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COST/ROME

The Role of Science within the Rule of Law



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- Housekeeping
- Definitions
- The roles of **Laws**
- The roles of **Science** in **Law**
- Difficulties when **Science** meets **Law**
- Lessons from recent court cases
- Responses to Managerial risks
- The future





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Funding

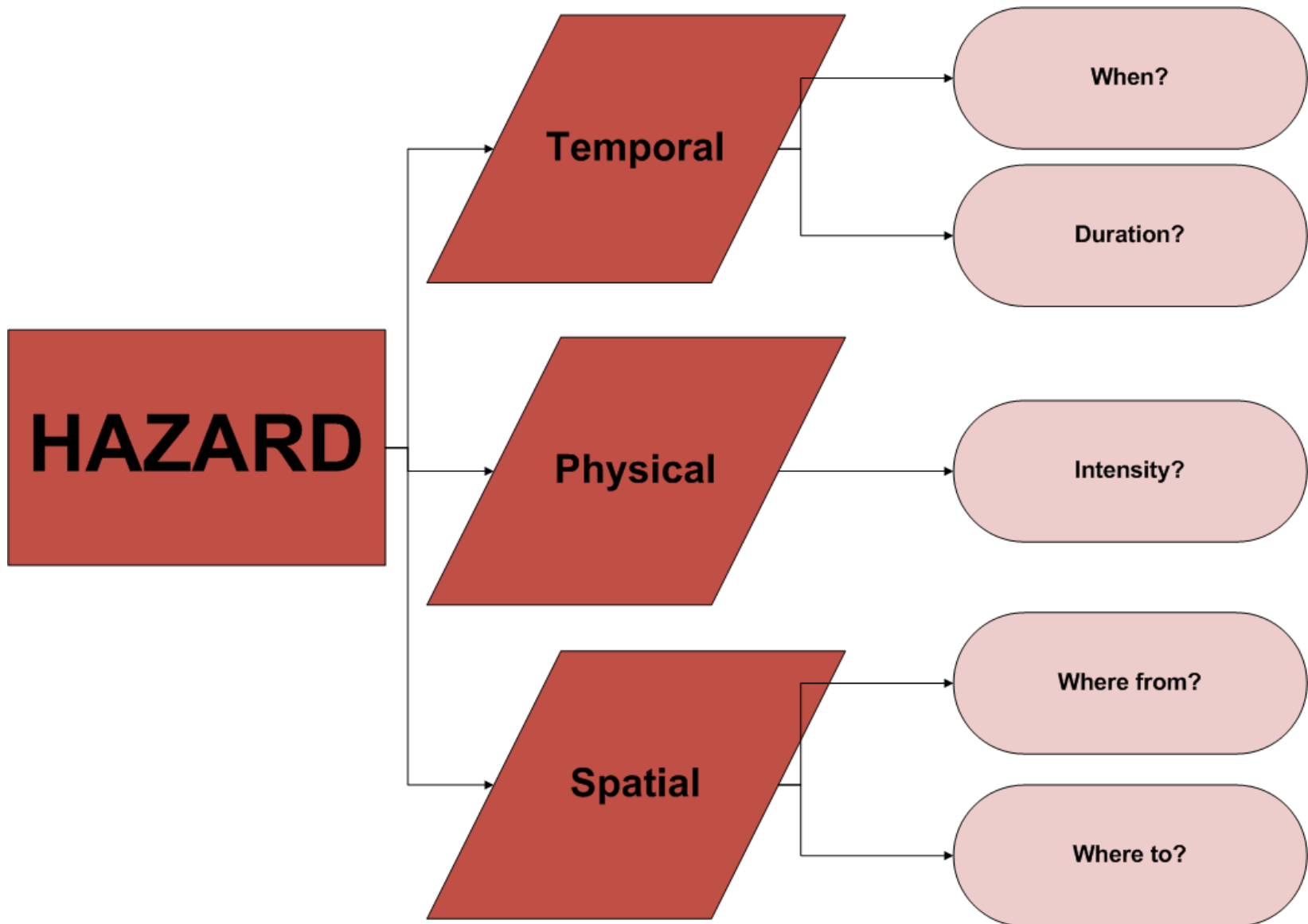
VUELCO a project financed by the European Commission under the 7th Framework Programme for Research & Technological Development

Definitions

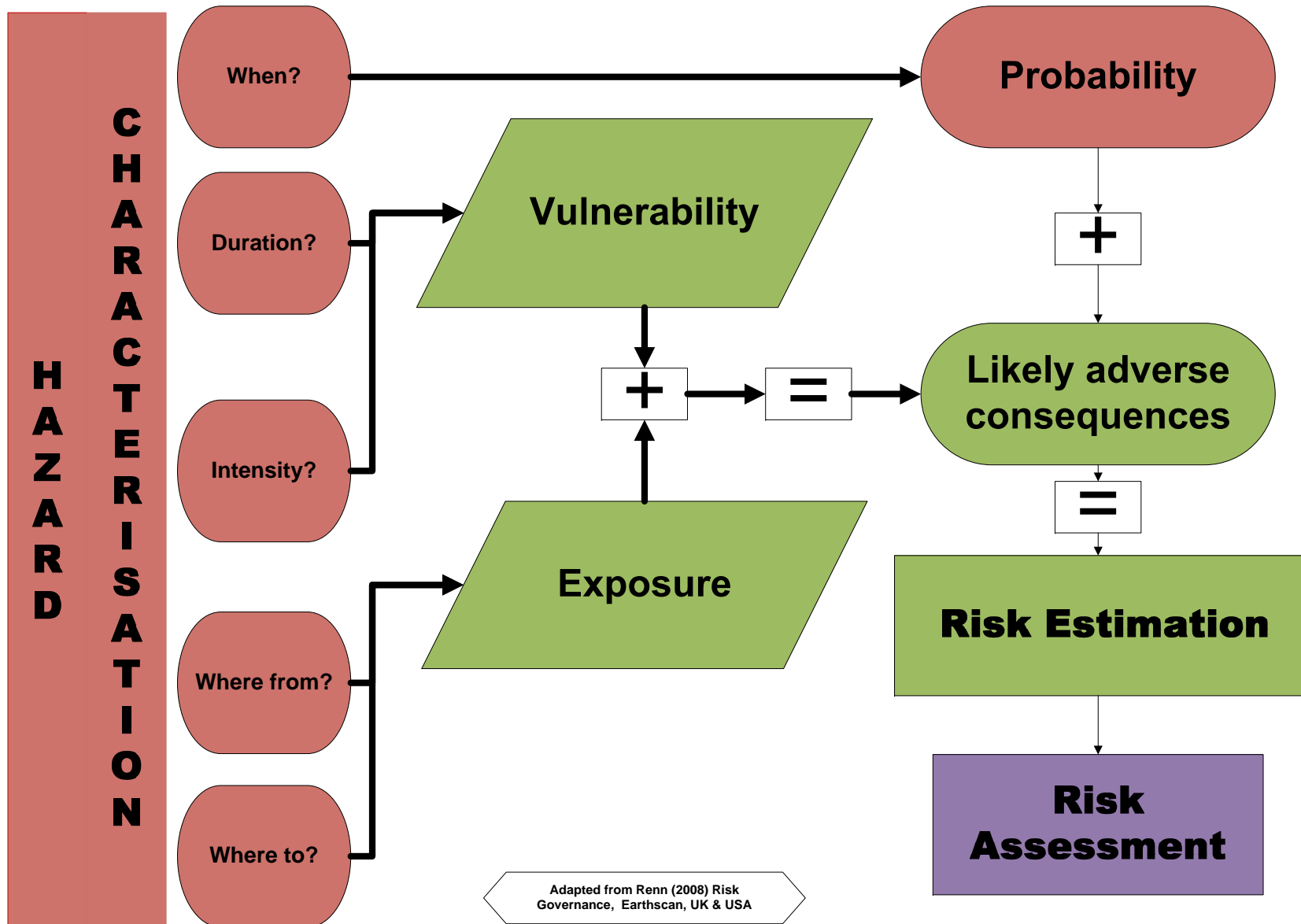


$$\text{Risk} = \text{Hazard} + \text{Exposure} + \text{Vulnerability}$$

Definitions



Definitions



Definitions

Societal risks



Managerial risks

- Institutional risks – Entities
- Professional risks - Individuals



Definitions

Standard Equivocality

The absence of commonly recognised standards (norms) capable of guiding, measuring and evolving acceptable practice

Rothstein 2002; Hood 1986



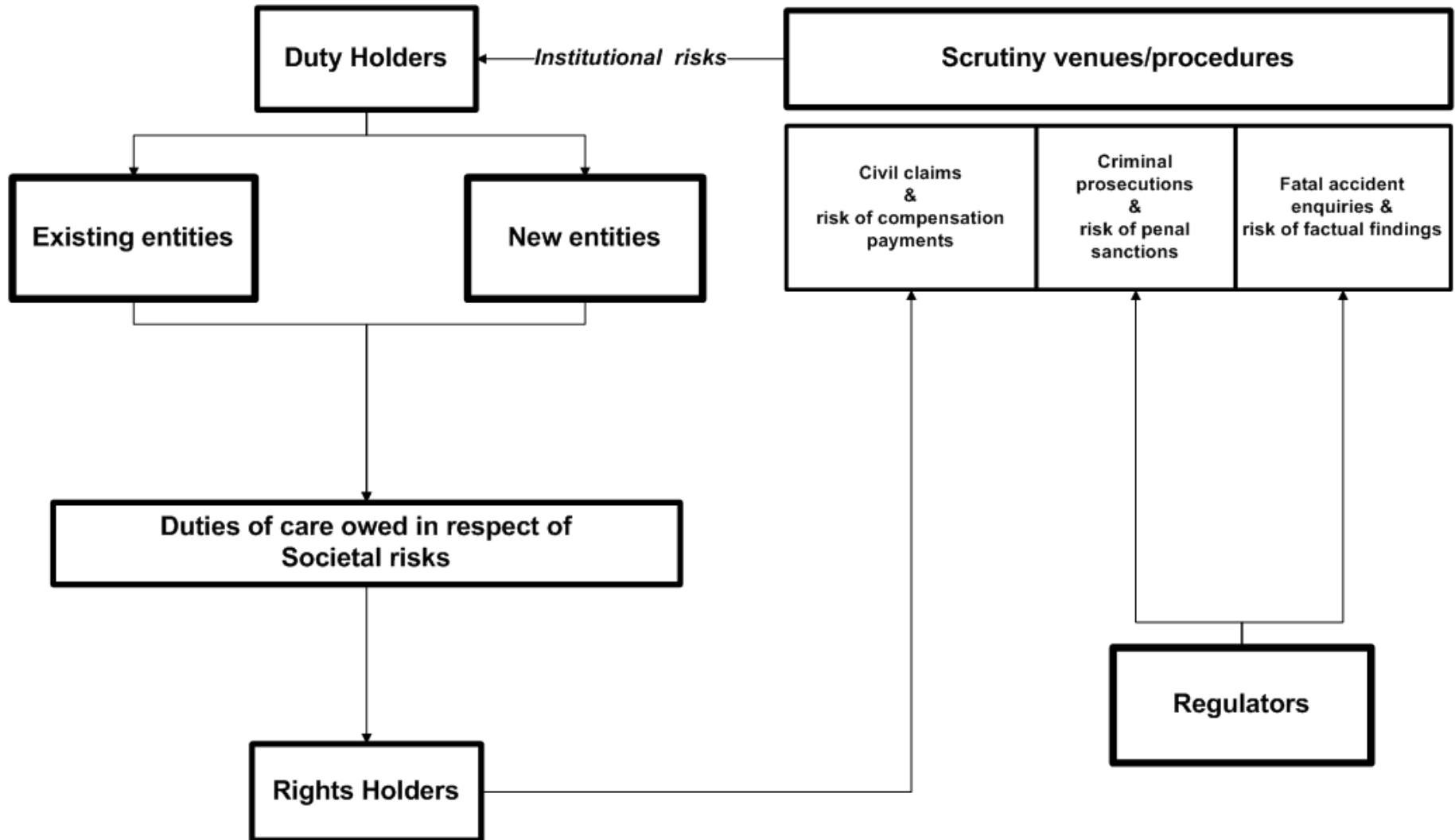
The link between Societal and Managerial Risks in the context of volcanic hazards

	Societal risks
Hazard	A wide range of scenarios including ash, lava, lahars, pyroclastic flows etc. that represent volcanic hazards
Exposure	People & assets within the spatial parameters of the hazard in question.
Vulnerability	The susceptibility of the exposed people/assets to the physical parameters of the hazard in question and the resulting consequences (i.e. death, injury or damage).

The link between Societal and Managerial Risks in the context of volcanic hazards

	Managerial risks
Hazard	The governance of the Societal risks of volcanic hazards
Exposure	Entities and individuals who are duty holders in law in respect of the governance of societal risks – in reach of the long arm of the law!
Vulnerability	Any situation which represents a failure to fulfil a societal risk duty of care (a non-compliance) and the consequences of non-compliance including, but not limited to, naming-and-shaming, public scrutiny and criminal & civil law sanctions

Laws create the infrastructure of societal risk governance



Constants

- Do not vary from case to case
- Issues of Law not Fact (but they may still be disputed)
- Duty holders (Exposure? Yes. Vulnerability ? Depends!)
- Duties of care (often a function or a desired, qualified on cost/benefit, result/goal)
- Rights holders
- Regulators & their powers

Constants

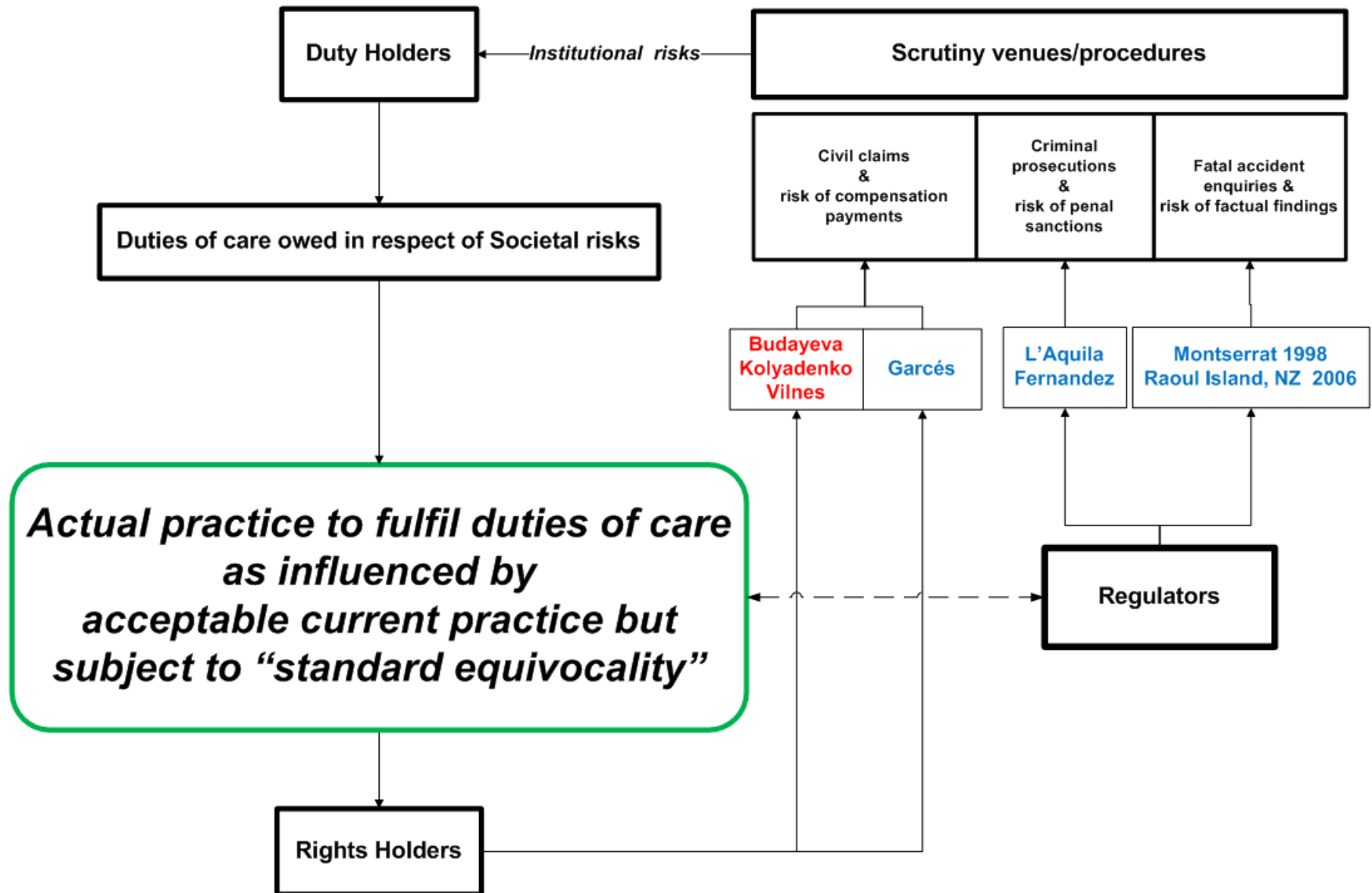
Football analogy

- Playing field
- Position & dimensions of goal
- Players
- Rules of game
- Referee & red cards



NOT how to kick the ball or score a goal!

Laws create the infrastructure of societal risk governance



Variables

- Vary from case to case
- Issues of Fact not Law
- Actual performance which is then measured against what was required in law – Was there legal compliance?

Variables

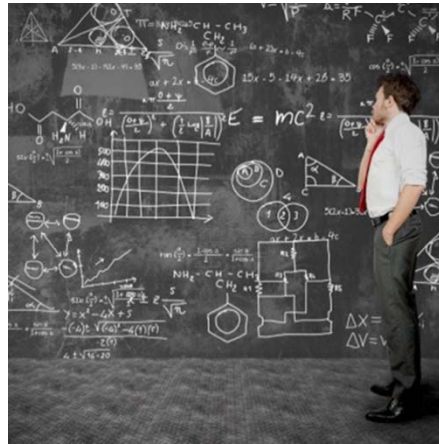
Football analogy

- Actual kicking of the ball
- What actually happened during the game?
- What was the final score?
- Court cases = Slow motion TV replays, in front of partisan onlookers and hindsight experts, to determine whether the ball went over the line and, if not, why not! – Was there legal compliance and, if not, why not?





Laws **create the infrastructure of** Societal risk governance



Societal risk governance **should be based upon sound** Science

Making Policy & Designing REGULATION

Expert judgement input possible to:

- Characterise the temporal, spatial and physical parameters of many hazards thereby answering the basic questions of what, when, where and with what consequences
- Policy Impact Assessments

Policy

Legal regulation

Law-backed
self-regulation

Self-regulation

Achieving REGULATORY Compliance

Expert judgement will:

- enable characterisation of the REGULATED hazard; and thereby
- contribute to characterisation of the risk and
- assist risk mitigation by identifying practicable, science-based risk mitigation options.

Duty holders

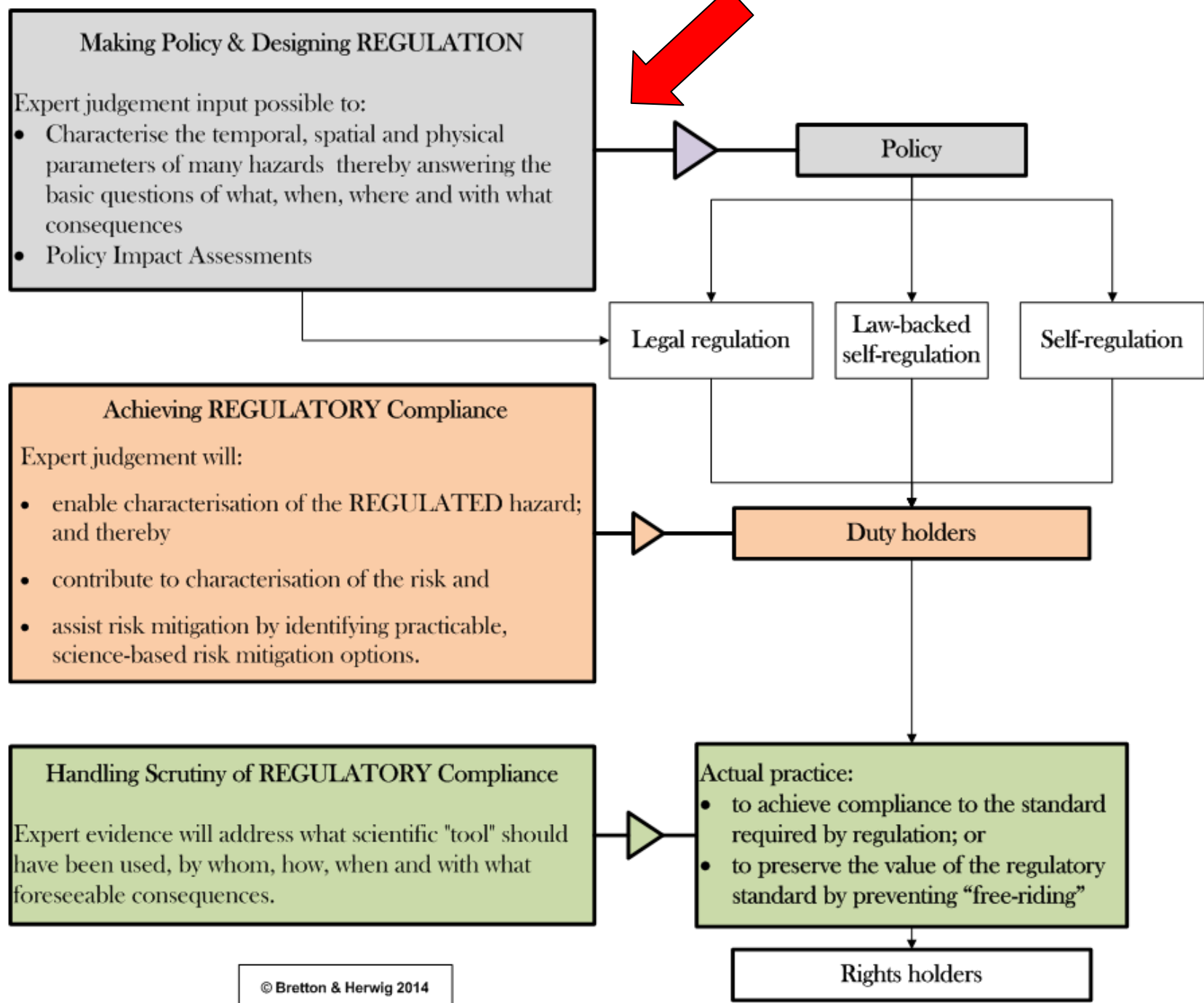
Handling Scrutiny of REGULATORY Compliance

Expert evidence will address what scientific "tool" should have been used, by whom, how, when and with what foreseeable consequences.

Actual practice:

- to achieve compliance to the standard required by regulation; or
- to preserve the value of the regulatory standard by preventing "free-riding"

Rights holders



Scientific input to:

- Characterise the temporal, spatial and physical parameters of hazards
- Answering the basic questions of what, when, where and with what consequences
- Policy Impact Assessments

Expert Elicitation may assist if there are conflicting science inputs

Making Policy & Designing Regulation

Policy makers & Politicians

Decision makers

Proof

Policy makers & Politicians

Burden of

Not applicable

Political drivers - *Credit v Blame*
Economic drivers - *Benefit v Cost*

Standard of

Making Policy & Designing REGULATION

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Law-backed self-regulation

Self-regulation

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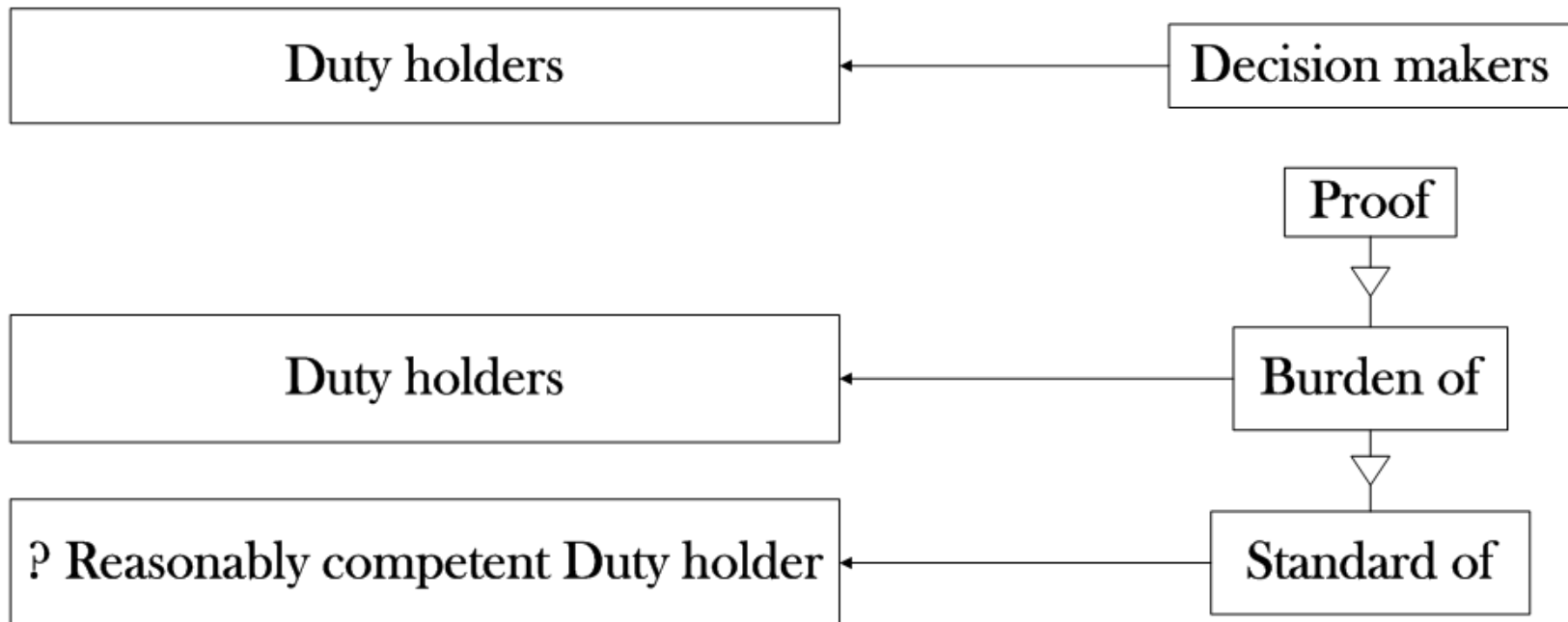
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Achieving Regulatory Compliance



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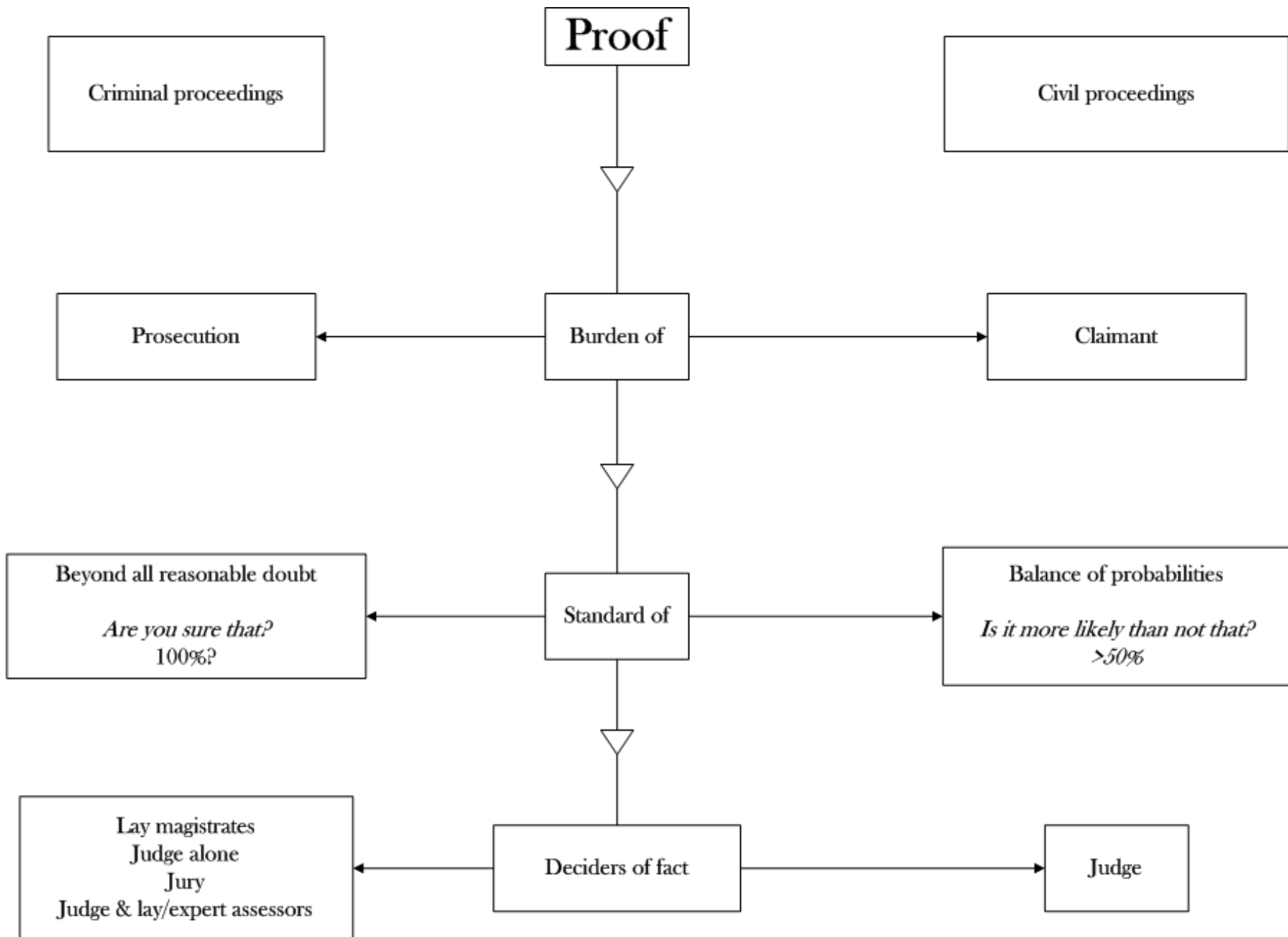
Scientific expert evidence will address what scientific "tool" should have been used, by whom, how, when and with what foreseeable consequences.

Handling Scrutiny of Regulatory Compliance

Science and scientists as
objects of scrutiny
within a scrutiny process



Raises questions of:
Fact
Opinion
Law



Science as a
forensic tool
within a scrutiny
process

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graph LR; A[Science as a forensic tool within a scrutiny process] --> B[Drawing an inference about the proportion of a large consignment which contains something that is illegal. It is not practicably feasible to inspect a whole consignment that contains something illegal. Ought the target proportion inspected be taken as being greater than a particular threshold?]; A --> C[Which of 2 competing propositions is true? Uncertainty about whether the Defendant's shoe, or some unknown shoe, is the source of a mark found at the scene of a crime];
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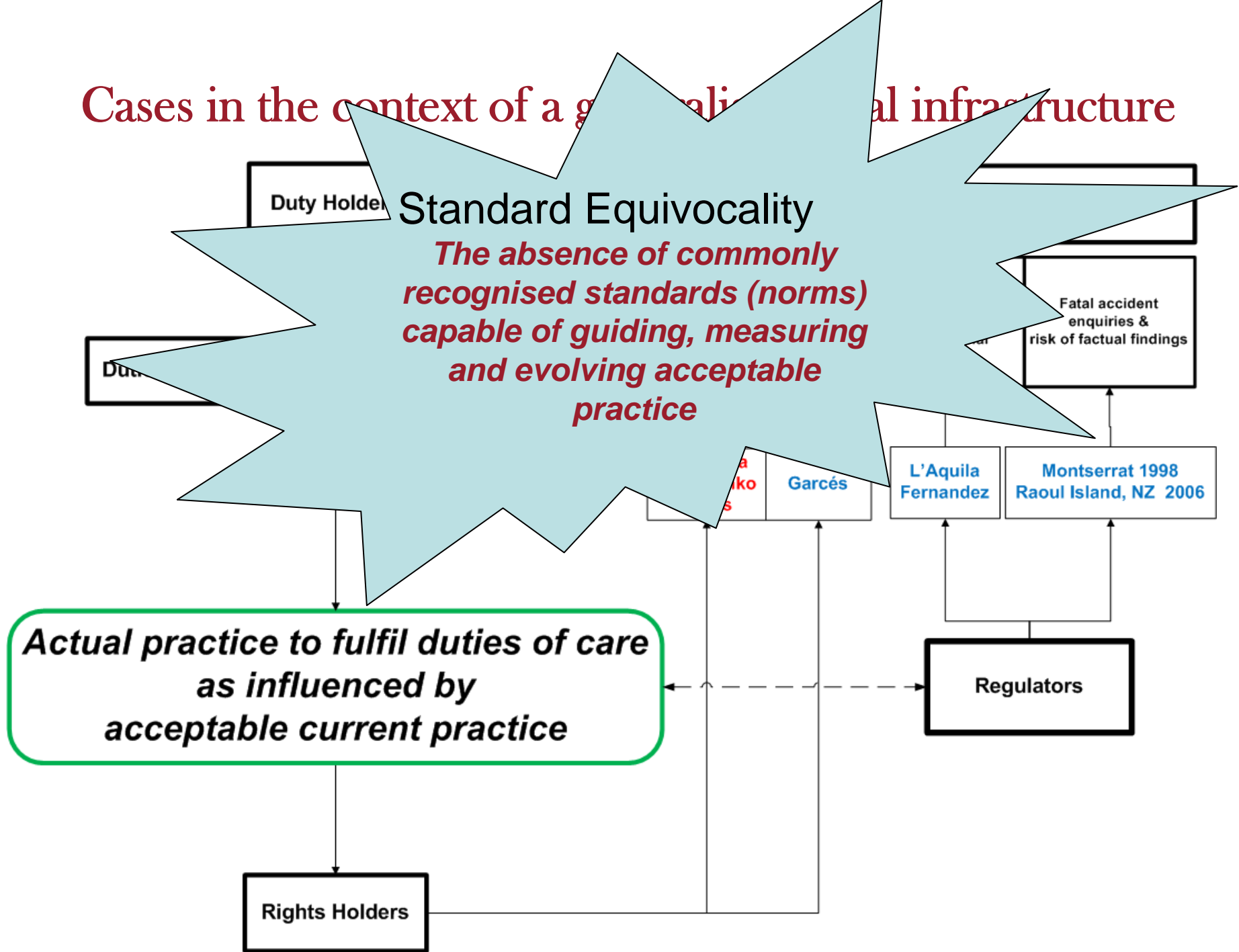
Drawing an inference about the proportion of a large consignment which contains something that is illegal. It is not practicably feasible to inspect a whole consignment that contains something illegal.

Ought the target proportion inspected be taken as being greater than a particular threshold?

Which of 2 competing propositions is true?

Uncertainty about whether the Defendant's shoe, or some unknown shoe, is the source of a mark found at the scene of a crime

Cases in the context of a globalised infrastructure



Standard Equivocality

Football analogy

- What is good play (Acceptable practice)?
- Who are good players (Who are competent experts)?
- Who are good players playing badly (Has a competent expert made an culpable error?)
- When and how can they be measured & verified?
- Can characteristics of good play (competency) be:
 - Recognised?
 - Taught?
 - Improved with coaching?



Responses to Managerial Risks

Performance Management



Get Better

– at Societal risk management



Get Smarter

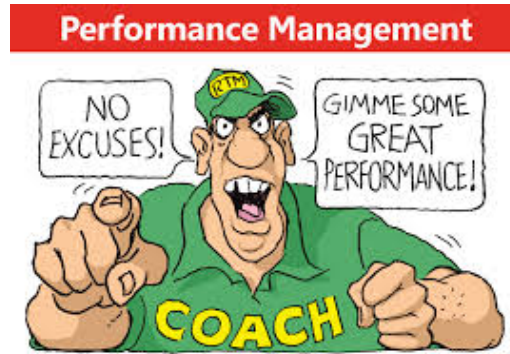
– at Managerial risk management

- Get out
- Get defensive



Get a Lawyer

Responses to Managerial Risks – The Future



Get Better at Societal Risk Management

Volcano Observatory Best Practice Workshop (Sicily, 2013)
IAVCEI (COV8, Indonesia, 2014)
COST (Rome, 2014)

Questions



Cases in the context of a generalised legal infrastructure

