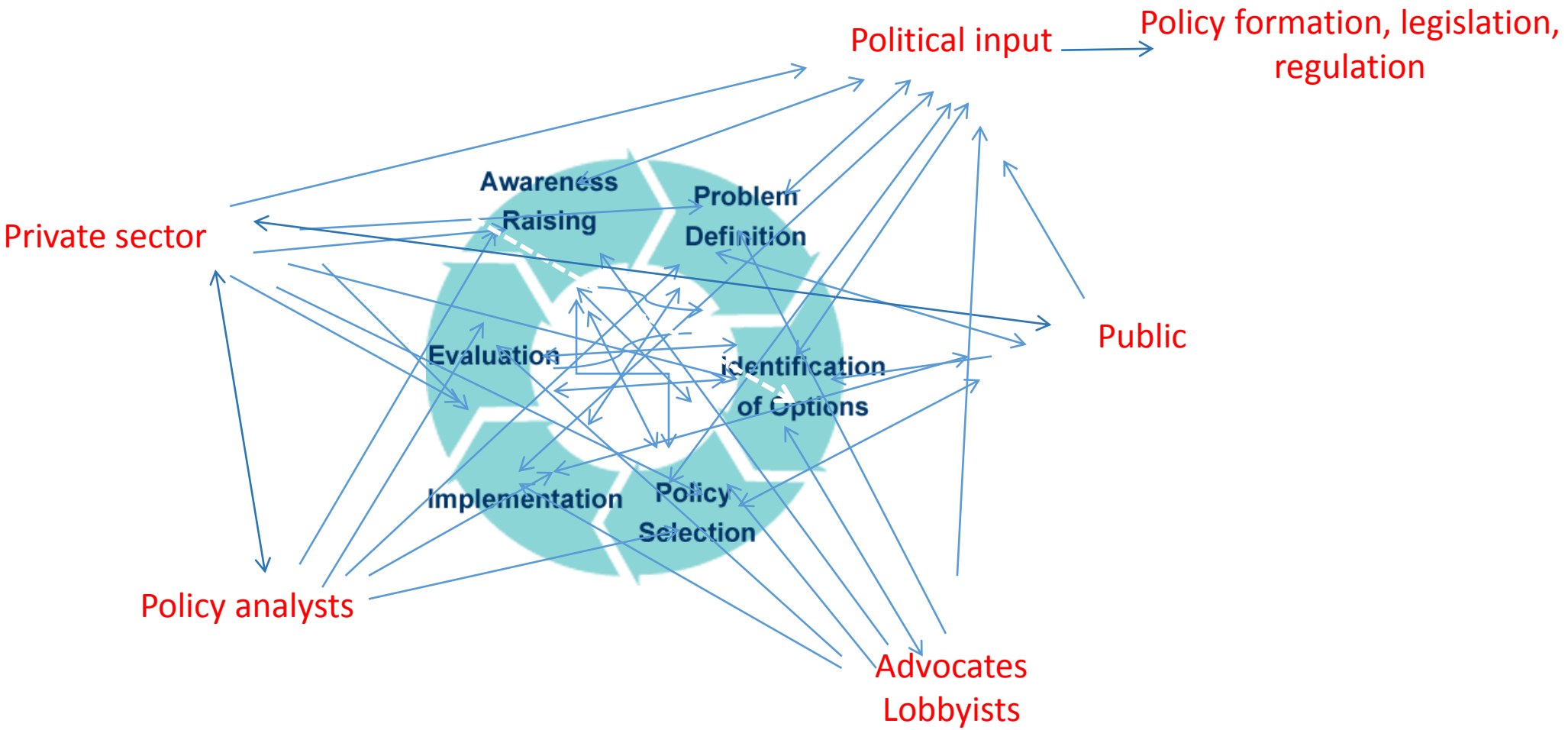
~~Evidence based policy making~~

What is evidence ?

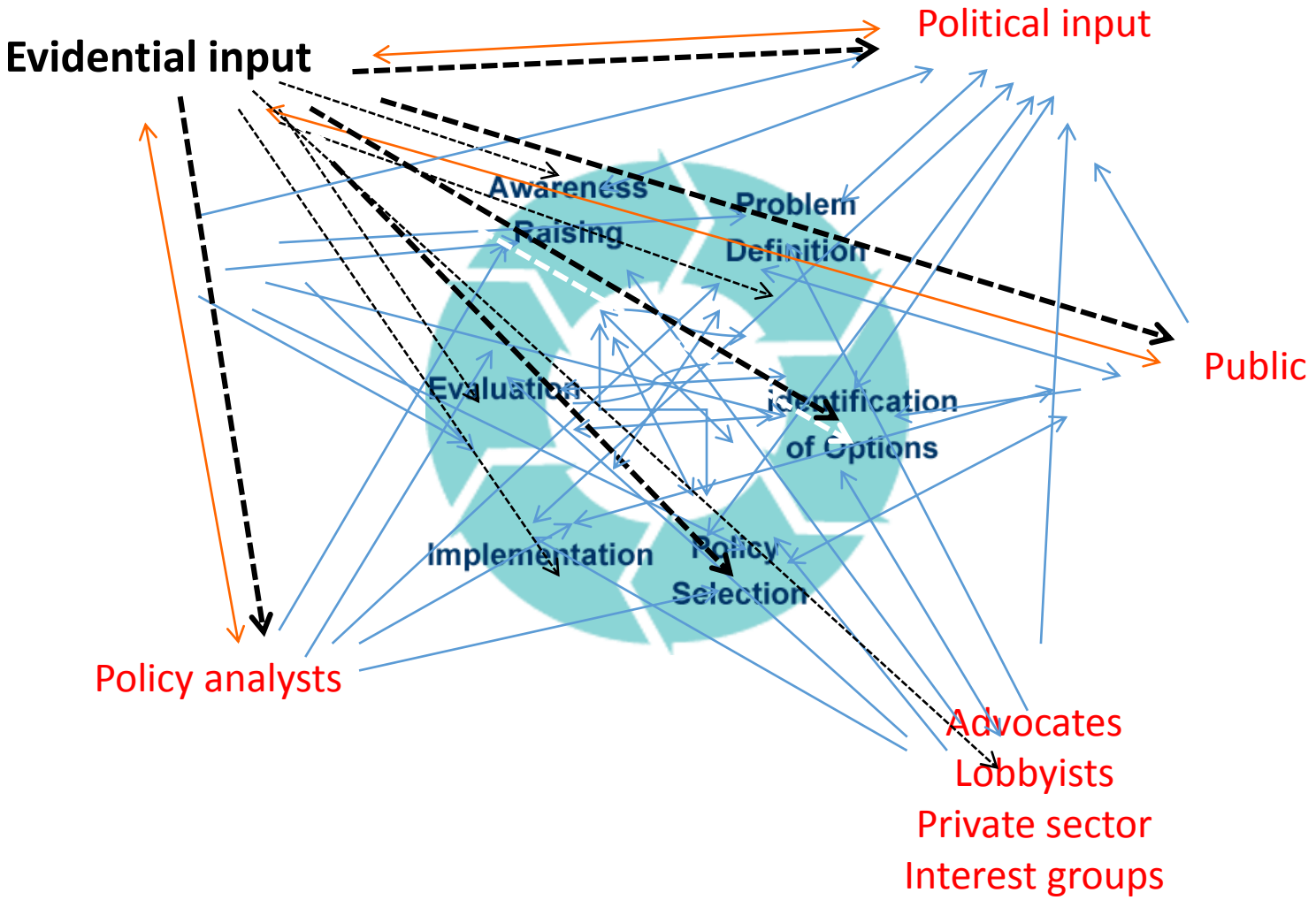
- Politicians and policy makers have many sources of evidence
  - Tradition
  - Prior belief
  - Anecdote and observation
  - Science
- Scientific evidence is argument supported by information produced according to a set of formal processes
- Scientific processes aim to obtain relatively objective understandings of the natural and built world. Science is defined by its processes which are designed to reduce bias and enhance objectivity.
  - But important value judgments lie within science especially over what question and how to study it. But the most important in the context of policy is the sufficiency and quality of evidence.

- The policy process is rarely as described in textbooks

Policy making is messy



So what is the value of science advice in the ‘post-trust context?



More important than ever

But it matters how it is done

It needs sensitivity to the complex dynamics

It needs to work with this complex entanglement of formal and informal actors

Policy makers

- Have limited bandwidth and often limited manouvrability
- They lurch to problems
- The policy cycle is generally very short and getting shorter
- Most relevant science incomplete and much is ambiguous
- They cannot be expected to be scientific referees
    - The need for translation and brokerage
- Policy makers see evidence is one of a number of inputs
    - In what sense is it privileged and how is that privilege maintained? The role of the broker.

The challenge of science at the policy-societal nexus

- Too much science
- The changed nature of science
- The challenge of values within and beyond science
- The post-normal nature of much science
- Different perceptions of risk
- Different perceptions of expertise
- The behavior and reciprocal perceptions of scientists and policy makers
- The utilitarian poistioning of science
- Implications for the future of public science

The construct of science advice: the concept of brokerage

- What is known, what is the consensus
  (need, impact, alternatives, monitoring etc)
- What is not known
- Other caveats
- The inferential gap, risk management
- How it relates to other considerations
- Options and tradeoffs

- Science does not make policy, it informs policy by elucidating options.

Five overlapping dimensions of science advice

- From technical advice to regulatory advice to policy advice
- Time scales from immediate (crisis) to deliberative to foresighting
- Informal/formal
- Internal to the policy system (eg science advisors) to external to the policy system (most academies)
- From local to national to international

International Network for Government Science Advice

Internal versus external inputs

- Internal
  - That close to the executive of government
    - Informal
    - Instant in crises
    - Repeated and iterative
    - Identify opportunity and need
    - Conduit to science community
    - Maintain the integrity of input

- External
  - The broader academy
    - Expert committees, professional bodies, national scientific academies
    - Generally deliberative and formal
    - Single point intervention

Different roles in a science advisory ecosystem

	Knowledge generators	Knowledge synthesizers	Knowledge brokers
Individual academics	+++	++	
Academic societies/professional bodies		+	
Government employed practicing scientists	+++	+	
Scientist within regulatory agency		++	++
Independent think tanks		++	
What works units etc		+++	+
National academies		+++	+
Government advisory boards/science councils		++	+
Science advisors to executive of govt		+	+++
Science advice to legislators		+	++

The nature of advice

	Policy for science	Evidence for policy: options (strategic)	Evidence for policy: Implementation (operational and tactical)	Evidence for policy: Evaluation (strategic and tactical)	Horizon scanning	Crises
Individual academics	+	±	±	±	±	
Academic societies/profess'l bodies	+++	+	+	±	±	
Gov't employed scientists		+	++	+	+	+
Scientists within regulatory agencies		+	++	++		
Independent think tanks		++	±	±	+	
What works units etc			++	±		
National academies	+++	+			+	
Gov' t advisory bds/science councils	++	+	+		+	
Science advisors to executive of govt	+	++++	++	++	++	+++
Science advisor to legislators	±	+	++	++	+	

Further challenges are created by ..

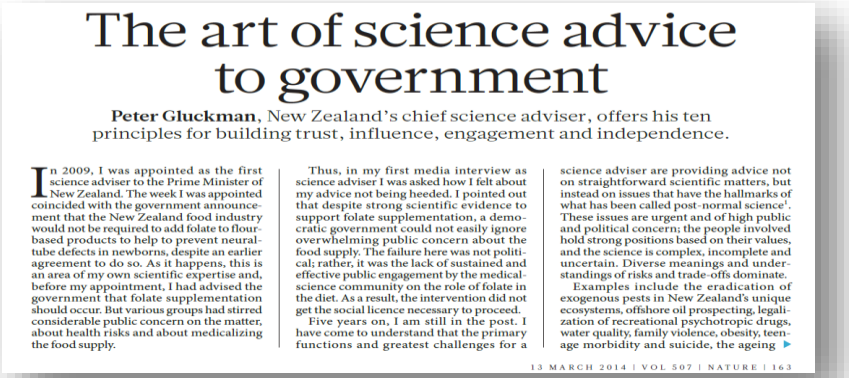
- State of national development
  - Governance
  - National institutions
  - National science capacities

- Context, culture, constitution
- Nature of public and policy discourse

- Attitude to experts

Principles and guidelines for science advising

- **Trust with multiple audiences**
- **Humility/Avoidance of hubris**
- Distinguish *science for policy* from *policy for science*
- Understand science informs and does not make policy
- Protect the privilege of science
- Recognize the limits of science
- **Brokerage not advocacy**
  - What is known, what is the expert consensus
  - What is not known and other caveats
  - The inferential gap, risk management
  - How it relates to other considerations, alertness to social implications
  - Options and tradeoffs



The art of science advice to government

Peter Gluckman, New Zealand's chief science adviser, offers his ten principles for building trust, influence, engagement and independence.

In 2009, I was appointed as the first science adviser to the Prime Minister of New Zealand. The week I was appointed coincided with the government announcement that the New Zealand food industry would not be required to add folate to flour-based products to help to prevent neural-tube defects in newborns, despite an earlier agreement to do so. As it happens, this is an area of my own scientific expertise and, before my appointment, I had advised the government that folate supplementation should occur. But various groups had stirred considerable public concern on the matter, about health risks and about medicalizing the food supply.

Thus, in my first media interview as science adviser I was asked how I felt about my advice not being heeded. I pointed out that despite strong scientific evidence to support folate supplementation, a democratic government could not easily ignore overwhelming public concern about the food supply. The failure here was not political; rather, it was the lack of sustained and effective public engagement by the medical-science community on the role of folate in the diet. As a result, the intervention did not get the social licence necessary to proceed.

Five years on, I am still in the post. I have come to understand that the primary functions and greatest challenges for a science adviser are providing advice not on straightforward scientific matters, but instead on issues that have the hallmarks of what has been called post-normal science'. These issues are urgent and of high public and political concern; the people involved hold strong positions based on their values, and the science is complex, incomplete and uncertain. Diverse meanings and understandings of risks and trade-offs dominate.

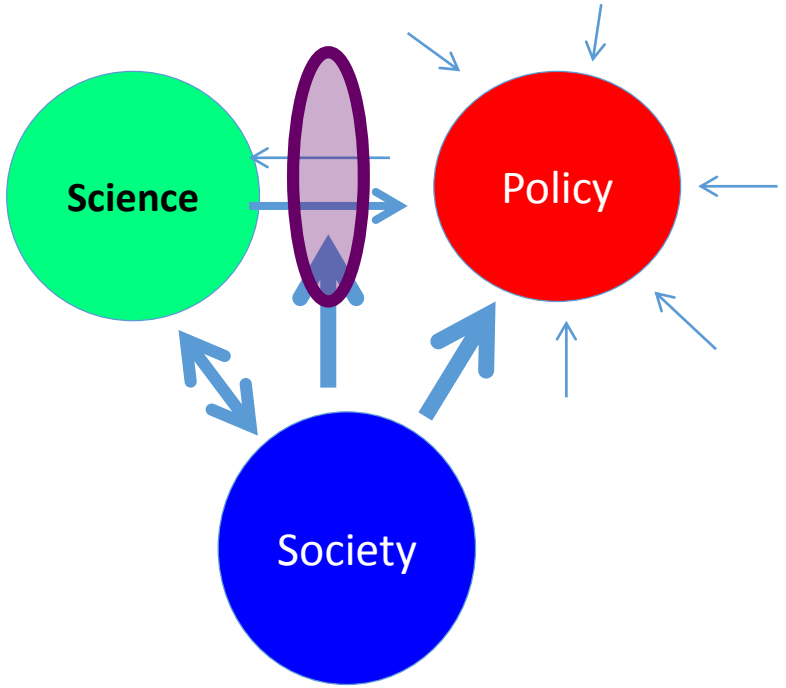
Examples include the eradication of exogenous pests in New Zealand's unique ecosystems, offshore oil prospecting, legalization of recreational psychotropic drugs, water quality, family violence, obesity, teenage morbidity and suicide, the ageing ▶

13 MARCH 2014 | VOL 507 | NATURE | 163

Peter Gluckman
Nature, 13 March 2014

Enhancing the uptake of scientifically developed knowledge into public policy

1. Acknowledge the three way relationship
2. The need for brokers
3. Broadening the understanding of scientists
4. Co-design and co-production of science
5. Promote science literacy and critical thinking
6. Strengthening international coordination



Science Diplomacy from a foreign policy perspective

- **Global interest**
  - Common and global challenges (SDGs)
  - Ungoverned spaces (eg Antarctic)

- **Common interest**
  - Resources
    - Trans-boundary/regional issues
  - Standards and definitions
  - Shared technical services
  - Crisis and disaster management
  - Threats (eg cyber)
  - Social license for new technologies
  - Big science

- **National interest**
  - Voice/influence /soft power/reputation
    - Track 2 diplomacy
    - Bilateral relations
    - National projection
    - Development assistance
  - Security
    - Threats, crisis, emergencies, disasters
    - Technical aspects of treaties
  - Economic
    - Trade
    - Innovation
  - National need and capability
    - Technical capabilities
    - Access to knowhow, knowledge
    - Develop domestic STI

INGSA establishing a science diplomacy chapter
INGSA administers FMSTAN – Foreign Ministry Science and Technology Advisory Network
INGSA partners to provide annual workshop for foreign ministries

INGSA

INGSA founded in 2014 under the aegis of ICSU
Memorandum of understanding with UNESCO
Concerned with all dimensions of science advice

Networking
Research
Forum, resources, networking
Capacity building workshops –academies (Auckland April 2017), small nations (Apia April 2017) Dakar March 2017, Copenhagen April 2017, Johore June 2017, Nigeria Nov 2017, Tokyo Nov 2017)
institutions, demand side
Thematic workshops (eg foreign ministries, environment, migration)
Partnerships (eg with JRC, OECD, ICSU)
Principles of science advice (WSF 2017)

Membership is free : academics, practitioners, policy makers (>2800 members, 75 countries)
African and Asian chapters established. Latin American chapter in development.
Science diplomacy chapter in development

www.ingsa.org

International Network for Government Science Advice